How Organisations Play: Creating Stakeholder Value with Enterprise Gamification

A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, this work is that of the author alone. This work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of this thesis is the result of work that has been carried out since the official commencement date of the approved research program. Any editorial work, paid or unpaid, carried out by a third party is acknowledged, and ethics procedures and guidelines have been followed.

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List of Publications

This doctoral dissertation consists of a summary of the following peer-reviewed publications that are referred to in the body of this document. This dissertation also includes original research that has not yet been published.


Abstract

The application of gamification to enterprise business challenges has become a significant area of interest among researchers and practitioners over the past five years. This interest is driven by the perceived need for more effective business management approaches in an environment where workplace and market disengagement is common, and where technology is disrupting traditional approaches to organisational strategy, design and development. Limited by a lack of rigorous research, industry need for an informed approach to applying gamification in enterprises has become necessary to advance the domain.

This research aims to: (a) identify effective approaches to enterprise gamification grounded in both rigorous research and industry experience; and (b) identify potential tools and frameworks that may assist in advancing the research domain and the practice of enterprise gamification. To this purpose a design-science approach was adopted due to its focus on innovative problem-solving in enterprise information systems, and its emphasis on the production of practical research artefacts as a contribution to knowledge and theory.

The core research question in this study is: *What are the key success factors in creating stakeholder value with enterprise gamification?* This work examines how organisations have been attempting to create business value with the use of gamification. Four distinct but interconnected research modules were subsequently developed, using a mix of epistemological and methodological approaches to address the different facets of the research question.
From a conceptual perspective, the first research module examines how enterprise gamification can be informed by design disciplines to develop a holistic design framework, methodology, and design tools. The next research module undertook an empirical study of over 300 examples of enterprise gamification to develop a taxonomy consisting of five core elements and 41 sub-elements.

Following on from this is the third research module which consists of a survey of 25 global organisations on their direct experiences with the design, development and implementation of enterprise gamification projects. A combined total of 11.5 million users were affected by the projects in this survey which represents a substantial representation and an original piece of work. The final research module is a conceptual study of the capabilities required by an organisation to create and implement an effective enterprise gamification project. A capability framework was consequently developed by synthesising the findings derived from the combination of the preceding research modules.

The overall results of this study highlight the need for a rigorous and holistic approach towards gamification project development involving the triage of design, technology and management. This study’s four research artefacts and corresponding findings offer a contribution to this research gap.

The findings of this research, as well as an accompanying reflection on the business ethics of gamification enhance our critical understanding of the effective design and best-practice implementations of enterprise gamification.

This dissertation is presented in two parts: Part 1 provides a concise overview of the research findings; and Part 2 contains the detailed studies of each of the four research modules.
Part 1: Research Summary
Chapter 1: Introduction

This chapter outlines the research objectives, research problem and research questions at the core of this dissertation. A proposal is also put forward on the positioning of enterprise gamification at the intersection of the three research domains of design, management studies and information systems.

1.1 Research objectives

The objectives of this research were to: (a) identify effective approaches to enterprise gamification grounded in both rigorous research and industry experience; and (b) identify potential tools and frameworks that may assist in advancing the domain and practice of enterprise gamification. The overall aim of this research was to investigate how organisations can use gamification to improve their business performance and create sustainable value for their stakeholders.

Gamification has grown in popularity among practitioners and researchers over a relatively short period of time (Deterding, Dixon, Khaled and Nacke 2011; Huotari and Hamari 2012; Werbach and Hunter 2012), and has shown promise as a tool that can help organisations improve employee and customer engagement through product, process and system redesign (Lee et al. 2013; Mollick and Rothbard 2014; Thom, Millen and DiMicco 2012; Walz and Deterding 2015). However, the domain has been restrained by limited objective and rigorous research to validate its claims of driving organisational improvements (Deterding 2011; Hamari, Koivisto and Sasra 2014). It has also been criticised by some for exaggerating its benefits (Fuchs, Fizek, Ruffino and Schrape 2014), and for representing a subversive form of manipulation and trickery (Bogost 2011; Fuchs et al. 2014).
As a doctoral researcher and practitioner in organisational strategy and development, my aim was to undertake a critical and objective review of the domain and identify how enterprises can use gamification effectively so they can meet their stakeholder value creation objectives.

The research goal was to achieve this by generating new knowledge via a critical review of current applications of enterprise gamification, to produce new insights into the strategy, design and implementation of enterprise gamification applications. As design knowledge grows in part from practice (Friedman 2003), this dissertation provides a systematic and methodological enquirey into enterprise gamification practice as a foundation of theory building.

A further objective of this work was to create practical research artefacts in the form of management tools and frameworks. The aim was to build a body of work that can be utilised by both researchers and practitioners to advance the enterprise gamification domain. To this purpose, a design-science approach was adopted due to its focus on innovative problem-solving in enterprise information systems, and its emphasis on the production of practical research artefacts as a contribution to knowledge and theory. This is research approach is detailed in Chapter 4: Methodology.

1.2 The research problem

The domain of enterprise gamification is affected by the following four key research problems that are affecting its long-term development:

1) an overhyped industry rhetoric that tends to overstate the power of enterprise gamification to transform business performance (Bogost 2011; Fuchs et al. 2014; Walz and Deterding 2015).
2) a lack of rigorous research and frameworks, which is preventing organisations from making informed and strategic decisions about gamification project investment (Lee et al. 2013; Mollick and Rothbard 2014; Thom, Millen and DiMicco 2012; Walz and Deterding 2015).

3) the absence of robust management models and frameworks for practitioner use, which renders gamification vulnerable to moral and ethical issues, particularly as it is generally used as a persuasive technology (Fuchs et al. 2014; de Winter and Kocurek 2014; Bogost 2011; Nicolson 2012).

4) an alleged 80 per cent failure rate of gamification implementation (Gartner 2012), which may also be a result of the above three combined.

Despite these overarching research problems, there have been ample isolated reports of successful applications of enterprise gamification to warrant further considered research and investigation (Hamari et al. 2014; Mollick and Rothbard 2014; Mollick and Werbach 2015; Thom et al. 2012). This presented a significant opportunity for focusing my research, given that industry need for more effective business solutions in the current economic climate is compelling.

1.3 Enterprise gamification as an information system

An important element of this research is the placement of gamification at the confluence of various domains that include design, management and information systems (IS). To date gamification research has largely focused on the motivational affordances and psychological outcomes of gamified applications, espoused by scholars with design or human-factor perspectives (Deterding et al. 2011; Deterding 2012, 2014; Hamari 2013, 2015; Hamari et al. 2014; Huotari and Hamari 2012) – a focus that is often narrow for
gamification in enterprise applications, particularly in large, complex organisations with a dominant logic focused on financial return on investment.

Enterprise systems and processes are largely cross-purpose and cross-functional, and new applications need to integrate with (or transform or replace) complex and costly legacy systems and processes. This can often present significant challenges for gamified applications, which need to consider the corresponding impact on an enterprise beyond human-factor issues, to also include systems and organisational implications.

As a new and emerging field, enterprise gamification has lacked robust theories or frameworks, largely drawing on other fields including psychology, technology and design. This study’s specific focus on a holistic view of enterprise gamification positions it at the intersection of the four fields of game design, human-computer interaction (HCI), information systems (IS), and strategic management.

Over the course of this research, it became apparent that there are two key components of an enterprise gamification application, with each affected by different design objectives and implementation challenges. While this is discussed further in this dissertation, an overview of the two components is as follows:

1) The ‘back-end’ which is where a gamification project is designed as an IS to collect and process data about customer or staff behaviour, to be used as business intelligence in management decision-making. This falls in the domains of IS, information technology and business strategy.

2) The ‘front-end’ of gamification is designed around motivational affordances and the game design patterns that influence user motivation and interaction. This falls in the domains of design, information systems and HCI.
These two parts need to work in tandem to deliver a successful gamified enterprise system. One part engages users (front-end), the other enables business intelligence to be generated (back-end). One of the main arguments in this dissertation is that these two components are unique in their own right but need to work together for organisations to make more informed design and investment decisions on enterprise gamification projects. The diagram below illustrates the breakdown, or anatomy, of an enterprise gamification project.

![Diagram of enterprise gamification project anatomy](image)

**Figure 1: Anatomy of an enterprise gamification application**

The findings of the research undertaken in this dissertation indicate that organisations that have implemented an enterprise gamification project often take a holistic approach across front-end and back-end functions which is in line with a strategic view to project design, technology selection, and management. For this reason, this dissertation has addressed the research problem by taking an end-to-end perspective of an enterprise gamification implementation within the enterprise. It is important to make this position clear at this juncture as it is unique to this thesis.

The theoretical and practical implications of the treatment of enterprise gamification, in part, as an information system presented the opportunity to utilise the Information System Success Model (DeLone and McLean 1992,
2003; Venkatesh et al. 2003) to inform my research, and in turn provide a contribution to this theory.

1.4 Research questions

The core research question explored in this dissertation is: *What are the key success factors in creating stakeholder value with enterprise gamification?* This focus on stakeholder value creation was derived from the perceived organisational need for performance improvement and innovation that is ethical and sustainable over the long term.

At the foundation of this research question is the *stakeholder theory of the modern corporation* which asserts that there are many stakeholders to an organisation in addition to traditional ‘shareholders’ such as employees, customers, suppliers and community that need to be taken into consideration in enterprise strategy development and implementation. In addition to this, the role of ethics and ethical conduct is of significant importance in business decision making (Freeman 1984; Miles 2012; Donaldson and Preston 1995).

This core research question is comprised of four sub-questions:

1) What are the key **design principles** and decisions that might need to be considered for effective gamification design?
2) What are the key **technical features** of current enterprise gamification constructs in the enterprise? Specifically, what are the technologies, purpose, audience and game design patterns currently being used?
3) What has been the **management experience** to date of organisations that have experimented with gamification? What do they see as the key enablers, barriers and capabilities for successful implementation?
4) What are the implications for the **design, implementation and management** of gamified applications in the enterprise?
The key elements of these research questions – design, technology and management – were used to triangulate the research problem. Four distinct yet overlapping research modules were designed to develop a holistic understanding of gamification in the complex context of an enterprise.

The structure and corresponding elements of these questions are not uncommon in research domains that are at the confluence of technology and organisational systems and processes. For example, the Dynamic Capability Theory (Teece, Pisano and Shuen 1997), the Capability Approach Theory to systems design (Sen 1988, 1990), and the User Acceptance of Information Technology Theory (Venkatesh, Morris, Davis and Davis 2003) all emphasise the importance of the integration of design, technological and management elements to shape a holistic perspective of the essential features of system design for effective and sustainable organisational improvement. Finally, this triage is also the foundation of the design-science research paradigm (Hevner 2007; Hevner, March, Park and Ram 2004; Venable 2009) that has informed my research design. Design science operates at the intersection of management, people and systems (Hevner et al. 2004), and this has provided an optimal approach from which to explore the complexities of how gamification can work in an enterprise. This approach is detailed in Chapter 4: Methodology.

1.5 Definitions in this dissertation

The definitions of key terms used in these research questions are as follows:

- **Gamification** is a set of game design patterns, technologies and organisational capabilities that enable an organisation to create value for stakeholders (derived from Huotari and Hamari 2012).
• An *enterprise* is an organisation that is a legal entity that engages in formal activities and ventures that create value for stakeholders (OECD 1993; Sabeti in Harvard Business Review 2011).

• *Enterprise systems and processes* are the structures, organisation and activities that an entity uses to manage its functional, operational, technological and strategic activities (OECD 1993; Sabeti in Harvard Business Review 2011).

• The focus of enterprise gamification needs to be on both internal systems and processes such as IS, enterprise planning, monitoring and reporting systems, as well as externally-facing gamification such as marketing, sales and promotions, which contribute towards overall project and stakeholder value creation goals.

In addition to the above key terms, the definition of ‘success’ in this dissertation is: *Where a gamification project result satisfactorily meets its intended objectives*. This allows for the difficulty in clearly defining an objective measure of success in gamification due to the broad range of uses, motivations and applications that are evident in the domain. This definition of success can be either: (a) specific like a quantifiable goal or metric such as a return on investment, or staff/customer satisfaction survey scores; or (b) broad such as meeting high-level learning or experiential goals where the project has been set up as an experiment or a prototype.

In this introduction, the research objectives, research problems, research questions and definitions at the core of this dissertation have been discussed. In the next chapter, a detailed understanding of enterprise gamification including its positioning at the intersection of several key research domains will be presented.
Chapter 2: Positioning gamification

The purpose of this chapter is to establish a foundational understanding of how gamification has been defined and positioned in this dissertation. It is based on an examination of peer-reviewed research in the domain and also draws on key findings from this study’s field research.

2.1 Defining gamification

The definition of gamification has been evolving over the past five years, but still lacks a clear and unified description (Burke 2014; Deterding 2014, 2015; Nicholson 2012). Rather than provide a comprehensive background on the various definitions, this dissertation outlines only the key works that have shaped the domain into what it is today.

The original definition and use of the term ‘gamification’ is attributed to Nick Pelling\(^1\), who initiated its concept in 2002. His definition was “applying game-like accelerated user interface design to make electronic transactions both enjoyable and fast” (Pelling 2011). However, gamification only became popularised through the later work of US entrepreneur Gabe Zichermann, including his books and series of annual GSummit\(^2\) global events in the USA. He defined gamification as “the use of game-thinking and game mechanics to engage users and solve problems” (Zichermann and Lindler 2010).

The most common definition of gamification has since been attributed to Deterding et al. (2011): “The use of game design elements in non-game


\(^{2}\) www.gsummit.co
contexts”. Yet a more refined version of this by Huotari and Hamari (2012)
is perceived by some as more closely aligned with the primary focus of
design, enterprise gamification: “A process of enhancing a service with affordances
for gameful experiences in order to support user’s overall value creation”.

Two other influential definitions of gamification that have evolved out of
industry are:

• “The use of game elements and game-design techniques in non-game
contexts” (Werbach and Hunter 2012), which has since been changed to
“the process of making activities more game-like” (Werbach 2014) to
better address combined academic and practitioner perspectives.

• “Gamification is the use of game design and game mechanics to engage
a target audience to change behaviours, learn new skills or engage in
innovation” (Gartner 2012). This definition was then changed to “the
use of game mechanics and experience design to digitally engage and
motivate people to achieve their goals”3 (Gartner 2014), which received
considerable backlash from industry practitioners due to its perceived
narrow definition and over-focus on digital technologies.

The gamification domain is currently defined via a mix of these descriptions,
including hybrids based on the researchers’ individual perspectives and the
topic under review. Yet while the lack of a definitive gamification definition
is often perceived as a weakness, it also represents an opportunity for
researchers and practitioners alike to deepen our understanding of the
domain.

A review of the complexity and diversity of how gamification is generally
defined and applied that arose out of this dissertation (Raftopoulos, Walz
and Greuter 2015 – see further detail in Chapter 8) revealed a broad range of

motivations, purposes, markets, methods and technologies. However, it still remains unclear whether a single definitive definition is even possible or would be helpful to the advancement of the domain. Within the design professions, it is often stated that no single definitions of design, or branches of professional practice, adequately cover the diversity of ideas and methods that are gathered together under that label; essentially design “eludes reduction” (Buchanan 1992, p.5). As a design profession, gamification should be no exception.

This study’s findings in Research Module 3 (Chapter 5.3) in relation to defining gamification indicates that it means different things to different organisations. This implies that differing organisational contexts can influence the diversity in definitions. This has been documented by what I have termed as ‘The Five Ways of Enterprise Gamification’:

1) *Gamification as a product*. This is a ‘gamified application’ which is predominantly the use of platforms that offer gamification software as a service (SaaS) such as Badgeville⁴ and Bunchball⁵, or similar self-built systems that gamify a specific organisational product, service or process. It can also be a game or simulation that has been produced for a training or promotions tool, which have also seemingly been labeled as ‘gamification’ rather their traditional terms of serious games or advergames.

2) *Gamification as a way of thinking*. This is ‘thinking like a game designer’ (Reeves and Read 2009) or ‘thinking playfully’ or ‘being gameful’ (Deterding et al. 2011; McGonigal 2011) to motivate or engage your target audience for a specific purpose. An example of this is when German enterprise software developer SAP gamified the  

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⁴ www.badgeville.com
⁵ www.bunchball.com
process of gamifying its software by running a SAP Gamification Cup\(^6\) competition between teams of staff and stakeholders. The competitors were tasked with developing gamified features for SAP’s software. Another example is when Google ran a mystery challenge to subversively recruit engineers, by placing billboards on highways with mathematical equations that would only be noticed by and arouse the curiosity of the right candidates\(^7\).

3) *Gamification as a process.* This is where organisations create a collaborative business process for a specific project or strategy that involves differing elements including gamification to hold the enterprise process together. For example, Citicorp\(^8\) ran an internal Citi-Ventures Challenge campaign to generate business innovation ideas from staff members. Various elements including crowdsourcing, on/off-line events, and social enterprise strategies were employed, with the campaign held together by a gamified innovation platform that managed the end-to-end process.

4) *Gamification as an experience.* This is where organisations facilitate ‘product discovery’ through playful or gameful experiences such as a scavenger hunt. Well-known examples include the audience-targeted launch of JayZ’s autobiography to his music fans\(^9\), and the New York Public Library’s (NYPL) strategy to re-engage the youth demographic\(^10\). In both examples, organisers of the experience created an immersive experience of a digitised scavenger hunt within the architecture of a city.

\(^6\) [http://scn.sap.com/people/mario.herger/blog/2011/05/13/the-game-is-on-sap-gamification-cup](http://scn.sap.com/people/mario.herger/blog/2011/05/13/the-game-is-on-sap-gamification-cup)
\(^9\) [http://realestate.aol.com/blog/videos/real-estate/517371523/](http://realestate.aol.com/blog/videos/real-estate/517371523/)
(JayZ) or a library (NYPL) to embody the experience and the overall intended message about the product or service being promoted.

5) Gamification as a designerly way. This is using game design elements to enhance a design to solve a ‘wicked problem’. A wicked problem is a term that originated with Rittel and Webber (1973) who identified that such problems cannot be resolved using traditional processes; not only do these processes seem unable to resolve them, they may even exacerbate them. Since Rittel and Webber, solving wicked problems has become part of the design lexicon (Buchanan 1992; Friedman 2003; Hevner et al. 2004) and can be seen in the range of complex problems that gamification is aiming to solve. Using game elements as part of a designerly way to solve problems has been a feature of HCI design over the last ten years, where practitioners have identified that the use of game elements, interfaces, aesthetics and narratives have resulted in positive user experiences and process outcomes (Marache-Francisco and Brangier 2013; Friedman and Kahn 1992; Kuka and Oswald 2012).

The working definition of gamification that evolved out of this research and underpins the findings and conclusions is: A set of game design patterns, technologies and organisational capabilities that enable an organisation to create value for stakeholders.

To add depth to this working definition, the Five Ways of Enterprise Gamification provides a frame of reference of the different ways in which an enterprise might use or apply gamification. It covers a wide spectrum of what organisations have perceived gamification to be, and how they have decided to use it given the problem they wish to solve. This study has developed this frame of reference to provide an independent perspective on enterprise gamification, and to produce a useful resource for its target
audience – that is, business leaders making design and investment decisions about how to use gamification in their organisation.

In operational terms, contemporary enterprises are complex organisations, and their leaders need to be aware of the different and nuanced applications of gamification. For this reason, the domain needs to advance from the first classification of gamification that was proposed by Deterding et al. (2011) as the two-by-two matrix (see Figure 2 below), which largely places gamification in the domain of games and play, rather than an organisational context relevant for enterprise systems.

![Classification of gamification by Deterding et al. (2011)](image)

It’s been five years since this theoretical classification was first developed, and researchers can now extend it through an investigation and reflection of the practical gamification artefacts that have been created by organisations during this time. There is now a critical mass of industry implementations for studying how gamification can be used by organisations, to help situate their practices and create further knowledge for the domain.
The challenge for any research, particularly one as fluid as gamification, is to anchor a definition in its field of enquiry. For the investigation of this study’s specific research questions, the working definition above was used to both shape and inform the work. Where the description of gamification appears to vary from the working definition in this dissertation, it is most likely referring to the works of other researchers. Such differentiation in gamification definitions has been clarified in this dissertation as much as possible to reduce confusion.

2.2 Gamification in the enterprise

This section focuses on two well-known enterprises – Nike and Google – which have previously applied gamification as a product enhancement strategy, to explore the similarities and differences. It also provides a discussion about the research game FoldIt, which is often used as a key example of gamification in product innovation.

The three examples in this chapter provide a high-level deconstruction of enterprise gamification in order to establish a foundational level of understanding of the domain before this study’s field research is presented in subsequent chapters. Some information has been drawn from non-academic literature in this chapter to provide perspective around business motivations and the design decisions that organisations make in their gamification strategy. This is to provide the practical context that is fundamental in the design-science approach taken in this research, by understanding how organisations create meaning and value with gamification. These findings are further augmented with peer-reviewed research provided in Chapter 5: Literature Review.
The case of Nike+

A popular example of an enterprise that has successfully implemented gamification is the sportswear manufacturer Nike, which integrated different forms of gamification to create stakeholder value at various touchpoints in its product lines and business process. Nike introduced its first gamified running application (app) Nike+iPod in 2006, followed by the Nike+ running application in 2010 which provided an engaging customer experience in the form of a wearable device fitted with a combined accelerometer and geo-location sensor.

Runners wore these devices in their shoe or on their clothing to keep track of their physical activity and to monitor the distance they have run and the calories they have burned, and in the process earned ‘fuel points’. Nike’s gamified product range continued with the development of wearables with the Nike+ Sports Band followed by the Nike+ Fuel Band in 2012, and eventually moved to pure Nike+ software applications which customers could download onto their smartphone.

To activate the apps (both the wearables and software apps) customers needed to register and provide their contact details to unlock its full functionality. At the time, these Nike applications had led the way in the ‘quantified self’ in the digital sports movement (McClusky 2009; Van Rijmenam 2013). Gamification works in conjunction with the quantified-self applications and is the primary enabler of the functionality (Rapp 2013). The key driver in encouraging behaviour change among application users is self-knowledge generated by their performance data feedback rather than the gamification elements alone.

The focus of these applications, whilst providing for engaging customer experiences, was centred around the key objective of data capture to create improved business intelligence so that Nike could make insightful decisions
about marketing, product development and manufacturing. This has enabled Nike to not only gain control over its customer data, but to deepen the granular level of detail across its supply chain\textsuperscript{11} (Van Rijmenam 2013).

For example, the customer data generated via the Nike apps was used to investigate efficiencies on the production side of the company’s supply chain. This enabled the introduction of initiatives that would not have been possible without the data capture generated by the gamified customer-facing application. One of the key initiatives that was generated was a vendor’s index that was used as an enterprise resource management (ERM) tool to identify inefficiencies and thereby reduce costs by streamlining the supply chain (datamashup.com 2014; Van Rijmenam 2013).

The design of Nike’s gamified apps was supported by an ecosystem of other gamification initiatives, each designed to consolidate and build on one another as a seamless experience for the customer. For example, Nike introduced a gamified website to support the mobile apps, which created an active social network of global runners for what is traditionally a solitary sport. This included shared competitions and challenges, as well as dietary and fitness advice.

Nike has subsequently expanded its use of gamification in new product marketing in the form of playable, browser-based games. These games include customers ‘playing’ a sporting star going through their paces, such as running a sprint, shooting baskets, or kicking a soccer goal. At the end of the game, customers are offered the opportunity to buy the products worn by the game character in the form of a traditional in-game purchase mechanism, or to subscribe to updates of upcoming product releases and special deals (Guarda 2013; Nike 2012; Van Rijmenam 2013).

\textsuperscript{11} http://www.datamashup.info/turning-big-data-into-smart-data-nike-drives-valuable-insight/
In these examples of Nike’s gamification, the data flows that were generated by the games and gamified applications were fed into Nike’s customer relationship management (CRM) system, management support systems (MSS), and enterprise resource planning (ERP) system as depicted in Figure 1: Anatomy of an enterprise gamification application. These reporting mechanisms enabled Nike’s management to make informed decisions about the future of their business product and marketing strategy. Utilising an IS perspective of gamification in this way often provides a deeper understanding of the complexities and interdependencies involved in gamification project design and implementations at the strategic level that focused on both the front-end and the back-end of their gamification initiative.

Overall, Nike’s gamified apps were deemed a success by both the company and the media (McClusky 2009; Van Rijmenam 2013). Nike was seen to have achieved its objective of engaging customers with the brand by providing a unique experience and a value-added service that helped to build customer sales and loyalty. As of April 2014, over 28 million runners\textsuperscript{12} had registered for Nike+ and engaged with the website, and the company’s market share growth had outpaced that of its competitors.

The case of Google

While Nike provides a clear example of gamification success, case studies of gamification failures are not as readily available. Media reporting of gamification project outcomes appears to be mostly positive for public relations, and promotional purposes. Although a relatively well-known case of where gamification was unsuccessful was when Google introduced a point and badge gamification system for customers reading and commenting on the news feed (Mohanty 2011; Wauters 2011). Within hours of the

\textsuperscript{12} http://news.nike.com/news/nike-fuel-lab-launches-in-san-francisco
release of these gamification features on its revamped news service, customers were complaining about their lack of functionality or engagement. Common feedback was that the features were unnecessary and pointless, and a movement started on social media where customers refused to use Google’s news service until the features were removed.

This example highlights how gamification can *destroy value*: in contrast with the Nike example where it *created value* – a theme which is further discussed in Chapter 3: Literature Review. The act of destroying value often occurs when an existing activity is already perceived as intrinsically motivating, where the introduction of external rewards can adversely effect the experience. In psychological terms, this has been deemed as disempowering and reducing human agency, initiative and autonomy (Deci and Ryan 2000; Eisenberger, Pierce and Cameron 1999; Gagne and Deci 2005).

Furthermore, the inappropriateness of Google’s gamification strategy is an indicator that many organisations often apply a ‘me too’ approach in relation to gamification. This approach often involves no clarification of the core problem needing to be solved, including pinpointing the causes of the problem and understanding whether gamification is the right strategy to fix it; and if so, what the most appropriate design decisions are. Learning from this mistake, within days of the release of the gamified features, Google had removed them and restored the service to its former format (Wauters 2011).

**Comparing Nike and Google**

In the case of Nike, it was not gamification alone that was responsible for the overall strategy’s success. A closer examination of this case study reveals a holistic digital strategy at play involving the integration of web, mobile, social networks and big data. Furthermore, Nike’s games and
gamification elements were designed and integrated as a seamless customer experience, which suggests a well-considered strategy based on intimate customer knowledge and a well-executed value creation goals. In the case study of Google’s failure, the gamification strategy appears to have involved the tacking on of a few elements borrowed from game mechanics without considering an overall integration framework, or even running a diagnostic to better identify the core problem.

It is also important to reiterate that ‘successful’ examples of gamification are often reported in isolation of any other mitigating strategies that may have enabled their success or contributed to their failure. This relates to one of the limitations of this dissertation where the field research relates to self-reported examples of enterprise gamification by organisations invested in them. Apart from the potential for self-justification bias from organisations that report on their successes with gamification, the issue still remains of whether is it possible to separate the unique contribution of gamification from a project’s ‘success’. Despite the difficulty in scientifically identifying and isolating the impact of gamification, it is still nevertheless a contributing actor to a project’s success.

2.3 An innovative tool but not necessarily for an innovative outcome

Some of the research findings in this thesis indicate that while gamification can be a driver of innovation, it is mostly used as a tool to support existing organisation constructs rather than to reimagine or reinvent new systems. Design patterns in most gamification projects have not been unique – using gamification to drive innovation appears to be the exception rather than the rule. It has become an innovative tool to deliver improvements to the
current system, rather than a tool to drive systemic organisational change or disruptive innovation. Gamification is therefore most commonly used to drive transactional rather than innovative change.

For example, in the Nike case study discussed above, the company used gamification as an innovative tool to extract efficiencies out of the current system via improved data capturing through customer loyalty and engaging customer experiences. Gamification did not transform its fundamental business model – Nike is still a sportswear manufacturer that produces its products in developing countries and predominantly sells to developed countries via retail outlets and online stores. However, gamification has helped to improve its customer loyalty and captured a benchmark amount of data and analytics, which has improved its product development, marketing, sales and customer service. These outcomes have enabled Nike to advance ahead of most of its competitors.

An example of where gamification has been used as a disruptive innovation tool is the FoldIt game developed by the University of Washington. A Massively Multiplayer Online Game (MMOG) was developed to solve a research problem that its laboratories had been struggling with for 15 years which was understanding the folding properties of the protein enzyme of the monkey AIDS virus. (Khatib et al. 2011). In the tradition of Games With a Purpose (von Ahn 2006; von Ahn and Dabbish 2008) and other serious games and simulations, the university developed FoldIt. The public was invited to play the game without any requisite knowledge of the scientific research problem as FoldIt was puzzle-based game which mimicked the known properties of the enzyme. With over 240,000 participants enrolled to play and thereby contribute to mapping the behaviour of the enzyme, the university was finally able to solve its research problem within 21 days of releasing the game (Khatib et al. 2011).
The *FoldIt* project provided significant inspiration to advocates of gamification movement as an example of where games, and by implication gamification, provide organisations with the opportunity to explore innovation in new and different methods. This is notwithstanding the game’s additional use of additional strategies including crowdsourcing, collaboration and co-creation to achieve its successful outcomes. This is now being replicated across many other medical and scientific research projects around the world in the name of ‘citizen science’, although it is still recognized as experimental and is being used to supplement existing practices rather than replace them. Therefore, the use of gamification for innovative problem-solving is still a long way from revolutionising the enterprise approach to innovation.

However this phenomenon is not unique to gamification. Research in the neighbouring domains of management research and IS indicates that the majority of their models and tools are more inclined towards performance improvement rather than transformational change. This is largely due to organisational inertia, switching costs and structural limitations (Antons and Piller 2014; Polites and Karahanna 2012), organisational culture and business model restrictions (Chesbrough and Rosenbloom 2002), and organisational cognitive biases (Chesbrough 2005). Management scholars like Schon maintained that organisations are characterised by “dynamic conservatism” (Schon 1983 p.30), which is the tendency to simultaneously embrace change but work towards a conservative stable state. It is this very essence that makes it difficult for organisations to transform themselves. Thus, it would be unrealistic to expect or assert that gamification is capable of driving enterprise innovation on its own in the face of these known obstacles.

Despite its apparent limitations as an innovation strategy, research indicates that there are positive benefits that can be derived from gamification
(Hamari et al. 2014; Mollick and Rothbard 2014). In line with these findings, my research (particularly in Research Module 3) indicates that most organisations that have undertaken gamification projects are satisfied with their outcomes, and with the use of gamification to achieve business improvement goals. This in itself provides validation of the potential of gamification and is worthy of further research.
Chapter 3: Literature Review

The purpose of this chapter is to provide an overview of peer-reviewed research in the enterprise gamification domain that gives perspective to the research problem and research questions addressed in this dissertation.

This literature review provides an overview of the enterprise gamification domain, with a focus on gamification as an information system that balances both the front-end and back-end of a project to achieve organisational value creation objectives. As this perspective is unique in the domain there is a limited albeit growing body of empirical research that can be drawn upon. Beyond my direct field of inquiry, I have however drawn upon relevant literature in the gamification domain that have a direct and indirect impact on the enterprise.

While this chapter provides an overview of literature on enterprise gamification, additional literature reviews are provided in two of this study’s research modules:

• **Research Module 1 – Towards a conceptual design framework.** This module contains an additional literature review focused on design methodologies to support the development of a conceptual design framework for an enterprise gamification design process to address Research Question 1.

• **Research Module 2 – Towards an enterprise gamification taxonomy.** This module contains an additional literature review focused on taxonomies used in serious games to support the development of a
grounded theory approach in developing a proposed enterprise gamification taxonomy to address Research Question 2.

In this overview chapter, the literature review is presented in three sections:

- **3.1 Gamification as an information system** provides an overview of empirical research on gamification as an IS in the enterprise.

- **3.2 Gamification in the workplace** provides a critical review of gamification that provides a balanced perspective not only on where it can create stakeholder value but where it can potentially destroy value for the enterprise.

- **3.3 Implications for enterprise gamification** draws upon relevant and related research in HCI, design and technology to provide a holistic perspective on gamification that highlights the risks of opportunities presented by gamification for enterprise systems.

### 3.1 Gamification as an information system

As discussed in Chapter 1: Introduction, there are two important components of an enterprise gamification project: (1) the front-end which relates to the user interface and experience; and (2) the back-end which relates to information systems and technology. Yet empirical research appears to have focused on one or the other – absent is research that has an integrated or holistic view of enterprise gamification as an information system.

For example, the majority of research on gamification in information systems are largely focused on the study of motivational affordances of users so that the organisation investing in gamification can extract greater levels of system utilisation – or the front-end of gamification (Thiebes et al.
The research gap appears in incorporating a whole-of-systems perspective of gamification in the enterprise, particularly in terms of the integration of technology, enterprise strategy, systems, processes and capabilities (the back-end of enterprise gamification) with the front-end motivational affordances.

From a broader research perspective, there have been many scholarly articles and book chapters that provide philosophical, theoretical and conceptual insight, but limited empirical research that has produced tangible artefacts to inform gamification design and business decision-making within an enterprise. For example, several chapters and articles in the anthologies on gamification edited by Fuchs et al. (2014), deWinter and Kocurek (2014), and Walz and Deterding (2015) offer critical discussion on the use of gamification in business applications, but do not offer any original empirical research or field studies to prove or disprove claims of the effectiveness of gamification.

This literature review suggests that there is limited research undertaken that has directly asked enterprise project leaders and decision-makers about their experiences and perspectives on enterprise gamification, as has been done in this study’s field research. This is important for my field of inquiry given, as stated in Chapter 1, that design knowledge is partly informed by practice (Friedman 2003). Furthermore, the objective of design-science research in information systems is to further knowledge in the productive application of information technology to human organisations and their management (Hevner et al. 2004).
An overview of the literature review that has informed this dissertation is discussed below:

Mollick and Rothbard (2014) undertook a field experiment and an additional laboratory experiment to review the psychological responses of employees to ‘mandatory fun’ and the role of consent in producing a positive affect at work. The authors found that games, when consented to, increase positive affect at work; however, when consent is lacking, there is a decrease in the positive affect. This is based on the perspective that enterprise games cannot be treated like entertainment games where players are free to opt in and out. Where there is an expectation to play (especially mandatory to play as is often the case with enterprise games), there is a considerable negative affect on the psychological and behavioural impacts on players.

Mollick and Rothbard (2014 p.7) offered a definition of gamification that is not dissimilar to scholars who view games and play as a ‘capitalist appropriation’ that benefits profits over people: “An employer-imposed game in a work environment where the goals of the game are designed to reinforce the goals and purpose of the employer”. This reinforces the dichotomy of the politics and tensions between ‘management’ versus ‘workers’, which is typical of the industrial view of the firm. This may be because these authors have openly drawn upon the historical works of management scholars writing about work and play in the industrial era (Burawoy 1979; Roethlisberger and Dickson 1943) when developing their definition and shaping their study.

While this is a valid approach for this epistemological position, the approach towards enterprise gamification in this dissertation is based on a contemporary view of post-industrial organisations. This view of
organisations is that they are largely knowledge- and service-based enterprises driven by technological innovation (Benkler 2006; Chesbrough 2005; Hertog 2000; Teece et al. 1997). In addition, they are characterised by an internal focus on building human capital to encourage creativity and innovation by ‘bringing the outside in’ with open innovation, social networks and external collaborations (Benkler 2006; Christensen 1997, 2003). This view is also consistent with the pragmatist epistemological perspective that underpins this research.

Consequently, the focus of this research and the working definition of gamification somewhat differ from Mollick and Rothbard (2014), but still build on their pioneering research on enterprise gamification. It should also be noted that these authors provided a comprehensive summary of research on different forms of workplace games and play that predate gamification, which also provides positive affects and performance. However for this dissertation, these form of games and play have been excluded as they are outside the scope of what constitutes gamification derived from digital or video games.

Thom et al. (2012) articulated the benefits of gamification via an experiment involving the removal of gamification elements from an internal social networking service (SNS), which had resulted in a significant decrease in employee motivation and interaction with the system. The authors recommended that the use of gamification elements, as well as the withdrawal of them, needs to be carefully considered and designed due to the impact it can have on employee motivation and behaviour.

Herzig, Strahringer and Ameling (2012) found positive effects on user acceptance constructs in their experiment involving gamifying an Enterprise Resource Planning (ERP) system which is a subset of the IS domain. The authors framed their research on the Technology Acceptance Model (TAM),
which is a framework commonly used in IS design for testing user acceptance of new or modified enterprise systems. The authors found that gamification yielded performance improvements in factors such as user software enjoyment and perceived ease of use; yet the experiment could not prove that the gamified system affected behavioural intention – that is, that the user’s intention to use the system was motivated by gamification.

Herzig, Jugel, Momm, Ameling and Schill (2013) researched into using game design elements to increase user engagement and motivation for using an enterprise information systems, and one of the outcomes of this research was the development of a modeling language that can be used in the enterprise gamification design process.

Hamari (2013, 2015) in an 18-month field experiment researched the use of badges in a utilitarian peer-to-peer online trading service. While this falls outside the scope of what constitutes an ‘enterprise’ the study nevertheless provided a valuable contribution to understanding the psychological affects such as social influence and goal commitment. Users that actively exposed themselves to using the badges were significantly more likely to actively use the service, however this did not influence usage frequency, quality or social interactions.

Lee, Dugan, Geyer, Ratchford, Rasmussen, Shami and Lupushor (2013) ran a six-month experiment at IBM and found that gamified social achievement had a positive impact on worker motivation and participation in a crowdsourcing project. The authors found that the impact of gamification was higher-quality output and higher user engagement.

Makanawala, Godara, Goldwasser and Le (2013) ran an experiment in applying gamification to a customer service enterprise application to improve job engagement and customer service among agents.
The use of gamification in crowdsourcing, collaboration and online communities has been a popular topic amongst researchers, as has been exemplified by the example of FoldIt in Chapter 1. These examples can be seen applications or strategies that are frequently used by enterprises to improve business outcomes. Morschheuser, Hamari and Koivisto (2016) produced a literature review of empirical research in this domain.

Key papers in the gamification of crowdsourcing, collaboration and online communities include Fernandez, Duarte, Ribeiro, Farina, Pereira and da Silva (2012) who tested gamified collaboration tools to generate requirements for information systems development; Geiger and Schader (2014) who tested a gamified personalized task recommendation in a crowdsourcing information system; Witt, Scheiner and Robra-Bissantz (2011) on the gamification of online idea competitions; Kankanhalli, Taher, Cavusoglu and Kim (2012) on online user engagement; and Kranz, Murman and Michahelles (2013) who researched a gamified crowdsourcing approach that gave users in-game incentives on a mobile application.

There is also extensive research on gamification in enterprise application domains such as market research (Cechanowicz, Gutwin, Brownell and Goodfellow 2013; Puleson 2014; Downes-LeGuin, Baker and Ruylea 2014), advertising (Terlutter and Capella 2013; Bittner and Schipper 2014), and software development (Pedreira, Garcia, Brisaboa and Piattini 2015; Varajao, Martinho and Acosta 2015; Liu and Santhanam 2015), that focus on the motivational affordances of users to improve the effectiveness and efficiency of enterprise systems.

The common theme in these key research papers in this section of the literature review is a focus on how gamification impacts user behaviour in terms of positive affect (Mollick and Rothbard 2014; Hamari 2013, 2015), user interaction with a system (Lee et al. 2013; Makanawala et al. 2013).
Thom et al. 2012), user enjoyment in using a system (Herzig et al. 2012 Lee et al. 2013, Mekler et al.2013; Arparcio et al. 20120), and better quality outputs (Lee et al. 2013, Cechanowicz et al. 2013; Pedreira et al. 2015).

While motivational affordances and user behaviour is a critical component in technology acceptance and utilisation, it is only one of many critical components that determines system success. This is supported by several IS researchers who have evaluated implementation success models for enterprise applications (DeLone and McLean 1992, 2002, 2003; Infinedo, Rapp, Infinedo and Sundberg 2010; Scedra et al. 2002; van der Heijden 2004, Venkatesh et al. 2003), with all agreeing that motivational affordances only partly determine user engagement and acceptance, and use of a new enterprise system.

For example, the Information System Success Model (ISSM) which is a key model in the IS domain that determines the success or effectiveness of an information system (DeLone and McLean 2003), indicates that there are six key interdependent and multidimensional elements that determine system success: System Quality, Information Quality, Service Quality, System Use, User Satisfaction, and Net Benefits. Motivational affordances only form part of the equation for system success, and there are several systemic and organisational elements that also need to be considered. For this reason, the ISSM theory has informed the development and analysis of my field research in Research Module 3.

To complete this section of the literature review, I present other relevant papers that are based on literature reviews of relevant empirical research in gamification of information systems:

- Broer and Poeppelbuss (2013) identified overlaps between IS and gamification research where they share common ground, such as user engagement, and suggested avenues for further research on gamification
from an IS perspective. Their literature review identified that the areas common to both gamification and IS include user learning, motivation and engagement, technology adoption, flow, user satisfaction, and user experience.

- The Hamari et al. (2014) literature review involved the identification and examination of 24 empirical studies; however, only eight of these were specific to enterprise gamification (i.e. most were learning, social networking, or health and lifestyle applications). Their focus was on reviewing the independent variables of examined motivational affordances in the studies, and the dependent variables of psychological or behavioural outcomes. The overall findings were that even though gamification provides positive effects, these are greatly dependent on the context in which gamification is being implemented, as well as the users using the gamified system. This suggests a whole-of-system approach to enterprise gamification may be required.

- Thiebes, Lins and Basten (2014) conducted a literature review on how gamification is being applied to IS, and identified key clusters of game elements (focusing on mechanics and dynamics) that are commonly applied to systems in finance, health, education and entertainment. They identified 29 empirical studies relating to workplace IS and conducted an analysis of these studies to identify which game elements were used in the examples. While they found that gamification elements had been used to motivate users, risks associated with implementations were also identified, causing them to recommend more careful and deliberate design decisions in relation to the gamification elements that are used.

The general consensus from these studies is that gamification has a positive impact on the operation of enterprise systems due to its ability to engage and motivate users. However these studies have also suggested that while
Gamification can have a positive affect, it is only when certain optimal conditions are prevalent to the organisation using it. Furthermore, several of these studies indicated that there are operational risks involved with gamification projects that need to be managed via careful and deliberate design decisions. The apparent research gap that arose in the literature is the need for a more considered view of what constitutes gamification project risks and optimal design decisions, and the capabilities required by organisations to effectively adapt gamification to their situational contexts.

The research outlined above is closely related to this dissertation’s field of enquiry however the gaps and opportunities that present themselves are the examination of enterprise gamification as an end-to-end process. The majority of research to date has largely focused on the psychological and motivational affordances offered by gamification. While this is relevant to my field of enquiry, it only relates to part of the problem my research has sought to address. My research focus is extended to include an equal focus on the decisions, tools and capabilities required by organisations to effectively implement a gamification project.

To conclude this section of the literature review, it is important to note that there is a considerable and rapidly growing body of work that has investigated the use of gamification in fields such as education, learning, healthcare, fitness and wellness that have a solid but indirect contribution to the enterprise gamification domain. However as this research falls outside the scope of the research gaps and research questions under review in this dissertation, I have omitted these from this literature review, but acknowledge their importance to the domain as a whole.
3.2 Gamification used in the enterprise – a meta view

The economics of enterprise rewards and punishments used in the workplace to motivate workers has a long and complex history in the industrial era (Akerlof and Kranton 2005; Fehr and Gachter 2000). Organisation ‘motivation’ to date has largely relied on monetary incentives and has underutilised the ‘motivational capital of organisations’ to engage in more creative and sustainable ways (Akerlof and Kranton 2005). It has also mostly derived from the ‘self-interest hypothesis’ of human nature (i.e. we are all driven to maximise our self-interests above all else), which overlooks the essence of deep intrinsic employee motivators that drive cooperative and collaborative action (Fehr and Schmidt 2006; Fehr and Gachter 2000). The reward/punishment paradigm is predicated on the assumption of self-interest, which is little more than what Fehr and Schmidt (2006 p.683) termed “a convenient simplification” which is not serving enterprises well.

This notion is also echoed by Deming, the founder of Total Quality Management (TQM) a management practice to improve company performance that heavily influenced contemporary operations management (Easton and Jarrell 1998). Deming believed that ‘the prevailing management system is failing our people’ after realising that TQM, created to operate in cooperation with workers, was eventually being used against them (Senge 1990). In the current socioeconomic era affected by rising levels of employee disengagement and declining productivity – often cited as at critically low levels (Gallup 2013; Towers Perrin 2011, 2014) – many enterprises are seeking more effective tools and approaches to address these issues, with some beginning to consider games and gamification as a potential solution.

Presented as being derived from ‘motivational science’ and shaped by the engaging art form of game design, gamification is often sold as a seductive
alternative to more traditional forms of staff engagement, process improvement and organisational design. Fundamentally, however, gamification is a persuasive technology, and persuasive technologies can be just as exploitative as traditional forms of enterprise management, depending on the inherent values, intent and transparency of the system design (de Winter and Kocurek 2014; Llagostera 2012; Nicholson 2012; Raftopoulos and Walz 2014). Thus, if the current enterprise engagement crisis is an outcome of people feeling a lack of meaningful connection, intrinsic motivation and contribution to a system, then gamified persuasive or behaviour design may not be the sustainable solution that it is hoped to be.

Blurring the boundaries between work and play

The boundaries between work, leisure and fun had already begun to blur before gamification was popularised, spurred on by management practices since the 1980s designed to make employees feel more connected, productive or effective at work (Akerlof and Kranton 2005; de Winter and Kocurek 2014; Fehr and Gachter 2000). Precursors to gamification can be traced back to the introduction of playfully-driven business tools and methods used to make work more interesting or to facilitate greater levels of creativity by breaking the traditional patterns of cognition, framing, analysing and finding solutions to problems. These precursors included serious games and simulations (Deterding et al. 2011; Llagostera 2012), pervasive games (Bogost 2007), Games With a Purpose (Khatib et al. 2011; von Ahn 2006; von Ahn and Dabbish 2008), and the more popular or playful business methods such as Gamestorming (Gray and Brown 2010), Innovation Games (Hohmann 2006) and Lego Serious Play (Roos 2006), as well as other forms of workplace games used for specific events or activities (Mollick and Rothbard 2014).
Prior to these organisational games, there were many other analogue forms of play from the 1930s, as documented by Mollick and Rothbard (2014), including games to relieve workers from tedious and boring work activities. However, even though these other earlier forms of organisational play and organisational games were significant precursors to gamification, they have not been included in the scope of this research due to some clear evolutionary differences. For example, these precursors changed the employee experience but not the fundamental nature of the work itself; whereas gamification has the potential to rethink and alter the nature of the work and the organisational systems and processes that support it.

In contrast to earlier formats, games and gamification have been represented as a potential new frontier for improved enterprise performance, due to its apparent ability to better engage with staff to achieve improved business outcomes (Accenture 2013; CapGemini Consulting 2013; Deloitte 2013; Gartner 2011, 2012a, 2012b, 2012c; Hagel, Seely, Brown and Davison 2009; KPMG 2014; PricewaterhouseCoopers 2012; Reeves and Read 2009; Werbach and Hunter 2012; Werbach 2014; Zichermann and Linder 2010).

**Gamification and ethics**

Responsible application of enterprise gamification is similar to the implementation of any other strategic management tool in enterprise settings (Reeves and Read 2009; Werbach and Hunter 2012; Mollick and Werbach 2015), except that robust management tools and governance frameworks have been noticeably absent. Without robust management frameworks, gamification is also vulnerable to moral and ethical issues, particularly as it is often used as a persuasive technology (Bogost 2011; Nicolson 2012; Raftopoulos 2015). Furthermore, there is a dearth of peer-
reviewed research to support industry claims of sustained improved business performance (Deterding 2012; Hamari 2013; Hamari et al. 2014; Huotari and Hamari 2012; Mollick and Rothbard 2014).

This lack of rigour and strategic focus is often seen in the language used by vendors of gamification solutions. It implies that gamification is something that is subversively performed on employees by management using tools and tricks from game design. For example, assertions are often made in popular media about how gamification can be used to ‘exploit workers’, ‘motivate staff with rewards and competitions’ or ‘make work addictive for employees’. The implicit assumption in such rhetoric is that there is diminished agency on the part of the employee to be more engaged and productive at work, and that it is up to management to provide the external stimulus to crank up performance. However, this perspective often neglects the common need for a review of systemic organisational issues that may be affecting overall performance in the first place.

There has also been some questioning over the transferability of the engagement experienced in entertainment games onto gamified applications. Gamification in the workplace often raises an overt or implied obligation or expectation to play in a context where management is potentially watching and measuring workers ‘at play’, whereas entertainment games and play are based on voluntary participation to opt in and opt out to generate true engagement (Llagostera 2012). The argument here is that overt or implied expectation to play completely changes the nature and effectiveness of the gamified engagement.

Other negative or morally questionable attributes in relation to enterprise gamification include extracting value from labour via the shaping of emotions (Bogost 2007, 2011; Dyer-Witherford and de Peuter 2009; Schell 2011), using persuasive technologies or captology to reinforce human
actions and behaviours, such as via surveillance, conditioning and channelling. In addition, gamification has been viewed by some as an operant conditioning type of persuasion tool where technology shapes employee behaviour via a predetermined schedule of reward and punishment (Deterding 2012; Fogg 2002; Llagostera 2012; Schell 2011; Nicolson 2012).

Given the business risks such issues potentially pose, there are two key questions that an enterprise first needs to address: (1) what type of gamification solution will solve existing problems; and (2) how might it inadvertently create new ones?

Another less obvious concern with using gamification technologies is that such data collection could potentially compromise individual privacy such as via performance monitoring, surveillance and ‘leakage’ in gamified enterprise applications. However such issues are not unique to gamification, as they also form part of the wider HCI discourse on data, privacy and ethics of persuasive technologies (Albrechtslund 2007; Ball 2003; Berdichevsky and Neuenschwander 1999; Carroll 1997).

The impact of technology on workplace labour and labour processes in general indicates that empowerment and disempowerment, skilling and deskilling, and autonomy and control often coexist, and is dependent on the context of the organisational and authority structures, and the nature of the technology deployment (Zureik 2003). However, such complexity with regard to the impact of gamification has rarely been researched and discussed.

The table below lists the key themes reported in popular media and previous research on using gamification to create value. It also outlines recurring themes on the potential risks where gamification and related technology can destroy value.
Table 1: Value creation vs. value destruction

<table>
<thead>
<tr>
<th>Create value</th>
<th>Destroy value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Engage and motivate employees</td>
<td>1. Coercive participation</td>
</tr>
<tr>
<td>2. Performance data and analytics</td>
<td>2. Leaky container problem</td>
</tr>
<tr>
<td>3. Improve learning and collaboration</td>
<td>3. Technological whip</td>
</tr>
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<td>4. Shape behaviour and performance</td>
<td>4. Homogenisation of the workforce</td>
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<td>5. Improve employee productivity</td>
<td>5. Loss of human agency</td>
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<td>7. Make work more fun</td>
<td>7. Shallow and inauthentic</td>
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Whether a gamification strategy might either create or destroy value will depend on the design decisions that are made, the implied values in those decisions, and the context in which they are applied. A further exploration of these value destruction elements is presented below:

**Value destruction item 1: Coercive participation**

Games require voluntary participation or opt-in to play. This is a sticking point with enterprise gamification, where even a sense of obligation to play may detract from the experience and hence the effectiveness of the gamification strategy from both a practical and philosophical perspective (Deterding 2012; Deterding et al. 2011; Hamari 2013; Mollick and Rothbard 2014). The ability of games to engage players in gameplay for extended periods of time is well-researched and accepted, as is their ability to assist or even accelerate learning (Foreman et al. 2004; Prensky 2001), with advocates often citing research on goal orientation and intrinsic motivation (Eisenberger et al. 1999; Elliot and McGregor 2002) as an
explanation of the effectiveness of games and gamification, and how it can work in enterprise situations. However, fun and games in the workplace context (where people are under pressure and obligation to perform, and are aware they are being scrutinised, measured and evaluated) remains understudied and lacks the evidence base to support that gamification can lead to sustained improvements in workplace morale and productivity (Georganta 2012).

**Value destruction item 2: The leaky container problem**

The concept of ‘leaky containers’ (Lyon 2003) describes the increasingly fluid movement of data between different applications and networks, particularly as technology and computing become more mobile, intelligent and pervasive (also see Albrechtslund 2007). In the leaky container context, data captured in one application or network for a particular purpose can easily find its way into another application or network and can be used for a different purpose. Albrechtslund (2007) used the simple example of how a surveillance camera intended to capture evidence of shoplifting can also be used to monitor staff.

While gamification is less ubiquitous than surveillance cameras, it does pose the same leaky container problem – gamified applications designed to boost motivation, engagement and performance could also be used for surveillance, performance monitoring, and worker control and conditioning (de Winter and Kocurek 2014). This raises several ethical and moral issues such as whether gamification operates under full transparency, disclosure and user permissions. This is to minimise the potential for misuse or abuse of the information ‘leaked’ into other enterprise systems or applications. The connection between any technology design and its usage is complex and unpredictable. Overarching ethics and design principles can therefore play a key role in providing high-level guidelines and transparency.
measures to ensure human rights are protected, particularly when persuasive technologies are in use (Albrechtslund 2007; Berdichevsky and Neuenschwander 1999).

Such leaky container issues have recently received wide media attention (Ball 2013) with revelations of the US National Security Agency (NSA) and Central Intelligence Agency (CIA) ‘spying’ on players in massively multiplayer online role-playing games (MMORPGs) such as World of Warcraft (Blizzard Entertainment 2014) on the Xbox Live platform and in virtual worlds such as Second Life (Linden Lab 2014), as part of a wider surveillance on potential terrorism (Ball 2013). Such reports have drawn attention to the legitimacy of games and digital gameplay as a means by which people can collaborate, strategise and communicate. Although in contrast, they have also highlighted how such systems can be used by third parties by stealth in this leaky container problem to monitor and ‘spy’ on how people play and who they play with, and to cast judgement on their intentions and motivations on matters unrelated to pure gameplay. This is despite the fact that causal links cannot be inferred between gameplay and real-life behaviours of an individual (Mayer-Schönberger 2009).

**Value destruction item 3: The technological whip**

Surveillance and performance monitoring has often had a key function in enterprise operations, and now with even more sophisticated technological tools they have become more pervasive (Ball 2003). For example, the unrelenting use of pervasive technologies in the surveillance, monitoring and performance tracking of call centres (an area that has many examples of gamification) has been described as the “technological whip of the electronics age” (Ball 2003, p. 203) or as an “electronic sweatshop” (Fleming and Sturdy 2010, p. 192). This shows that over time, the social construct and the traditional structures and hierarchies of the workplace
have mostly remained the same – it is only the technical management tools that have changed and become even more pervasive (Ball 2003; Hanson and Kysar 1999).

These issues form part of the ‘dark side’ of persuasive and pervasive technologies which, including gamification, largely remain hidden beneath the rhetoric of business improvement. Gamified enterprise applications could potentially be viewed not only as leaky containers, but also as yet another ‘technological whip’ that has been developed to maintain current social and enterprise constructs.

**Value destruction item 4: Homogenisation of the workforce**

Data collection, data mining and player dossiers are key features of game development and are a key selling proposition of gamified enterprise applications. In this context, player dossiers are data-driven reports on player gameplay that provide the developer with the information required to develop meaningful constructs about player identity, preferences and motivations. The developer then uses this data to develop a better game design, aimed at reducing player attrition by building in more compelling gameplay, and building and maintaining a profitable game economy (Kennedy 2003; Medler 2011).

Data collection and mining within games also provide the data points required to build feedback loops that earn players points, badges, gear, achievements or currency. Player data derived during gameplay represents behaviours, motivations and actions that may be relevant during the paradigm of gameplay but not to their real life outside of a game environment; hence, no further meaning can be inferred (Mayer-Schönberger 2009). In HCI research, data monitoring and mining has been used to construct user models or personas to develop better human-computer systems and interfaces (Fischer 2001). Yet even within HCI,
issues on misuse and ethics have spurred on calls for greater transparency and controls, particularly when user data is captured across different domains (e.g. phone, loyalty cards, website visits) and synthesised to infer something about a person in a different situational context (Fischer 2001).

The capacity of gamified applications to collect and mine data, and then synthesise individualised player reports on employees is a strong attraction for human resource management; however, this is not proven to be accurate or appropriate. Ball (2003) pointed out that most enterprise human resource management systems (EHRMS) require powerful analytical tools to predict and manage optimum staffing levels, skills and competency development, which are then used in tandem with other ‘softer’ people management technology such as 360 degree feedback appraisals and training needs assessments. Human resource management is a key area targeted by gamification platform vendors, based on the promise of improved employee engagement, productivity and financial performance via inbuilt game mechanics (e.g. Badgeville.com and Bunchball.com).

The use of enterprise gamification platforms appears to provide a different tool for the same purpose, but with a greater level of engagement and persuasion. However, the limitation of these technologies is that they are self-optimising systems, which means they provoke “system conform reactions” from users but are a poor mechanism for attitudinal change (Kuka and Oswald 2012, p. 6). The persuasive technologies used such as measurement dashboards, user feedback and data visualisation were originally developed to control machinery, but are now used to control people. Kuka and Oswald (2012) confirmed that such technology often has a normative influence on the affected workforce, which could cause reduced capacity for divergent thinking for creative problem-solving and innovation, particularly if employees are corralled into the behavioural pre-sets of the persuasive technology.
Value destruction item 5: Loss of human agency

Playful or gameful interfaces used in gamification can lull players into a false sense of trust in the system where they would generally be more discerning (Friedman and Kahn 1992; Llagostera 2012; Marache-Francisco and Brangier 2013; O’Brien and Toms 2008). This is because games in our cultural context are generally viewed as a fun and innocent activity (Bogost 2011; Deterding et al. 2011; Llagostera 2012; Schell 2011), and the rhetoric and ambiguity of play disarms us (Sutton-Smith 1997). It is these sociocultural factors that may make a gamified application appear more trustworthy and persuasive to users than it should be, rendering their users more vulnerable to exploitation.

The power of gamification lies in its persuasive design elements (from a socio-cognition point of view) and in the graphic interfaces that are unique to game development (Marache-Francisco and Brangier 2013). Most HCI professionals agree that persuasive technologies and graphics are key explanations of user commitment to gamified software or applications, which is attained through attractiveness (triggering emotions and providing immersive experiences), opportunities for self and social competition (goal setting, evaluation, rewards), and freedom of choice (voluntary participation and control of the sequence of events). Gamification can become a decisive factor in the design of a successful human-technology relationship (Marache-Francisco and Brangier 2013).

However some concerns have been raised about the increased sophistication in HCI technology via the anthropomorphising of computer systems interfaces (Friedman and Kahn 1992), where human-to-human interaction is used as a model to develop human-computer systems or interfaces. Such technologies can lead people to attribute agency away from themselves and onto computational systems, which diminishes the role and autonomy of
humans (Kuka and Oswald 2012), and can result in reduced work experiences and enjoyment. This is especially apparent in computer-based courseware, where a high level of design can erode the learner’s sense of their own agency and active decision-making in their learning (Friedman and Kahn 1992). A socio-political critique in the HCI domain regarding such technologies that may apply to gamified applications is that the increasingly improved usability of software interfaces has unwittingly become a vehicle for deskilling and disempowering workers (Carroll 1997).

**Value destruction item 6: Illusion of change**

Gamification has the potential to go beyond the capability and reach of traditional ‘workplace games’ or ‘games at work’ such as Lego Serious Play, Innovation Games, and Gamestorming. These games have not fundamentally changed the nature of the tasks being performed; instead only changing the employee experience while the games are being played, without redesigning the job, function or process (Llagostera 2012; Marache-Francisco and Brangier 2013; Mollick and Rothbard 2014).

Gamification could be used to introduce systemic changes to how work is currently designed and managed while enhancing enterprise innovative and productive potential. However, many believe that it needs to go beyond introducing a game layer; it needs to develop a renewed game design-thinking approach in redesigning or reinventing current enterprise structures and processes (Castronova 2005, 2007; Hagel et al. 2009; Reeves and Reid 2009). Yet the key selling proposition among enterprise gamification practitioners and platform vendors is the immediate gains in employee productivity and engagement, rather than on business transformation. This sales focus is likely based on buyer needs and demands rather than the capability or foresight of gamification consultants and vendors.
Most software is designed with a set of explicit and implicit assumptions and values. For example, enterprise computer-based performance monitoring systems (CBPMS) are designed as a form of worker categorisation, enmeshed within the boundaries of the existing workplace’s socio-technical assumptions and values systems (Ball 2003). At the meta level, there is an implicit social design of workplaces (as there are in game worlds), and all technology development in terms of systems and software design reinforces this meta social design – that is, it reproduces rather than changes the status quo (Ball 2003; Carroll 1997; Llagostera 2012). These are pre-existing social constructs, and most games and gamification applications work within these boundaries and are worlds apart from the more idealistic and worldly aspirations that games can change the way we construct the real world (Castronova 2005, 2007; McGonigal 2011).

Organisations are more likely to seek efficiencies in existing legacy systems rather than significant changes or reinvention of the workplace. The latter requires significant financial investment and corporate risk, which is a difficult proposition for most enterprises in challenging economic conditions. On a practical or operational level, most enterprises have a longstanding history and capability in change management and business transformation, involving rigorous processes, detailed procedures, methodologies and systems, as well as a large base of qualified and well-trained practitioners and consultants. Gamification is currently without such tools, and until such time as these enterprise tools are developed, the potential of gamification to develop new systems that emulate game worlds, particularly in the areas of meaningful intrinsic motivation, collaboration, democratisation of power, leadership and decision-making, will remain untapped.
Value destruction item 7: Shallow and inauthentic

Fun in the workplace differs from gamification as a design process and as a management tool but is similarly used to enhance positive affects in the workplace. However, previous research has suggested that ‘fun’ at work is more often about distracting employees from organisational dysfunctions and the taxing controls of management practices. In addition, it has been claimed that fun activities are often used to homogenise the worker experience for better control, while also introducing a level of debilitating “emotional labour” in the workforce (Fleming and Sturdy 2010, p. 195). “Fun at work” programs have been known to backfire, leaving employees disgruntled when such agendas are in reality attempts to cover up poor work practices, which render the exercises shallow and inauthentic, and leave staff disillusioned (Fleming and Sturdy 2010; Fleming and Spicer 2003).

Beyond the rhetoric of gamification

Despite the incidence of the value destruction elements and lack of rigorous research and frameworks, there have been a sufficient number of experiments and reports of successful applications of gamification in enterprises to warrant further considered research and investigation (Hamari et al. 2014; Mollick and Rothbard 2014; Thom et al. 2012).

The potential benefits of gamification should not be ignored or undersold, as industry need for more effective business solutions in the current challenged economic climate is compelling. However, rather than exploring how gamification can prop up ailing, hierarchical enterprise systems, it is its potential to develop systems that positively emulate game worlds that should be further investigated. More specifically, this should be in the areas that will drive renewed creativity and innovation in organisations such as
meaningful intrinsic motivation, collaboration, democratisation of power, leadership and decision-making (Castronova 2005; Hagel et al. 2009; McGonigal 2011; Reeves and Reed 2009).

Management research has often shown that individual and workplace engagement, creativity and innovation are determined by the intrinsic nature of the work itself (Amabile 1982, 1983, 1988, 1996; Cartwright and Holmes 2006; Eisenberger et al. 1999; Elliot and McGregor 2002) while well-designed and executed fun programs mostly provide only a temporary lift in the workplace before it goes back to ‘business as usual’. Without meaningful workplace design, interactions and experiences at the core of the organisation, longer-term employee satisfaction and productivity will be diminished. Whether gamification can provide for these intrinsic motivators remains debateable, particularly when a systemic re-think and redesign is often required; and this is often beyond the scope of a typical gamification project.

3.3 Implications for enterprise gamification

Increased competitive pressures, squeezed financial margins and consequent changes in the enterprise workplace structures over the past two decades have significantly increased the demands on employees, often to the detriment of their health and personal life (Cartwright and Holmes 2006; Gallup 2013; Towers Perrin Global Workforce Study 2011, 2014). Furthermore, changing labour market structures and conditions have fundamentally altered employment policies and practices, with most workplaces lacking security in terms of employment and working conditions with no sustainable long-term solutions in place (Grimshaw, Ward, Rubery and Beynon 2001).
Organisations are now expecting more from their workforce with little perceived return other than employment itself, which has raised levels of cynicism and mistrust among employees within a context of increasing job insecurity. This has a negative impact on job satisfaction, organisational commitment, life satisfaction and self-rated performance (Cartwright and Holmes 2006).

If gamification forms even a small part of the overall solution to these systemic problems, it needs to be done with care so that it is not superficial and meaningless, which will only amplify these labour market issues. It has been suggested that gamification can create seductive experiences (Khaslavsky and Shedroff 1999), be persuasive (Llagostera 2012) and fun (Mollick and Rothbard 2014), and therefore produce improved levels and quality of staff engagement with enterprise systems for at least a short period of time. However, used inappropriately, gamification can backfire and destroy value.

The negative effects of gamification generally occur where there is a lack of awareness or misinformation among managers or designers, a misuse of the technology, or an inability to effectively navigate a trade-off between short-term gains (quick and easy to implement gamification strategies) and long-term benefits (requiring a more considered and methodological approach). This is often attributed to the forced and hurried engineering and design decisions based on tight timelines and resources dedicated to enterprise systems development and implementation, and perceptions that work on values and ethics may slow down system development for minimal gain (Manders-Huits and Zimmer 2009).

In summarising this chapter, the literature review, it has outlined: (a) the early progress that has been made on research on gamification in the enterprise from an IS perspective; (b) literature that has focused on the
proposed benefits of gamification in the workplace; and (c) the potential negative affects of enterprise gamification. The key conclusion for this chapter is that organisations need to take a holistic view of both the front and back ends of a gamified information system, and that without a strategic approach to design and implementation, gamification can destroy rather than create value. This is an important step towards understanding the limitations of gamification in order to minimise the impact of unintended consequences so that gamified systems can better enable enterprises value creation objectives.
Chapter 4: Methodology

The methodology in this dissertation focuses on four core research modules to address the core research question of how enterprises can create stakeholder value with gamification. Given the predominantly self-contained nature of each research module, each designed to address separate sub-questions, different methodologies and epistemological approaches were required. The overall methodology adopted in this dissertation is in line with the design-science research approach, which emphasises the core activity of research as being the development of new and innovative research artefacts to help solve ‘wicked problems’ in the application domain (Hevner 2007; Hevner, March, Park and Ram 2004; Venable 2009). The research modules consequently adopted one of two different epistemological perspectives in order to enable a full exploration of the complex social, technological phenomena of the individual question under review. The two perspectives are pragmatism and interpretivism, which are common in the fields of qualitative research in the information systems domain (Goldkuhl 2012).

Research Modules 1 and 4 adopted an interpretivist approach which generates insight through deconstructing and understanding social constructs such as shared language, meanings and instruments in a domain (Myers 2008, p.38; Goldkuhl 2012). The core idea of interpretivism is to work with these subjective meanings in the topic under review, understand them, reconstruct them (without distorting them) to use as building blocks in theorising (Goldkuhl 2012, p.5). This approach was useful in developing the conceptual frameworks as artefacts of both research modules.
In contrast, the pragmatism perspective is associated with action, intervention, and constructive knowledge (Goldkuhl 2012). The essence of pragmatism is on “action and change – humans acting in a world which is in a constant state of becoming” (Blumer 1969 in Goldkuhl 2012, p.71). Hence this was the ideal paradigm to frame Research Module 2 which delved into the development of the taxonomy (which is by nature a practical tool) and Research Module 3 which generated real world insight into industry experience with gamification by surveying enterprises directly.

There is a growing interest in pragmatism in organisational, management and information research in response to the perceived widening gap and disconnect between research and practice (Goldkuhl 2004; Goles and Hirschheim 2000; Wicks and Freeman 1998). Given its bias for action perspective, a pragmatist approach is most suitable to the field of enterprise gamification at this point in time, as it looks to ground itself within solid theoretical frameworks and models.

In terms of an overall research framework, this dissertation is based on a design-science approach. Design-science research is a set of analytical techniques and perspectives for performing research, particularly in IS (Hevner et al. 2004). The design-science approach is also derived from the traditions of pragmatism which has provided a sound philosophical and theoretical grounding for research into enterprise gamification.

An outline of the methodology used for each of the four research modules is provided in sections 4.2 to 4.5 of this chapter. The more detailed methodologies are provided in the detailed research reports for each of the research modules in Chapters 7 to 10 in Part 2 of this dissertation.

The next section of 4.1 provides an overview of the theoretical foundations of the overall methodology used in this dissertation.
4.1 Theoretical foundations: Design-science in information systems

As discussed in Chapter 1: Introduction, enterprise gamification is a new and emerging field and is still without any robust theories or frameworks. However one of the key defining features of enterprise gamification is that it presents itself in part as a technological innovation through the use of gamified enterprise technologies and platforms, and the use of digital games and simulations that combine front-end and back-end functionalities.

As a technological innovation, gamification therefore has significant IS implications for an organisation, particularly in the areas of Management Support Systems, Enterprise Resource Planning and Customer Relationship Management – as can be seen the example of Nike in Chapter 2, whose gamification strategy encompassed all three of these IS applications. Gamification has received attention from researchers in the IS domain and has opened an area of new research opportunities over the last few years (Broer & Poppelbuss 2013; Herzig et al. 2013; Mekler et al. 2013; Varajao et al. 2014; Liu and Santhanam 2015; Fernandes et al. 2012).

This provides an opportunity to utilize established IS frameworks and models that may help to inform ongoing research and development of enterprise gamification. Therefore the theoretical foundations of this research is based on design-science in information systems (Hevner et al. 2004) and has been used to inform the design of this methodology.

Design Science in IS Research

Hevner et al. (2004) in their seminal work on design-science in information systems research, provide a concise conceptual framework and guidelines for understanding, executing and evaluating research in the IS domain. The
design-science paradigm focuses on problem-solving in human, technology and organisation systems, and provides pertinent and rigorous term of reference for research in enterprise gamification. The key features of design-science in information systems bares similarities with the purpose and focus of gamification in the enterprise, and therefore provides an appropriate theoretical foundation for my field of enquiry. A selection of features in design-science in information systems that overlap with enterprise gamification are as follows:

- An information system is implemented in an organisation for the purpose of improving the effectiveness and efficiency of that organisation;
- Improving organisational effectiveness and efficiency is also a product of the capabilities of the IS, characteristics of the organisation, its works systems, its people, and its development and implementation methodologies (Silver et al. in Hevner et al. 2004);
- Aim of researchers in design-science is to further knowledge that aids in the productive application of information technology to human organisations and their management (ISR 2002, in Hevner et al. 2004);
- Behavioral science is a critical component of design-science (often referred to as the opposite side of the same coin) as it informs researchers and practitioners of the interactions between people, technology and organisations that must be managed if an information system is to achieve its stated purpose;
- Design-science is essentially a problem solving paradigm and it seeks to create innovations that define the ideas, practices, technical capabilities and products used in organisational information systems (Denning 1997; Tsichritzis, in Hevner et al. 2004);
• Theories, methods and systems that are developed using a design-science approach need to take into account functional capabilities, information content and human interfaces;

• Artefacts need to be developed as part of the design-science approach. Artefacts need to extend the boundaries of human problem solving and organisational capabilities by providing intellectual as well as computational tools to problem solving;

• Artefacts that are developed as a product of design-science are broadly defined as falling in four key areas:
  o Constructs: which are vocabularies and symbols
  o Models: which are abstractions and representations
  o Methods: which are practices or algorithms
  o Instantiations: which are implemented or prototyped systems.

In design-science, design is integral to the process of linking all these elements together to accomplish a business goal. Design is both a process (a set of activities) and a product (artefact) and this is consistent with the problem-solving paradigm of the pragmatist approach that is at the core of design-science (Hevner et al. 2004 p.78).

Hevner (2004) states that information systems, and the organisations that they support, are complex, artificial and purposefully designed. They are comprised of people, structures, technologies and work systems - which are the same conditions and constraints under which enterprise gamification operates.

There are four key philosophical aspects of Hevner’s perspective of design-science approach that have also informed my approach to investigating enterprise gamification during my research and on reflecting on the final research outcomes:
The goal of behavioural science is truth, and the goal of design science is utility;

- Truth and utility are inseparable;
- Truth informs design, and utility informs theory;
- An artefact has some utility, and an element of some yet undiscovered truth.

Throughout my research my aim has been to ascertain truth and create utility in the design-science tradition as a means to (a) address the research problems and research objectives at the centre of this dissertation, and to (b) provide a research contribution.

**Applying Design Science to ‘Wicked Problems’**

Design-science research addresses unsolved problems in unique or innovative ways (Hevner et al. 2004 p.81), and encourages researchers to take different or unique approaches to design. The design-science approach works best when requisite knowledge in a field is non-existent, there is a reliance on creativity to find the truth, and that there is an element of trial-and-error that is required in the research effort in tackling a ‘wicked problem’ (Hevner et al. 2004 p.81). These ‘wicked problems’ as described by Hevner, are characterized by the following elements in the list below. Beneath each item, I have indicated to what degree these elements apply in the enterprise gamification domain and to my research:

1. **Unstable requirements and constraints based upon ill-defined environmental contexts.**

   Environmental contexts in enterprise gamification are still fluid, ill-defined and lack overall classification and definitions given the early stage of research;
2. **Complex interactions among sub-components of the problem and its solution.**

There are many complex sub components of enterprise gamification problems and solutions that stem from design, technological, psychological, behavioural, and systems based domains;

3. **Inherent inflexibility to change design processes as well as design artefacts.**

While there is some flexibility within the gamified artefacts that can be developed, there is however inherent inflexibility within the enterprise systems with which gamification needs to integrate;

4. **A critical dependence on human cognitive abilities (e.g. creativity) to produce effective solutions.**

This is a prime characteristic of enterprise gamification, as it is dependent on human creativity, analysis and design to create effective, human-centred gamification solutions;

5. **A critical dependence upon human social abilities (e.g. teamwork) to produce effective solutions.**

This is also a prime characteristic of enterprise gamification design as it requires cross functional & multi-disciplinary teams to produce effective solutions.

Using the theoretical perspective provided by Hevner et al. (2004) enterprise gamification research can be characterised as a ‘wicked problem’. The elements of unstable requirements and constraints, complex interactions, and critical dependence on human cognitive and social abilities are particularly pertinent in gamification research.
4.2 Research Module 1: Towards a conceptual design framework

This module addresses Research Question 1: *What are the key design principles and decisions that might need to be considered for effective gamification design?*

The main objective in this research module was to derive an understanding of best-practice design methodologies, frameworks and approaches that can inform the development of a conceptual model for enterprise gamification. The methodology for this research module was as follows:

- Apply grounded theory in developing a conceptual design framework and methodology based on a literature review on best-practice design methods and frameworks in related design domains. This inductive methodology allowed me to develop a design framework through systematic approach to research into the domain (Glaser 1978, 1998, 2000).

- Apply a practitioner reflection approach using the observational method in naturalistic settings (the enterprise workshop environment for this field research) to test and modify the conceptual design framework and methodology (Ritchie, Lewis, Nicols and Ormiston 2013). Using reflective practice (Schon 1983) I was able to reflect on the effectiveness of the conceptual design framework and methodology and provide further insight into how they can be improved.

In design science, the development of a conceptual design framework constitutes a ‘soft artefact’, which means it has less emphasis on the production of a technical artefact such as a software code common in pure IS research (Amrollahi et al. 2013). There are five main types of applicable evaluation methods for artefacts (Hevner et al. 2004; Peffers et al. 2007),
and in this study the observational method was selected to evaluate the conceptual design framework, which comprised of a field study approach as the key artefact evaluation method (Nakakawa et al. 2010). The field study approach involves the monitoring of the use of a design artefact across several field projects. The observational method is defined as a technique drawn from social sciences which involves the direct observation of a phenomenon in a natural setting (Ritchie, Lewis, Nicols and Ormiston 2013).

This study’s evaluation method consisted of a field study comprising of 16 gamification design workshops with 256 participants conducted across Australia, New Zealand and Germany. It should be noted that participants were not design experts, but domain experts that were interested to learn how they can use gamification design in their field. Participants had little or no understanding of gamification before the workshops. The workshops were designed for organisations interested in using gamification to design engaging user experiences and enterprise applications. The workshops were initiated by enterprise project leaders who approached me or the university directly about participating in our research in exchange for a facilitated learning experience.

The observational method was used in conjunction with reflective field notes with the purpose of gaining deeper insights on: (a) the ease of participant understanding and use of the design framework; (b) how readily participants were able to apply it to their enterprise problems; and (c) areas for improvement for the framework and methodology. The list of workshops is provided in Appendix 1.

The detailed methodology and outcomes of Research Module 1 are presented in Chapter 7 of this dissertation.
4.3 Research Module 2: Towards an enterprise gamification taxonomy

This module addressed Research Question 2: *What are the key technical features of current enterprise gamification constructs in the enterprise? Specifically what are the technologies, purpose, audience and gameful designs that are being used?*

The main objective of Research Module 2 was to undertake an audit of enterprise gamification projects that have been developed over the last three years and map their key features. The aim was to derive a better understanding of the different technologies, purposes, audiences and game design patterns that are in use. The approach in this module was to derive an understanding of enterprise gamification by studying the artefacts that have been created by the early adopters of enterprise gamification.

The methodology for this research module was as follows:

- **Undertake an industry audit of organisations that had self-identified as undertaking a gamification project.** The total sample was 304 case studies.

- **Develop a proposed framework of a gamification taxonomy based on the taxonomies of serious games.** The rationale for this was that in the absence of rigorous gamification taxonomy, serious games provide a reliable foundation. This is based on the fact that serious games have been used and integrated with enterprise systems and processes for several decades, in areas such as staff training, learning and development, system testing, marketing, communication and public relations. On this basis, serious games provide a reliable foundation than entertainment games. Several taxonomies of serious games were
explored and used to develop a broad range of initial parameters from which to test against the gamification examples that were identified.

- **Use a grounded theory approach to derive an enterprise gamification taxonomy based on an analysis of the 304 examples.**
  
  This involved building a theory about the taxonomy inductively from that data that was collected during the audit. This was executed through a comparative analysis of the first conceptual categories that were derived from serious games, then through developing a generalized theory from the data (Glaser and Strauss 1967; Glaser 1978, 1998, 2000).

The audit questions for the investigation of the 304 examples are provided in Appendix 2. The detailed methodology and research report of Research Module 2 are presented in Chapter 8 of this dissertation.

### 4.4 Research Module 3: Understanding the enterprise experience with gamification

This module addressed Research Question 3: *What has been the management experience to date of organisations that have experimented with gamification? What do they see as the key enablers, barriers and required capabilities for successful gamification implementations?*

The objective for Research Module 3 was to directly survey a sample of organisations from the pool of 304 organisations identified in Research Module 2. The aim was to undertake a deeper analysis of the direct organisational experience with implementing enterprise gamification projects. A total of 40 invitations were sent out to complete a confidential online survey, and 25 responses were received.
Survey questions covered a wide range of managerial and operational variables including open-ended questions exploring respondents’ views on the barriers and enablers to successful gamification implementation.

The methodology for this research module was as follows:

• A total of 40 enterprise gamification examples were selected from the 304 in the database accumulated in Research Method 2 and invited to participate in the survey. A selective sampling method was used to ensure that participating organisations had undertaken a thoughtful and rigorous approach to their gamification project, and were perceived leaders in their field. This was determined by examining the contribution of these organisations about their enterprise gamification experiences through the public media and in gamification conferences.

• With a total of 25 surveys returned, the combined gamified projects in this sample equate to 11.4 million users (a combination of internal staff and external customers or stakeholders) that have been affected by these gamified enterprise applications. This represents a significant sample and an original piece of work in the enterprise gamification domain.

• The online survey contained 17 multiple choice questions and 3 questions used 5-point Likert scales for responses to 34 sub-questions were posed, and were analysed using quantitative methods. Four open-ended questions were also posed, which were analysed using qualitative methods of card sorting and affinity mapping (Ritchie et al. 2013; Denzin et al. 2000). The online survey instrument was developed using RMIT’s Qualtrics account.

The detailed methodology and research report of Research Module 3 are presented in Chapter 9 of this dissertation.
4.5 Research Module 4: Towards a capability framework

This module synthesised the findings of Research Modules 1, 2 and 3 to address Research Question 4: *What are the implications for the design, implementation and management of gamified applications in the enterprise?*

This research module also used grounded theory (Glaser and Strauss 1967; Glaser 1978, 1998, 2000) to find common denominators among the key findings of Research Modules 1, 2 and 3 to derive an understanding of the organisational capabilities that are required to design, develop and implement optimal enterprise gamification applications. The methodology for this research module used the survey data to extrapolate capability issues, and then used a card-sorting technique (Ritchie et al. 2013; Denzin et al. 2000) to identify a set of common denominators to form a capability framework. The detailed methodology and research report of Research Module 4 are presented in Chapter 10 of this dissertation.

**Summary methodology**

A summary of the methodologies used in this dissertation is as follows:

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Epistemology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Module 1</td>
<td>• Conceptual-analytical</td>
<td>Interpretivist</td>
</tr>
<tr>
<td></td>
<td>• Grounded approach in the investigation and development of a conceptual design framework</td>
<td></td>
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<tr>
<td></td>
<td>• Field experiment using a reflective-practice approach to test the conceptual design framework and design methodology</td>
<td></td>
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</tbody>
</table>
Each of this study’s research modules was undertaken sequentially, and while they were independent components concentrating on separate sub-questions, they were all interrelated in how they combined to form a holistic understanding of the research problem and to form theories inductively as a contribution to knowledge.
Chapter 5: Research results

In this chapter, the results of each of the four research modules of this dissertation are presented in a separate section for each module. Each section is structured in three parts: (1) overview of results; (2) summary of results; and (3) conclusion of results. References are also made to the detailed research reports that are provided in Part 2 of this dissertation for each research module.

5.1 Results of Research Module 1: Towards a conceptual design framework

5.1.1 Overview of results for Research Module 1

The results of this research module extend the work of other design fields with proven design applications in the enterprise domain. There is a rich history of design practices used in enterprise settings, and have been used by organisations seeking new perspectives on how design can impact products, services and organisational systems and processes (Brown 2009; Kumar 2012; Mendel 2012). For example, the use of design-thinking as popularised by design firms such as IDEO, Frog Design and XPlane has influenced renewed approaches and tools in service design, industrial design, interaction design and experience design (Brown 2009; Kumar 2012).

In addition to these design fields, using game design elements in systems development also has a history in HCI research as motivational affordances in ICT design and use (Zhang 2008) and as hedonic systems (Van der
Heijden 2004). This study has therefore augmented this research with key features of game design-thinking or gamefulness (Deterding 2012; Fullerton 2008; McGonigal 2011; Zimmerman and Salen 2004, 2014) to develop a conceptual framework for a sustainable and ethical approach to enterprise gamification design.

In game development, the fundamental role of the game designer is to be the ‘advocate of the player’ (Fullerton 2008). This means that the designer must view the game world they are creating through the eyes of the game player. Their full focus needs to be on the player experience without being distracted by the other concerns of production.

Here there is a disconnect between the role of game designer versus the role of gamification designer. In contrast with the full focus on the game player, a gamification designer is often the advocate of management or the investor (the enterprise), and the role of the player or worker is fundamentally subordinate in the game they are developing to meet business requirements. The engagement and experience of the player in a gamified enterprise application is typically a means to an end (business outcome), rather than the end in itself (enjoyment). It is this clear distinction between these two positions, and the tension that arises from it, that often creates the value destruction risks of gamification discussed earlier.

For this reason, a high-level ‘game thinking’ approach was applied in developing the conceptual design framework in this research module, to ensure the gamification designer is an advocate of the player as much as an advocate of management. This is based on the assumption that the greatest opportunity for organisational performance and innovation means finding an equilibrium between these two positions.

To this end, this study incorporated a values-conscious design approach, which has been described as a method that designs technology that
comprehensively accounts for human values (Friedman, Kahn and Borning 2008). Key features included the use of co-design or participatory design with stakeholders at each stage of the design process, and the development of a set of project values that framed the terms of reference for the project. While this design approach is not without its challenges (Manders-Huits and Zimmer 2009), it provides a tested, theoretically-grounded approach that may help circumvent some of the value-destroying aspects of gamification.

From a value creation perspective, a values-driven approach is also significant as a strategic management tool, as it is generally considered a more humanistic approach in facilitating employee engagement and trust, positive culture change, and in providing opportunity for innovation, growth and creative problem-solving (Kanter 2009). Therefore, in an enterprise setting, the discussion and use of values in business settings already has precedence. This approach will also help counteract many of the value destruction risks discussed in Chapter 3’s literature review, as it pays more attention to the unintended consequences of gamification design practices.

The research artefact created in Research Module 1 was a conceptual enterprise gamification design framework focused on sustainable gamification design that will yield a Minimum Viable Design (MVD) for gamified enterprise applications. The detailed study of Research Module 1 is provided in Chapter 7 of this dissertation.

5.1.2 Summary of results for Research Module 1

After a detailed review of various design models and frameworks from a wide range of design disciplines, a conceptual gamification design framework was synthesised that could be used in the enterprise. As part of the development and testing of this framework, several tangible design tools were created to assist organisations in the design process. These tools include a workshop process and several different card-based design tools
that can be used to stimulate organisational thinking and creativity in designing enterprise gamification solutions. The conceptual design framework developed was termed ‘Sustainable Gamification Design’ (Raftopoulos 2014), and further detail is provided in Chapter 7 in Part 2 of this dissertation.

The focus of this research module was to address Research Question 1: *What are the key design principles and decisions that need to be considered for enterprise gamification design?* The corresponding results and key findings are as follows:

1. **Four key design elements.** The results of this research module suggested that the key elements for a potential gamification design process need to consider four different phases if an organisation is to adopt a holistic approach to design (Raftopoulos 2014). Design is about solving wicked problems (Hevner 2008) and that problems that need to be well-defined within the context of the organisation and its operating environment (Friedman 2003). Four common design phases that appear in some form within well-established design methodologies have been identified, which can provide a solid foundation for the practice of gamification design (Deterding 2015; Raftopoulos 2014). These common design phases are illustrated in Figure 3 below are: (A) discover; (B) reframe; (C) envision; and (D) create, and form the foundation of my conceptual design framework for this research module.

2. **Ethics as a design consideration.** One of this study’s unique contributions to a conceptual gamification design framework is the inclusion of ethics as a key design consideration. Ethics has often been at the core of value-sensitive design (Friedman and Hendry 2012; Friedman et al. 2008; Yoo, Huldtgren, Woelfer, Hendry and Friedman 2013) and values-conscious design (Belman and Flanagan 2010;
Belman, Nissenbaum, Flanagan and Diamond 2011; Flanagan and Nissenbaum 2007), as well as being a key discourse in HCI for several decades (Albrechtslund 2007; Berdichevsky and Neuenschwander 1999). Given that ethics has become a key area of concern for gamification researchers (Deterding et al. 2015), it was embedded into this study’s design process as an important feature in gamification design. This is illustrated at the centre of the conceptual design framework as depicted in Figure 3.

3. **Seven-step methodology.** It was found that the key design decisions and actions that need to be considered in an enterprise gamification project include seven practical steps or exercises in a loosely structured process (Raftopoulos 2014). These steps are: (1) setting project objectives; (2) mapping project motivations, methods and outcomes; (3) mapping stakeholder and user personas; (4) creative problem-solving through participatory design; (5) exploring suitable technology platforms; (6) selecting appropriate gameplay and game mechanics; and (7) prototyping, piloting, testing and launching the gamified enterprise application. These are also illustrated in Figure 3 below.
The evaluation of this study’s conceptual design framework involved a field study using the method (Ritchie, Lewis, Nicols and Ormiston 2013; Nakakawa et al. 2010). This process delivered insights that had refined the framework and methodology over the course of the study. Most importantly, it had highlighted the need to develop templates or workbooks, as well as tools such as design cards, to assist participants through the process. This was a particularly insightful and useful exercise, as most leaders of gamification projects are project managers who may not possess sufficient design skills and expertise. The results of this evaluation are outlined below.

**Evaluation of the conceptual design framework via reflective practice**

This evaluation involved a field study comprised of sixteen facilitated workshops with 256 project managers from various roles in enterprise domains, such as human resources, project management, marketing, and
innovation management (see Table 4: Summary of workshops for further detail). It should be noted that participants were not design experts, but domain experts that were interested to learn how that can use gamification design in their field. The workshops were targeted at organisations interested in using gamification to design engaging user experiences and enterprise applications. Reflective field notes were taken on: (a) the ease of understanding and use of the gamification design framework; (b) how readily they could apply it to the real-world problems they brought to the workshop; and (c) suggested areas for improvement to the framework and methodology.

Reflective-practice was selected for this research module because as a design discipline, the conceptualisation of the gamification design framework needed to be tested in practice to fully address the question. Maintaining a reflective journal from a methodological perspective was an integral part of the research process (Boud 2001; Ortlipp 2008; Schon 1983, 1987) and in the continual refinement of the design framework and methodology.

The limitation with this approach is the bias of the practitioner, which is duly acknowledged in this dissertation. However as Schon (1983, 1987) pointed out, even though such biases are invisible and unconscious to the practitioner, they are an integral part of the artistry of effective practice.

The following eight key findings stemmed from this study’s evaluation of the conceptual design framework:

1. **Participants like structure.** Participants responded positively to this structured approach towards gamification design. Most participants perceived it as comprehensive, which enabled them to take gamification “more seriously”.
2. **Work vs. fun and games.** There were several participants at each workshop that were surprised that the design process “involved so much work”, in response to the seven steps in the methodology. Participants with these types of views were often expecting a “simple and fun” process that was easy to implement and did not require specialised facilitation. This observation reinforced the findings in the literature review that there is a wide, inconsistent perceptions of what constitutes gamification, and that there is a misconception that gamification is all about “fun and games”.

3. **Practical guidance was needed.** After the first five (out of sixteen) workshops, it became evident that there was a need to better communicate the conceptual design framework and provide an even more detailed step-by-step guide during a practical design workshop. While most participants found the conceptual framework useful, they were looking for a practical approach to ground themselves in the process. It became apparent that tangible tools would be needed to anchor participants during a gamification design process particularly while they were simultaneously learning about this new domain and how to apply it in a practical way. This is highly insightful feedback, as most project managers responsible for gamification design are not professional designers, but rather organisational process or domain experts. It highlighted the need to develop templates for participants to work with as a guide, along the lines of the design-thinking methodology developed by IDEO (2003).

4. **Templates to guide design.** A set of templates in the form of ‘design canvases’ were therefore developed for the remaining workshops that were informed by the Toyota A3 method (Shook 2009), design-thinking
(IDEO 2003) and business model canvas (Osterwalder and Pigneur 2010).

5. **Design tools as prompts.** In the next five workshops that included templates, participants responded positively, quickly engaging with the template booklets by adding notes and drawings. However, it became apparent that additional tangible tools would be required during the workshop design process, particularly in the early phases of the conceptual design framework of Discover and Reframe. There was a tendency for workshop participants to rush through these early phases, which in all design professions are arguably the most important for drilling into stakeholder analysis and problem definition. In particular, the participants often rushed towards selecting the best game mechanics steps in the process, which personified gamification to most participants. It therefore emphasised that the gamification design process needed to be slowed down in these phases, so that participants paid a sufficient amount of attention to the problem, purpose and target audience they were designing for.

6. **Design cards as design aids.** From these workshop insights, four sets of unique design cards were developed to strengthen the conceptual design framework by encouraging participants to focus on methodically working through activities in key areas. These cards focused on: (a) developing user personas; (b) identifying organisational and project values; (c) identifying problems to be solved; and (d) considering ethics in design. The benefits of using design cards has formerly been acknowledged by Brandt and Messeter (2004), Hornecker (2010), and Lucero and Arrasvuori (2010), who all emphasised the importance of tangible design tools (e.g. cards and card games) to facilitate a better understanding of underlying conceptual frameworks and issues related
to the design challenge. The cards developed in this study, along with the templates and the inclusion of experiential playful elements, were added to the process and tested in the final six workshops. These were by far the most fluid and productive workshops, which is where the final evaluation was conducted. Further detail on the development of the design cards is provided in Chapter 7 in Part 2 of this dissertation, and has been published in Raftopoulos (2015).

7. **A taxonomy was needed.** Across the sixteen workshops, it became apparent that a greater level of guidance was required on the types of technologies, game mechanics and gameplay, as the industry did not yet have a benchmark. This finding was earmarked for investigation in Research Module 2 during the development of a taxonomy.

8. **Capability building was needed.** It was also recognised that a greater level of guidance or benchmarks was needed for the create phase of the conceptual design framework, in terms of the management skills and capabilities required to build and implement the gamification solution. This was earmarked for investigation in Research Modules 3 and 4 in relation to management experience and capabilities.

### 5.1.3 Conclusion of results for Research Module 1

Research Module 1 addressed the question relating to key design principles and decisions, and put forward a conceptual design framework. The results indicated that the key components important to the design of rigorous gamified enterprise applications are as follows:

- Four design phases and seven practical creative exercises based on an agile approach to the development of a gamified enterprise application.
• The use of design templates such as workbooks and prototyping materials to guide the process. As has been the experience in design-thinking (Brown 2009; IDEO 2003), a template provides a high-level structure for grounding, guiding and prompting participants during an enterprise gamification design process.

• The use of tangible design tools such as design cards and experiential activities to prompt discussion, debate and creativity.

The research gaps that were identified in this research module were instrumental to the subsequent investigation into a proposed taxonomy in Research Module 2, and the development of the survey into organisational experience with the development and implementation of gamification projects in Research Module 3, and the development of a capability framework in Research Module 4.

5.2 Results for Research Module 2: Towards an enterprise gamification taxonomy

5.2.1 Overview of results

The research for this module focused on mapping and understanding the key features of enterprise gamification projects that have been developed over the last three years in order to evaluate the different technologies, purposes, audiences and game design patterns that have been in use. This research was conducted because the gamification domain appeared to be without a specific design language or a framework for critical review. The key outcome from this research module is an enterprise gamification taxonomy.

The purpose of this research module was to assess the field of enterprise gamification by: (a) investigating common design patterns and technical
solutions; and (b) developing a framework that could lead to the development of an enterprise gamification taxonomy. A grounded approach was used, via the documenting of case studies where organisations had self-identified as being gamification projects, irrespective of whether they were peer-reviewed. The aim was to gain insights into how the market defines and interprets gamification, and where and why organisations had invested in gamification projects. It was anticipated that this would then provide the foundation of a common classification system that could be used to place, describe, define and develop enterprise gamification as a rigorous business activity.

Taxonomies are a common construct in the corporate sector, particularly in information systems, knowledge management and human resources domains (Delphi Group 2004; Heddon 2010; Lamb 2007). Thus, a taxonomy is an important tool for the integration of gamification into an enterprise. The results of this research module identified a potential enterprise gamification taxonomy comprising of five core elements, as illustrated in Figure 4 below:
These core elements are primary purpose, target audience, technology strategy, core gameplay and key mechanics, which are further comprised of 52 sub-elements that are outlined in this chapter below. A more detailed analysis of each of these elements and sub-elements is available in Chapter 8 in Part 2 of this dissertation. In addition, the research and findings in this research module was published as a long conference paper at DiGRA in Luneburg, Germany in April 2015 (Raftopoulos et al. 2015).

5.2.2 Summary of results for Research Module 2

This proposed gamification taxonomy presented a proposed high-level classification of enterprise gamification design and technology decisions that can provide a conceptual framework for discussion, analysis or system design by both researchers and practitioners. The purpose of this taxonomy was not to determine gamification effectiveness, or to describe how to
combine optimal variables to enhance the design or performance of a gamified application. This is not the general purpose of a taxonomy, as it is not intended as a substitute for business acumen or creative design. The purpose of a taxonomy is to provide a common language, a term of reference, and an indication of the key points of decision-making required to build a gamified application.

Gamification is in part a creative endeavour and therefore cannot be completely codified. The lack of coherent and agreed common frameworks, definitions and classifications within game design, games and serious games that have been in operation for several decades is testament to this. The core elements and sub-elements identified in this research module, which form the foundation of the proposed taxonomy, are as follows:

1) **Primary purpose**

The following 17 sub-elements were identified:

- Education
- Entertainment
- Innovation
- Staff productivity
- Sales and marketing
- PR/Promotions
- Recruitment
- Operational process efficiency
- Training and skill development
- Problem-solving
- Motivation and morale
- Build community
- Customer loyalty
- Events
- Safety and compliance
- Social or community good
- Information and awareness raising

These were then aggregated into these six key sub-elements:

- Customer loyalty
- Marketing, sales and promotions
- Education, training and recruitment
• Innovation and problem-solving
• Community good or development
• Staff morale, motivation and productivity

2) Target audience
A total of five independent sub-elements were identified:
• Internal staff
• Customers, clients or patients
• Suppliers
• Industry or community specific
• General market or public

3) Technology strategy
A total of eight core types of technologies are currently in use, which form the following sub-elements in this taxonomy:
• Digital game
• Digital simulation
• Platform A (vendor platforms, APIs or plugins)
• Platform B (custom-built platforms or operating systems)
• Product features A (simple product modification)
• Product features B (significant product modification)
• Playful experiences A (no or low levels of technology)
• Playful experiences B (high levels of technology)

These technologies are often run in conjunction with other supporting or secondary technologies, such as augmented reality, virtual reality, social media and mobile technology. All identified projects also incorporated data analytics to quantify player participation, feedback, actions undertaken, or
engagement, as well as specific financial analytics such as sales, revenue raised or return on investment.

4) **Core gameplay**

A total of 12 common types of core gameplay are currently in use:

- Territory acquisition
- Prediction
- Survival
- Building
- Chasing or evading
- Trading
- Puzzle or problem-solving
- Social
- Spatial navigation
- Destruction
- Collection
- Racing
- Other

5) **Key game mechanics**

A total of 10 common types of key game mechanics are currently in use:

- Status, success, recognition
- Points
- Social (friend, connect, chat)
- Experiences
- Missions and quests
- Currency, rewards (real or virtual)
- Achievements (badges, trophies)
- Leaderboards
- Progression
- Narrative
- Other

A final analysis of the 304 examples was then undertaken to: (a) deconstruct each one into the identified elements; (b) codify them into the survey instrument; and (c) analyse the final results. The end result was the
development of a proposed taxonomy that features five core elements – primary purpose, target audience, technology strategy, core gameplay and key game mechanics – which provide a streamlined classification of the various enterprise gamification projects in use. The classification of these core elements was further refined by distinguishing them by their orientation as being either: (a) market-based; (b) technology-based; or (c) design-based.

In addition to these elements, data was captured from another two fields and tagged to each of this study’s 304 case studies for future cross-referencing and analysis. These fields are:

- **Industry classification**: A total of 18 industries were identified, based on the Global Industry Classification Standard (MSCI 1999).
- **Geographic location**: It was recorded where the gamification projects were implemented, which identified a total of 11 geographic regions.

The key research insights that can be drawn from the characteristics of this proposed gamification taxonomy are as follows.

**Technology strategy**

Technology options were not immediately obvious to this study, where it was initially hypothesised that the most common would be gamification platform offerings by vendors such as Badgeville and Bunchball, or any of the other 80 or so other similar but smaller vendors of gamification software as a service offerings (Technology Advice 2014). However, on closer investigation of the study’s 304 case studies, there appeared to be a need to split the taxonomy’s technology category into eight sub-categories. This is because organisations that self-reported on their gamification projects also included games, serious games, simulations, and playful experiences – technologies that have so far been excluded from formal definitions of
gamification (Deterding et al. 2011; Huotari and Hamari 2012). Debate remains in the industry on whether any of these constitute gamification.

A close inspection of the games labelled as ‘gamification’ indicated that they would have at one time been called ‘advergaming’, ‘edugaming’ or ‘training games’, which all belong within the serious games domain. However, these technologies were still included in this proposed taxonomy, as this study is reporting on its grounded research findings that suggests that gamification is being used as a collective term by industry that is broader than that of the research community. This phenomenon may be an early signal, or opportunity, for the continued evolution of the gamification domain.

The largest technology sub-category is platforms, which forms 46% of the market and is equally divided between vendor solutions (23%) and self-built systems (23%). The other sub-categories are digital games (19%), simulations (6%), playful experiences (8%), and product or service feature modifications (20%). Specific industry examples and detailed discussion of these different gamification technologies that were drawn from the 304 case studies are detailed in Chapter 8 in Part 2 of this dissertation.

These case studies also highlighted that each of the eight technology strategy sub-elements listed above require a unique set of design and investment decisions tailored to specific business needs. A further challenge would be determining whether organisations are seeking or receiving balanced advice on the optimal gamification technology options available to them to meet their specific business needs, given that each option is marketed by different vendors. For example, vendors selling games are different to those selling platforms, and those selling simulations or playful experiences. With such vested interests and fragmentation amongst vendors, it is difficult to assess whether an organisation is receiving independent
advice on the best technology option for their specific problem. This is a subject that is further explored in Research Module 3.

**Target audience**

The following five main, mutually-exclusive target audience categories for enterprise gamification were identified in this study: internal staff (19%); external customers, clients or patients (33%); suppliers (1%); industry or community (9%); and the general market or public (37%). The key challenge here is in understanding how organisations would develop user or player profiling given the complexities of using gamification across a broad range of potential contexts, motivations, technologies and objectives within an enterprise system or process.

Given that the primary goal for most enterprises is value creation, this study highlights the necessity of player or user profiling tools that reflect business realities, rather than the popular game-world constructs. This is particularly important when considering that there is no guaranteed outcome of game or gamification experience as the designer intended, as the player or user is an active agent in creating and defining their experience (Hamari et al. 2014).

**Primary purpose**

Most gamification projects identified as having several objectives, and many noted spinoff benefits that were either sought or unexpected. However this research aimed to pinpoint the primary purpose for each project to ascertain the specific design decisions that were made. The result was that 17 sub-elements of primary purpose for enterprise gamification projects were identified, which were then aggregated into the following six key areas for ease of use:

- customer loyalty (18%)
- marketing, sales and promotions (16%)
• education, training and recruitment (18%)
• innovation and problem-solving (19%)
• community good or development (12%)
• staff morale, motivation and productivity (15%)
• other (2%).

There was a reasonably even spread across all primary purpose sub-elements, which indicates that experimentation with enterprise gamification is already occurring across a broad range of business areas.

**Core gameplay**

While the relevance of core gameplay in gamification projects was initially questioned when shaping this study, a closer inspection of the case studies indicated that it is often just as important as game mechanics in the design and delivery of the core user experience. Twelve common sub-elements or genres of core gameplay (or styles of play with core rules that constitute a game) used in enterprise gamification projects were identified, which aligned with those used in the design of both entertainment and serious games (Braithwaite and Schreiber 2009; Djaouti, Alvarez and Jessel 2012; Fullerton 2008). However, it should be noted that this was not intended as an exhaustive list – only an indication of the more common types of core gameplay found in the 304 audited examples.

Collection was the most dominant form of core gameplay (57% of all gamified cases in the sample), which is the collection of points or other items to build scores, used to eventually earn free or discounted goods and services, or build reputation or a position on a leaderboard etc. The other less common forms of core gameplay identified in the sample were:

• prediction (6%)
• survival (5%)
• puzzle/problem-solving (10%)
• social/role-play (3%)
• as well as lower percentages for building, territory acquisition, racing, trading, destruction and spatial navigation.

The focus on collection gameplay could be a reflection of the early days of enterprise gamification. This could be because organisations are still experimenting with simple forms of gameplay while workplaces and markets are getting used to the idea of gamefulness in traditional business functions. It could also be a reflection of the influence and size of the gamification platform market and the size of the loyalty market, both of which still predominantly rely on simple point and badge ‘collection’ games. In addition, it could be an indication of the limited range of capabilities of vendors and consultants of gamification solutions, or technologies that are available.

**Key game mechanics**

When codifying the case studies, an arbitrary benchmark was set to identify up to three key game mechanics that were used in each case study. There was a fairly even spread of use of the more common mechanics, especially points (mentioned by 43% of cases), as well as other achievements such as badges and trophies (52%), currency and rewards (35%), and missions and quests (29%). As with core gameplay, the skew towards simple game mechanics is probably due to the early days of trial and experimentation, and the limited size of the loyalty and platform markets, which tend to employ simple mechanics in their systems.

**5.2.2 Conclusion of results for Research Module 2**

The research results of Research Module 2 indicate that many organisations that have invested in gamification have defined it as including games, simulations and playful experiences. This may be attributed to confusion
created by the lack of rigorous definitions, frameworks and tools that are necessary precursors to building industry consensus on this issue. Furthermore it could be result of opportunistic game development vendors relabelling games as gamification to take advantage of growing business interest an investment. From an enterprise perspective, the similarities between gamification, games and simulations may have compelled them to label the field under a single umbrella term that is easier to communicate with internal stakeholders.

Five key parameters have been covered by organisations in their gamification projects – primary purpose, target audience, technology strategy, core gameplay, and key mechanics – have formed the foundation of this proposed enterprise gamification taxonomy. This taxonomy should be considered the commencement of an evolving construct as gamification technologies and design practices continue to grow and develop. This proposed taxonomy can potentially be used in providing researchers and practitioners with an initial framework from which to develop the following tools:

- common language and communication tools
- objective diagnostic tool of mapping problems and potential solutions
- rubric for design decisions and technology investment decisions
- collaborative research instruments.

However the key research challenges to the next phase of development and application of this proposed taxonomy would need to address the following:

1. How do we best define enterprise gamification so that it captures the essence of how enterprises can create value for organisational stakeholders?
2. How do we develop practical knowledge that allows researchers and practitioners to develop informed decisions on using gamification for value creation?

Previous research to date has focused on human factors and motivational affordances in gamification; the opportunity has now presented itself to delve more deeply into management and information systems research, given the central importance of the technology decisions that need to be made in enterprise gamification projects.

A final conclusion that can be drawn from Research Module 2 is in relation to the meta issue within the ethics of gamification in enterprise environments, where there is either an overt or implied expectation, or even a covert persuasion, for staff or stakeholders to participate. Depending on the scale and scope of a gamified application, it is in effect creating a virtual or synthetic world and experience for the target audience. Bartle (2003) and Castronova (2005, 2007) both argued that the most important effect of creating virtual spaces and the roles assigned to players within them is that they must influence the player’s self-development by aiding them on a journey of self-discovery.

However, most of the parameters identified in this research do not necessarily aim to influence players in this way. More often than not, the key gamification features that have been documented can be classified as elements of ‘self-optimising systems’, which means they provoke “system conform reactions” from users (Kuka and Oswald 2012, p. 6), rather than creating opportunities for deep human experiences and learning, or divergent thinking and action.

In conclusion, Research Module 2 did not uncover any new or novel forms of design patterns, technology use or gameplay, or examples where gamification has influenced systemic changes in market structures or
workplace practices. This supports the position that at this point in time, gamified systems generally support existing workplace and market constructs (albeit in a more engaging way), rather than create new forms of organisation structures, systems or rules of play.

5.3 Results for Research Module 3: Understanding the enterprise experience with gamification

The objective of Research Module 3 was to address Research Question 3: *What has been the experience to date of organisations that have experimented with gamification? What do they see as the key enablers, barriers, and capabilities for successful implementations?*

The key instrument in this research module was an online survey, known as the Enterprise Gamification Experience Survey (herein ‘the survey’), which involved confidential, in-depth surveying of 25 organisations that have implemented an enterprise gamification project. The combined projects in this sample equated to 11.4 million users (a combination of both internal staff and external customers or stakeholders) that have been affected by these gamified enterprise applications. This represents a significant reach for a survey of this kind, and a rich data source that provides insights into this study’s research questions and the gamification domain in general.

Most previous research in the enterprise gamification domain has focused on an evaluation of peer-reviewed studies (Hamari et al. 2014) or experiments undertaken in single organisations (Mollick and Rothbard 2014). Thus, an opportunity was identified in this study to survey a cross-section of global organisations based on their direct experiences with enterprise gamification across a range of strategic and operational factors, to
ascertain their common views on enablers and barriers to successful enterprise gamification implementation.

The literature review in this dissertation identified that the main missing element in enterprise gamification research has been hearing directly and candidly from enterprises about their experiences with gamification. This means that missing from the current discourse was a lack of first-hand perspectives from gamification project leaders on the procurement, development and integration with internal systems and processes, and on navigating the internal systemic, cultural and decision-making processes after the introduction of such a novel and potentially disruptive concept.

A total of 17 multiple choice questions and 3 sets of questions using 5-point Likert scales for responses to 20 sub-questions were asked relating to organisational experiences with enterprise gamification over a wide range of strategic and operational areas. Four open-ended questions were also asked in the areas of barriers (Q25), enablers (Q24), recommendations (Q26), and definitions (Q16). The survey questions are provided in Appendix 3.

As noted in Chapter 3: Literature Review, the Information System Success Model (ISSM) has informed the development of my field research in Research Module 3. ISSM is a key model in the IS domain that determines the success or effectiveness of an information system (DeLone and McLean 2003), and it postulates that there are six key interdependent and multidimensional elements that determine system success: System Quality, Information Quality, Service Quality, System Use, User Satisfaction, and Net Benefits. Motivational affordances only form part of the equation for system success, and there are several systemic and organisational elements that also need to be considered. These factors were built into my survey questions which can be seen in Table 21, Table 23, Table 24, and Table 26.
5.3.1 Overview of results for Research Module 3

Insights derived from the experience survey revealed a wide range of findings relating to elements of management, technology and design of gamification implementations, as outlined below.

Management elements

Management elements relate to the overall experience of organisations in the development and implementation of enterprise gamification projects. The key findings are as follows (note that n=25 for each):

• **Positive overall impact.** Most respondents (44%) believed they had achieved an innovative project outcome, followed by those that achieved a short-term improvement (12%), a sustained improvement (8%), breakthrough results (12%) and 20% said that it was too early to tell. No-one indicated that they were in a worse position or that they had achieved no change at all.

• **Motivations for undertaking gamification focus on engagement.** A majority of respondents (56%) were primarily motivated to use gamification to engage their target audience, with only a minor amount wishing to “improve our performance or bottom line”, “want to experiment with something different”, or, “wanted to be seen as creative and innovative in the field” each at 12% of total responses.

• **General satisfaction across most operational areas.** Overall, respondents showed high levels of satisfaction across most of the twenty operational elements that were surveyed (Table 21: Rating of operational elements and Table 22: Level of satisfaction - operational elements heatmap). Only one factor, data and analytics, fell into the ‘somewhat satisfied’ category which also showed the lowest means.
score and the highest standard deviation.

• **Privacy, security, ethics, values are considered important.** The majority of respondents (60%) indicated they had spent a significant amount of time on issues relating to security, privacy, ethics, values and collaboration when developing their gamified enterprise application. Only a small number indicated they spent a moderate amount of effort (21%) or no/low effort (19%).

• **The expectation to play is largely optional.** For internal gamification projects (n=17), the majority of participants (65%) ran their gamified projects as completely optional to participation. A further 24 per cent stated that while the gamified application was optional to participate in, there was an implied expectation to participate; another 6 per cent described it as mandatory to participate.

• **Management is critical to project success.** Most respondents believed that project management is of central importance for the success of gamification projects, particularly to address the unique needs of gamification. The second most critical element was understanding and applying design, followed by the selection and implementation of technology.

• **Unexpected benefits in running a gamification project.** The majority of respondents (72%) stated that they had learned a lot of useful things about their organisation and achieved other unexpected benefits during the process of project development and implementation.
• **Respondents would recommend gamification.** When asked about the likelihood of recommending gamification to a colleague, the majority of respondents (84%) answered 9 or 10 out of a possible score of 10.

**Technology elements**

Technology elements relate to the experience of organisations based on the performance of their selected gamification technology. The key findings in this area are as follows:

• **Mixed response to technology performance.** The highest levels of satisfaction with gamification technology related to ease of use, pricing/value for money, and impact on target audience. The lowest satisfaction was for data and analytics, and customisation and flexibility.

• **Greatest room for improvement is in data and analytics.** While there was scope across several technology elements, the area most often noted as requiring improvement was data and analytics. This is of critical importance, as data and analytics is the foundation from which the most commonly purported gamification strategy of ‘behaviour design’ is developed and implemented, and is a key selling point used by most platform vendors.

• **Organisations are neutral about vendor advice.** A significant proportion of respondents voiced neutrality about whether gamification vendors had provided them with independent advice (44%), whether the consultants were informative (32%).

• **Technology products and services are considered immature.** Several key areas produced an unclear positioning or disagreement among
respondents on the maturity of gamification technology or enterprise needs. Although many felt that gamification technology products are somewhat immature (48%), that there are privacy and trust issues when using these technologies (40%), and that the technologies that are somewhat restrictive (44%). There was also some anxiety about staff participation (44%).

• **Technology is the biggest barrier to success.** In addition to featuring low on the overall success factors in gamification implementation, technology topped the key barriers to success list. Thirty-eight per cent noted technology as the main barrier to project success, followed by project management at 26 per cent.

**Design elements**

Design elements relate to organisations’ experiences with the design process and features of their enterprise gamification projects. The key survey findings relating to design are as follows:

• **Game elements are largely self-selected.** Respondents indicated they were more likely to generate their own ideas for gameplay and game mechanics or undertake their own research what would appeal to their target market, rather than predominantly following the guidance of their vendor or consultant. This indicates a high level of independent research and thinking on behalf of enterprises.

• **Most organisations develop their own player types or personas.** The majority had not only developed their own player types or personas for their gamified enterprise application (68%), but produced a specific, customised set based on the needs of their target audience, rather than
using industry models (60%).

- **Some organisations did not use personas.** A notable proportion of organisations are not developing personas or player types for their gamified applications (32%), even though industry standards recommend this for any form of software or system design (Miaskiewicz and Kozar 2011; Pruitt and Grudin 2003).

- **Design is perceived as a major success factor.** Design issues mostly related to frustration in a lack of understanding of what elements of design can provide a ‘bridge’ between the business problem and the technology front- and back-ends developed as part of the solution. Frustrations were also expressed on not possessing an adequate design literacy within enterprises.

### 5.3.2 Summary of results for Research Module 3

In this section for Research Module 3, results from the open-ended questions are presented in relation to what respondents believed were the key success factors, barriers to success and optimal gamification design process. Also included here is an examination on the working definitions of gamification used by enterprise project leaders. The results are as follows under each respective heading:

**Key success factors**

Respondents were asked: *Please name up to three strategies that were key to the relative success of your project* (Q23); and a total of 42 responses (n=42) were received. Seven key themes emerged from the 42 data points, which were classified under each of the meta categories of management (43% of overall responses), design (36%) or technology (21%) factors.
These categorisation results indicate that how well a project is managed is pivotal to its success (see Table 29: Enablers of gamification projects – Overview). A summary of these factors is as follows:

For management factors, the key elements that were raised included:

- **Project management.** This included stakeholder engagement and management, communication, sponsorship, and building internal networks.

- **Teamwork.** This included interdepartmental co-operation, teamwork with vendors and consultants and participation of stakeholders.

- **Measurement.** This included the setting of clear goals, targets and key performance indicators (KPIs), as well as measuring and reporting on performance against KPIs.

For design factors, the key elements were:

- **Design aspects.** This included setting design objectives and design principles, possessing design skills and an understanding of motivational psychology, prototyping and testing, and aligning game elements to business goals.

- **Target audience.** This included understanding of the target audience, organisational culture, and undertaking a deep analysis of the players.

For technology factors, the key elements were:

- **Agile development.** This included flexible and iterative development, usability testing, internal support and freedom to select and develop the right technology, and learning from mistakes.
• **Technology.** This included two items – the experience of the vendor, and the flexibility of the gamification platform to meet project requirements.

Respondent sentiment on what was critical to the success of their gamification project is shown in the sample responses listed below:

• “Interdepartmental cooperation was essential – IT, HR, Marketing, Financial Planning.”

• “We started with a test and learn phase (beta) developed by a small, tight, focused team over a long gestation period (24 months).”

• “It was designed and built brick by brick, and we never lost focus of what we wanted to achieve.”

It appears as if most enterprises treat a gamification project as they would any other project management exercise, with results indicating the key to successful implementation centres around project integration and business transformation. This brings into question the need to distinguish what parts of an enterprise gamification project are unique to gamification, and which parts are standard project management issues if they are to be managed effectively.

A deeper investigation of these responses suggests that there may be two key considerations for developing and implementing an enterprise gamification project: (a) the unique challenges of gamification in terms of generating an appropriate gameful design and selecting appropriate gamification technologies, which are often new capabilities for an organisation; and (b) the adeptness in which a project manager can navigate the gamification project through a business transformation process.
Barriers to success

Respondents were also asked: *Please name three barriers to success that you experienced during the project* (Q24); with a total of 50 responses (n=50) received. Five key themes emerged which were classified under each of the meta categories of management (34% of overall responses), design (28%) or technology (38%) factors (see Table 30: Barriers to success - Overview).

In line with its low rating as a key success factor, technology featured highly as a key barrier to success. Technology as a barrier to project success achieved 38 per cent of all mentions, followed by project management at 26 per cent, which was also listed as the key success enabler. This further supports the common perception that project management plays a critical role in enterprise gamification implementation.

The many key technology issues listed by respondents as a barrier to project success indicate critical shortcomings in core technical IT and IS elements, including:

- vendor capability
- technological limitations
- gamification platform restrictions
- data integrity issues
- limited reporting capabilities
- vendors not knowing the target market
- on-time delivery
- scalability issues
- development team resources
- adoption of the platform.
These technology barriers also suggest a significant limitation in the enterprise gamification domain that has not been previously identified in the industry, where gamification failure has generally been attributed to poor design decisions (Gartner 2012c). The existence of this level of technological limitation presents a potentially high barrier to the further growth and development of the domain.

To gain a deeper perspective of respondents’ views on gamification technology barriers, below is a selection of their corresponding quotes:

• “Barriers were primarily with technology: we waited a long time for vendors to mature, [and] even then I do not believe vendor solutions are mature enough yet to handle large-scale, complex enterprise use cases. We faced a lot of challenges with integration, especially with our data security requirements.”

• “Our IT infrastructure is not state-of-the-art. That meant that the vendor had to develop for an ‘old’ situation. They could not re-use their new technologies, neither their experience.”

• “Gamification platform restrictions are not yet adapted to communities with serious content where reputation and quality are key. There are limited reporting capabilities and data integrity issues.”

Project management was rated highest in terms of key success factors, as well as second highest in terms of barriers to success. This could be because the task appears to be more complex given the unique needs and lack of prior knowledge of the domain relative to other innovation or business transformation initiatives. Some of the key issues raised in relation to project management as a barrier to successful gamification implementation are as follows:
• decision-making
• stakeholder management
• management buy-in
• envisioning
• budget constraints
• clear strategy
• resourcing
• time pressures
• expectations and assumptions
• organisational priority
• communication.

It should be noted that these factors are not uncommon in the domain of business transformation or change management (Kotter 1996; Kotter and Cohen 2012) as well as innovation management (Christensen 1997, 2003; Chesbrough 2005; Von Hippel 1988, 2005), yet appear to have received limited attention in enterprise gamification research. To gain a deeper perspective of respondents’ views, here is a selection of relevant quotes:

• “In a big organisation such as ours, getting approval for these kinds of projects is tough.”

• “The path of decision-making in content development and implementation was and still is quite bureaucratic.”

• “Decision-makers could not envision what users will experience when playing the game. That caused the inability to decide.”

• “It was hard to measure success and set up KPIs.”

• “We didn’t have a clear strategy when we started – we had to make it up as we went.”
Once again, these issues are common to the project management and change management domain, and these survey results indicate that better use of these fields could help inform the ongoing development of enterprise gamification. In addition to project management, design was deemed to be both a major success factor for gamification projects, as well as a notable barrier if it was not done well. Some of the key issues that caused design to be perceived as a barrier include:

- not being familiar with gamification
- resistance to gamification
- use of arbitrary game mechanics
- lack of game design expertise
- too much focus on game elements
- finding/balancing the right game content.

On the topic of design, respondents cited their key challenge as being on balancing the right selection of gamefulness and content - whilst being constrained by limited stakeholder skills, familiarity and acceptance of gamification. This suggests a difficulty in understanding design principles and design capability, including how gameful design elements can be creatively integrated into ‘serious’ business applications. To gain a deeper perspective of respondents’ views on design, below is a selection of corresponding quotes:

- “There were times I felt that I was ‘playing the wrong game.’”
- “Not everyone liked our design.”
- “There was meaningless use of arbitrary game mechanics.”
There was an inability to identify useful business topics on which to apply gamification.”

Specific issues relating to gamification design often appear to stem from frustrations in understanding the design issues providing the ‘bridge’ between the business problem, and the technology front- and back-ends of the proposed solution.

The survey results show that enterprise interest in applying gameful design to business problems is often paralleled with a lack of finesse and balance in the design component of the process. This suggests that the role of the designer is essential; yet design and design process expertise appears to be underdeveloped, which has often resulted in less effective design decisions.

The most significant finding in regard to barriers to success (and enablers) was not the responses that were voiced, but rather those that were not. When addressing open-ended questions about barriers and enablers, respondents did not refer to the motivational affordances of the gamification elements or the effectiveness of the project to engage users. Respondents mostly believed that indicators of success, or barriers, are predominantly based on how well a project is managed, the robustness of the technology, and its integration within the organisation. It would appear that motivational affordances in terms of the right balance of gameful design features, while of significant importance, rank secondary to enterprise system and process integration.

Creating an optimal design process

Respondents were asked: Knowing what you do now, how would you create a better gamification design process? (Q25); with a total of 27 responses (n=27) received. Seven key themes emerged which were classified under
each of the meta categories of management (21% of overall responses), design (59%) or technology (19%) factors (see Table 31: Creating a better design process - Overview).

In regard to improving the design process, respondents mostly echoed what was said in relation to success enablers and barriers, in terms of the importance of project management and technological platforms. Although even more revealing was the high concentration of design factor responses, which mostly related to capability issues. On reflection, this consistent with the general consensus that project management and technology are standard core competencies in the enterprise, while design is less so.

Even though design capability in the enterprise has been gaining momentum, particularly via the growing popularity of design-thinking, it is essentially new and unfamiliar territory. This is even more so for the more recent game design-thinking that has emerged from the interest in gamification, as reflected in these survey responses. These results indicate that design methodologies and capabilities are not yet at the level they should be for enterprise gamification.

Furthermore, these results show that the language used by respondents in the open-ended questions conveyed an operational and tactical focus in their recommendations, rather than strategic or systemic. This indicates that projects managers had perhaps confined their gamification projects within an operational paradigm that was within the scope of their capabilities or job description. Alternatively, the projects have so far been smaller and tactical in nature due to gamification only recently being introduced. Very often such projects were reported to be trials, experiments or prototypes, rather than a full-scale re-think or re-design of an enterprise system or process.

Most respondents indicated that they would like to develop a better design process (26%), followed by more careful or considered use of
gameplay/mechanics (22%), as well as selection of the right technology (19%).

The key issues raised by respondents issues in relation to improving the gamification design process revolved around the use of tighter, more thoughtful use of design and technology, such as:

- improved ideation and prototyping
- facilitating learning opportunities
- using more meaningful design features
- developing innovative mechanics (narrative, experience, reputation)
- using less traditional mechanics (rewards, points, leaderboards)
- reduction in technological limitations
- careful selection of vendors.

To gain a deeper perspective of respondents’ views on the optimal design process, below is a selection of relevant quotes:

- “I would have spent more time at the beginning looking at more into game-thinking elements and fewer game mechanics. I think we would have created a more engaging program.”

- “We would like to see an extended version of the game to turn passion and intuitive gameplay into a deeper consideration of the issues.”

- “I think that it is more important to be clear on your goals and your audience. There was a disconnect between the prototypes and concepts being discussed and the stated goal, the audience of the game.”

- “Be focused on the target audience, define critical success factors for the game at the game design stage, be innovative with the game mechanics.”
A close examination of such responses indicates that project owners are in effect talking about the need for sophisticated forms of experience design, game-thinking, and creativity in their gamification designs. However, it would seem that these factors are currently beyond the capabilities of the technology and designs that dominate the enterprise gamification domain.

This supports the outcomes of Research Module 1 on the need for a rigorous design framework and methodology to produce optimal gamified applications. Furthermore, the findings of this survey also suggest that there is a need for more refined organisational capabilities to develop more sophisticated gamification designs. This had identified the need for the development of a capability framework which became the focus of Research Module 4.

**Definitions of gamification**

The survey results showed that there is a wide range of definitions of enterprise gamification. Most respondents contextualised their definition of gamification in a business environment that aimed to solve problems, change behaviour, or improve business effectiveness. The definitions that were provided by each of the respondents appeared to have been abstracted to fit each project owner’s view of the environment where their project was implemented. The range of responses were as follows:

- **What gamification is:** Play or fun, game mechanics, game elements, games, game design, meaningful play, game thinking
- **What gamification does:** Change/modify/drive behaviour, engage, create value, knowledge transfer, manipulate, lower friction.
- **Where it is applied:** Business environment, real world problems, non-game situations/contexts/processes or environments.
While the diversity of definitions can be perceived as an absence of a united position, it can also be viewed as a reflection of the broad range of application domains within the enterprise, as well as the different approaches and methods in which gamification can be used. This was described in Chapter 2 as the *Five Ways* of gamification:

- It is a process, and an artefact, and an experience.
- It enhances a product, service, process or system.
- It provides affordances for gameful experiences through games, play and game design patterns.
- It is the integration of design, technology and management or organisational capabilities.
- It results in value creation for organisational stakeholders.

The common denominator in these descriptions indicate that the emphasis is on *improving, enhancing and creating value*. This insight supports one of the main arguments of this research – that gamification is generally being used to support or enhance existing organisational and management constructs rather than invent new ones.

### 5.3.3 Conclusions of results for Research Module 3

Organisations are rising to the challenge of managing the development, implementation and integration of enterprise gamification projects. Many are already achieving positive results from gamification projects, but there’s still room for improvement across many operational areas. In particular, there are effectiveness issues associated with technology and vendor maturity, and a need to improve the capabilities of organisations in the design and implementation of gamification projects. Despite this, most
surveyed respondents voiced optimism about the future development of the domain, which is mostly based on the positive results that have already been achieved from previous gamification implementations.

Enterprise gamification appears to share an overlap with other enterprise system development in the areas of enablers and barriers to system success. However the unique challenges of enterprise gamification appear to be a greater emphasis on design – this isn’t only the design of system interfaces and interactions, it is extended to include the process of design - to be a game, game-like or playful, as well as collaborative. Furthermore there is also the expectation of a parallel alignment with non-system or ‘offline” fun and gameful interactions within an organisation, or between organisations and its stakeholders. This unique challenge that gamification faces appears to be taking enterprise system development a step closer to human-centred design by offering a more lucid language and tangible methods to achieve it. This is in itself a decisive factor in facilitating enterprise stakeholder value creation.
5.4 Results for Research Module 4: Towards a capability framework

5.4.1 Overview of results

This section addresses Research Question 4: *What are the implications for the design, implementation and management of gamified application in the enterprise?*

In the Research Module 3 findings, many varied and complex issues surfaced in relation to the experiences of organisations when implementing an enterprise gamification project. The results provided insights on a range of operational issues, and also identified common enablers, barriers and optimal capabilities required for successful enterprise gamification. The main objective of Research Module 4 was to extrapolate from these results, and to draw on related findings from the other research modules, to identify the implications of how to move forward with future gamification design, implementation and management.

The common denominator of all of the research findings relates to capability development. The building of organisational capabilities in design, technology and management is recognised as a key enabler for developing gamified projects that optimise value creation. From the extrapolation of these findings, a *conceptual capability framework* was identified and developed in Research Module 4.

This artefact closes the loop on the *conceptual design framework* developed in Research Module 1, by providing a competency-enhancing model that can be applied during the design process to ensure robust designs are developed. This capability framework also closes the loop on the taxonomy
that was developed in Research Module 2, by providing deeper management insights into the design decisions for enterprise gamification interventions.

5.4.2 Summary of results for Research Module 4

The term “capability” is defined in this dissertation as a set of skills, knowledge, abilities, behaviours and resources required for the successful design, development and implementation of an enterprise gamification project. It is important to note that this definition of capability is not restricted to individual or staff capability, but organisational capability as a whole. This definition has been informed by the theory of dynamic capabilities (Teece et al. 1997), which emphasises the importance of a holistic approach to strategic management in adapting, integrating and reconfiguring internal and external organisational skills, resources and functional competencies to achieve organisational goals. Dynamic capabilities are generally embedded in an organisation’s performance routines and processes, and are conditioned by its culture. They have been recognised as a key driver of organisational performance and competitive advantage (Teece and Pisano 1994; Teece et al. 1997; Sen 1988, 1990).

The capabilities identified in the Research Module 3 based on survey responses to the open-ended questions on enablers, barriers and recommendations of best practices, formed the basis of the capability framework proposed in this research module. This framework identifies three nodes representing the three core enterprise gamification capabilities of design, technology and management.

The usefulness of this framework is two-fold. First, it identifies the key capabilities that are required to design and implement an enterprise gamification project based on empirical research. Secondly, it provides a
practical framework that organisations can use for project development or to run a diagnostic or health-check on an existing project. A discussion of the key features of each of these three nodes of the capability framework are detailed below.

**Management node elements**

Management elements include factors that relate to how the leadership or project management team of an enterprise manage their stakeholders and resources to optimise gamification project outcomes. While there are overlaps, elements that directly relate to technology or design are treated separately, as the management node mostly relates to the capability of management decision-making, collaboration, communication and execution.

All the management node elements from the survey questions in Research Module 3 pertaining to enablers (see Table 29: Enablers of gamification projects – Overview), barriers (see Table 30: Barriers to success - Overview) and best practice (see Table 31: Creating a better design process - Overview) were synthesised into Table 33: Management node (see Part 2 of this dissertation) to provide an overview of the nuanced feedback from respondents. A card-sorting technique (Ritchie et al. 2013; Denzin et al. 2000) was also adopted using keywords and phrases from the outcomes of the survey to determine the key groupings of all the key elements. The key capabilities that emerged in this analysis in relation to the management node are as follows:

• **Strategic focus.** Being strategic about the gamification project, which implies a clear vision and direction of what the project is working towards.

• **Measurement.** Setting clear goals, metrics and KPIs for the project, and measuring key progress along the way.
• **Stakeholder engagement.** Stakeholder management includes engaging them about the project, managing expectations, seeking their cooperation, and managing resistance.

• **Sponsorship support.** This includes engaging an internal project sponsor for the project, as well as leveraging networks and building teamwork and cooperation.

• **Communication.** Communication campaigns and ongoing project communications including with users are considered important to keep stakeholders engaged, and to manage angst, fears and concerns.

• **Establish a process.** Establishing a process for the project where one does not exist or to cater for the unique requirements of gamification.

• **Provide a space.** Providing a safe space where the project can be nurtured and given the freedom to explore and develop.

• **Continuous learning.** Providing continuous learning experiences and opportunities, and actively sharing lessons learned.

A critical review of this list of key capabilities indicates that most respondents treated and perceived an enterprise gamification project just like any other business transformation project. This can be identified through the language and concept that were mentioned, which are typical of the project and change management domains (Kotter 1996; Kotter and Cohen 2012). As the majority of respondents achieved a positive experience and outcome from their gamification project, the implication is that astute and proactive project management is a key factor in the success of these projects. Given Gartner’s (2012c) absence of detailed research findings to back their claim of an 80 per cent failure rate of gamification projects, it can postulated that perhaps some of those projects may not have been managed by experienced project managers. This is consistent with findings in the
business transformation and project management domains overall (Atkinson 1999; Baker et al. 2008; Morris and Hough 1987).

The limitations of the results for management node elements is that survey respondents may have limited the full potential of a gamification project by restricting it to existing project management and organisational constructs or the constraints of their positional authority or responsibilities.

Furthermore, the positive project experiences reported by respondents may not be attributed to gamification alone – they could be due to the special attention paid to the business problem. This can be viewed as being similar to a Hawthorne effect (Mayo 1949; Adair 1984) where performance is improved simply by virtue of the business process receiving special attention. This provides an opportunity for further research in enterprise gamification.

**Design node elements**

Design elements refer to the skills and processes by which an organisation uses design practices and methods to solve a business challenge, or in the words of Zimmerman, Forlizzi and Evenson (2007) and Hevner et al. (2004), ‘wicked problems’. It was hypothesised in this study that a meta investigation of the design domain can be used to inform how we may be able to approach gamification design with more rigour. This is based on the notion that design is about ‘making the right thing’ as an artefact of the process (Zimmerman et al. 2007) which transforms a problem from its current state to a future state (Friedman 2000, 2003). Philosophically, artistically and practically, the focus of gamification design in the enterprise is just that – a goal orientated design process to solve problems. This was also borne out of Research Module 1 via the development of the conceptual design framework, which was then validated by the respondents’ feedback
in the experience survey in Research Module 3 on barriers, enablers and best-practice recommendations for gamification projects.

Using the same method as for the management node, the design elements from Research Module 3 were extracted and synthesised from the tables pertaining to enablers (Table 29: Enablers of gamification projects – Overview), barriers (Table 30: Barriers to success - Overview) and best practice (Table 31: Creating a better design process - Overview), which where synthesised into Table 34: Design node (see Part 2 of this dissertation). The key capabilities that emerged in this analysis in relation to the design node are as follows:

- **Design goals.** Setting clear project and design goals at the outset of the project. This also includes the clarification, establishment and alignment of design goals with the overall business goals.

- **Customer focus.** Focusing on the target audience, players or users in terms of identifying who they are and what motivates them, as the focus of all subsequent design decisions. This is also extended to include consideration of the levels of customer-centricity in the culture of the organisation developing the gamification project.

- **Design process.** Establishing a design process that consists of structured elements including ideation, design, prototyping, testing and iterating, as well as showcasing examples and achievements. Processes need to be structured around creative problem solving for ‘wicked problems’.

- **Design skills.** Creating real and tangible design skills in the organisation to improve staff expertise, confidence and understanding of gamification design. In addition to directly applying these skills to the project, they should also be used to manage different vendors during the design, prototyping and testing phases.
• **Design approach.** Establishing a meta view or approach on a way of thinking about design and the use of design principles such as scaffolding in applying gamification to the enterprise.

• **Selective gamefulness.** Selecting appropriate and meaningful game elements such as gameplay, game mechanics, storylines and narratives aligned with the design goals. This also includes avoiding simple and overused mechanics, and striving to be more innovative.

The elements identified by the survey respondents covered issues similar to those identified in Research Module 1 during the development of the conceptual design framework; thus, this capability framework can work as a compendium to the conceptual design framework in identifying the capabilities that are required to execute each of the seven-steps in the design process. Furthermore, there is alignment with the key findings of the enterprise gamification taxonomy in Research Module 2. The taxonomy provides an objective overview that maps the key elements commonly used in enterprise gamification projects, and provides high-level insights on the possibility space or the boundary conditions. The capability framework complements the taxonomy by providing an overview of the key capabilities and direct actions required for design decisions and consequent project development and execution.

**Technology node elements**

Technology was one of the most contentious issues that emerged in Research Module 3, particularly in terms of the sub-optimal performance of the technology and vendors as reported by respondents in the experience survey. As learned from the taxonomy in Research Module 3, there are often a variety of primary and secondary technologies employed when executing gamification in an enterprise, and the capability elements as previously specified in this chapter provide an overview of the range of
competencies required to manage the technology side of an enterprise gamification project.

Consistent with the method used for both the management and design nodes, the technology elements were extracted from Research Module 3 tables pertaining to enablers (Table 29: Enablers of gamification projects – Overview), barriers (Table 30: Barriers to success - Overview) and best practice (Table 31: Creating a better design process - Overview), and were synthesised into Table 35: Technology node (these links will take you to the detail in Part 2 of this dissertation). The key capabilities that emerged in this analysis in relation to the technology node are as follows:

- **Agile development.** This provides a viable development methodology given the amount of unknowns in a gamification project. Elements such as flexibility, freedom, iteration, prototype testing and ongoing learning featured highly among more experienced project leaders in this study.

- **Vendor capability.** There is a perceived limitation in the capability and experience of gamification vendors as advisors (separate from the technologies they are selling). Therefore, the ability of organisations to select, monitor and manage expert vendors is a crucial one.

- **Platform capability.** There is a perceived limitation in the number, range and differences across the platforms on the market. The ability to distinguish between them, or to make a call to invest in ‘building your own’, is crucial based on the organisational resource investments that are required.

- **Technology robustness.** There is also a perceived limitation in the gamification technologies available on the market – they are commonly associated with product immaturity. Issues that need to be proactively
managed include scalability, systems integration and meeting enterprise specifications.

- **Data integrity and reporting.** While this may be considered a subset of platform capability and technology robustness, it warrants a separate mention due to its significance as an input into management decision-making. Even though gamification promises insightful data analytics in its value proposition, experience suggests this is an area that requires improvement.

- **Internal IT support.** Many organisations underestimate the amount of internal and cross-function teamwork and resources required to design and deliver a gamification project. One of the most crucial requirements is internal IT support for the project, given the need for specialist knowledge on the gamification technology being used, and most importantly how to integrate it with existing enterprise systems.

The technology node of the capability framework provides significant information that can be used throughout the design process to enable project leaders to make better decisions. For example, in the Envision and Create phases of the conceptual design framework (see Figure 3: Conceptual design framework) critical decisions are often made about the selection, design and development of gamification technology, which could benefit from guidance provided by this node in terms of the experiences of other gamification project leaders.

### 5.4.3 Conclusion of results for Research Module 4

An overall summary of the full range of capabilities across all three nodes that evolved out of Research Module 3 (which also build upon and extend the research outcomes in Research Modules 1 and 2) are outlined in Table 3 below:
Several themes were raised in the survey in Research Module 3 that were common between all the three key nodes that appear to be ‘enablers’ of the capabilities. Results from the survey suggest that there are three such enablers that act as the conduits between the three capability nodes to produce tangible action and outputs which are iteration, participation and integration. These enablers are depicted in the overall capability framework in Figure 5 below.

<table>
<thead>
<tr>
<th>Management node</th>
<th>Design node</th>
<th>Technology node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic focus</td>
<td>Design goals</td>
<td>Agile development</td>
</tr>
<tr>
<td>Measurement</td>
<td>Target audience</td>
<td>Vendor capability</td>
</tr>
<tr>
<td>Stakeholder engagement</td>
<td>Design approach</td>
<td>Platform capability</td>
</tr>
<tr>
<td>Sponsorship support</td>
<td>Design skills</td>
<td>Technology robustness</td>
</tr>
<tr>
<td>Communication</td>
<td>Design process</td>
<td>Data integrity and reporting</td>
</tr>
<tr>
<td>Process</td>
<td>Selective gamefulness</td>
<td>Internal IT support</td>
</tr>
<tr>
<td>Provide a space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous learning</td>
<td></td>
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</tr>
</tbody>
</table>
For example, common to both the design and technology nodes is the *iteration* enabler, which involves the use of agile development, frequent prototyping and testing to get the solution right. It is the key activity that enhances capabilities into definitive action and the delivery of tangible artefacts. The enabler common to the design and management nodes is the *participation* enabler. Several respondents mentioned the need for participatory and consultative practices to develop deep insights into the problem and to adequately engage internal work teams and stakeholders affected by the project. The enabler common to the technology and management nodes is *integration*. This means that without attention on the integration of the gamified solution within existing enterprises systems and processes, the solution may not be optimised.

The relevance of the enablers in this framework is that they assist in the execution of all other capabilities to ensure the best-possible outcome for the enterprise. Capabilities across all three nodes can be viewed as *static competencies* contained in an organisation, and the enablers as *dynamic*
**competency** which is the key action that sets the capabilities in motion during project development implementation (to produce tangible outcomes).

The capability framework therefore provides a practical tool for gamification project leaders. Each of the elements, enablers and nodes can be used as a checklist of items when project leaders are designing and implementing their gamification project to minimise risks and enhance the full potential of a holistic design process. It is also a framework that can be used as a due diligence tool when developing a project proposal or business case, or as a health check for a project that has already commenced.

This proposed framework shows that there are many elements that are involved in ensuring a successful enterprise gamification application that goes beyond motivational affordances and gameful design to include systemic and infrastructure considerations. This is supported by several IS researchers who evaluated the successful implementation of models for enterprise applications (DeLone and McLean 1992; Infinedo et al. 2010; Sedera et al. 2002; Van der Heijden 2004; Venkatesh et al. 2003) – all agreed that motivational affordances only partly determine user engagement and acceptance, and the use of an enterprise system.

Specifically, the ERP implementation success model (Infinedo et al. 2010) indicated that a range of variables determine the success of enterprise systems that go beyond design and motivational affordances. Infinedo et al. (2010) maintained there are six success dimensions – system quality, information quality, service quality, individual impact, workgroup impact, and organisational impact – that indicate that systemic and infrastructure elements have a key impact on user acceptance of technology. The authors identified 46 individual measurement scales across these six dimensions that explain 69 per cent of the variance in the performance data of user acceptance – one of the highest statistical explanation rates for extensive
works of this kind. The findings in this dissertation indicate that the first three of these variables have also been identified as significant issues that emerged in Research Module 3. Insofar as implementation success is concerned, half of the equation relates to the quality of the system, service and information, which has been underexplored in gamification research to date. This dissertation comes some way in partially filling this gap.

Given the relevance of the above factors to enterprise gamification applications, it should be considered that gamification is also, in part, an enterprise information system and therefore it needs to also be informed by research in this domain. IS research provides a complex array of relevant factors that align with the various concerns that were raised in the experience survey in Research Module 3 that should be considered in the design and implementation of enterprise gamification projects. The outcomes of the survey in Research Module 3 suggest that experienced project leaders perceive an equally complex array of systemic factors, infrastructure issues and capabilities that can impact on the success of enterprise gamification applications. This provides an opportunity for further research to better align enterprise gamification with IS research.
Chapter 6: Conclusions

This chapter presents a discussion on the key findings of this dissertation and their contribution to knowledge. In the final section, a reflection of this leaning journey is presented.

6.1 Discussion

The growth in public interest in gamification is commensurate with the rise in the uptake in games and play in the wider socioeconomic and business landscape (Kremple and Beyes 2011; Roth, Schneckenberg and Tsai 2015). This has often been cited by scholars as a reflection of the ‘ludification of culture’ (Deterding 2014; Mayra 2015; Walz and Deterding 2015) and of how computer games are transforming the construction of personal and cultural identities (Raessens 2015). This can also be seen to be part of the wider discourse of the influence of media on culture, identity and politics (Kellner 2003; Curran 2010; Turkle 2011; McLuhan 1964). Games and gamification can be seen as impacting society in a similar manner as any other digital media that exhibits the characteristics of engaging interfaces and interaction.

Among enterprises, gamification is manifesting itself as a tool that can potentially improve business performance, in particular, with systems that are designed for higher levels of customer and staff interaction. Yet while the potential of early-stage gamification has been acknowledged (Hamari et al. 2014; Mollick and Rothbard 2014), tangible tools and frameworks are yet to be developed to advance the domain and business practices in
particular. The outcomes of this dissertation provide research contributions and artefacts that may help fill this gap.

The conclusions of this research provide a body of work that contributes to knowledge in terms of (a) critiquing how gamification is defined and how it is applied in enterprise systems; (b) understanding the unintended adverse consequences of gamification projects in the absence of a strategic approach to design and implementation; and (c) argues for the need for rigorous frameworks and methodologies and capabilities that will enhance gamification project success. A discussion of the key elements of these research conclusions is as follows:

- **There are two key components of an enterprise gamification application.** These are the ‘back-end’ which is where a gamification project is designed as an IS to collect and process data about customer or staff behaviour, to be used as business intelligence in management decision-making; and the ‘front-end’ of gamification is designed around motivational affordances and the game design patterns that influence user experience and interaction. These two parts need to work in tandem to deliver a successful gamified enterprise system. One part engages users (front-end); the other enables business intelligence to be generated that aids management decision making (back-end). This is consistent with literature in the design-science domain that emphasises that an information system needs to integrate people, organisations and technology if it is to achieve its stated purpose rather than view components of the system in isolation (Hevner et al. 2004).

- **Gamification means different things to different organisations,** and it appears that different organisational contexts and project purposes have influenced the diversity in definitions that have
evolved to date. This has been documented in the ‘The Five Ways of Enterprise Gamification’ that describes gamification as being a product, a way of thinking, a process, an experience, or a designerly way. It still remains unclear whether a single definitive definition is even possible or even if it would be helpful to the advancement of the domain. Within the design professions, it is often stated that no single definition of design, or branches of professional practice, adequately cover the diversity of ideas and methods that are gathered together under that label; essentially design “eludes reduction” (Buchanan 1992, p.5). As it’s partly a design discipline, gamification should be no exception to this rule of avoiding reductionism. Furthermore as it’s partly an information systems discipline, gamification can be both a process (activity) and a product (artefact) which requires a ‘platonic view of design’ (Hevner et al. 2004 p.78).

Consequently, the working definition of gamification that evolved out of this research and underpins the findings and conclusions is: A set of game design patterns, technologies and organisational capabilities that enable an organisation to create value for stakeholders. This builds upon the definitions that have evolved from the works of Deterding et al. (2011), Deterding (2014), Huotari and Hamari (2012), Hamari et al. (2014), Warbach (2014), Werbach and Hunter (2012).

- There are potential negative affects of enterprise gamification in terms of how enterprise gamification can destroy rather than create value without a strategic approach to design and implementation. Key areas of value destruction were discussed in the areas of coercive participation, data leakage, homogenisation of the workforce, loss of human agency, the illusion of change and shallow and inauthentic gamification design. The lack of rigour and strategic
focus is often seen in the language used by vendors of gamification solution where it is implied that gamification is something that is subversively performed on employees by management using tools and tricks from game design. The implicit assumption in such rhetoric is that there is diminished agency on the part of the employee to be more engaged and productive at work, and that it is up to management to provide the stimulus to improve performance. This is the management mindset that had created the current level of employee and customer disengagement in the first place, and where gamification needs to take care to not replicate. This contributes to the body of work in HCI in this field and builds on the work of Marache-Francisco and Brangier (2013), Friedman and Kahn (1992), Kuka and Oswald (2012) and Fleming and Sturdy (2010).

- The results of Research Module 1 indicated that the key components important to the design of rigorous gamified enterprise applications include four design phases and seven practical creative exercises based on an agile approach to the development of a gamified enterprise application. This also includes the use of design templates such as workbooks to provide a high-level structure for grounding, guiding and prompting participants during an enterprise gamification design process. The use of tangible design tools such as design cards and experiential activities prompt discussion, debate and creativity. This is consistent with the findings of Brandt and Messeter (2004), Hornecker (2010), and Lucero and Arrasvuori (2010). This module also contributes to knowledge in the design domain by highlighting how to incorporate gamification elements by building on the works of Mendel (2012), Dubberly et al. (2008) and Kumar (2012). A further contribution is also made in the field of ethics and values in game design in terms of how it can be applied to
gamification, which contributes to the work of Friedman et al. (2008), Yoo et al. (2013), and Flanagan and Nissenbaum (2007).

- In Research Module 2, the taxonomy that was developed showed that there are five key parameters in enterprise gamification projects – primary purpose, target audience, technology strategy, core gameplay, and key mechanics – that form the foundation of this proposed enterprise gamification taxonomy. More often than not, the key gamification features that have been documented can be classified as elements of ‘self-optimising systems’, which means they provoke “system conform reactions” from users (Kuka and Oswald 2012, p. 6), rather than creating opportunities for deep human experiences and learning, or divergent thinking and action. Whilst this has been researched in HCI, it presents itself as an opportunity for further research in the enterprise gamification domain.

- Research Module 2 therefore did not uncover any new or novel forms of design patterns, technology use or gameplay, or examples where gamification has influenced systemic changes in market structures or workplace practices. This supports the position that at this point in time, gamified systems generally support existing workplace and market constructs (albeit in a more engaging way), rather than create new forms of organisation structures, systems or rules of play. The opportunities for further research here is in the development of new or novel forms of gameplay in enterprise systems that look to stimulating innovative outcomes.

- This taxonomy should be considered the commencement of an evolving construct as gamification technologies and design practices continue to grow and develop. Therefore opportunities for further research lay in building greater depth and scope in this
taxonomy, as well as developing specialist enterprise functions such as marketing, human resources development, education, and innovation management.

- In Research Module 3 the **investigation of management experiences with gamification provided extensive insights into the design, management and technology of enterprise gamification**, with a particular focus on barriers, enablers and best practice. The most significant finding in regard to barriers to success and enablers was not the responses that were voiced, but rather those that were not. When addressing open-ended questions about barriers and enablers, respondents did not refer to the motivational affordances of the gamification elements or the effectiveness of the project to engage users. Respondents mostly believed that **indicators of success, or barriers, are predominantly based on how well a project is managed, the robustness of the technology, and its integration within the organisation**. It would appear that motivational affordances in terms of the right balance of gameful design features, while of significant importance, rank secondary to enterprise system and process integration. This presents an opportunity for further research in identifying how systemic elements may enhance or impede the motivational affordances of gamification design. This is consistent with the findings in IS research on technology acceptance (DeLone and McLean 2003; Vankatesh et al. 2003; Seder et al. 2002; Van der Heijden et al. 2003).

- Most organisations participating in the survey in Research Module 3 reported achieving positive results from gamification projects, but indicated that there’s still room for improvement across many operational areas. In particular, there are effectiveness issues
associated with technology and vendor maturity, and a need to improve the capabilities of organisations in the design and implementation of gamification projects. Despite this, most surveyed respondents voiced optimism about the future development of the domain, which is mostly based on the positive results that have already been achieved from previous gamification implementations. Opportunities for further research lays in building on the outcomes of the proposed Capability Framework in Research Module 4, focusing on the capabilities of an organisation as a means to enhance gamification project outcomes.

- **The findings of this research also provide a contribution to the Information Systems Success Model (ISSM)** (DeLone and McLean 1992, 2003). The ISSM provides a framework to conceptualise and operationalize information systems success. The model identified six independent variables that determine the success of IS implementations which are – System Quality (SyQ), Information Quality (IQ), Service Quality (SQ), System Use (SU), User Satisfaction (US), and Net Benefit (NB). This model is an important tool critical to understanding the value and efficacy of IS management actions and IS investments (DeLone and McLean 2003, 2002, 1992). In my research I investigated three of these independent variables in my survey in Research Module 3 – SyQ, IQ and SQ. These factors were built into my survey questions which can be seen in Table 21, Table 23, Table 24, and Table 26.

- These three independent variables were selected for particular attention as they are arguably the precursors to the remaining independent variables of SU, US and NB (DeLone and McLean 2003). Results showed high average scores given by survey respondents on the relative importance of variables that constitute
SyQ, IQ and SQ in gamification project success. My research findings confirmed the multidimensional and interdependent nature of information system success, and the **relevance of ISSM in being equally applicable to gamified enterprise systems**.

- An additional contribution of my research is to go beyond the confirmation of the importance of the elements of the independent variables, but extending **ISSM to identify a capability framework that highlights the design, technology and management capabilities that are required to ensure the effective implementation of gamified enterprise systems**. This also provides an opportunity for further research for a wider and more in-depth study of the one I have commenced here, by also including the SU, US and NB elements of the ISSM.

Enterprise gamification appears to share an overlap with other enterprise system development in the areas of enablers and barriers to system success. However the unique challenges of enterprise gamification appear to be a greater emphasis on design – this isn’t only the design of system interfaces and interactions, it is extended to include the process of design - to be a game, game-like or playful, as well as collaborative. Furthermore there is also the expectation of a parallel alignment with non-system or ‘offline’ fun and gameful interactions within an organisation, or between organisations and its stakeholders. This unique challenge that gamification faces appears to be taking enterprise system development a step closer to human-centred design by offering a more lucid language and tangible methods to achieve it. This is in itself a decisive factor in facilitating enterprise stakeholder value creation.
6.2 Summary of contributions

This research aimed to: (a) identify effective approaches to enterprise gamification grounded in both rigorous research and industry experience; and (b) identify potential tools and frameworks that may assist in advancing the research domain and the practice of enterprise gamification. To this purpose a design-science approach was adopted due to its focus on innovative problem-solving in enterprise information systems, and its emphasis on the production of practical research artefacts as a contribution to knowledge and theory.

The core research question addressed was: *What are the key success factors in creating stakeholder value with enterprise gamification?* This question was comprised of four sub-questions, and a discussion on their respective research contributions are presented below:

1. **What are the key design principles and decisions that need to be considered for effective enterprise gamification design?**

The investigation in Research Module 1 uncovered that as a design discipline, enterprise gamification can be informed by the research and experience of related domains in design, information systems, and HCI. Building on this foundational knowledge, an enterprise gamification design framework and methodology was developed, along with four unique sets of design cards, templates and experiential exercises as an aid to the design process. A further contribution of this research is the introduction of ethics as a key design frame for overcoming the potential value destruction elements of gamification design and practices. The work in this research module has earned the following publications:
(a) The design framework was published as a long paper in the *Journal of Gaming and Virtual Worlds* in September 2014.

(b) The work on ethics was published as a position paper at CHI 2015, Seoul, at the Gamification Research Network workshop on *Researching Gamification: Strategies, Opportunities, Challenges, Ethics*.

(c) Work on design cards was published as a short paper at OZCHI 2015: *Playful card-based tools for gamification design*.

2. **What are the key technical features of current enterprise gamification constructs in the enterprise? What are the technologies, purpose, audience and game design patterns that are being used?**

From the study in Research Module 2 of over 300 gamification artefacts created by organisations over the last three years, an enterprise gamification taxonomy was developed which included five core elements: primary purpose, target audience, technology strategy, core gameplay and key game mechanics, with over 52 sub-elements. This taxonomy has enabled the identification of the conceptual boundary conditions and possibility space which shape the design and development of enterprise gamification projects. This taxonomy also provides a framework for classifying and designing enterprise gamification initiatives. It was the first extensive work of its kind in the enterprise gamification domain and was published as a long paper at DiGRA 2015 Luneburg, Germany.

3. **What has been the management experience to date of organisations that have experimented with gamification? What do they see as the key enablers, barriers and capabilities required for successful**
implementations?

An online survey of 25 early adopters of enterprise gamification was undertaken in Research Module 3, which provided a unique insight into the first-hand experiences of enterprise gamification. The combined gamified projects covered in this survey equated to 11.4 million users (a combination of internal staff and external customers or stakeholders) that have been affected by these gamified enterprise applications. This represents a significant sample and an original piece of work in the enterprise gamification domain.

The outcomes of this survey were used to expand on the taxonomy developed in the preceding research module by providing granular level detail on what shapes organisational decision-making on enterprise gamification projects. Key implementation insights were uncovered across the three areas of technology, design and management. These insights can be used as a compendium to the conceptual design framework created in Research Module 1. They can provide guidance on the development of gamified applications, that aligns with information systems theories on implementation success. The outcomes of this research module also provided the data and insight for Research Module 4, which was used to develop a conceptual capability framework.

4. What are the implications for the design, implementation and management of gamified applications in the enterprise?

Building on the insights drawn from the experience survey on enablers, barriers and best practice, a conceptual capability framework was developed to address this research question in Research Module 4. The capability framework provides an outline of the range of core
organisational competencies required for the successful design and implementation of a gamification project. The three core areas of the capability framework are management, technology and design, and the three enablers are integration, participation and iteration. The outcomes of this research revealed a complex array of factors that are often involved in developing and implementing a successful enterprise gamification project, which is consistent with IS and IT research. This presents an opportunity for further research into aligning enterprise gamification with the IS research domain.

These research questions were investigated in this study via four detailed research modules using different epistemological approaches within the overall research framework of design-science in information systems. This research has produced outcomes in the form of three key interconnected and interdisciplinary artefacts that provide new knowledge on how gamification can be used by organisations to create value for their stakeholders.

Gamification tools to address boundary value problems

An enterprise gamification project poses a boundary value problem (Drucker 1964) which is an organisational problem to be solved that must also satisfy certain boundary conditions – which are organisational, market and industry constraints, before it can create value for stakeholders.

Enterprise gamification boundary conditions are the technological, design and management conditions that both shape and constrain a gamification project. This challenge can be illustrated by using the four research artefacts in this dissertation as a combined approach:

• A manifestation of the boundary constraints can be seen in the taxonomy that was mapped in Research Module 2. The five key elements identified – primary purpose, target audience, technology
strategy, core gameplay and key mechanics – and their associated sub-elements form the *boundary constraints and the boundary conditions*. These boundaries can also be perceived as framing the possibility space\(^\text{13}\) which contains the design decisions are made by an organisation.

- Within this possibility space, Research Module 3 presented the enablers, barriers and best practices that affect the success of enterprise gamification projects, and in Research Module 4, the capability framework articulates the organisational constructs required to enable the organisation to reach its value creation goals.

- All these research modules then loop back to the beginning in Research Module 1, where the conceptual design framework can be used as a canvas that is bounded by the possibility space. This design framework could be considered the ‘magic circle’ of enterprise gamification design, and the taxonomic and capability elements within it are the palette of strategies at the organisation’s disposal.

The apparent limited innovation in gamefulness, design and technology found in this dissertation suggests there are conscious or subconscious limitations, or *boundary conditions*, that organisations have imposed on their gamification projects. However, in a broader strategic and operational context, this phenomenon can also be observed in situations where organisations are undergoing systemic change (Kotter 1996; Kotter and Cohen 2012), which has also been identified as the major barrier to adopting innovation (Chesbrough 2005; Christensen 1997). Such boundary

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\(^{13}\) In game design, a ‘possibility space’ is the safe space where all the action takes place within the boundaries of the game rules and elements used to engage people in play (Salen and Zimmerman 2004; Sicart 2008; Wright, interviewed in Seabrook 2006), which is also akin to Huizenga’s (1955) ‘magic circle’ and Castronova’s (2005) concept of a shield or membrane protecting the fantasy world from the outside world.
conditions are generally formed by organisation culture, legacy systems and systemic constraints (Cohen 2013; Drucker 1964), as well as limitations in organisational capabilities (Teece et al. 1997). Thus, this phenomenon is not unique to gamification, but to any strategic innovation project that an organisation is looking to implement.

With the right tools, enterprise gamification has the opportunity to make these constraints more visible and open up the possibility space for creating greater value for stakeholders.
6.3 Reflection

One of the key design philosophies that has inspired this research was the assertion by design scholar Ken Friedman that “design is about changing existing situations into preferred ones, and those who cannot achieve this fail in the process of design” (Friedman 2003 p.509). Looking deeply into this design philosophy throughout my research raised several complex and interrelated issues that gamification design needs to address if it is to evolve as a rigorous strategic design discipline.

- The first is that design is a process, which means that it is a continuous stream of interconnected activities rather than a set of static design features.
- It assumes that practitioners have an acute insight into the complexity of a current business situation, and that they have the wisdom of what constitutes a preferred state for an organisation, and the astuteness to design the optimal pathway to attain it.
- It assumes that the designer has the elusive capability to enable sustainable change in complex human systems.
- It assumes that design is an effective agent of change against the systemic rigidity and power structures of legacy systems.

This is a formidable challenge for any well developed business discipline, let alone for one as underdeveloped as gamification which is short on rigorous and tested methods, frameworks and tools.

Failure is common across all design professions, or in Friedman’s words, it occurs when design is unable to change existing situations into preferred ones. Following Friedman’s logic, he asserts that design failure is usually caused by an absence of a systematic and comprehensive understanding of
the design process, and an absence of the ability required to ameliorate a business problem with design methods that are both creative and strategic.

Rigorous research and theory development plays an important role in filling these knowledge and capability gaps that may assist in helping to reduce the incidence of design failure; and this has been my key motivation in undertaking this doctoral research. After four years of research, I can conclude that *under the right circumstances*, gamification can be a positive strategy for performance improvement in the enterprise. These ‘right circumstances’ are a balance of design, management and technology elements, which are detailed in my research artefacts of the gamification design framework, the design taxonomy and the capability framework.

However what has become more transparent for me is that the depth and intricacy of this task is much more complex than anticipated. And much of this was unearthed when I looked deeper into the origins of game design and games as media in general. This led me to question whether some types of gamification were viable in facilitating innovation or systemic change, or whether they are just another tool that make existing business problems more palatable to increasing disillusioned enterprise stakeholders.

**Values and intent are built into system design**

A closer look at the origins of video games from which gamification has largely evolved shows us that like all human constructs, games have inbuilt value systems in their designs that reflect the existing world order. This means that the inbuilt mechanism of most games largely reflect a different way of looking at and interacting with the status quo, rather than a mechanism to challenge the core design of the system.

Games scholar Sicart (2011) articulated this succinctly in his critique of proceduralism in game design (Bogost 2007). Sicart argues that game rules
are fixed by the designer and that these predetermined rules control the meaning of the game or the core game experience. This means that players only follow the rules of the game, deriving meaning from the game that has already been predetermined for them by the designers. Players of the game are just ‘activators’ of the process of gameplay, which has been designed with predetermined meanings that are woven into the game. Apart from the disempowering aspect of such proceduralism, this also has ethical and political underpinnings that are invisible to the player while they participate in gameplay.

This has important implications for how games, and by implication, gamification, are used in the enterprise - particularly as there is an implicit expectation to participate in a gamified enterprise system. In an entertainment game, a player can freely elect not to play. However in an enterprise setting, even an implied expectation to participate places the player in a situation where they are subjected to enterprise inculcations without their awareness or choosing. While play and games provide a positive means for people to explore and make sense of their surroundings, they can also be dangerous and destructive (Sicart 2011, 2014; Braithwaite & Sharp 2010; Flanagan & Nissenbaum 2009; Flanagan 2009). For example, it is argued by games scholars that the most common game design methods that are used in serious games and persuasive games tend to fail to engage players or immerse them in transformative experiences. This is due to the triggering of normal human psychological reactions when people are subject to overtly message-driven interventions such as games (Kaufman, Flanagan & Seidman 2015).

Beyond these psychological factors, there are also potentially more subversive factors at play. Social theorists such as de Winter, Kocurek and Nicols (2014) identified a link between gamification, scientific management and what they call the ‘capitalist appropriation of play’ in what they believe
to be a method that creates economic value for owners of capital through unpaid labour. By exploiting the cultural perceptions of the innocence and harmlessness of games and play, people are lured into gamified participation under the guise of fun. Social theorists would argue that in reality, this is an exercise in wealth creation where the proceeds are unevenly distributed to the owners of capital rather than the participants in gamified application.

Building on this theme, there is a considerable body of work that claims that games and play not only reflect our pre-existing social constructs, but also work towards their preservation. Crogan (2011), Dyer-Witheford and de Peuter (2009), and Stahl (2010) claim that video games originated as training and propaganda tools of the military-industrial complex. These scholars argue that games contain the technological ability to envelop players in a mindset based on prediction and control (Bullinger 2014). These scholars argue that like most modern media, video games are a tool to help shape public understanding and support for contemporary technoculture, capitalism and war, and social perspectives on how we conceptualise the future.

However such interpretations of games and media are not new – they go back as far as Plato, who believed that games and play possess such significant power that they need to be regulated to prevent social disorder (Gouldner 1965; Ardley 1967). Plato even suggested that one way to avoid the social disorder that play can bring is to harness its power for utilitarian purposes, such as developing games that shape people’s actions and character so they can be more useful in serving social order (D’Angour 2013; Ardley 1967).

Reflecting on this body of work, it can be argued that such positions on games and play can be seen as overtly political. However similar undertones
of subversiveness can also be detected in modern-day ‘behavioural economics’ and ‘persuasive technology’ commonly used by gamification practitioners and vendors, who often espouse the use of gamification to shape desired behaviour, make predetermined actions addictive, manipulate action, or drive loyalty. This language and intent is geared towards supporting a potentially broken status quo, rather than working towards systemic change or innovative outcomes.

In this context however, all digital media and technology are subject to (and become a tool of) the prevailing ideology of the society that has created them. Postmodernists like Foucault (1991), Korzybski (Durant 2010), and McLuhan (1964) all maintained that what is often seen on the surface of entertaining contemporary media and technology is not always what it seems, as it often serves a different purpose or motivation such as towards social shaping and control. These works suggest the need to reflect on deep human psychology right through the systemic design of the complex human systems that shape social constructs and our economy. The implications of these works is that if organisations are investing in gamification to achieve sustained systemic change and innovation, then they need to be mindful and transparent with their designs, the design process they employ, and the technology they use.

**Reflecting on my research questions and contributions**

Research needs to operate within the boundaries containing the specific system and research problem being investigated. This study’s boundaries were drawn around elements that can be managed by enterprises and project leaders, in terms of the agency and autonomy they have to design and implement a gamification project. Within this context, this research highlights that gamification can be used to generate positive outcomes in the enterprise through conscious, collaborative design and mindful
implementation. This is what was set out to achieve via this study’s research objectives, and this is what has been accomplished. The unanticipated insights into enterprise operations as well as the overall socioeconomic and political underpinnings of games and gamification were equally beneficial. These unexpected insights placed a broader perspective on how this knowledge can be used by organisations and designers with greater awareness of the systemic constraints that limit possibility spaces, and the ability to better identify and design for a preferred future state. This research contributes to the design challenges that were raised by Friedman (2003) that was discussed earlier in this reflection – a method and systematic and comprehensive understanding of that we are designing for.

Gamification can also be seen as representing a more tangible language to express what we need to change about the way we think about work, how we relate to our stakeholders, and how we organise and manage our people and our resources. Gamification may be an abstraction of the deeper problems we are facing in our organisations, and the new possibilities we are contemplating as solutions. Using a metaphor described by Korzybski (1933), perhaps gamification provides the map, but it’s not the territory. The map provided by gamification could be a symbol of our need to find solutions to wicked problems that are more human-centred, meaningful and playful.

This research has been an investigation into the endeavours of people trying to work with a new idea to create something tangible, to the best of their ability, within the visible and invisible constraints of their organisations. Despite the limitations of gamification that have been discussed in this thesis, it appears that given the right knowledge, tools and capabilities, gamification can stimulate human connection and creativity, which is the source of true innovation and value creation.
This section contains the detailed reports of research modules 1 to 4. Each of the research module chapters provides a detailed outline of their individual methodology, literature reviews, and research findings to the specific research question that they are addressing.

The summary findings presented in Part 1 of this dissertation has been distilled from these detailed research reports, and therefore some repetition is unavoidable as the research modules were designed (and published) as standalone pieces of work, under the auspices of the core research question.
Chapter 7: Research Module 1: Towards a Conceptual Design Framework

There is a limited number of a comprehensive and holistic design approaches for the development of gamified applications for enterprise settings. The absence of rigorous empirical research on gamification design practices has opened the path for a variety of practices being developed, much of them taken directly from game development and loosely applied enterprise business applications. Notwithstanding that there isn’t a universal or agreed game design method, nor a comprehensive consideration of the enterprise system to which the gamified application will be applied to, questions arise as to the capabilities that are required to design and implement an enterprise gamification project.

Many different design practices are already used in enterprise operations, therefore organisations are open to new ways of thinking about how design can impact products, services and organisation systems and processes (Brown 2009; Kumar 2012; Mendel 2012). For example the use of design-thinking as popularised by design firms such as IDEO, Frog Design and XPlane, have spawned renewed approaches and tools in service design, industrial design, interaction design, and experience design (Brown 2009).

Gamification, or “game design thinking” has now emerged as a relative newcomer to the field of design that can be applied to enterprise settings, however it comes without proven design frameworks, tools or trained practitioners. In many instances it is claimed that gamification is only an extension of user experience design, however using game elements in systems development has a history in HCI research as motivational
affordances in ICT design and use (Zhang 2008) and as hedonic systems (Van der Heijden 2004).

In this research module, I will explore the various design fields that have had proven applications in the enterprise domain, and augment this research with key features of game design thinking or gamefulness (Deterding 2012, 2014; Fullerton 2008; McGonigal 2011; Zimmerman and Salen 2004) to develop a conceptual framework for a holistic approach to enterprise gamification design.

**Towards a conceptual design framework**

In game development, the fundamental role of the game designer is to be the ‘advocate of the player’ and the designer must look at the game world that is being created through the eyes of the player and focus completely on the player experience without being distracted by the other concerns of production (Fullerton 2008). Here already we have a disconnect between the role of a game designer versus the role of a gamification designer, which affects the dynamics and effectiveness of game elements used in non-entertainment contexts. A gamification designer is often the advocate of management or the investor – the enterprise itself – and the role of the player or worker is fundamentally subordinate in the game that is being developed. The engagement and experience of the player in a gamified enterprise application is typically a means to an end (business outcome), rather than the end in itself (enjoyment). And it’s this very distinction between these two positions, and the tensions that arise between them, that has given rise to the value destruction risks of gamification and is the design challenge that all gamification designers face.

For this reason, I have applied a ‘game-thinking’ approach in developing this conceptual model and process to ensure that the gamification designer
is principally an advocate of the player just as much as an advocate of management in order to gain the greatest possible benefits from the use of game elements in enterprise contexts. This is based on the assumption that the greatest opportunity for organisational performance and innovation lies in finding an equilibrium of these two positions by taking a more human-centred approach to systems development. To this end, I have incorporated a value-conscious design approach that uses methods to design technology that accounts for human values in a comprehensive manner (Friedman et al. 2008). Key features include the use of co-design or participatory design with stakeholders at each stage of the design process and the development of a set of project values that frames the terms of reference for the project. This approach is not without its challenges (Manders-Huits and Zimmer 2009) but provides a tested, theoretically grounded approach that may help circumvent some of the value-destroying aspects of gamification features.

From a value creation perspective, a values-driven approach is also significant as a strategic management tool as it’s considered a more humanistic approach in facilitating employee engagement and trust, positive culture change, and in providing opportunity for innovation, growth and creative problem-solving (Kanter 2009). Therefore in an enterprise setting, the discussion and use of values already has precedence. This approach will also help counteract many of the ‘value destruction’ risks discussed in the literature review in Chapter 3 by paying more attention to the unintended consequences of gamification design practices.

The research artefact created in Research Module 1 was a conceptual enterprise gamification design framework that focuses on sustainable gamification design that will yield a minimum viable design for gamified enterprise applications. My approach in developing this model was as follows:
• Foundations: This model has been abstracted from Mendel’s (2012) taxonomy of models used in the design process, the Analysis-Synthesis Bridge Model (Dubberly, Evenson and Robinson 2008) and the Design Innovation Process (Kumar 2012). My approach was based on the fact that as a design and HCI discipline, enterprise gamification needs to be subject to (or make use of) the same rigors, models and frameworks that have already been developed and tested in these fields. However, flexibility is also built into this model as game and gamification design is also partly an art-form that requires room for creative expression.

• Design Framework: My conceptual framework outlines a four-step design framework that incorporates the phases of (A) Discover, (B) Reframe, (C) Envision and (D) Create. This has again influenced by Mendel (2012), Dubberly et al. (2008) and Kumar (2012), which is a structure that is not uncommon in design and design-thinking disciplines. In addition to this, the two axes of Understand/Make and Reflect/Act frame the nature of the activities that will be performed by gamification designers and stakeholders in each quadrant. This framework is illustrated in the figure below.
Values and Ethics: A important and significant contribution of my model is the inclusion of a fifth element, (E) Values and Ethics frame, at the centre of the framework that has been influenced by the works in human values in technology design, the most notable being Value Sensitive Design (VSD) (Friedman and Hendry 2012; Friedman et al. 2008; Yoo et al. 2013), Value Conscious Design (VCD) in game development (Belman and Flanagan 2010; Belman et al. 2011; Flanagan and Nissenbaum 2007) and Ethics of Persuasive Technology (Albrechtslund 2007; Berdichevsky and Neuenschwander 1999). The purpose of the Values and Ethics frame in this model is to manage the potentially negative impacts of the ‘value-destroying’ elements of gamification that I have outlined in the literature review, by integrating into each step of the development process.

Design Process: I propose a seven-step process synthesised from various game development, design thinking and innovation processes (Brown
The seven steps include: (1) setting project objectives; (2) mapping project motivations, methods and outcomes; (3) mapping stakeholders and user personas; (4) creative problem-solving through participatory design; (5) exploring suitable technology platforms; (6) selecting appropriate gameplay and game mechanics; and (7) prototype, pilot, test and launch the gamified application. Each step includes exercises at key intervals to ‘check-in’ on how the process is tracking with agreed values and ethics principles that are set up at the beginning of the process. It should be noted that this is not necessarily a linear process, and is highly iterative. A more detailed discussion on this process, including the purpose, activity and sample methods for each step is provided in a later section of this chapter. The design process is illustrated in the figure below:

![Figure 7: The SGD process](image)

In this final section, I will briefly run through each of the four phases of the
model and outline the purpose and activities to be undertaken in the design process, and examples of methods and tools that can be used in the design process.

There are many different methods and tools that can be applied and can be sourced from across the design professions, such as service design, user-centred design, interaction design, as well as game design. A range of options is offered, as methods and tools need to be tailored to the unique needs of the organisation, the participants and the problem that is to be solved. What is more important here is the process that ensures that diligence is paid the key components to deliver a minimal viable design. An outline of the process is described below:

**Phase A of the design process: Discover**

![Figure 8: The Discover phase](image)
**Purpose:** The purpose of this phase is to understand the context and actors of the system to be gamified. This phase also establishes the values and ethics framework that will shape the project, and will be a term of reference at ‘check-points’ throughout the development process.

**Activities:** The key activities in this phase are (1) Establish project needs and objectives, and ethical foundations; (2) Map project motivations, methods and outcomes; and (3) Stakeholder mapping and user or player personas.

**Example methods:** Examples of methods that can be used to draw out the activities are the Motivations-Methods-Outcomes framework (Berdichevsky and Neuenschwander 1999); Conceptual-Empirical-Technical method (Friedman et al. 2008); Envisioning Cards (Friedman and Hendry 2012); Method Cards (IDEO 2003); Grow a Game Cards (Flanagan and Nissenbaum 2007).

The importance of this segment in gamification design is in developing a critical understanding of the current situation, system or process that the enterprise is looking to gamify. The Discover phase evaluates data to reveal patterns, challenges and gaps, and identifies the key stakeholders in the system. The outcomes from this process are used as input into next phase of the design process. Each phase continuously builds and iterates on the outputs of the previous phases.
Phase B of the design process: Reframe

**Purpose:** The key purpose of this segment is to analyse the information generated in the Discovery phase and participants build on that information by rethinking them as potential opportunities and solutions.

**Activity:** The key activity in this segment is (4) Creative problem-solving and ideation through participatory/co-design.

**Example methods:** Examples of methods that can be used to draw out the activities are: Ideation; Scenarios; Storyboarding; Gamestorming; Envisioning Cards (Friedman and Hendry 2012); Method Cards (IDEO 2003); Grow a Game Cards (Flanagan and Nissenbaum 2007); Values and Ethics Checklist (Berdichevsky and Neuenschwander 1999).
The importance of this segment in gamification design is to develop a richer understanding of the current situation and to create alternate possibilities to challenge assumptions and paradigms. This is particularly necessary with gamification design as we are challenging participants to add playful or gameful elements in traditionally conservative organisational processes.

**Phase C of the design process: Envision**

![Figure 10: The Envision phase](image)

**Purpose:** The purpose of this segment is to explore, identify and scope a preferred solution.

**Activities:** The key activities in this segment are (5) Exploring suitable gamification technology options, and (6) Selecting appropriate gameplay and game mechanics that are not only motivational, but also lead to meeting organisational objectives.
**Example methods:** Examples of methods that can be used to draw out the activities are: Storyboarding; conceptual modeling; wireframing; game design document; Game Design Cards (Schell 2008); Grow a Game Cards (Friedman and Hendry 2012); Values and Ethics Checklist (Berdichevsky and Neuenschwander 1999).

The importance of this segment in gamification design is envisioning how the gameful elements and technologies may fit together in a design perspective, and how it may be implemented and managed in an organisation. It looks to visualise and foresee gamified possibilities in the target environment and users that are grounded in research and analysis.

**Phase D of the design process: Create**

![Figure 11: The Create Phase](image-url)
**Purpose:** The key purpose of this segment is to design and launch a gamified solution.

**Activity:** The key activity in this segment is (7) Prototype, pilot, test, iterate and launch the gamified application.

**Example methods:** Examples of methods that can be used to draw out the activities are: Agile methodologies, game design, and how values and ethics checklist. Systems dynamics methodologies also provide valuable tools to ensure that effective gamification systems are developed.

The importance of this segment in gamification design is about designing the future state through concrete forms such as prototyping, testing and iteration. Concepts are then translated into specifications not only for technical development, but for how the project will be communicated and integrated into the organisation. This is in itself a complex and specialist task, and is explored in subsequent Research Modules 3 and 4 in this dissertation.

In the next two sections I outline how the design framework and methodology was refined through three key exercises:

- Prototyping through reflective practice;
- Iterative development through the initiation of templates or workbooks to aid in the design process;
- Iterative development through the initiation and creation of design cards to aid in the design process.
Prototyping and evaluating the conceptual design framework through reflective practice

In design-science, the development of a conceptual design framework constitutes a ‘soft artefact’ which means it has less emphasis on the production of a technical artefact such as software code that is common in pure IS research (Amrollahi et al. 2013). There are five different types of applicable evaluation methods for artefacts (Hevner et al. 2004; Peffers et al. 2007) and I selected the observational method for the evaluation of my conceptual design framework which comprised of a field study approach as the key artefact evaluation method (Nakakawa et al. 2010). The field study approach involves the monitoring of the use of a design artefact across several field projects. The observational method is defined as a technique drawn from social sciences that involves the direct observation of a phenomenon in a natural setting (Ritchie, Lewis, Nicols and Ormiston 2013).

The evaluation of the conceptual design framework consisted of a field study comprised of running sixteen facilitated workshops involving 256 project managers from various roles in human resource management, project management, marketing, and innovation management. It should be noted that participants were not design experts, but domain experts that were interested to learn how they can use gamification design in their field. Participants had little or no understanding of gamification before the workshops. The workshops were designed for organisations interested in using gamification to design engaging user experiences and enterprise applications. The workshops were initiated by enterprise project leaders who approached me or the university directly about participating in our research in exchange for a facilitated learning experience.
Reflective field notes were taken on: (a) the ease of understanding and use of the design framework; (b) how readily they could apply it to their real-world problems that they brought to the workshop; and (c) areas for improvement to the framework and methodology. A summary of the workshops that were held is as follows:
Table 4: Summary of workshops

<table>
<thead>
<tr>
<th>Category</th>
<th>Workshops</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A: Design Framework plus Presentation</strong></td>
<td>1. Germany, November 2012</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2. Sydney, September 2012</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3. Sydney, April 2012</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4. Melbourne, April 2012</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>5. Melbourne, June 2013</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6. Canberra, January 2013</td>
<td>16</td>
</tr>
<tr>
<td><strong>Group B: Design Framework plus Template</strong></td>
<td>7. Sydney, February 2013</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>8. Melbourne, June 2013</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>9. Sydney, April 2013</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>10. Sydney, March 2013</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>11. Germany, October 2013</td>
<td>20</td>
</tr>
<tr>
<td><strong>Group C: Framework, Template and Cards</strong></td>
<td>12. New Zealand, September 2013</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>13. Sydney, April 2014</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>14. Sydney 2014</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>15. Germany, October 2014</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>16. Brisbane, June 2015</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>16</td>
<td>256</td>
</tr>
</tbody>
</table>

Reflective practice was selected for this research module because as a design discipline, I believe that the conceptualisation of the design framework needed to be tested in practice. The keeping of a reflective journal from a methodological perspective was an integral part of the
research process (Boud 2001; Ortlipp 2008; Schon 1983, 1987). The limitation with this approach is the bias of the practitioner and this is duly acknowledged. As Schon points out (1983, 1987) these biases are invisible and unconscious, however they are also part of the artistry of effective practice.

There were six key findings in the evaluation of the conceptual design framework:

- Participants responded positively to a structured approach towards gamification design. Most participants showed a positive attitude towards the model because they perceived it as comprehensive and this enabled them to take gamification “more seriously”. There were also several participants at each session that were surprised that the design process “involved so much work” through the various steps in the methodology. This group was expecting a “simple and fun” process that was easy to implement and did not require specialised facilitation. This helped to reinforce the findings in the literature review that there was a wide and inconsistent view of what constituted gamification, and that there was a misconception that gamification was all about “fun and games”.

- After running the first five (out of the sixteen) workshops, it became evident that there was a need to better communicate the conceptual design framework and provide an even more detailed step-by-step guide during a practical design workshop. It became apparent that tangible tools were needed to anchor participants during a gamification design process whilst they were simultaneously learning about this new domain. This was particularly important as project managers responsible for gamification design were not necessarily professional designers, but
organisational process or domain experts. This then raised the need to develop templates for workshop participants to work with as a guide, along the lines of a design thinking methodology developed by IDEO.

A set of templates in the form of ‘design canvases’ were developed that were informed by the Toyota A3 method (Shook 2009), design thinking (IDEO 2003) and business model canvas (Osterwalder and Pigneur 2010). These templates provided questions and prompts for participants to work with. An example is provided below of the design canvas as a problem statement (Figure 12), and the second as the canvas on which the solutions were developed (Figure 13). The third example is of a canvas in action (Figure 14), which was further refined by the use of prototyping material and design cards during the design process:

![Design canvas: 'Problem statement template']
Figure 13: Design canvas: 'Solution template'

Figure 14: Design canvas: The template in action
• In the next round of five workshops that included templates, participants responded positively as they quickly engaged with the booklets which allowed them to add their own notes and drawings. However it became evident that additional tangible tools were still required during the design process, particularly in the early phases of the conceptual design framework of Discover and Reframe. There was a tendency of workshop participants to rush through these phases, which are arguably the most important phases to drill into stakeholder analysis and problem definition. In particular, participants tended to rush towards technology selection and selecting the best game mechanics steps in the process, as it was this phase that personified gamification to most participants. It became evident that the process needed to be slowed down in these phases so that participants paid a sufficient amount of attention to the problem, purpose and target audience they were designing for.

• From these insights, I developed four sets of unique design cards to strengthen the conceptual design framework by encouraging participants to focus on working through activities in key areas. These cards focused in (a) developing user personas, (b) identifying organisational and project values, (c) identifying problems to be solved, and (d) working with ethics in design.

The use of design cards to aid the design process has also been the experience of Brandt and Messeter (2004), Hornecker (2010), and Lucero and Arrasvuori (2010) who all emphasise the importance of tangible design tools (such as cards and card games) to facilitate a better understanding of underlying conceptual frameworks and issues related to the design challenge at hand. The cards that I developed, along with the templates and the inclusion of experiential playful elements were
added to the process and tested in the final six workshops. These were by far the most fluid and productive workshops, and I completed the evaluation of the conceptual design framework at this juncture as it reached a saturation point. This work is provided in the next section of this chapter, and was published in Raftopoulos (2015).

- Throughout all sixteen workshops, it was evident that a greater level of guidance was required on the types of technologies, game mechanics and gameplay as the industry still did not have a benchmark. This finding was earmarked for investigation in Research Module 2 for the development of a taxonomy.

- A greater level of guidance or benchmarks were needed for the “Create” phase of the conceptual model in terms of the management skills and capabilities required to build and implement the gamification solution. This was earmarked for investigation in Research Modules 3 and 4 on management experience and capabilities.

The development of ‘design cards’ to strengthen the conceptual design framework

In prototyping and reviewing my conceptual framework and process for gamified enterprise applications, it became apparent that tangible tools were needed to anchor participants during a gamification design process whilst they were simultaneously learning about this new domain. This was particularly important as project managers responsible for gamification design were not necessarily professional designers, but organisational process or domain experts.
The different design tools that were investigated in the development of the conceptual framework gave some perspective to the importance of such practical tools in providing an optimal hands-on design experience for organisations to produce tangible design artefacts. Looking closely at the literature, this has also been the experience of Brandt and Messeter (2004), Hornecker (2010), and Lucero and Arrasvuori (2010) who all emphasise the importance of tangible design tools (such as cards and card games) to facilitate a better understanding of underlying conceptual frameworks and issues related to the design challenge at hand. How I developed these tools is outlined in the following section.

**Introduction to design cards**

In reviewing all the key elements in the conceptual design framework, I undertook an experimental design project to develop a unique set of cards for each of the key activity modules identified in the framework.

The objective of this component of the research project was to develop and test practical design tools that support project managers in developing enterprise gamification applications that are human-centred and values-conscious. The method and approach for the development of this project has been placed in the field of design games (Brandt and Messeter 2004; Hornecker 2010; Mueller, Gibbs, Vetere and Edge 2014) and design card methodologies (Ferro, Walz and Greuter 2014; Flanagan and Nissenbaum 2007; Friedman and Hendry 2012; IDEO 2003; Schell 2008). The project has been grounded in design practice involving 114 participants over seven workshops who engaged in problem solving of business challenges in human resources, training, marketing and innovation management, and the creation of design artefacts in business or enterprise settings.
The use of card-based methods provides tools for brainstorming exercises during workshops that facilitate creative dialogue (Hornecker 2010). They also assist in creating an environment for better understanding the systems that are being designed and the user interactions and experiences that are being created. Physical objects such as cards also make tensions and disagreements between workshop participants more tangible and less personal. They can also speed up the design process by helping participants focus, and create common ground in application design features whilst also allowing room for divergent interpretation (Hornecker 2010).

**Design cards as gamification design tools**

Playfulness is deeply rooted in human culture (Huizinga 1955) and any activity can potentially be designed with a playful approach. This is to not only provide an enjoyable experience for participants, but to also facilitate the creation of practical design outcomes (Arrasvouri et al. 2011; Lucero and Arrasvuori 2010). Playful design has been a feature of using game design thinking in business contexts, and is becoming a key tenet of gamification (Deterding et al. 2011). The definition of gamification used in this project is an adaptation of the Huotari and Hamari (2012, p.17) definition of gamification as: a process for enhancing the design of a product, service or process with affordances for gameful experiences that supports overall value creation for stakeholders.

The popularity of using cards as design tools lies in the fact that they are tangible representations of abstract concepts, and are simple to use and easy to manipulate (Wolfel and Merritt 2013). This helps to make the design process more visible and less abstract (Hornecker 2010; Lucero and Arrasvuori 2010) and provides a process to reason and justify design decisions as well as facilitate a creative ideation process (Mueller et al. 2014).
This is particularly important for gamification design given that there are few rigorous or validated frameworks and tools available to researchers and practitioners. Introducing a level of playfulness is also an important element in the overall design process in enterprise gamification projects in order to stimulate new ways of thinking about existing problems. The following four decks of cards were developed to explore this confluence of creativity with critical and systemic thinking as an early contribution to the field.

**Persona cards**

Existing game industry constructs used in gamification include Bartle’s player types (Bartle 2003) and game studio methodologies such as Playnomics (2014). However, criticism of using personas derived from game industry constructs include questions over the applicability and the transferability of these tools to workplace and market environments. Enterprise gamification is subject to a different set of meta rules, constraints, expectations, social constructs and consequences that are very different compared to game-world environments.

The development of personas is not unique to the games industry and there are extensive tools that form part of the user experience, interaction design, HCI and marketing domains that have been developed over the last few decades, largely influenced by the work by Cooper, Reinmann and Cronin (2007) on goal-directed design. In developing a set of persona tools to be used in gamification design, a review was undertaken as to how personas are developed in system design, service design, HCI, user-experience design and in market research.

A set of cards was then developed based on Jung’s archetypes (Campbell 2008; Jung 1968, 2006) and based on work that has been used in strategic marketing applications (Mark and Pearson 2001). The cards comprise of 12
key archetypes (which are divided into four orientations) popularised by Mark and Pearson in their work on marketing and market research. These are: The Ruler, The Sage, The Magician (Visionary orientation), The Lover, The Rebel, The Jester (Teambuilder orientation), The Everyperson, The Caregiver, the Innocent (Doer orientation), and The Hero, The Explorer, and The Creator (Trailblazer orientation). Each of these personas has a unique set of features that are listed on the reverse side of the card that describe the character of the archetype. These features are: motto, core desire, goal, greatest fear, strategy, weakness, talent, and ‘also known as’ or AKA. A graphic artist was employed to develop unique artwork, colour schemes and symbols for the cards. An example of the front and back of one of these cards is depicted in Figure 15 below.

An important feature of how these cards are applied in the design process is the use of blank cards so participants can create their own unique archetype or persona for the gamification application that is being developed. During a workshop, participants work in teams and are introduced to personas after the business problem or challenge has been defined and scoped using a design-thinking approach. Participants are asked to define the target audience by selecting 1-2 cards that best describe their audience. This is done by teams laying all the cards out on a table and selecting, questioning, discussing and narrowing down the field for their project. Participants are then given a blank card to design their own unique persona which includes developing their own drawings, colour background and word descriptions.

This step is then repeated by asking each individual participant to identify what kind of persona or archetype they are themselves. This exercise is used to enable the participants to identify their own individual biases and orientations, so that they are aware of their responsibilities as a designer to not design interventions for themselves, but for their target audience. A key observation from this process is that in the majority of cases participants
tended to personally identify with personas that were very different to that of their target audience. This realisation often becomes an important insight that a designer needs to be aware of their own personal preferences and biases before designing systems for others.

Figure 15: Persona development cards

The persona card exercise is not intended to replace rigorous target market research, but to trigger the process. Persona cards provide the initial impetus to expose assumptions and biases of the system owners and designers, and in providing the questions needed to focus the market research after the first phase of development has been completed. Additional research is then introduced to the process to provide further intelligence for the next iteration of the design process. This facilitates an agile approach in producing a Minimum Viable Design for gamified systems.
Values: Superpowers and anti-superpower cards

Twelve cards reflecting personal and organisational values were developed influenced by the work on values (Schwartz 1994), desire (Reiss 2000, FLEX cards (Lucero and Arrasvuori 2010), and inspiration cards (Halskov and Dalsgard 2006). The objective was to develop 12 cards that reflected common human values applicable in enterprise project settings. The intention was not to provide an exhaustive list, but to provide a sufficient number as a starting point for reflection and discussion between workshop participants.

The cards and process were designed to provide a unique and sensory experience for workshop participants by (a) embodying playfulness into the cards through visual artwork; (b) bypassing the well-worn corporate language that has stigmatised values. This has been done by changing the word “values” to “superpowers” to reflect the core strengths of each player in the system, and “anti-superpower” to reflect the systemic issues that are creating tensions or problems in the project that is under review; and (c) the process is conducted with upbeat music playing in the background. Additional methods were employed such as body storming and theatre improvisation for participants to physically enact the superpowers and anti-superpowers in the system that is under review. This method not only adds a level of playfulness into the process, but it enables a greater level of pathos and empathy between the participants through physical movement that enables them to gain a greater level of team bonding, and through this, greater insight into the system that they are redesigning.

This process gives workshop participants insight into the capabilities and aspirations of the target audience and an indication of the factors important in the design process to (a) build capabilities and engagement, and (b)
overcome blockages and friction. An example of the cards is depicted below:

Figure 16: Superpower cards

Figure 17: Anti-superpower cards

Working in teams, workshop participants are asked to discuss and select a superpower for each of the personas they created. The 12 superpowers included in the deck are: Foresight, Imagination, Adaptability, Wisdom, Endurance, Creativity, Courage, Intuition, Empathy, Optimism, Resilience,
and Compassion. Participants are also given a blank card to design their own card if they thought a different superpower would be more appropriate. The questions participants work with are as follows:

- If your player was granted a superpower to help in this project, what would it be?

- How can we bring this superpower to life in this project?

- Physical exercise: Use body-storming or theatre improvisation to show us what this looks like.

Participants are then asked to select an “anti-superpower” that was blocking the superpower from emerging or working to its full potential. The anti-superpower cards are: Fatigue, Defeat, Anger, Divisiveness, Doubt, Regression, Blame, Boredom, Bias, Frustration, Compliance, and Fear. Participants are also given a blank card to design their own unique anti-superpower. The questions participants work with are as follows:

- Which anti-superpower is creating problems and tensions in the system?

- Why is this happening?

- How can we combat this anti-superpower in this project?

- Physical exercise: Use body-storming or theatre improvisation to show us what this looks like.

The ensuing discussion in the workshop focuses on drilling into the systemic causes of the anti-superpower, as this gives participants clues for the types of design interventions that may be required to counteract its negative effects. The process thus far leads into the next phase of the design process that includes:
• Selecting the type of gameplay, game mechanics, and technology that can be used that will best ‘enable’ that superpower, or subdue the anti-superpower, in the gamified system, and;

• Designing ‘non-gamification’ interventions that may be required in the system, such as operational, cultural and management changes that may need to occur.

The use of the superpower and anti-superpower cards in team discussions have proven useful in playfully exposing serious systemic issues in the organisation that are at the root cause of the problems or challenges that teams are seeking to address. This discussion then centres on clarifying which of these issues gamification can manage, and which issues are best managed though different or more appropriate non-gamification interventions. This process enables the designer in using gamification thoughtfully and sparingly in a targeted and meaningful manner.

**Ethics cards**

Extensive work has been undertaken in ethical issues in the design of computers, software and technology that is part of the wider discourse in HCI, which is therefore also relevant in gamification (Raftopoulos 2014). Even in pure entertainment computer games, games have a predetermined moral system embedded in the design, which means that games are ethical objects, and players are ethical agents in the game experience (Sicart 2009). The message here is to take care to not to rob humans from their autonomy or agency in any system that is created.

Overarching ethics and design principles can therefore play an important role in providing high-level guidelines and transparency measures to ensure that the rights and privacy of players are protected and human agency and
autonomy are enhanced, particularly when persuasive technologies are in use (Albrechtslund 2007; Berdichevsky and Neuenschwander 1999).

To embed a discussion on ethics into the gamification design process, precedence was sought from work in human values in technology design, the most notable being Value Sensitive Design (VSD) (Friedman and Hendry 2012; Friedman et al. 2008; Yoo et al. 2013), Value Conscious Design (VCD) in game development (Belman and Flanagan 2010; Belman et al. 2011; Flanagan and Nissenbaum 2007) and Ethics of Persuasive Technology (Albrechtslund 2007; Berdichevsky and Neuenschwander 1999). From this research, twelve cards were developed: Disclosure, Privacy, Accuracy, Responsibility, Motivation, Leakage, Intention, Autonomy, Identity, Accountability, Ownership, and Trust. An explanation of each ethical issue is provided on the reverse side of the card. An example of one of these cards is depicted in Figure 18: Ethics cards.

These cards were introduced into the workshop once the first paper prototype of the gamification design had been completed. Each team member drew a card which led the discussion on the following questions:
• How may this issue apply to our prototype?

• What are the risks with our current design?

• What modifications to our prototype should we consider?

The purpose of using ethics cards in the design process is to stimulate a discussion on ethics that might otherwise be missed. This helps to manage the potentially negative elements of gamification by providing an opportunity for structured reflection among designers and stakeholders. This process brings ethics issues to the attention of designers in a way that is playful rather than directive.

**Next phase of development of the design cards**

These methods have been applied in sixteen design workshops involving 256 participants, which enabled the refinement of the design tools and process with insights drawn from reflective practice in order to review and refine the overall conceptual design framework. The opportunity now is to build this card methodology into (a) a deeper empirical research project using the paper cards, and (b) an interactive application on a tablet and smartphone. This tool can function both as a practitioner tool and as a research instrument to further the domain of gamification design for business applications that are values-conscious and ethical.

**Limitations with the gamification design cards**

The gamification design cards presented in this paper are early prototypes grounded in professional practice. Experiments over the last 2 years have refined the process and stabilised the design, and has enabled the cards to be taken to the next level of development and testing. The cards and the playful design process have been developed using a design-thinking design process, and have not yet been tested against other design frameworks. Furthermore
they have not been tested by other gamification, HCI or service-design practitioners. This means that the current development, testing and evaluation of these cards as design tools may be reflecting my own theoretical, moral, cognitive or design biases and are not representative of the overall design community.

A further limitation is that the quality of the design outcomes to date have not been evaluated, and there was no formal follow up with the project design teams that participated in the workshops, to see how they may have applied the tools they have learned to their projects. While workshop feedback has been extremely positive immediately after the workshop experience, the real test lays in how well the process is able to facilitate the design of sustainable solutions that create value for stakeholders. All these limitations open important opportunities for further empirical research.

**Conclusions on the design cards**

The gamification design cards and methods presented in this section build on the tradition of design games and the use of cards as a design tool that have been developed across domains that include human-computer interaction, user experience design, user interface design, and video game design. This provides a solid foundation from which to develop toolsets suitable for the enterprise gamification domain. The cards and methodology provide a comprehensive and agile process for purpose driven designs that place importance on personas, values and ethics. This provides a holistic approach to developing a comprehensive gamification design artefact that does not over-focus on game elements. This enables designers to apply a ‘light-touch’ gamification strategy by selecting the most appropriate gameplay, game mechanics and technology that has been facilitated through a process of discovery and incorporation of meaningful aspects of human needs, values and ethics early in the design process.
Chapter summary

In this chapter I presented the results of Research Module 1: Towards a Conceptual Framework. A review was undertaken of models used across various design disciplines, and synthesised into a design framework that may develop a minimal viable design of an enterprise gamification project.

This conceptual design framework was prototyped, tested and refined by using the method of reflective practice over 16 workshops and 256 participants. As a result of this prototyping and review process, several tools were developed to assist organisations in the design process which were workshop templates or workbooks, and several different design cards to stimulate organisational thinking and creativity in key phases of the design process.
Chapter 8: Research Module 2: Towards a Gamification Taxonomy

Research Module 2 was designed to address Research Question 2: What are the key technical features of current enterprise gamification constructs in the enterprise? Specifically, what are the technologies, purpose, audience and game design patterns that are being used?

My research for this module focused on mapping and analysis of the key features of enterprise gamification projects that have been developed over the last three years to derive a better understanding of the different technologies, purposes, audience and game design patterns that are in use. The key research outcome that has been produced is an enterprise gamification taxonomy.

The work in this chapter has been published as a long conference paper at DiGRA in Luneburg, Germany in April 2015.

The field research

My original research was an investigation of the design decisions undertaken by organisations on their gamification design projects as well as the enablers and barriers to sustainable and ethical enterprise gamification design. This research was initiated to investigate the claim of high failure rates of gamification projects (Gartner 2012c) in order to identify probable causes and potential solutions. I identified a large number of case studies, but found they could not be easily compared given the wide range of purposes, business contexts and technology solutions. I ascertained that a formal classification system was both absent and essential for providing a baseline from which to develop and compare gamification design strategies.
Consequently I undertook additional research with the purpose of critically assessing the field of enterprise gamification by: (a) investigating common design patterns and technical solutions; and (b) developing an initial framework that could lead to the development of an enterprise gamification taxonomy. I utilised a grounded approach, documenting case studies where organisations had self-identified them as being gamification projects, irrespective of whether the studies were peer reviewed. I did this to gain insights into how the market defines and interprets gamification, and where and why organisations were investing in gamification projects. This was then used to provide the foundation of a common classification system that can be used to place, describe, define and develop enterprise gamification as a rigorous business activity. Taxonomies are an important and common construct in the corporate sector, particularly in IS, knowledge management, and human resources (Delphi Group 2004; Heddon 2010; Lamb 2007). Therefore a taxonomy becomes an important tool for the integration of gamification within the enterprise. I identified this as the core problem that this research sought to solve.

My research identified an enterprise gamification taxonomy comprising of five core elements as illustrated in the Figure below:
These core elements are primary purpose, target audience, technology strategy, core gameplay and key mechanics. Each core element comprises of several sub-elements that are further discussed in the following sections of this paper. There are many definitions of gamification, and to anchor my research I initially considered the most popular definition of “the use of game design elements in non-game contexts” (Deterding et al. 2011, p.9). However, we found this definition provided a limited lens of how game design elements can be utilised from a strategic management point-of-view. Given that enterprise gamification is used across diverse business areas including human resource management, enterprise resource planning (ERP), information technology (IT), project management, market research and marketing, I instead sought a more holistic business-orientated definition that combines human factors, design and HCI perspectives. For a guide to the selection of case studies, I used Huotari and Hamari’s (2012, p.17)
definition as: “A process of enhancing a service with affordances for
gameful experiences in order to support user’s overall value creation”.
While this definition lacks crispness, it does: (a) offer a more holistic
perspective on enterprise gamification, and (b) better aligns with the
enterprise focus of stakeholder engagement for value creation.
Contemporary strategic objectives such as, personalised consumer
experiences, and co-creating value with staff and customers (Bowman and
Ambrosini 2000; Prahalad and Ramaswamy 2004; Vargo 2008) are often
quoted as being the key motivator in using a gamification strategy.

Enterprise motivations in undertaking gamification projects have not been
well-covered or understood in academic research to date. Gamification has
been perceived as exploitative (Bogost 2011), naïve (Deterding 2011), or at
best underdeveloped and overly optimistic on the basis of limited or mixed
results (Hamari et al. 2014; Huotari and Hamari 2012; Mollick and
Rothbard 2014). To develop a better understanding of enterprise
motivations in gamification projects, I have grounded my work in this
research module on evaluating the self-identified cases where organisations
have attempted to create business value.

In setting up the research parameters I adopted the OECD’s enterprise
definition, to maintain consistency with global statistical standards: “An
enterprise is an institutional unit in its capacity as a producer of goods and
services; an enterprise may be a corporation, a quasi-corporation, a non-
profit institution, or an unincorporated enterprise” (OECD 2014). Thus we
have included case studies of enterprise gamification from private and
public companies, government organisations, and not-for-profits, engaged in
an activity that serves internal or external stakeholders.
Methodology

My methodology was detailed in the methods chapter, however I am providing it here again for completeness to maintain the flow of my argument. I used grounded theory to construct a potential enterprise gamification taxonomy framework, given that one did not already exist, and then develop a theory of that taxonomy inductively from my research data. My approach was informed by Glaser (1998, 2000) method of starting with data collection, building up categories and then forming a theory. There are several challenges that I saw with our approach. The first being that all such research is interpretive as it is guided by the researcher’s world-view and set of beliefs (Denzin and Lincoln, 2011). From my perspective, I have taken a pragmatist research paradigm given that enterprise gamification is essentially practice-based. Glaser himself claimed that the grounded theory methodology largely occupies a pragmatist position (Glaser 1998; Age 2011). Secondly, some level of ambiguity is unavoidable in enterprise taxonomies as business concepts and structures are essentially conceptual and contextual to the environment in which an organisation operates (Delphi Group 2004). Therefore they are human constructs, compared to scientific taxonomies where categories are not ambiguous, and as such any attempt at developing an enterprise gamification taxonomy will engender some debate. I duly acknowledge that these issues as limitations of this research.

My methodology for this research module included a literature review on taxonomies used in serious games and simulations based on the assumption that these, as opposed to the various taxonomies used in pure entertainment games, are already well-versed in: (a) solving enterprise business problems; and (b) using technologies that can integrate with enterprise systems and organisational constructs. The most important point about using taxonomies that already exist is that they have been tested before, are validated, and
therefore have produced reliable results in their domain. As such, taxonomies of serious games and simulations can viewed as precursors to the development of an enterprise gamification taxonomy.

My methodology was organised in three phases: (1) conduct an initial industry survey to identify cases or examples where organisations had self-identified as having undertaken gamification projects, (2) conduct a literature review to ascertain the broad elements and categories used in serious games taxonomies and use this data to inform the development of the key parameters of an enterprise gamification taxonomy, and (3) conduct a detailed industry survey of self-identified case studies of enterprise gamification to (a) refine the initial categories, and (b) validate the findings. My methodology was as follows:

1. **Stage one: Initial industry survey.** I commenced the data collection phase by undertaking a survey of self-identified enterprise gamification projects. The key words we used were: “enterprise, gamification, examples, cases, applications”. The databases we searched were ProQuest ABI/INFORM (which returned 747 hits), OneFile Gale (288), Google Scholar (1,950) and Google search (187,000). A research assistant was employed to assist in identifying cases that met the following set criteria: (i) the organisation met the OECD definition of ‘an enterprise’, (ii) the case was used on an enterprise product, service, function, application or system to add value to the business or its stakeholders, (iii) the organisation self-identified that it was a gamification project, and (iv) there was sufficient detail in the case for us to identify the broad parameters of the project. Cases that met these criteria were listed in a spreadsheet along with a weblink to the source, and then were systematically analysed for emerging themes. Weblinks were sought on individual cases to obtain more detail where required.
2. I carried out **open coding to allow for an open exploration of themes** that emerged (Glaser 1998, 2000) and a codebook was maintained (DeCuir-Gunby, Marshall and McCulloch 2011; MacQueen, McLellan, Kay and Milstein 1998) as a tool to list the emerging elements and to ensure consistency in definition and coding or tagging between the researchers. The initial industry scan involved 60 cases, which denominated what Glaser (1979) calls a theoretical saturation. I felt I could commence the conceptualisation process (Strauss and Corbin 1998) by bringing the codes together to form an early concept to then test and further develop through a review of other taxonomies.

3. **Stage two: Literature review.** In this stage I conducted a literature review on taxonomies used in serious games and simulations, as well as other established enterprise taxonomies in areas such as management Decision Support Systems (DSS), Knowledge Management (KM) and IS, to identify potential categories or elements for the gamification taxonomy. While it is an unresolved issue as to when a literature review should be conducted when using grounded theory (Dunne 2011), I decided to undertake the literature review mid-project as I viewed it as a reliable source of data on types of taxonomy categories in use. I believe that this constituted a contextualisation of the research, rather than a traditional literature review, an approach that has precedence in qualities research (Dunne 2011). The outcomes of the literature review are discussed in more detail in the next section. Using the conceptualisation from the first industry scan, and from the literature review, I developed a foundation set of parameters to form a proposed taxonomy that I tested and validated through a more detailed industry audit.

4. **Stage three: The detailed industry survey.** A survey instrument was created using Qualtrics, and a research assistant was employed again to
assist with the further collection, reading and coding of case studies against the proposed taxonomy. Before I commenced the detailed survey, I ran a pilot test to determine the quality and accuracy of the draft taxonomy by randomly selecting 20 case studies from the database for a detailed examination. Further minor adjustments were made until I was confident that the draft taxonomy and survey instrument contained all the variables that accurately reflected the nature of the full range of enterprise gamification projects. The final stage was concluded with the coding of 304 identified cases in the database against the draft taxonomy and analysis of the results. Once again I stopped at this number as we reached Glaser’s theoretical saturation point.

In grounded theory, once the conceptualisation and categorisation processes are completed, researchers are in a position to develop a theory (Glaser 1979, 2000). For my research project, I developed a theoretical model of an enterprise gamification taxonomy that we will present in this chapter.

**A foundation built from serious games taxonomies**

In the literature review I identified several key sources that helped to inform the development of the taxonomy framework. In his proposed taxonomies for classifying games and simulations, Klabbers (2003) used ‘areas of applications’ as reference systems, and included twelve specific areas of application and six foci of interest where an organisation may use games and simulations. The twelve areas of application are business administration, public administration, educational institutions, environment, health care, human services, international relations, military, religion, technology, human settlements and imaginary worlds. The six foci of interest are competence, communication, knowledge and skills, management and organisation, policy, and fun. This model was informative to the draft taxonomy, as it covered a broad range of activities common to enterprises,
however the fields did not appear to reflect the range in the case studies I had collected, particularly in marketing and business processes and technology.

A key reference point in serious games taxonomies is the model developed by Sawyer and Smith (2008) which proposes a matrix of two major criteria of market (application domain) and purpose (initial purpose of the designer). Items in the market criteria include government and non-government organisations, defence, health care, marketing and communications, education, corporate, and industry. Items in the purpose criteria included games for health, advergames, games for training, games for education, game for science and research, production, and games as work. This model has strong application to a potential gamification taxonomy, but was also unable to cover the scope of the cases studies we accumulated.

A collaborative classification system of serious games focused on gameplay, purpose and scope (G/P/S) was developed by Djaouti, Alvarez and Jessel (2012). This classification was a particularly interesting reference point for my research, as the depth of categories they include are an extension of the model by Sawyer and Smith (2008). For example, the online classification system by Djaouti et al. (2012) features 3076 serious games and includes the following categories: gameplay (specific core rules that constitute a game), purpose (education, information, marketing), market (entertainment, government, defence, health care), corporate (humanitarian, media, advertising, scientific research), and audience (general public, professionals, students, age groups). This model came closest in reflecting the gamification case study range, and became instrumental in evolving my draft taxonomy framework.

Other frameworks were also useful in informing the development of the proposed taxonomy. For example, Bedwell, Pavlas, Heyne, Lazzara and
Salas (2012) developed a comprehensive game attribute taxonomy in serious games for learning contexts, which provided useful reference points. Pereira et al. (2012) developed their taxonomy with a similar motivation to mine – the need for a shared vocabulary – and thereby created a structured snapshot of the field, as well as development and design guidelines. Ratan and Ritterfeld (2009) used a useful high-level, four-dimension classification based on a database of 600 self-proclaimed serious games; and we also reviewed various market-based classifications developed by Alvarez and Michaud (2008), Michael and Chen (2005), and Zyda (2005), and purpose-based classifications by Alvarez, Rampnoux, Jessel and Methel (2007), and Bergeron (2006).

Outside of serious games, our search for specific enterprise gamification taxonomies produced limited results. The field of gamification is still in an early stage of development and there is limited substantive work on the advancement of classifications, schemas or taxonomies. Robinson and Bellotti (2013) developed a preliminary taxonomy of gamification elements to engage users of a computer-based service, but only provided a narrow focus on design elements, and did not cover classifications for markets, purpose or technology.

Deterding et al. (2011) offer a generic four-frame model that includes game (gamefulness, gameful interactions and gameful design), element, design and context. However, the authors situated gamification in the game and design fields, which lacked an adequate grounding of enterprise needs and motivations in the business context. In another example, Kappen and Nacke (2013) produced a useful framework based on deconstructing a gamified task-management application using six categories of actions, challenge, achievements, fun, game design process, and motivation.
Hamari et al. (2014) developed a literature review of empirical studies on gamification in the service sector and identified five key categories: core service activity, motivational category, motivational affordances, psychological outcomes, and behavioural outcomes based on their assessment of the characteristics and successes of 24 different projects. However, only eight of the 24 projects can be classified as enterprise gamification projects. The study is also based on human factors of motivational affordances, psychological outcomes and behavioural outcomes.

In addition to reviewing serious games taxonomies and gamification classifications and schemas, I also looked at existing corporate taxonomies. These already have an important role to play in the development, organisation and access of enterprise knowledge across all key functions, ranging from knowledge management, legal, accounting, finance, human resources and IT. Responsible application of gamification in an enterprise means treating it like any other strategic management tool (Raftopoulos 2014; Reeves and Read 2009; Werbach and Hunter 2012).

However, robust enterprise gamification models and frameworks have been noticeably absent and have largely relied on anecdotal evidence of success (Deterding et al. 2011; Hamari 2013; Mollick and Rothbard 2014). Therefore, the development of a taxonomy specific to enterprise gamification projects fills a research gap and can contribute to the ongoing development of the domain.

**The proposed enterprise gamification taxonomy**

This proposed taxonomy presents a proposed high-level classification of enterprise gamification design and technology decisions that can provide a conceptual framework for discussion, analysis or system design by both
researchers and practitioners. The purpose of this taxonomy is not to determine gamification effectiveness, or to describe how to combine optimal variables to optimise the design or performance of a gamified application. This is not the purpose of a taxonomy, as it is not intended to be a substitute for business acumen or creative design – it only provides a common language and terms of reference, and indicates key points of decision-making required to build a gamified application.

Gamification is in part a creative endeavour and therefore cannot be completely codified. The lack of coherent and agreed common frameworks, definitions and classifications within game design, games and serious games which have been in operation for several decades is testament to this. The core elements and sub-elements I found in my research, and form the foundation of our proposed taxonomy, are as follows:

**Primary purpose:** A total of 17 primary purposes were identified in the research

- Education
- Entertainment
- Innovation
- Staff productivity
- Sales and marketing
- PR/Promotions
- Recruitment
- Operational process efficiency
- Training and skill development
- Problem solving
- Motivation and morale
- Build community
- Customer loyalty
- Events
- Safety and compliance
- Social or community good
- Information and awareness raising
In the final analysis I aggregated the results for **primary purpose** into the following six key sub-elements:

- Customer loyalty
- Marketing, sales and promotions
- Education, training and recruitment
- Innovation and problem solving
- Community good or development
- Staff morale, motivation and productivity

**Target audience:** A total of five independent audience elements were identified:

- Internal staff
- Customers, clients or patients
- Suppliers
- Industry or community specific
- General market or public

**Technology strategy:** A total of eight core types of technologies are currently in use, and these form the technology strategy sub-elements in the taxonomy:

- Digital game
- Digital simulation
- Platform A (vendor platforms, API or plugin)
- Platform B (custom built platforms or operating systems)
- Product features A (simple product modification)
- Product features B (significant product modification)
- Playful experiences A (no or low levels of technology)
- Playful experiences B (high levels of technology)
These technologies were often run in conjunction with other supporting or secondary technologies such as augmented reality, virtual reality, social media and mobile technology. All projects also incorporated data analytics to quantify player participation, feedback, actions undertaken, or engagement, as well as specific financial analytics such as sales, revenue raised, or return on investment.

**Core gameplay:** A total of 12 types of common core gameplay were identified:

- Territory acquisition
- Prediction
- Survival
- Building
- Chasing or evading
- Trading
- Puzzle or problem-solving
- Social
- Spatial navigation
- Destruction
- Collection
- Racing
- Other

**Key game mechanics:** A total of 10 types of common key game mechanics were identified:

- Status, success, recognition
- Points
- Social (friend, connect, chat)
- Experiences
- Missions and quests
- Currency, rewards (real or virtual)
- Achievements (badges, trophies)
- Leaderboards
- Progression
- Narrative
- Other
A final analysis of the case studies was then undertaken in detail to: (a) deconstruct each one into the elements that were identified; (b) codify them into the survey instrument; and finally to (c) analyse the results. The result was the development of a proposed taxonomy that features five core elements – primary purpose, target audience, technology strategy, core gameplay and key mechanics – which provide a streamlined classification of the various enterprise gamification projects in use. I further refined the classification of these core elements by distinguishing them by their orientation as either (a) market-based, (b) technology-based, or (c) design-based elements. An outline of these key core and sub-elements is summarised in the figure below:
Figure 20: Proposed Enterprise Gamification Taxonomy
In addition to these elements, we also captured data on two other fields and tagged these to each of the 304 case studies in our database for future cross-referencing and analysis. These fields are:

- **Industry classification:** A total of 18 industries were identified, based on the Global Industry Classification Standard (MSCI 1999).
- **Geographic location:** We recorded where the gamification projects were implemented, and identified a total of 11 geographic regions.

**Key research insights**

The review of the 304 enterprise gamification case studies has enabled me to draw the following insights into the key characteristics of the proposed taxonomy:

**Technology strategy**

Technology options were not immediately obvious, as we initially hypothesised that the most common technology would be platform offerings by vendors such as Badgeville and Bunchball, given that there are 80 other similar providers of gamification software as a service offering (Technology Advice 2014). However, on closer investigation of the case studies, I found that I needed to split the technology category into eight sub-categories. This is because organisations that self-reported gamification projects included games, serious games, simulations, and playful experiences – technologies that have been excluded from formal definitions of gamification (Deterding et al. 2011; Huotari and Hamari 2012).

A close inspection of the games labelled as gamification indicates that at one time they may have been called advergaming, edugaming or training
games, which are technically in the domain of serious games. However we have included these technologies in this proposed taxonomy as we are reporting on our grounded research findings that industry believes gamification to be a collective term that is broader than that of the research community, and perhaps more useful to its internal decision making, organisation and communication. This phenomenon may be an early signal, or opportunity, for the continued evolvement of the domain.

The largest sub-category is platforms which forms 46% of the market (n=304) and is equally divided between vendor solutions (23%) and self-built systems (23%). The other sub-categories include digital games (19%), simulations (6%), playful experiences (8%), and product or service feature modifications (20%). Examples of these gamification technologies are as follows:

### Games

KPMG used gamification in its online recruitment process to increase recruitment of potential graduates to its consulting firm. The game challenged candidates to race around the world in 80 days in a balloon and return to the starting point in the quickest time after having completed 10 challenges. The aim of the challenge is to encourage new staff members to familiarise themselves with the company’s core business offerings and connect with other consultants and knowledge experts in the organisation.
Using the taxonomy, the profile of this example of gamification is as follows:

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purpose</td>
<td>Recruitment</td>
</tr>
<tr>
<td>Target audience</td>
<td>Internal staff</td>
</tr>
<tr>
<td>Technology strategy</td>
<td>Game (browser based)</td>
</tr>
<tr>
<td>Gameplay</td>
<td>Racing</td>
</tr>
<tr>
<td>Game mechanics</td>
<td>Challenges, Points, Achievements</td>
</tr>
</tbody>
</table>

The ‘back end’ provisions of this example of enterprise gamification includes analytics of the level of staff awareness of core offerings and the level of connection they made with other members of their organisation. The outcomes were used to inform the development of subsequent awareness and training needs in the organisation.
**Simulations**

The Commonwealth Bank of Australia developed an online simulator tool called “Investorville” targeting existing and potential customers to take out a home loan or a property investment loan. The data used in the simulation was modelled on real world consumer costs for taking out and paying back loans.

![Investorville Simulator](image)

Figure 22: CBA simulator "Investorville"

The ‘front end’ profile of this example of enterprise gamification is as follows:

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purpose</td>
<td>Sales</td>
</tr>
<tr>
<td>Target audience</td>
<td>Existing customers</td>
</tr>
<tr>
<td>Technology strategy</td>
<td>Simulation (browser based)</td>
</tr>
<tr>
<td>Core Gameplay</td>
<td>Territory acquisition</td>
</tr>
<tr>
<td>Key Game mechanics</td>
<td>Status, Currency, Achievements</td>
</tr>
</tbody>
</table>
The ‘back end’ provisions of this example of enterprise gamification includes analytics on customer experimentation and decision making during simulation gameplay that goes to shaping decisions on marketing and product development, and data on sales conversion.

**Platforms**

There is a broad range of platform based gamified enterprise applications that are designed to integrate within existing enterprise systems. For example, gamified sales applications are popular target areas for gamification due to the ease by which traditional competition and reward schedules can be incorporated into more engaging gamified applications. There are currently over 90 major gamification platform vendors in the market which accounted for half the total examples of platforms in my survey. Figure 23 below illustrates the use of racing gameplay and point and leader board mechanics in a SAP and Salesforce CRM sales function application.¹⁴

¹⁴ Source for picture: http://thomasdemmler.wordpress.com/2012/09/05/enterprise-gamification-design-for-motivation/
The ‘front end’ profile of this example of enterprise gamification is as follows:

Table 7: Profile of SAP’s platform “SAP Rapid Deployment Solutions”

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purpose</td>
<td>Sales</td>
</tr>
<tr>
<td>Target audience</td>
<td>Internal staff</td>
</tr>
<tr>
<td>Technology strategy</td>
<td>Platform (Vendor supplied)</td>
</tr>
<tr>
<td>Core Gameplay</td>
<td>Racing</td>
</tr>
<tr>
<td>Key Game mechanics</td>
<td>Points, Leaderboards, Trophies</td>
</tr>
</tbody>
</table>

The ‘back-end’ provisions of this example of enterprise gamification include analytics on sales data by product by region and by salesperson.
Product modifications

The use of game mechanics to influence the behaviours of consumers is increasing in popularity. An example where this has been used to modify a product or service is Nissan Leaf electrical vehicle ‘CarWings’ system which has modified its traditional dashboard to include engaging feedback mechanics to inform the driver of how economical they have been driving compared to others in the region, and rewards efficient drivers with bronze, silver, gold and platinum medals.

The ‘front end’ profile of this example of enterprise gamification is as follows:

Table 8: Profile of Nissan Leaf "CarWings"

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purpose</td>
<td>Awareness</td>
</tr>
<tr>
<td>Target audience</td>
<td>Customers</td>
</tr>
<tr>
<td>Technology strategy</td>
<td>Custom build vending machine</td>
</tr>
<tr>
<td>Core Gameplay</td>
<td>Problem/Puzzle Solving</td>
</tr>
<tr>
<td>Key Game Mechanics</td>
<td>Mission, Points, Trophy/Medals</td>
</tr>
</tbody>
</table>
The ‘back-end’ provisions of this example of enterprise gamification include analytics on driver preferences and performance. This intelligence goes towards future decision making on product development, marketing and promotions.

**Engaging experiences**

There have been a broad range of gamified applications using physical experiences with various degrees of technological sophistication. Examples include Lay’s chips use of interactive vending machines\(^\text{15}\) (Figure 25), New York Public Library use of a digital scavenger-hunt game ‘Find the Future’ to re-engage the youth demographic with their library facility, history and collections\(^\text{16}\) (Figure 26), and Nike+ use of gamified apps\(^\text{17}\) that are activated by the physical running or walking of their customers using their products (Figure 27).

\(^{15}\) \url{http://www.coloribus.com/adsarchive/ambient/fantastic-delites-how-far-would-you-go-delite-o-matic-15618655/}

\(^{16}\) \url{http://latimesblogs.latimes.com/technology/2011/04/new-york-public-library-game.html}

\(^{17}\) \url{http://marketingresearch24.files.wordpress.com/2014/03/nike-plus-update-panorama.png}
The ‘front end’ profile of this example of enterprise gamification is as follows:

Table 9: Profile of Delites vending machine

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary purpose</strong></td>
<td>Promotions</td>
</tr>
<tr>
<td><strong>Target audience</strong></td>
<td>General public</td>
</tr>
<tr>
<td><strong>Technology strategy</strong></td>
<td>Custom build vending machine</td>
</tr>
<tr>
<td><strong>Core Gameplay</strong></td>
<td>Collection</td>
</tr>
<tr>
<td><strong>Key Game Mechanics</strong></td>
<td>Mission, Points, Prize</td>
</tr>
</tbody>
</table>

The ‘back end’ of this example is limited by the fact that this type of playful experience does not feed into a standard notion of an enterprise IS, but it still nonetheless provide an important data collection point. The data that is captured provides (a) user performance data on how people ‘play’ to win the prize, and (b) the use of a surveillance camera provides the organisation’s marketing, psychology or human factors personnel opportunities for observational research on user behaviour. This would include how users...
interact with the machine, with people that accompany them, and with strangers observing the gameplay.

![NYPL “Find the Future” Game](image)

**Figure 26:** NYPL “Find the Future” Game

The ‘front end’ profile of the NYPL example of enterprise gamification is as follows:

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary purpose</strong></td>
<td>Awareness</td>
</tr>
<tr>
<td><strong>Target audience</strong></td>
<td>General public</td>
</tr>
<tr>
<td><strong>Technology strategy</strong></td>
<td>Playful experience: Mobile game app</td>
</tr>
<tr>
<td><strong>Core Gameplay</strong></td>
<td>Scavenger Hunt (collection)</td>
</tr>
<tr>
<td><strong>Key Game mechanics</strong></td>
<td>Problem solving, Missions, Points,</td>
</tr>
</tbody>
</table>

The exercise run by the NYPL appeared to be a one-off example of how they used a game to create a unique engaging experience with the library that challenged their target demographics’ perceptions of the library. It is
unclear how they used the extensive data that was gathered as part of the ‘back end’ operation of the digital mobile app that was used during the game, or the interactions with the website that ran the challenge to select the players from the applications that were sent in. Very often, novice users of gamification often do not act on the data that has been gathered, and let it ‘sit’ in case it becomes useful at a later point in time.

Figure 27: Nike+ Running App

The ‘front end’ profile of this example of enterprise gamification is as follows:

<table>
<thead>
<tr>
<th>Taxonomy Element</th>
<th>Profile of this example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purpose</td>
<td>Customer Loyalty + Marketing</td>
</tr>
<tr>
<td>Target audience</td>
<td>Customers</td>
</tr>
<tr>
<td>Technology strategy</td>
<td>Playful experiences (multi-platform)</td>
</tr>
<tr>
<td>Core Gameplay</td>
<td>Collection</td>
</tr>
<tr>
<td>Key Game mechanics</td>
<td>Missions, Points, Leaderboards</td>
</tr>
</tbody>
</table>
The ‘back end’ provisions of the Nike+ example of enterprise gamification is extensive, as discussed in Chapter 2. The extensive data collection that was generated through the app and interactions with the website enabled Nike to accumulate an extensive customer and materials databases that was fed into management DSS, ERP and CRM systems and used for more informed strategic decision making.

**Overview on technology strategy**

It was evident from the cases that each of the eight technology strategy options would require a unique set of design and investment decisions that are tailored to specific business needs. A further challenge would be deciding whether organisations are seeking or receiving balanced advice on the optimal technology options available to them to meet their specific business needs, given that each option is marketed by different vendors. For example, vendors selling games are different to those selling platforms, and those selling simulations or playful experiences.

Therefore when it comes to definitions of gamification, the general industry consensus would be mixed and a key contributor in this may not only be the lack of rigorous research but because of the wide range of vested interests among vendors of the different technologies that constitute gamification.

**Target audience**

I identified five key mutually exclusive target audience categories for enterprise gamification. These are internal staff (19%), external customers, clients or patients (33%), suppliers (1%), industry or community (9%), and the general market or public (37%). The key challenge we saw here was the essentiality of developing user or player profiling during the design process, particularly when you consider the range of complexities of using
gamification across the broad range of potential contexts, motivations, technologies and objectives within an enterprise system or process.

Given that the primary goal for many enterprises is value creation, we identified the necessity of player or user profiling tools that reflect business realities, rather than the popular game-world constructs. This is particularly important when considering that there is no guaranteed outcome of game or gamification experience that will be as the designer intended, as the player or user is an active agent in creating and defining their experience (Hamari et al. 2014).

**Primary purpose**

Most gamification projects were reported as having several objectives, and many noted spinoff or contingency benefits that were either sought or unexpected. For my research we aimed to pinpoint the primary purpose within each project to ascertain the design decisions influenced by it. I mapped a total of 17 categories of primary purpose for enterprise gamification projects, and we then aggregated these into six key areas for ease of use. These are:

- Customer loyalty (18%)
- Marketing, sales and promotions (16%)
- Education, training and recruitment (18%)
- Innovation and problem-solving (19%)
- Community good or development (12%)
- Staff morale, motivation and productivity (15%)
- Other (2%).
I found there was a reasonably even spread of purpose, which shows that organisations are experimenting with enterprise gamification across a broad range of business areas.

**Core gameplay**

I initially debated the significance of gameplay in gamification projects; however, on closer inspection of the case studies it was evident that in most projects gameplay was just as important as game mechanics in the design and delivery of the core user experience. I mapped 12 common types or genres of gameplay (or styles of play with core rules that constitute a game) used in enterprise gamification projects that were also consistent with the types used in the design of both entertainment and serious games (Braithwaite et al. 2009; Djaouti et al. 2012; Fullerton 2008). Note that this was not intended as an exhaustive list, only an indication of the more common types of gameplay we found in key examples.

I found that collection was the most dominant form of gameplay (57% of all gamified cases in our sample), which is the collection of points or other items to build scores, used to eventually earn free or discounted goods and services, or build reputation or a position on a leaderboard, etc. The other less common but important forms of gameplay in the sample included:

- Prediction (6%)
- Survival (5%)
- Puzzle/problem-solving (10%)
- Social/role-play (3%)
- There were smaller percentages for building, territory acquisition, racing, trading, destruction and spatial navigation.
I acknowledge that this is a complex topic in entertainment games, however is still largely simplistic in enterprise gamification.

The focus on collection gameplay could be explained as a reflection of the early days of enterprise gamification. Organisations are still experimenting with simple forms of gameplay while workplaces or markets are getting used to the idea of gamefulness in traditional business functions. It could also be a reflection of the size of the platform market and the size of the loyalty market, both of which still predominantly rely on simple point and badge ‘collection’ games. In addition it could be an indication of the limited range of capabilities of vendors and consultants of gamification solutions, or the technologies that are available.

**Key game mechanics**

When codifying the case studies, I identified three key game mechanics that were used in each case study. There was a fairly even spread of use of the more common mechanics, especially points (mentioned by 43% of cases), achievements such as badges and trophies (52%), currency and rewards (35%), and missions and quests (29%). Once again, the skew towards simple mechanics can be explained by the early days of trial and experimentation, and also the size of the loyalty market, and the platform market, which tend to employ very simple mechanics in their systems.

**Industry classification and geographic location**

All 18 MSCI industry classifications were represented in our sample. Industries that reported the largest number of enterprise gamification projects were IT, technical and professional services (17%), health care (14%), arts, entertainment and recreation (11%), wholesale and retail trades (9%), and finance and insurance (8%). In terms of geographic region, the
majority of cases in our sample were implemented in North America (47%) or were released globally across several continents (36%). A smaller number were implemented in Europe (10%), Australia/New Zealand (5%) and Asia (2%).

**Discussion on findings for Research Module 3**

My research indicates that many organisations that have invested in gamification have defined it as including games, simulations and playful experiences. This may be attributed to the lack of rigorous definitions, frameworks and tools within enterprise gamification that are required to build consensus. From an enterprise perspective, however, gamification, games and simulations fall under a single umbrella of tools that can potentially be used to improve the performance of existing business processes and applications across multiple domains.

My research has mapped five key parameters that have been explored by organisations in their gamification projects – primary purpose, target audience, technology strategy, core gameplay, and key mechanics – and I propose that these form the basis of a proposed enterprise gamification taxonomy. It is important to note that I consider this the beginning of an evolving construct as gamification technologies and design practices continue to grow and develop. This proposed taxonomy can potentially be used in providing researchers and practitioners with an initial framework from which to develop the following tools:

1. Common language and communication tool
2. Objective diagnostic tool of mapping problems and potential solutions
3. Rubric for design decisions and technology investment decisions
4. Collaborative research instrument.
The key challenges to the further development and application of this proposed taxonomy are:

- How do we best define enterprise gamification so that it captures the essence of how enterprises can create value for organisational stakeholders; and,

- How do we develop practical knowledge that allows researchers and practitioners to developed informed decisions on using gamification for value creation.

Research to date has focused on human factors, and the opportunity is now emerging to delve more deeply into management and IS research, given the central importance of the technology decisions that need to be made in enterprise gamification projects.

My final discussion point for this research module is on the meta issue within the ethics of gamification in enterprise environments where there is either an overt or implied expectation, or even a covert persuasion, for staff or stakeholders to participate. Depending on the scale and scope of a gamified application, it is in effect creating a virtual or synthetic world and experience for the target audience. Bartle (2003) and Castronova (2005, 2007) argued that the most important effect of creating virtual spaces and the roles assigned to players within them is that they must influence the player’s self-development by aiding them on a journey of self-discovery.

However, most of the parameters we have assessed in this research do not necessarily do this. More often than not, the key features I have documented can be classified as elements of ‘self-optimising systems’, which means that they provoke “system conform reactions” from users (Kuka and Oswald 2012, p.6), rather than creating opportunities for deep human experiences and learning, or divergent thinking and action.
Limitations of Research Module 2

I analysed 304 gamification project implementations that were available via public, industry and academic search engines or networks. Private or confidential gamification projects have not been included, and it is therefore difficult to estimate the size of this sector and its impact on our research. The self-identified cases we reviewed were reported directly or indirectly through popular media channels. This raises the following issues:

(a) The reports are from an industry perspective that may have lacked analytical rigor and a longer term perspective;

(b) The motivation for organisations to report on their projects as gamification may have been from a public relations or self-promotions perspective;

(c) The potential for self-justification bias of undertaking the project and reporting it in a positive manner. In my analyses I identified a bias toward the positive reporting of gamification projects;

(d) I do not have a perspective on projects that failed, or were reported as failing, and how this may impact on our study. This would be a difficult exercise given the confirmation bias of organisations of predominantly reporting on the projects that they perceived as being a success.

The proposed taxonomy was designed as a high-level overview and structural framework in order to survey the landscape, and is therefore limited in its deep application into specific domains within the enterprise (e.g. human resources, innovation, finance, compliance).

While all care was taken to document all key elements of the 304 examples, and to ensure I covered all key enterprise domains, there is scope to undertake a deeper analysis to develop a unique taxonomy for each of the
specific domains. For instance, from my analysis the examples for marketing, sales and promotions were mainly games and simulations with minimal built-in user interactions, compared to examples for staff morale, motivation and productivity which were highly interactive platform applications. Delving deeper into the differences and similarities in different domains is also an opportunity for further research.

A final limitation I encountered is that I sought to document the key elements of enterprise gamification projects and classify them in a format useful for both researchers and practitioners. I have not attempted to tie motivational affordances and psychological outcomes from a user perspective to this taxonomy, and I acknowledge that this has been the focus of a significant body of research elsewhere.

The most significant contribution of this research output at this point in time is the creation of a high-level classification system based on key elements that are a strategic fit with existing organisational constructs in management and IS. Furthermore, the research output meets the objective of this research module to comprehensively address Research Question 2. It also builds on the additional knowledge needed to expand and support the ‘Envision’ phase of the conceptual design framework developed in the previous chapter for Research Module 1.

**Opportunities for further research on the taxonomy**

A key category that is currently emerging in the enterprise gamification domain is called playful experiences or ‘low or no tech gamification’. In the not too distant past such activities were considered business, conference or workshop games, and more recently as gamestorming, body storming or even theatre improvisation for business. This is a significant group of methods and tools that has a long history that pre-dates gamification, and
evidence is emerging that some of these tools and techniques are being rebranded by practitioners as ‘gamification’.

An important opportunity therefore exists to further investigate how these tools and techniques may be used to complement gamification in the area of collaborative problem-solving and system design. This will assist in the management of the pervasive issues in many HCI fields, such as ethical design and the anthropomorphising of technology, to design gamified systems that will allow humans to operate at their full potential. A final opportunity is to develop a tool for enterprise gamification similar to the online serious games classification system Djaouti et al. (2012) developed. This tool can potentially be built and incrementally developed over time as an ongoing industry resource and academic research tool.

The next step in my research is to apply this taxonomy to gain further insight into each of the categories. I aim to do this by directly surveying a sample of the 304 cases for an in-depth analysis of the motivations and experiences in the implementation of gamification projects, with a particular focus on the barriers and enablers to success.

**Conclusions for Research Module 2**

As enterprise gamification continues to grow in size and scope, the more difficult it becomes to define what it is, what it does, and how we can use it to improve business outcomes. Commensurate with this growth in interest, the field is also experiencing an increase in contradictory and disjointed information from consultants, vendors, game designers, academics and industry media, without adequate rigorous models that are fit for widespread enterprise use.

The outcomes of my research in this module have resulted in a body of work that has led to the development of a proposed taxonomy that provides
a framework for constructing, deconstructing, and classifying enterprise gamification projects that can be used by both researchers and practitioners. I identified five unique core elements of primary purpose, target audience, technology strategy, core gameplay and key mechanics. Each core element comprises several sub-elements that provide a map of current practices that can form the basis of the development of a potential design guide and a common language.

I did not find any new or novel forms of design patterns, technology use or gameplay, or examples where gamification has influenced systemic changes in market structures or workplace practices. This supports the assertion that at this point in time, gamified systems tend to support existing workplace and market constructs (albeit in a more engaging way), rather than create new forms of organisation structures, systems or rules of play.
Chapter 9: Research Module 3: The Enterprise Experience with Gamification

Research module 3 was set up to address Research Question 3: What has been the experience to date of organisations that have experimented with gamification? What do they see as the key enablers and barriers, and what can we learn from that in moving forward?

The majority of research in the enterprise gamification domain has focused on an evaluation of peer-reviewed studies (Hamari et al. 2014) or experiments undertaken in single organisations (Mollick and Rothbard 2014). The opportunity I saw was to survey a cross section of global organisations on their direct experiences on a wide range of strategic and operational factors, and for their views on the key enablers and barriers to a successful enterprise gamification implementation.

Background to the survey

I will recap the methodology of my approach to this research module which was initially presented in the detailed methodology in Chapter 4.

The key research instrument in Research Module 3: Enterprise Experience was an online survey, known as the Enterprise Gamification Experience Survey (herein the experience survey), which involved a confidential, in-depth online survey of 25 organisations who have implemented an enterprise gamification project over the last three years. This sample was derived from an initial group of 40 organisations that were invited to participate in this survey.
The reason for the small sample size relative to the size of the database I accumulated for the taxonomy is due to the difficulty in gaining the trust of large, mostly private organisations to undertake a survey of this nature. Despite it being a confidential survey, organisations that declined were concerned with potential commercial-in-confidence issues as they viewed their gamification project as a precursor to developing competitive advantage.

This survey followed on from my research in Research Module 2, the industry survey or audit of 304 publically available and self-identified case studies of enterprise gamification to form the proposed taxonomy presented in the previous chapter. This taxonomy provided a much-needed baseline for my research in understanding the overall industry structure and patterns of use with enterprise gamification. This enabled me to place the 21 survey respondents within the overall industry context, and thereby facilitate the ability to draw further insight into each of those industry segments.

The survey for Research Module 3 was designed to target responses from a group of organisations selected to form a control group that were known in the industry to have been rigorous in the development of an enterprise gamification project. Only organisations that had developed and implemented a gamification project were considered and surveyed.

The definition of an ‘enterprise’ is based on the OECD’s enterprise definition to maintain consistency with global statistical standards. This definition is as follows: “An enterprise is an institutional unit in its capacity as a producer of goods and services; an enterprise may be a corporation, a quasi-corporation, a non-profit institution, or an unincorporated enterprise” (OECD 2014). Therefore I invited participants to the survey from private and public companies, government organisations, and not-for-profit
organisations, that are or were engaged in an activity that serves internal or external stakeholders.

The criteria that I set for the identification and selection of appropriate organisations for the survey were as follows:

- The organisations needed to have had direct experience with conducting an enterprise gamification project.
- The project owner (or the person responsible for the implementation of the project) was an internal staff member or project manager.
- The project was self-identified by the enterprise or the project owner as an enterprise gamification project.
- Gamification technology vendors, consultants or game developers were excluded from the survey.

To answer my research questions, it was important to not solicit survey input from consultants, technology vendors or academics. To derive insight into the research problems, it was more pertinent to hear direct from enterprise project managers on their experiences, motivations and learning with developing and implementing an enterprise gamification project, and avoid the promotional, marketing or sales rhetoric of vendors that is common in the industry. Furthermore, I also wanted to avoid the theoretical perspective from those who are predominantly researchers or academics, as my research focus is on direct enterprise experiences to deliver an outcome that is consistent with a design-science research approach of deriving practical solutions as research artefacts.

My literature review identified that there was a significant research gap in the enterprise gamification domain, particularly in hearing directly and candidly from enterprises about their experiences. This means that missing
from the current discourse is the perspective of project owners who have the direct and first-hand experience to report on the procurement, development and integration with internal systems and processes, and in navigating the internal systemic, cultural and decision making processes with the introduction of a concept, as new, and as potentially disruptive, as gamification.

**The survey selection process**

A target group of 40 organisations were selected from the database of 304 cases that were collected for the taxonomy. This list was then filtered by organisations that have publically shared their experiences with developing an enterprise gamification project. This was done by identifying organisations either in the media, or that have presented at industry events such as ‘GSummit’, a leading international conference on gamification held in the US each year ([http://gsummit.com](http://gsummit.com)), Gamification World Congress ([https://gamification.world/congress/gwc-2015](https://gamification.world/congress/gwc-2015)), the leading gamification event in Europe, and other public events featuring gamification in the enterprise.

After identifying 40 key target organisations, I sent a personal email invitation to the identified project leaders asking them to participate in the survey. In the majority of cases I had either already personally met the project owners informally at various conferences, or were they were referred to me though my professional networks or through social media channels such as LinkedIn. From this target group of 40 organisations, 25 responses were received.

Expert sampling was used to select participating organisations for the survey. Expert sampling is defined as a sampling strategy based on persons with known or demonstrable experience or expertise. The expert sampling
method is a subset of the overarching purposive sampling methods (Denzin and Lincoln 2011; Miles and Huberman 1994; Onwuegbuzie and Leech 2007; Patton 1990) which is a group of non-probability sampling techniques predominantly used in qualitative research with small samples, and are usually used in situations where exploratory research is undertaken in relatively under-researched areas where a select group of expertise would be more insightful (ibid). However this still is a non-probability sampling technique which means that I cannot draw inferences from the results of the sample on the population as a whole.

I already had 304 examples of self-identified examples in my database from developing the taxonomy, therefore the task I had set to gather respondents for this survey was to select the key ‘experts’ from this list. The criteria I set for the selection process was as follows:

1. From the taxonomy database, identify examples where an organisation offered detailed information to the public rather than just a short press release on their project. Several organisations were selected from the Gamification Summit website (http://gsummit.org) and other various blogs or websites that ran webinars or interviews on the topic for the business community (for example: bunchball.com; badgeville.com; enterprise-gamification.com) and examined the detail in the presentation videos and SlideShare presentations made by the presenters. For example, the GSummit site alone had over 200 videos and slide deck presentations from its guest enterprise presenters that it had accumulated since 2011.

2. The second step involved picking out those presentations that were enterprise gamification projects and that were made by the project manager directly (not a consultant or technology vendor). I also made note on assessing that the depth of content displayed an understanding
of various factors relating to technology, gameful design, organisational capability, and were honest or open about mistakes being made as part of the learning process. Many of these project leads also turned out to be an active blogger on their company’s website and in their professional network. From this work I was able to generate a short list of potential respondents for the expert-sample from the larger database.

3. Finally I cross-checked whether the project leaders were in my professional social networks on either LinkedIn or Twitter so I was able to introduce myself and my research project directly. Many of these target respondents were also known to me through attendance at gamification summits and conferences in the past. Where there was a secondary link (or one degree of separation) I would ask a colleague to make an introduction rather than cold call. Since I would be asking survey questions of a confidential nature with commercial sensitivity, it was important that I had the trust of the organisations involved and this would be best done through professional networks. The survey questions are provided in Appendix 3.

4. In the process of my enquiries through my network, other suggestions were made to me through my professional network on LinkedIn, and I followed up on these leads by also ensuring that they met the expert criteria.

5. There were two phases in the data collection and analysis: The first phase involved an initial analysis undertaken on the first 15 surveys to investigate the early results. This was done to ensure the adequacy of the initial categories that were provided in the multiple choice questions by investigating comments in the ‘other’ categories and open response questions to check that I was not missing critical issues.
After I was comfortable that the survey was all in order at 15 responses, I ran another check at 21 responses in the same manner and felt comfortable that I had an appropriate spread of questions and that responses showed a similar spread of results as they did at 15 responses. I viewed this as a theoretical saturation point and closed the survey soon after that at 25 survey responses for the final analysis.

The survey results from these 25 organisations provided a sufficiently rich dataset that was derived from an extensive survey with both multiple choice and open-ended questions. A follow-up qualitative assessment was not undertaken to test for validity through interviews or case studies given that this was also a selective survey, and that the results were strong enough to stand on their own.

As with any empirical research, this approach is not without its limitations. As a researcher undertaking grounded theory research, my biases and worldview is reflected in my research design decisions, and this may have influenced the selection of target organisations and the development of the specific questions that I had included in the survey. As identified in the methodology in Chapter 4, I have approached my research with a pragmatist epistemology, and this will have influenced the research design and analysis, and formation of the conclusions.

The 25 surveys that were returned indicated that their combined gamified projects equated to 11.4 million users (which is a combination of both internal staff and external customers or stakeholders) that have been affected by these gamified enterprise applications. This represents a significant reach for a survey of this kind and a rich data source that provides insight into my research questions and the domain in general. The breakdown of the size of the end-user groups by project reported on in the survey, is as follows:
The largest respondent had 6.0 million external customers, followed by a respondent with 3.0 million users in the organisation’s technical community (which included both internal and external community users).

For the remaining respondents, their combined end-user or target market was 2.2 million users, which showed an average of 122,000 per project, with a range from 160 to 500,000 users.

This survey also represents a significant sample of global organisations and projects. Given the size and magnitude of the projects, and the nature of the organisations involved, I believe that I have collected a dataset that has given me critical insight into enterprise experiences with gamification that has enabled me to directly address my research question.

Survey questions can be found in Appendix 3. In the following section I will provide a detailed analysis of the results of the survey, and discuss the significance of these results to my research questions.

**Survey results: About the 25 respondents**

The majority of respondents come from **seven key industries (n=25):**

- Banking, finance and insurance 10%
- Professional, media, scientific and research services 14%
- IT, technical, internet and software services 38%
- Travel, accommodation and food services 5%
- Government and public administration 10%
- Real estate, rental and leasing 5%
Education, training and development services 5%

Other 14%

All geographic regions are covered in terms of the location of where gamification projects took place. Respondents identified the various locations where their projects took place, and the majority of projects covered several regions. The table below indicates the spread of projects; total percentages do not aggregate to 100% as respondents selected several categories.

A total of 33% of projects for this survey were reported as being global projects spanning all continents. Other than Global, the largest representation of projects were from UK/Europe (33%), Australia/New Zealand (33%), and North America (24%).

![Figure 28: Geographic regions where projects were implemented](image)

Survey responses for target audience

Respondents were asked: *Who was the primary target audience for your gamification project?* (Q4). The primary objective of this survey question
was to ascertain the breakdown of the target audience by the survey group for their gamification project.

The results showed a high representation of gamification projects that were targeted to ‘internal staff’ and to ‘external customers/stakeholders’ relative to the taxonomy survey. The table below provides a breakdown of the target audience of the survey and compares it to the outcomes of the taxonomy.

<table>
<thead>
<tr>
<th>Target audience</th>
<th>Sample Survey</th>
<th>Taxonomy Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal staff</td>
<td>45%</td>
<td>19%</td>
</tr>
<tr>
<td>External customers/stakeholders</td>
<td>40%</td>
<td>33%</td>
</tr>
<tr>
<td>Government/Not for profit</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td>Suppliers</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Industry or community</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>General public</td>
<td>0%</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Survey responses for primary purpose**

Respondents were asked: *What was the primary purpose of your gamification project?* (Q5). The primary objective of this survey question was to ascertain the breakdown of the primary purpose by the survey group for their gamification project.

A good cross section of different purposes for running a gamification project were identified in my taxonomy, and most of these were also covered in my survey. The key exceptions however were the lack of representation for Customer Loyalty and the Community Good/Development categories. This is a limitation of the survey but not
necessarily a significant one as the results were adequate to address my research questions directly. The findings for the breakdown of primary purposes for this survey relative to the taxonomy are listed in the table below:

Table 13: Primary purpose

<table>
<thead>
<tr>
<th>Primary Purpose</th>
<th>Sample Survey n=25</th>
<th>Taxonomy Survey N=304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education, training and recruitment</td>
<td>34%</td>
<td>18%</td>
</tr>
<tr>
<td>Innovation and problem solving</td>
<td>28%</td>
<td>19%</td>
</tr>
<tr>
<td>Motivation, morale and productivity</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>Marketing, sales, promotions</td>
<td>19%</td>
<td>16%</td>
</tr>
<tr>
<td>Customer loyalty</td>
<td>0%</td>
<td>18%</td>
</tr>
<tr>
<td>Community good or development</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Survey responses for technology strategy**

Respondents were asked: *Which gamification technology strategy did you use for your project?* (Q7). The primary objective of this survey question was to ascertain the breakdown of the technology strategy used by the survey group for their gamification project. Respondents in the experience survey covered all the technologies that were catalogued in the proposed taxonomy in roughly equal proportions. This has given me confidence that my survey sample is representative of the different technologies in use.
To gain a deeper insight into enterprise technology decision-making, respondents were asked why they chose their particular technology strategy (Q12) and were given a range of options from which to select their answer.

I had hypothesised that organisations were heavily influenced by their vendors or consultants as (a) popular media is dominated by the marketing and advertising of the key platform vendors, and (b) critics of gamification paint enterprises as being either naïve or greedy organisations motivated by profit, and under the influence of unscrupulous consultants or vendors (Bogost 2011). Based on the research findings, neither of these negative assumptions are supported.

The selection of a gamification technology strategy by an enterprise was largely an internal process that was not predominantly influenced by vendors, consultants or game developers. Respondents were more likely to do their own research on what would appeal to their target audience (33%), or decide for themselves what would be a good fit with their organisation.

### Table 14: Technology strategy

<table>
<thead>
<tr>
<th>Technology strategy</th>
<th>Sample Survey n=25</th>
<th>Taxonomy Survey N=304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital game or simulation</td>
<td>24%</td>
<td>25%</td>
</tr>
<tr>
<td>Gamified platform A (Vendor supplied)</td>
<td>19%</td>
<td>23%</td>
</tr>
<tr>
<td>Gamified platform B (Self-built by enterprise)</td>
<td>24%</td>
<td>23%</td>
</tr>
<tr>
<td>Gamified product features</td>
<td>19%</td>
<td>20%</td>
</tr>
<tr>
<td>Playful experiences</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5%</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
culture (14%). Only a small percentage (14%) stated that they were predominantly advised by a game developer, consultant or vendor. The findings are listed in the table below:

<table>
<thead>
<tr>
<th>Reason for technology strategy selection</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>We researched what would appeal to our target market</td>
<td>33%</td>
</tr>
<tr>
<td>Other</td>
<td>29%</td>
</tr>
<tr>
<td>We were advised by our consultants, game designers or vendors</td>
<td>14%</td>
</tr>
<tr>
<td>It was a good fit for our organisation culture</td>
<td>14%</td>
</tr>
<tr>
<td>We were influenced by other similar gamification examples</td>
<td>5%</td>
</tr>
<tr>
<td>Not sure</td>
<td>5%</td>
</tr>
<tr>
<td>Internal pressures to run with this option</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The results in this table show that the ‘other’ category was a significant one, and the freeform responses (that were invited by the survey form for the ‘other’ category) are summarised below:

- “We looked for a tool to distinguish our brand from competitors.”
- “Testing a few different options for a pilot.”
- “Financial constraints limited options.”
- “We didn’t research but thought it would appeal.”
- “We did our own research for the proposal but outsourced the game design.”

The responses indicate a level of independence and flexibility of the project owners in determining the best technology strategy for their project.
Core gameplay

Respondents were asked: *What is the core gameplay used in your gamification project?* (Q11) and were asked to tick one of the options listed in the table below.

Core gameplay was defined on the survey form for the respondents as: “Core gameplay is the type of game genre that was designed to be the core experience for your users”. The primary objective of this survey question was to ascertain the core gameplay used by the survey group for their gamification project. There were also two other elements that I set out to explore:

- Identify any unique or innovative use of gameplay amongst this group of enterprise users. This was set up as an “Other” option and a prompt for a freeform response on the survey form. Note that all ‘other’ options provided in the survey are also listed below.

- Identify whether organisations understood what gameplay was and how it was used in their project. This was set up as an “Not Sure” option in the survey form.

The results for the survey were similar to what was found in the analysis of the dataset leading to the development of the taxonomy in terms of the spread of gameplay that is in use. The only significant differences between the survey and the taxonomy was that survey respondents used ‘collection’ gameplay less, and more of puzzle or problem solving games.

This could be an outcome of the nature of this particular group of organisations that have built gamification projects for a more sophisticated target audience or primary purpose. My dataset does not include examples of loyalty programs relative to the taxonomy survey, which predominantly
employ simple forms of collection gameplay. Only one respondent didn’t know the type of gameplay that was employed in their gamification project. Two other respondents identified gameplay types that were not on the list of options offered in the survey.

<table>
<thead>
<tr>
<th>Core Gameplay options selected</th>
<th>Survey n=25</th>
<th>Taxonomy N=304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territory acquisition</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Prediction (includes idea generating gameplay)</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>Spatial navigation</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Survival (includes management gameplay)</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Destruction (shoot, bomb, destroy etc.)</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Building</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Collection (includes scavenger/treasure hunts, hide n’seek, loyalty programs, gamified platforms/API)</td>
<td>29%</td>
<td>57%</td>
</tr>
<tr>
<td>Chasing or evading</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Racing</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Trading</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Social, ‘Sims’ or role-playing type gameplay</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>Puzzle or problem solving</td>
<td>19%</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Not sure</td>
<td>5%</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

To delve deeper into the enterprise decision making process on gameplay selection, respondents were asked *Why was this gameplay chosen for this project?* (Q12) and once again, these organisations showed independence of thought as they were not overwhelmingly influenced by consultants, game designers or vendors. Table 17 shows a breakdown of the responses:
Table 17: Reasons for core gameplay

<table>
<thead>
<tr>
<th>Reason for the selection of gameplay</th>
<th>Responses n=25</th>
</tr>
</thead>
<tbody>
<tr>
<td>We generated this idea ourselves</td>
<td>33%</td>
</tr>
<tr>
<td>We researched what would appeal to our target market</td>
<td>24%</td>
</tr>
<tr>
<td>Other</td>
<td>19%</td>
</tr>
<tr>
<td>We were advised by our consultants, game designers or vendors</td>
<td>14%</td>
</tr>
<tr>
<td>We were influenced by other similar gamification examples</td>
<td>5%</td>
</tr>
<tr>
<td>It was a good fit for our organisational culture</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Respondents were more likely to generate the idea for gameplay themselves (33%) or research what would appeal to their target market (24%) than predominantly follow the guidance of their vendor or consultant (14%).

**Key game mechanics**

Respondents were asked: *What are the key game mechanics used in your gamification project?* (Q13) and were asked to select a maximum of three game mechanics from a list of options (also offered were ‘Other’ and ‘Not Sure’ as options with a free form field to identify any mechanic that was not on the list). Game mechanics were defined in the survey forms as: “Core game mechanics are the main game tools or techniques used to score, provide user feedback, prompts, or otherwise engage your players”.

The objective of this survey question was to ascertain:

- The types of game mechanics that were employed by the survey group.
- Identify any unique or innovative use of game mechanics amongst this group of enterprise users. This was set up as an ‘Other’ option and a prompt for a freeform response on the survey form.
• Identify whether organisations understood what game mechanics were and how they were used in their project. This was set up as a ‘Not Sure’ option in the survey form.

• Whether the survey group was representative of the findings in the taxonomy. This was set up by providing respondents the same list of options on the survey form as was used in the taxonomy survey.

The table below indicates the number of times each mechanic was mentioned:

Table 18: Game mechanics options selected

<table>
<thead>
<tr>
<th>Game Mechanics options selected</th>
<th>Survey n=25 Per cent (%)</th>
<th>Taxonomy N=304 Per cent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td>57</td>
<td>43</td>
</tr>
<tr>
<td>Leaderboards</td>
<td>52</td>
<td>17</td>
</tr>
<tr>
<td>Status, success, recognition</td>
<td>52</td>
<td>27</td>
</tr>
<tr>
<td>Achievements (badges, trophies etc.)</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>Progression</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>Missions and quests</td>
<td>33</td>
<td>29</td>
</tr>
<tr>
<td>Currency or rewards (real or virtual)</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>Social (friending, connecting etc.)</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Narrative</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Chance, random or lottery mechanics</td>
<td>5</td>
<td>N/A</td>
</tr>
<tr>
<td>Experience</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Not sure</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*NB percentages indicate number of times mentioned. 3 key mechanics were selected for each project*

The results show that the most common game mechanics in the taxonomy are also the most common mechanics used by survey respondents – namely
point, badges, status and leaderboards. Respondents were asked ‘Why were these game mechanics chosen for this project?’ (Q14). As was the case in the question on gameplay, these organisations showed independence of evaluation and action and not overwhelmingly influenced by consultants, game designers or vendors. A breakdown of their responses is as follows:

Table 19: Reasons why game mechanics were chosen

<table>
<thead>
<tr>
<th>Reasons why game mechanics were chosen</th>
<th>n=25</th>
</tr>
</thead>
<tbody>
<tr>
<td>We generated this idea ourselves</td>
<td>33%</td>
</tr>
<tr>
<td>We researched what would appeal to our target market</td>
<td>19%</td>
</tr>
<tr>
<td>We were advised by our consultants, game designers or vendors</td>
<td>14%</td>
</tr>
<tr>
<td>It was a good fit for organisational culture</td>
<td>14%</td>
</tr>
<tr>
<td>We were influenced by other similar gamification examples</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

It appears that respondents are using the same or similar technologies, gameplay and mechanics and in roughly similar proportions to what was found in the taxonomy. The question that this brought to mind was that if my survey respondents are using the same technologies and design elements as the general population, then perhaps the key to their success is in how their gamification projects are initiated, developed, implemented and managed.

**Player types or personas**

Respondents were asked: *Did you develop player types or personas for your gamification project?* (Q17). The objective of this survey question was to ascertain:

- How rigorous they were in developing user-focused designs.
• Identify any unique or innovative use of persona or player type development. This was set up as an “Other” option and a prompt for a freeform response on the survey form.

• Identify whether organisations understood what player or persona development is and how it is used in their project. This was set up as a “Not sure” option in the survey form.

The majority of organisations not only developed player types or personas for their gamified enterprise application (62%), most of those developed a custom set by researching the needs of their target audience (52%). Industry concerns about the applicability, misuse or overuse of Bartle’s player types in enterprise gamification appear to be unwarranted.

<table>
<thead>
<tr>
<th>Player types or personas used</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=25</td>
<td></td>
</tr>
<tr>
<td>No, it wasn’t raised</td>
<td>24</td>
</tr>
<tr>
<td>No, we decided against it</td>
<td>5</td>
</tr>
<tr>
<td>Not sure</td>
<td>5</td>
</tr>
<tr>
<td>Yes, we did. We used an industry model</td>
<td>10</td>
</tr>
<tr>
<td>Yes, we did. We developed a custom set</td>
<td>52</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

However a significant proportion of organisations are not developing personas or player types for their gamified applications (29%) which is not advisable for any form of software or system design based on human-computer interaction (Miaskiewicz and Kozar 2011; Pruitt and Grudin 2003).
Survey results on operational factors

A note on using Likert scales before we continue. Before I present a discussion on the survey findings, I should make note of the current disagreement in the research community on the statistical analyses of survey questions that use Likert scales (Boone and Boone 2012; Kostoulas 2013; Westland 2014). This discussion was also presented in the methodology in Chapter 4.

Likert scales produce ordinal data that can be ranked or tallied, and many statisticians believe that ordinal data cannot be used like interval data to produce mean values (or other parametric statistics). As this is a contentious issue, I have still produced statistics such as calculating the mean values and standard deviations of all the survey questions that use Likert scales, however these have been used for illustrative purposes, and are only used to support my key analytical tools of tables, heat maps and bar charts. While many statisticians don’t approve of the calculation and use of parametric statistics off Likert scale data, they maintain that these statistics may still be used if the findings are broadly consistent (Boone and Boone 2012; Kostoulas 2013; Westland 2014). As that is the case with my data set, I will utilise both options.

Satisfaction level – operational factors

Respondents were asked: Please rate your organisation’s overall level of satisfaction with your gamification solution (Q18). Respondents were given a table of 12 operational factors and were asked to rate their level of satisfaction with their gamification project execution by using a Likert scale from 1 (completely dissatisfied) to 5 (completely satisfied). The objective of this survey question was to ascertain how the implementation of enterprise gamification projects compared to a range of factors that are key
to the effective implementation of IT and IS related projects (Henderson and Venkatraman 1993; McKinsey 2007). Therefore key strategic and operational factors were selected for questioning in key areas related to management, IS implementation and change management. Results showed that the highest levels of satisfaction came from: Ease of use, Pricing/value for money, and Impact on target audience, each with a mean score of 4.1 out of a possible 5. These high levels of satisfaction appear to be consistent with the positive portrayal of gamification in the media as a means to increase the motivation and engagement of staff, customers and stakeholders with easy “plug and play” solutions. However my survey showed that the least satisfaction came from Data and Analytics (3.2), and Customisation and Flexibility (3.6). The detailed results are provided in the table below.

Table 21: Rating of operational elements

<table>
<thead>
<tr>
<th>Operational element</th>
<th>Mean score</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of use</td>
<td>4.1</td>
<td>0.79</td>
</tr>
<tr>
<td>Pricing (value for money)</td>
<td>4.1</td>
<td>0.91</td>
</tr>
<tr>
<td>Impact on target audience</td>
<td>4.1</td>
<td>0.86</td>
</tr>
<tr>
<td>Licensing arrangements</td>
<td>4.0</td>
<td>0.97</td>
</tr>
<tr>
<td>Return on Investment</td>
<td>4.0</td>
<td>0.94</td>
</tr>
<tr>
<td>Customer service</td>
<td>4.0</td>
<td>0.91</td>
</tr>
<tr>
<td>Ease of set up and integration</td>
<td>3.9</td>
<td>0.85</td>
</tr>
<tr>
<td>Project administration</td>
<td>3.8</td>
<td>1.01</td>
</tr>
<tr>
<td>Ongoing maintenance</td>
<td>3.7</td>
<td>0.97</td>
</tr>
<tr>
<td>Project management</td>
<td>3.7</td>
<td>0.93</td>
</tr>
<tr>
<td>Customisation and flexibility</td>
<td>3.6</td>
<td>0.87</td>
</tr>
<tr>
<td>Data and analytics</td>
<td>3.2</td>
<td>1.06</td>
</tr>
</tbody>
</table>

In a closer investigation of satisfaction levels, the heat map in the table below shows the spread of responses according to their satisfaction levels.
Overall, respondents showed high levels of satisfaction across most operational elements with several factors situated at ‘satisfactory’ and only one, data and analytics, spreading into ‘somewhat satisfied’.

Table 22: Level of satisfaction - operational elements heatmap

<table>
<thead>
<tr>
<th>Operational element</th>
<th>Completely dissatisfied</th>
<th>Somewhat satisfied</th>
<th>Satisfied</th>
<th>Mostly satisfied</th>
<th>Completely satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of set up and integration</td>
<td>0%</td>
<td>5%</td>
<td>29%</td>
<td>43%</td>
<td>24%</td>
</tr>
<tr>
<td>Customisation and flexibility</td>
<td>0%</td>
<td>10%</td>
<td>38%</td>
<td>38%</td>
<td>14%</td>
</tr>
<tr>
<td>Ease of use</td>
<td>0%</td>
<td>0%</td>
<td>24%</td>
<td>38%</td>
<td>38%</td>
</tr>
<tr>
<td>Data and analytics</td>
<td>0%</td>
<td>30%</td>
<td>35%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Pricing (value for money)</td>
<td>0%</td>
<td>5%</td>
<td>20%</td>
<td>35%</td>
<td>40%</td>
</tr>
<tr>
<td>Licensing arrangements</td>
<td>0%</td>
<td>5%</td>
<td>32%</td>
<td>26%</td>
<td>40%</td>
</tr>
<tr>
<td>Project administration</td>
<td>5%</td>
<td>0%</td>
<td>30%</td>
<td>40%</td>
<td>25%</td>
</tr>
<tr>
<td>Ongoing maintenance</td>
<td>0%</td>
<td>10%</td>
<td>38%</td>
<td>29%</td>
<td>24%</td>
</tr>
<tr>
<td>Project management</td>
<td>0%</td>
<td>5%</td>
<td>42%</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Return on Investment</td>
<td>0%</td>
<td>5%</td>
<td>30%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Impact on target audience</td>
<td>0%</td>
<td>0%</td>
<td>33%</td>
<td>29%</td>
<td>38%</td>
</tr>
<tr>
<td>Customer service</td>
<td>0%</td>
<td>0%</td>
<td>42%</td>
<td>21%</td>
<td>37%</td>
</tr>
</tbody>
</table>

n=25

The overall scores were reasonably high across most operational areas, however there is room for improvement in several areas for the delivery of gamification services, the most notable being Data and Analytics, which is also a key selling point for gamification platforms.

This becomes a critical issue for further investigation particularly when we consider that Data and Analytics is one of the key cornerstones from which the gamification strategy of ‘behaviour design’ and ‘behaviour change’ is developed and implemented, which is a view held by academics and
commercial operators alike (Accenture 2013; Badgeville 2015\textsuperscript{18}; Bunchball 2015\textsuperscript{19}; Deterding et al. 2011; Hamari et al. 2014; Lithium 2011\textsuperscript{20}; Star 2013\textsuperscript{21}). If data and analytics is considered suboptimal by respondents, it raises questions on the effectiveness of behaviour design solutions that are developed from it.

**Security, privacy, ethics, values and collaboration**

Respondents were asked: *To what degree were the following items addressed during the development, design and implementation of your project?* (Q19). The purpose of this question was to ascertain how important security, privacy, ethics and collaboration were to organisations and how much effort they put into protecting, upholding or enhancing them.

Respondents were given a table of six factors and were asked to indicate the degree to which these items were addressed during their project development and implementation. A Likert scale was used for this question that ranged from 1 (not at all) to 5 (extensively).

\textsuperscript{18} https://badgeville.com/behavior-lab
\textsuperscript{19} http://www.bunchball.com/blog/post/1608/why-gamification-will-revolutionize-workplace-2015
\textsuperscript{20} https://community.lithium.com/t5/Science-of-Social-blog/The-Magic-Potion-of-Game-Dynamics/ba-p/19260
\textsuperscript{21} http://playgen.com/behavioural-design/
The majority of organisations, as can be seen in the figure below indicated that they had spent a significant amount of time on issues relating to security, privacy, ethics, values and collaboration when developing their gamified enterprise application. Only a small number indicated that they spent a moderate amount of effort or no/low effort.

As can be seen in the table below, the most time was spent on the integration of organisational values into the gamified application (mean score of 4.0 out of a possible 5) and manipulation and channeling had the lowest score of 3.3. This is not surprising as this is the least understood area of gamification design (Raftopoulos 2014).

Figure 29: Security, Values and collaboration
Table 23: Privacy, values and collaboration scores

<table>
<thead>
<tr>
<th>Privacy, Ethics and Values</th>
<th>Mean</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of organisational values</td>
<td>4.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Data security</td>
<td>3.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Privacy issues</td>
<td>3.9</td>
<td>1.3</td>
</tr>
<tr>
<td>Collaboration and co-design</td>
<td>3.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Ethics issues</td>
<td>3.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Issues on manipulation or channelling</td>
<td>3.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

It was clear from these results that the majority of organisations rated these issues with relative high importance during their project development and implementation. As is the case with all surveys of this nature, these results are predicated on the assumption of the integrity and honesty of survey participants, and on the understanding that there may be some element of confirmation bias.

It should also be noted that these issues are also of relative importance to other software and systems implementations in enterprises and have been a key feature of the HCI discourse to date on software applications in general. Therefore, organisations appear to be already well versed on these issues and have also applied them to their gamification projects. In light of recent developments on issues of surveillance in all social media and corporate applications, privacy is high on the corporate strategic agenda as well.

**Satisfaction – Project management and outcomes**

Respondents were asked: *To what degree do you agree or disagree on whether the following experiences applied to your organisation?* (Q20).

Respondents were given a table of 16 mixed positive and negative statements and were asked to indicate to what degree they agreed or
disagreed on how they applied to their own project experience. A Likert scale was used starting from 1 (completely disagree) to 5 (completely agree). The results are summarised in the tables below, and I have separated the positive statements from the negative ones into two tables for ease of analysis and discussion. Let’s look at the positive statements first:

Table 24: Positive statement scores

<table>
<thead>
<tr>
<th>Agreement with Positive Statements</th>
<th>Mean</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met our intended objectives</td>
<td>4.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Unexpected benefits</td>
<td>4.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Staff were actively involved</td>
<td>3.9</td>
<td>1.0</td>
</tr>
<tr>
<td>We learned useful things</td>
<td>3.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Ethical issues carefully considered</td>
<td>3.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Consultants were informative</td>
<td>3.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Vendors gave independent advice</td>
<td>3.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Tested prototypes</td>
<td>3.2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The data shows that the majority of respondents agreed with the positive statements as most elements received high mean scores (positive statements describe a positive outcome of their gamification project). The highest scores were for meeting intended objectives (4.2) and receiving unexpected benefits from their gamification project (4.0) and the lowest scores were for vendors giving independent advice (3.3) and the testing of a sufficient number of prototypes (3.2).

A closer look at the spread of responses, the heatmap below shows that the majority of respondents tended to agree with the positive statements. In other words, they had a positive overall experience with gamification. However, note should be made of the neutral areas as these issues are significant as they come up again later in the survey with the open questions.
It appears that there was a significant proportion of respondents that were neutral on whether gamification vendors gave them independent advice, on whether consultants were informative, or whether they tested a sufficient number of prototypes in the development of their project.

This brings into question the overall capability and professionalism of vendors and consultants, or the perceptions thereof by the organisation. I have already documented that organisations claim that they have made their own decisions with regards to technology adopted and the selection of gameplay and game mechanics, and did not attribute that their decisions were overwhelmingly informed by their vendors or consultants. This could be partly explained by the ‘neutrality’ of the responses in relation to perceiving their consultants as informative. Ahead, I will discuss the findings that respondents saw significant limitations with gamification technology in the open ended questions. As will be seen, respondents perceive an overall limited capability of enterprise gamification vendors and consultants.

<table>
<thead>
<tr>
<th>Positive Statements heatmap</th>
<th>Completely Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Completely Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met our intended objectives</td>
<td>5%</td>
<td>0%</td>
<td>14%</td>
<td>33%</td>
<td>48%</td>
</tr>
<tr>
<td>Staff were actively involved</td>
<td>0%</td>
<td>14%</td>
<td>14%</td>
<td>38%</td>
<td>33%</td>
</tr>
<tr>
<td>Vendors gave independent advice</td>
<td>10%</td>
<td>10%</td>
<td>38%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>We learned useful things</td>
<td>5%</td>
<td>5%</td>
<td>24%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Unexpected benefits</td>
<td>0%</td>
<td>5%</td>
<td>24%</td>
<td>33%</td>
<td>38%</td>
</tr>
<tr>
<td>Ethical issues carefully considered</td>
<td>5%</td>
<td>5%</td>
<td>33%</td>
<td>38%</td>
<td>19%</td>
</tr>
<tr>
<td>Consultants were informative</td>
<td>5%</td>
<td>10%</td>
<td>38%</td>
<td>33%</td>
<td>14%</td>
</tr>
<tr>
<td>Tested prototypes</td>
<td>10%</td>
<td>19%</td>
<td>33%</td>
<td>14%</td>
<td>24%</td>
</tr>
</tbody>
</table>
In the next table, we look at respondent levels of agreement or disagreement with the negative statements (or statements that describe a negative outcome of their gamification project).

The majority of respondents tended to disagree with the negative statements, indicating that these organisations were reasonably satisfied with the operational aspects of their projects. This can be seen with the low average mean scores in the table below – the higher the score (relative to the highest score out of 5), the higher level of disagreement with the negative statement.

Table 26: Negative statement scores

<table>
<thead>
<tr>
<th>Agreement with Negative Statements</th>
<th>Mean</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product was confusing</td>
<td>2.7</td>
<td>1.2</td>
</tr>
<tr>
<td>It did not fit our culture</td>
<td>2.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Privacy concerns</td>
<td>2.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Technology was restrictive</td>
<td>2.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Product somewhat immature</td>
<td>2.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Trust issues among target audience</td>
<td>2.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Anxiety from staff about participation</td>
<td>1.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Didn’t explore issues deeply enough</td>
<td>1.6</td>
<td>1.3</td>
</tr>
</tbody>
</table>

However on close investigation of the spread of responses show that while there is a significant proportion of responses that disagreed with the negative statements (in the dark shade in the table below), there was a significant amount that were either neutral or had agreed with the negative statements (see the spread of ‘neutral’ and ‘agree’ responses in the light shade in the table below) that bares more light on these issues.

From a methods perspective, this is where statisticians who believe that ‘ordinal data’ cannot be used like ‘interval data’ to produce mean values (or other parametric statistics) make a valid point. Looking at arithmetic mean
scores alone would not have drawn out this level of depth of analysis. It appears a more complex issue than the mean scores indicate.

Table 27: Agreement with negative statements

<table>
<thead>
<tr>
<th>Negative Statements</th>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product somewhat immature</td>
<td>33%</td>
<td>19%</td>
<td>33%</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>Product was confusing</td>
<td>33%</td>
<td>52%</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Privacy concerns</td>
<td>29%</td>
<td>29%</td>
<td>19%</td>
<td>24%</td>
<td>0%</td>
</tr>
<tr>
<td>Trust issues among target audience</td>
<td>33%</td>
<td>29%</td>
<td>19%</td>
<td>19%</td>
<td>0%</td>
</tr>
<tr>
<td>Didn’t explore issues deeply enough</td>
<td>24%</td>
<td>38%</td>
<td>29%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>It did not fit our culture</td>
<td>57%</td>
<td>29%</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Technology was restrictive</td>
<td>33%</td>
<td>14%</td>
<td>19%</td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td>Anxiety from staff about participation</td>
<td>24%</td>
<td>38%</td>
<td>14%</td>
<td>19%</td>
<td>5%</td>
</tr>
</tbody>
</table>

These results indicate that there is a spread of results in a few key areas where gamification performance is lacking, namely:

- Product being somewhat immature
- Privacy issues
- Trust issues
- Not exploring issues deeply enough
- Restrictive technology
- Anxiety about staff participation.

These results showed that there are a range of negative operational issues or attributes of gamified applications that require attention. The issues
identified above are not insignificant and can have a detrimental impact on project effectiveness in meeting its strategic objectives. However, despite these shortcomings, it appears that the projects achieved an overall positive result (which will be further explored in this chapter).

**Expectation to play (internal gamification projects only)**

Respondents were asked: *On the expectation to play or participate (please answer only for internal gamification projects)* (Q21). Respondents were given a range of options on the degree to which there was an expectation of internal staff to play or participate in the gamification project. This question was only applicable to 17 out of the 25 respondents.

The majority of participants (69% or 11) ran their gamified projects as completely optional to participation. A further 4 (23%) said the gamified application was optional to participate, but there was an implied expectation to participate, and 1 (8%) said it was mandatory to participate.

![Figure 30: Expectation to Play or Participate](image)

Whilst the dataset for the ‘mandatory to participate’ outlier is too small to make any meaningful observations, it is interesting to note that the
organisation that implemented the ‘mandatory to participate’ project is also
the same organisation that (a) used ‘destruction’ gameplay, and (b) had the
least project satisfaction overall. The opportunity for further research (that is
outside the scope of this dissertation) is:

• Does mandatory participation produce a sub-optimal project outcome?

• To what degree does the existing organisation culture contribute to
  project failure.

This would be a detailed piece of work for further investigation.

Motivations for undertaking gamification

Respondents are asked: *What motivated you to try gamification?* (Q16) to
identify the primary motivation for undertaking a gamification project. We
can see in the figure below that the clear majority of respondents (57%)
stated that they were primarily motivated by motivating and engaging their
target audience, and only a minor percentage of respondents (10%) chose
‘to improve our performance or bottom line’. This is not to assume that the
majority of respondents were not motivated by a profit motive, but were
more interested in investigating motivation and engagement as the primary
area of interest. This suggests an experimental approach by these
organisations in testing out a field as new as gamification.
Two reasons that scored a low mention were ‘To be seen as creative or innovative’ (14%) and ‘Other organisations in our industry were using it’ (5%) indicates that there is a low incidence of the ‘me too’ follower strategy adopted in this sample. This could be an indication that the organisations in this sample would be innovators or leaders in the field of gamification adoption, rather than followers.

**Overall project outcomes and impact**

Respondents were asked: *How would you describe your overall outcomes and business impact?* (Q22). The majority of the responses were positive with 44% selecting that they ‘achieved an innovative outcome’ followed by responses that achieved:

- Short term improvement 12%
- Sustained improvement 8%
- Sustained, breakthrough results 12%
No one selected that they were in a worse position or that they had achieved no change at all. A total of 24% stated that it was too early to tell. This shows a mix of results, albeit positive. The high proportion of ‘innovative outcomes’ suggests the experimental nature of these projects to date. The 20% of projects that showed either a sustained or breakthrough results still appear to be in a minority, but form the majority of the hype or rhetoric in the industry.

![Overall business Outcomes (Q22)](image)

**Figure 32: Overall business outcomes**

**Propensity to recommend gamification**

For this question I explored the overall Net Promoter Score (NPS) that participants would give to enterprise recommendation. The NPS is a popular metric in the business community that was initially used to measure the loyalty of a company’s customer relationships (Reichheld 2006), but has recently been expanded to being a measure of respondent satisfaction in general. Respondents are asked to rate a service or activity on a scale from 1 to 10. In NPS terms, the higher the score, the more satisfied the respondent
is, and the more likely they are to positively promote your product or
service (Reichheld 2003):

- A score of 9 and 10 indicates that the respondent is a “Promoter” or in
  other words, they exhibit high value-creating behaviours such as
  actively promoting your product or service due to their high level of
  satisfaction.

- A score of 0 to 6 indicates that these respondents are “Detractors” and
  their not so positive experience will mean that they are less likely to
  exhibit value-creating behaviours.

- A score of 7 and 8 indicate that the respondent are known as “Passives”
  which means that their behaviour will fall somewhere between that of
  the Promoters and Detractors.

Respondents were asked, *On a scale from 1 to 10, how likely are you to
recommend gamification to a friend or colleague?* (Q26). The majority of
respondents (81%) answered 9 or 10 (out of 10) and are provided below:

![Net Promoter Score](image)

Figure 33: Net Promoter Score
Open-ended questions in the survey

Four open-ended questions were asked in the areas of barriers (Q4), enablers (Q23), recommendations (Q25), and definitions (Q15). The reasons for using open-ended questions as part of my overall mixed methods approach were to:

- Investigate the perspectives of the respondents in their own words as a sense-making endeavour from a practical perspective;
- Reduce the potential bias and pre-existing assumptions in how I, as the researcher, constructed my questions (Creswell, Plano Clark, Gutmann and Hanson 2003).
- Variation in data collection leads to greater validity (Creswell et al. 2003).

I was interested in the perspectives of each of the 25 respondents as experienced enterprise project owners on areas that have featured highly in the gamification discourse to date both among researchers as well as practitioners. These areas are the definition of gamification, the enablers of successful implementations, the barriers to success, and the best practices that are used by leaders in the field.

My procedure in analysing the data from the open-ended questions centred on using a code book, a procedure I followed as outlined DeCuir-Gunby et al. (2011) and MacQueen et al. (1998), and was structured as follows:

- I undertook an initial first read through all the responses to broadly familiarise myself with the content and themes.
I created a codebook for a systematic evaluation of the text-based responses to each of the four open-ended questions. The structure was as follows:

- The coding hierarchy was therefore as follows:
  1. Identify **key words/phrases** in all the responses.
  2. Identify **key themes** or categories, and allocate responses to these key themes.

- Cross reference to the **meta categories** of technology, design, management, and allocate the identified themes to these meta categories.

- I identified the key recurring words or phrases for each response and highlighted these in the text.

- I reviewed the key words or phrases then coded them into categories that combined several key words/phrases within them (DeCuir-Gunby et al. 2011).

- I then used the tripartite approach of the ‘design, technology and management’ framework (that shaped my overall research questions for the thesis) to collate the open-ended responses into these three meta categories. This step in the coding process was essentially theory-driven to provide an overarching context to the overall findings in the data. This is consistent with the research process of investigating the role of theory in illuminating connections between the initial layers of code (DeCuir-Gunby et al. 2011).

- To further refine the codebook, each text response was reviewed over several iterations until I was satisfied that coding was logical and consistent. As I was the only researcher working on this survey,
inter-coder agreement on definitions and categories, and hence questions over coding reliability, were not issues that needed to be managed.

- To facilitate the quantitative analysis of the qualitative data, I then counted the number of mentions for each of the key words/phrases and categories for each of the questions, and this was built into a MS Excel spreadsheet. Tables, graphs and simple statistical analyses were then derived from this spreadsheet.

- I used a card sorting technique to analyse all the key words and phrases, and affinity diagrams to group the cards into themes. These methods provided a broad visual display of all the key words/phrases and their corresponding categories, and enabled the easy grouping of responses into themes and meta categories.

As mentioned above and in Chapter 4: Methodology, the meta categories of design, technology and management were used to provide a theory-driven perspective to the data. The process I set up to do this was as follows:

- I created a classification table (see Table 29 below) with a column for each of the three meta categories and allocated key words or phrases that appeared in the literature review as predominantly pertaining to each meta category. This provided the overall theoretical foundation to the investigation.

- The next step was to review the coded data of all the survey responses and match the key words/phrases in the data to the key words in the classification table.

- There were some overlapping issues (highlighted with an asterix in the table below) and these responses were reviewed to take into account the respondents’ overall intent and sentiment.
The final stage was to analyse the results.

There was a good fit of the responses into these meta categories i.e. it was clear that the majority of responses fit into one or more of the three categories. Whilst many straddled two or all categories, they were allocated to the category that matched where the respondents’ overall sentiment lay.

### Table 28: Meta category classification of coded responses to open questions

<table>
<thead>
<tr>
<th>Management</th>
<th>Technology</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td>Technology</td>
<td>Design</td>
</tr>
<tr>
<td>Management</td>
<td>Vendors</td>
<td>Designer</td>
</tr>
<tr>
<td>Project management</td>
<td>Technical</td>
<td>Game elements</td>
</tr>
<tr>
<td>Learning</td>
<td>Platform</td>
<td>Game mechanics</td>
</tr>
<tr>
<td>Goals</td>
<td>Feedback system</td>
<td>Game play</td>
</tr>
<tr>
<td>Metrics</td>
<td>Modular</td>
<td>Personas</td>
</tr>
<tr>
<td>Expectations</td>
<td>Information technology</td>
<td>Ideation</td>
</tr>
<tr>
<td>Budget</td>
<td>Information systems</td>
<td>Ideas</td>
</tr>
<tr>
<td>Finance</td>
<td>Data</td>
<td>Levels</td>
</tr>
<tr>
<td>Skills*</td>
<td>Infrastructure</td>
<td>Audience*</td>
</tr>
<tr>
<td>Communication*</td>
<td>Lean</td>
<td>Market*</td>
</tr>
<tr>
<td>Resources*</td>
<td>Agile</td>
<td>Participation*</td>
</tr>
<tr>
<td>KPIs*</td>
<td>Integration*</td>
<td>Needs*</td>
</tr>
<tr>
<td>Budget*</td>
<td>Pilot*</td>
<td>Requirements*</td>
</tr>
<tr>
<td>Teamwork*</td>
<td>Prototype*</td>
<td></td>
</tr>
<tr>
<td>Measurement*</td>
<td>Stakeholders*</td>
<td></td>
</tr>
</tbody>
</table>

Legend: * = potential overlaps

A key limitation with the analysis of the data in this way may be my own world view and confirmation bias in the allocation of the responses to my pre-conceived notions of the overall schema (particularly since I had already selected this model derived from the design-research field as my overarching framework for my methods). This may have limited the
opportunity of different categories from emerging (Creswell et al. 2003; DeCuir-Gunby et al. 2011).

A counter argument to this would be that this three-part classification of technology, design and management is not uncommon in how organisations organise and structure themselves along these core functions, nor is it particularly unique as it is a widely used schema. Therefore given that this thesis is guided by a design-science approach, this approach can be justified on the grounds that it remains a valid and rigorous method to produce artefacts in the pragmatist tradition.

The amount of potential overlapping areas (identified by the asterix in the table) is reflective of the nature of gamification at this point in time as it challenges existing enterprise design paradigms, particularly for IT and IS solutions. Further limitations involved with open-ended questions include confirmation bias and honesty, as I have raised elsewhere in my research methods. The key finding from the open survey questions are presented below.

**Enablers of enterprise gamification projects**

Respondents were asked: *Please name up to three strategies that were key to the relative success of your project* (Q23). A total of 42 responses (n=42) were received. Seven key themes emerged from the 42 data points, and these were classified under each of the meta categories of Management Factors (43% of overall responses), Design Factors (36%) or Technology Factors (21%). The list of themes (and a sample of some of the responses for each theme) are outlined in the following table:
Table 29: Enablers of gamification projects – Overview

<table>
<thead>
<tr>
<th>Management Factors (43% overall)</th>
<th>Design Factors (36% overall)</th>
<th>Technology Factors (21% overall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project management (10)</td>
<td>Design elements (10)</td>
<td>Agile development (5)</td>
</tr>
<tr>
<td>• Stakeholder engagement</td>
<td>• Clear design objectives</td>
<td>• Learn from mistakes</td>
</tr>
<tr>
<td>• Stakeholder management</td>
<td>• Game design skills</td>
<td>• Flexible development approach</td>
</tr>
<tr>
<td>• Persistence!</td>
<td>• Understanding of motivational psychology</td>
<td>• Iterative approach</td>
</tr>
<tr>
<td>• Build internal networks</td>
<td>• Thoughtful gamification design principles</td>
<td>• Support/freedom to implement the right solution</td>
</tr>
<tr>
<td>• Making it personal for stakeholders</td>
<td>• Design, test, iterate</td>
<td>• Usability testing</td>
</tr>
<tr>
<td>• Supportive sponsors</td>
<td>• Use design thinking</td>
<td></td>
</tr>
<tr>
<td>• Strong launch campaign</td>
<td>• Focus on core game mechanics</td>
<td></td>
</tr>
<tr>
<td>• Clear project communication</td>
<td>• Non-manipulative mechanics</td>
<td></td>
</tr>
<tr>
<td>• Managing expectations</td>
<td>• Game elements aligned to goals</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork (5)</td>
<td>Target audience (5)</td>
<td>Technology (4)</td>
</tr>
<tr>
<td>• Teamwork with the supplier</td>
<td>• Understanding of target audience and culture</td>
<td>• Experience of vendor</td>
</tr>
<tr>
<td>• Interdepartmental co-operation</td>
<td>• Deep analysis of players</td>
<td>• Flexible gamification platform</td>
</tr>
<tr>
<td>• Active participation of all stakeholders</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Set goals and KPIs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Set targets and measure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using the meta category classification to summarise the overall feedback, respondents claim that the key to the overall success of gamification projects are management factors, followed by design factors, then technology. This result indicates that how well a project is led and managed is primarily responsible for its success.

As depicted in the figure below, in terms of the overall individual items of what were the key enablers of project success, the most common enablers mentioned were project management and design issues at 24% mentions each.

![Seven Key Enablers: percentage of overall mentions by sub-category (n=42)](image)

The sentiment of respondents in terms of what was critical to the success of their gamification project can be seen in an example of some of the responses in respondents own words below:
• “Interdepartmental co-operation was essential – IT, HR, Marketing, Financial Planning.”

• “We started with a test and learn phase (beta) developed by a small, tight, focused team over a long gestation period (24 months).”

• “It was designed and built brick by brick, and we never lost focus of what we wanted to achieve.”

It appears as if enterprises treat and manage a gamification project as they would any other project management exercise, and survey responses show the key to successful implementation centres around project integration and business transformation. This brings into question the need to distinguish what parts of an enterprise gamification project are unique to gamification, and which parts are standard project management issues.

By breaking down the responses, there appears to be two components to developing and implementing an enterprise gamification project: (a) the unique challenges of gamification in terms of generating an appropriate gameful design and specific technologies which are new to most organisations, and (b) the adeptness in which a project manager can navigate the project through a business transformation process.

**Barriers to success**

Respondents were asked: *Please name three barriers to success that you experienced during the project* (Q24). A total of 50 responses were received. Five key themes emerged from the 50 data points, and these were classified under each of the meta categories of Management Factors (34% of overall responses), Design Factors (28%) or Technology Factors (38%). The list of themes (and a sample of some the responses for each theme) are outlined in the table below:
Table 30: Barriers to success - Overview

<table>
<thead>
<tr>
<th>Management Factors (34% overall)</th>
<th>Design Factors (28% overall)</th>
<th>Technology Factors (38% overall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=17</td>
<td>n=14</td>
<td>n=19</td>
</tr>
</tbody>
</table>

**Project management (13)**
- Not having a clear strategy at the start
- Internal resistance to gamification
- Ineffective communication
- Procurement process cumbersome
- Lack of organisational priority
- User angst
- Concerned stakeholders

**Game elements (8)**
- Meaningless, arbitrary game mechanics
- Lack of game design expertise
- Too much focus on game elements
- The right game content for the business problem
- Vendors do not know the target market
- Playing the wrong ‘game’

**Technology (19)**
- Vendor capability
- Vendor solutions not mature enough
- Technical difficulties
- Limited gamification platforms on the market
- Platform restrictions
- Under-planned for internal IT support
- Limited reporting capabilities
- Data integrity issues
- Scalability
- On time delivery

**Measurement (4)**
- Hard to measure success
- Lack of solid KPIs

**Design (6)**
- Not being familiar with gamification
- Design for serious content

A breakdown of the individual items that were considered to be barriers are summarised in the table below, with technology as a barrier to success ranking as the top item:
Not only did **technology** feature low on the overall success factors, it appeared to top the key barriers to success chart. Technology as a barrier to project success comprised of 38% of all mentions. This is followed by project management at 26% which as we saw earlier, also featured as a key enabler. This further supports the fact that project management plays a critical role in an enterprise gamification implementation.

The key technology issues that were listed by respondents as being a barrier to project success indicate critical shortcomings in core technical IT and IS elements such as:

- Vendor capability
- Technological limitations
- Gamification platform restrictions
- Data integrity issues
- Limited reporting capabilities
- Vendors do not know the target market
- On time delivery
- Scalability issues
- Development team resources
- Adoption of the platform

This indicates a critical limitation in the enterprise gamification domain that has not been previously identified in the industry where more often than not, gamification failure is attributed to poor design decisions (Gartner 2013) rather than technology. The existence of this level of technological limitation presents a significant barrier to the further growth and development of the domain.

To gain a deeper perspective of respondents’ views, here is a selection of key quotes in their own words:

- “Barriers were primarily with technology: we waited a long time for vendors to mature, even then I do not believe vendor solutions are mature enough yet to handle large scale, complex enterprise use cases. We faced a lot of challenges with integration, especially with our data security requirements.”

- “Our IT infrastructure is not state of the art. That meant that the vendor had to develop for an ‘old’ situation. They could not re-use their new technologies, neither their experience.”
• “Gamification platform restrictions are not yet adapted to communities with serious content where reputation and quality are key. There are limited reporting capabilities and data integrity issues.”

In terms of project management, this category rated the highest in terms of key success factors, and second highest in terms of barriers to success. This indicates the central importance of getting project management right for gamification projects, particularly in relation to the unique needs of managing a gamification project relative to other change, IS or IT projects. Some of the key issues that were raised for project management as a barrier to a successful implementation include deficits in the following areas:

• Decision making
• Stakeholder management
• Management buy-in
• Envisioning
• Budget constraints
• Clear strategy
• Resourcing
• Time pressures
• Expectations and assumptions
• Organisational priority
• Communication issues

It should be noted that these factors are not uncommon in the domain of business transformation or change management and appear to have received
limited attention in enterprise gamification research. To gain a deeper perspective of respondents’ views, here is a selection of key quotes in their own words:

• “In a big organisation such as ours, getting approval for these kinds of projects is tough.”

• “The path of decision making in content development and implementation was and still is quite bureaucratic.”

• “Decision makers could not envision what users will experience when playing the game. That caused the inability to decide.”

• “It was hard to measure success and set up KPIs.”

• “We didn’t have a clear strategy when we started – we had to make it up as we went.”

Once again, these issues are common to the project management and change management domain, and these survey results indicate that better use of these fields could help inform the ongoing development of the enterprise gamification domain.

**Design** was one of the major success factors for a gamification project, as well as one of the key barriers to success if organisations did not get the design right. Some of the key issues with design as a barrier included:

• Not being familiar with gamification

• Resistance to gamification

• Use of arbitrary game mechanics

• Game design expertise
• Too much focus on game elements

• Finding/balancing the right game content

In the design space the limitations centre around balancing the right selection and mix of gamefulness and content, within the context of stakeholder skills, familiarity and acceptance of gamification. This speaks of an awkwardness of understanding and capability in the design domain, and in how design elements can be integrated into ‘serious’ business applications. To gain a deeper perspective of respondents’ views, here is a selection of key quotes in their own words:

• “There were times I felt that I was ‘playing the wrong game’.”

• “Not everyone liked our design.”

• “There was meaningless use of arbitrary game mechanics.”

• “There was an inability to identify useful business topics on which to apply gamification.”

Specific issues relating to design appeared to be a product of frustration with understanding the design issues that provide the bridge between the business problem, and the technology front and back-ends that are developed as part of the solution.

The fascination and attraction is certainly present in applying gameful design to enterprise business problems, but there appears to be a lack of finesse and balance in the design component of the process. This suggests that the role of the designer is critical, however it appears the expertise of the designer and the design process is still underdeveloped and lacks expertise often resulting in less effective design decisions.
The most significant finding from this survey was not in what was said, but in what was not said. In addressing questions on barriers and enablers, respondents did not offer direct comments on the motivational affordances of the gamification elements themselves or the effectiveness of the project to engage users. It appears that respondents believe that indicators of success or barriers are predominantly in how well a project is managed, the robustness of the technology, and its integration within the organisation. The motivational affordances in terms of the right balance of gameful design features, while being of significant importance, come secondary to enterprise system and process integration.

Creating a better design process

Respondents were asked: Knowing what you do now, how would you create a better gamification design process? (Q25).

A total of 27 responses were received. Seven key themes emerged from the 27 data points, and these were classified under each of the meta categories of Management Factors (21% of overall responses), Design Factors (59%) or Technology Factors (19%), which are detailed below in Table 31: Creating a better design process - Overview.

In their recommendations for designing a better design process, respondents echoed what we heard in the previous questions in terms of the importance of first-principles for project management and technological platforms. Most telling, however, was the concentration of recommendations on design factors, the majority of which concerned capability issues. On reflection this makes sense when we consider that project management and technology are standard core competencies in the enterprise, whereas design is less so.
Design in the enterprise has been gaining momentum, particularly with the growth in the popularity of design thinking, however it is essentially new and unfamiliar territory, particularly in relation to game design thinking which is even more recent, and the responses in this survey reflects this. The survey results show that at this point in time, design methodologies and capability are not yet at the level they should be for enterprise gamification.

A closer inspection of the items in Table 31: Creating a better design process - Overview shows the language used by respondents in these open-ended questions showed an operational and tactical focus in their recommendations, rather than a strategic or systemic one. This indicates that project managers confined their gamification projects within an operational paradigm that was in the scope of their capabilities. Alternatively, the projects are smaller and tactical in nature at this point of development of the domain.

Table 31: Creating a better design process - Overview

<table>
<thead>
<tr>
<th>Management Factors (21% overall) n=6</th>
<th>Design Factors (59% overall) n=16</th>
<th>Technology Factors (19% overall) n=5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project management (2)</strong></td>
<td><strong>Prototypes (3)</strong></td>
<td><strong>Technology (5)</strong></td>
</tr>
<tr>
<td>• Set realistic expectations</td>
<td>• Build more prototypes</td>
<td>• Reduce, avoid, manage technical</td>
</tr>
<tr>
<td>• Offer a protected space to allow</td>
<td>• Showcase other games/examples as</td>
<td>limitations of existing technologies</td>
</tr>
<tr>
<td>freedom to explore design</td>
<td>• communications tool</td>
<td>• Build our own custom platform</td>
</tr>
<tr>
<td><strong>Metrics (2)</strong></td>
<td>• Prototypes must focus on</td>
<td></td>
</tr>
<tr>
<td>• Define critical success factors</td>
<td>business goals</td>
<td></td>
</tr>
<tr>
<td>(CSF) early in the process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Set CSF in the design stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Game elements (6)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Avoid ranking and collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Be innovative with game mechanics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Smaller quick rapid games within</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a long game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Factors (21% overall) n=6</td>
<td>Design Factors (59% overall) n=16</td>
<td>Technology Factors (19% overall) n=5</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>• More passionate and intuitive gameplay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use storylines and themes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Learning (2)</strong></td>
<td><strong>Design (7)</strong></td>
<td></td>
</tr>
<tr>
<td>• Provide for structured learning experiences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Actively share lessons learned</td>
<td>• Spend more time at the beginning looking at <em>game thinking</em> elements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use a showcase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Better game design!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Spend more time on good ideation sessions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Focus on the target audience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Set clear design goals</td>
<td></td>
</tr>
</tbody>
</table>

The overall breakdown of the individual items are summarised in the figure below, with design features rating highly as areas where respondents would change or improve their development process:
The majority of responses received stated that they would develop a better design process (26%) followed by more careful or considered use of gameplay/mechanics (22%), and the selection of the right technology (19%).

Some of the key issues raised with how respondents would improve the gamification design process revolved around the use of tighter, more thoughtful use of design and technology:

- More ideation and prototyping
- More learning opportunities
- More meaningful design features
- More innovative mechanics (narrative, experience, reputation)
- Less traditional mechanics (rewards, points, leaderboards)
- Reduce technological limitations
• Careful selection of vendors

To gain a deeper perspective of respondents’ views, here is a selection of key quotes in their own words:

• “I would have spent more time at the beginning looking at more into game thinking elements and fewer game mechanics. I think we would have created a more engaging program.”

• “We would like to see an extended version of the game to turn passion and intuitive game play into a deeper consideration of the issues.”

• “I think that it is more important to be clear on your goals and your audience. There was a disconnect between the prototypes and concepts being discussed and the stated goal, the audience of the game.”

• “Be focused on the target audience, define critical success factors for the game at the game design stage, be innovative with the game mechanics.”

A close examination of responses indicates that project owners are actually talking about sophisticated forms of experience design – game thinking, passion and intuition, deeper considerations, innovative mechanics. At this point in time, it appears that these factors are beyond the capability that is seen in the technology and designs that dominate the enterprise gamification domain.

This supports my initial research question on design methodology in Research Module 1. The findings of this survey show that (a) it was an important question to investigate as part of this thesis; (b) I have been able to provide further validation to Research Module 1 through this survey, and (c) highlights the need for capability development, which will lead into the development of a capability model as a research outcome and an artefact of Research Module 4.
Definitions of gamification

Respondents were asked: *What is your definition of gamification?* (Q15). A response was received from every respondent and we looked at each of the definitions that was provided in two parts: (a) what gamification is; and (b) what it does or where it is applied. For example, let’s take the popular definition of gamification in both industry and academia: “The use of game elements in non-game contexts” (Deterding et al. 2011). The two parts are as follows:

```
“The use of game elements in non-game contexts”
```

(a) what gamification is  (b) What it does or where it is applied

The reason this method was employed to analyse responses to this question is that I was interested in understanding how respondents defined the key elements of what gamification is (for example, “game elements” in the example above) or where they applied it (in this example, in a rather broad area of “non-game contexts”).

This approach has been guided by the use of Rhetorical Structure Theory (RST) to provide me with an objective and structured framework to analyse each of the text definitions offered by respondents. In RST terms, the components would be a ‘nucleus’, or text expressing an idea occurring in the interpretive context, and a ‘satellite’, or an interpretive context of situation or time (Mann and Thompson 1988). The justification for using
RST was to give me an objective method to deconstruct respondents’ definitions and to give me an objective lens by which I can review the material with impartiality. As I had declared in the introduction in Chapter 1, I am also a practitioner in this domain and it is important to my research that I remain objective and transparent at all times.

The first part of the analysis is on *(a) what gamification is*, which is the ‘nucleus’ or the expression of an idea in the interpretive context. The most popular items were the following key words that were most commonly used:

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play or fun</td>
<td>3</td>
</tr>
<tr>
<td>Game mechanics</td>
<td>7</td>
</tr>
<tr>
<td>Game elements</td>
<td>5</td>
</tr>
<tr>
<td>Game design</td>
<td>6</td>
</tr>
<tr>
<td>Games</td>
<td>2</td>
</tr>
<tr>
<td>Game thinking</td>
<td>1</td>
</tr>
<tr>
<td>Meaningful play</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 32: Defining gamification - What it is

It is no surprise that the results show that all respondents identified gamification with being associated with games, fun and play and/or utilising key mechanics, elements, design or thinking. There is no clear or uniting view of how gamification is defined apart from a thematic alignment to gamefulness.

The second part of the analysis is on *(b) what gamification does or where it is applied*, which is the ‘satellite’ or the interpretive context. The following key word or phrases were commonly used:
Where it’s applied:

- Business environment
- Real world problems
- Non-game situations, problems, contexts, processes, environments, scenarios

Which is added to what gamification does:

- To change/modify/drive behaviour
- To engage
- For value creation
- For knowledge transfer
- To manipulate
- To lower friction

In terms of what gamification does and where it’s applied, respondents contextualised gamification in a business environment that looks to create value through the solving of problems, changing behaviour or improving effectiveness. Each definition has been abstracted to fit each project owner’s view of the environment in which she/he has implemented the project.

While this result can be viewed as an absence of a unifying view, it can also be viewed as neither a negative nor a positive, but merely a reflection of the spread of gamification across a broad range of projects or activities which is as broad as the range of a typical enterprise’s activities itself.

In concluding the survey findings on the definition of gamification, responses show that the definition of gamification is broad and complex.
• It is a process, and an artefact, and an experience
• It enhances a product, service, process or system
• It provides affordances for gameful experiences through games, play and game design patterns
• It is the integration of design, technology and management or organisational capabilities
• It results in value creation for organisational stakeholders.

Overall the most common definition of gamification supports one of the most commonly occurring themes in my research, which is that gamification is being used to support or enhance existing organisational and management constructs rather than invent new ones.

A summary of findings for Research Module 3

There are 23 summary findings that I have identified from Research Module 3 and I have categorised them into four key areas of

(a) Strategic considerations

(b) Operational considerations

(c) Key design features, and

(d) The capability paradigm: Technology, Design and Management.

Each of these key areas and their summary findings are detailed below:
a. **Strategic considerations**

1. **Survey depth.** The 25 surveys that were returned indicated that their combined gamified projects **equated to 11.2 million users** (which is a combination of both internal staff and external customers/stakeholders) that have been affected by these gamified enterprise applications. This is a significant survey in terms of the size and scope and has not been undertaken before.

2. **Overall impact.** The majority responses (42%) stated that they achieved an innovative outcome followed by those that achieved a short-term improvement (14%), a sustained improvement (10%) and breakthrough results (14%). No one selected that they were in a worse position or that they had achieved no change at all.

3. **Recommend gamification.** The results were overwhelmingly positive where the majority of respondents answered 9 or 10 out of a possible score 10 (81%) that they would recommend gamification to a colleague.

4. **Enablers of gamification projects.** The key to the overall success of gamification projects is management issues (42%) followed by design (36%) then technology (21%).

5. **Barriers to success.** The overall barriers that were identified were technology (38%), management (34%) and design (28%).

6. **Improve the process.** The majority of responses received stated that they would develop a better design process (26%) followed by more careful or considered use of game elements (22%) and in selecting the right technology (19%).

7. **Improve the experience.** Respondents showed a high degree of sophistication in terms of how they would improve the overall user
experience with more compelling gameplay and game mechanics, which may be beyond the capability of the design and technology that is currently being utilised.

8. **Definition of gamification.** There appears to be an absence of a uniting view or definition of gamification. This is neither a negative nor a positive, but merely a reflection of the spread of gamification across a broad range of projects or activities which is as broad as the range of typical enterprise activities and functions itself.

9. **A point of differentiation.** A key question that needs to be explored is if my survey respondents as ‘industry leaders’ are using the same technologies and design elements as were found in the taxonomy, then perhaps the key to their success is in how their gamification projects are initiated, developed, implemented and managed that matters rather than the game elements themselves.

10. **Motivations for undertaking gamification.** The clear majority of respondents (57%) stated that they were primarily motivated by engaging their target audience, and only a minor percentage of respondents (10%) chose ‘to improve our performance or bottom line’.

b. **Operational considerations**

11. **There is general satisfaction across most operational areas.** Overall, respondents showed high levels of satisfaction across most of the 34 operational elements I surveyed with several factors situated at ‘satisfactory’ and only one factor, data and analytics, spread into the area of ‘somewhat satisfied’.
12. **Disappointing Data and Analytics.** Results showed that the highest levels of satisfaction came from: Ease of use, Pricing/value for money, and impact on target audience. Least satisfaction came from Data and Analytics, and Customisation and Flexibility.

13. **Greatest room for improvement is in data and analytics.** There is room for improvement in several areas, the most notable being data and analytics which is a key selling point for gamification platforms. This is a critical issue particularly since data and analytics is the foundation from which the key gamification strategy of ‘behaviour design’ is developed and implemented, and is a key selling point of platform vendors.

14. **Organisations are neutral on the advice of vendors.** There was a significant proportion of respondents that were neutral on whether gamification vendors gave them independent advice, whether consultants were informative, or whether they tested a sufficient number of prototypes in the development of their project.

15. **Technology product and services are considered immature.** There were several key areas where there was an unclear position or disagreement among respondents, namely: product being somewhat immature, privacy issues, trust issues, not exploring issues deeply enough, restrictive technology, and anxiety about staff participation.

c. **Key design features**

16. **Technology strategy is largely self-selected.** The selection of a gamification technology strategy by an enterprise is largely an internal process that was not predominantly influenced by vendors, consultants or game developers.
17. **Game elements are largely self-selected.** Respondents were more likely to generate the idea for gameplay and game mechanics themselves, or research what would appeal to their target market, rather than predominantly follow the guidance of their vendor or consultants.

18. **Most organisations develop their own player types or personas.** The majority of organisations not only developed player types or personas for their gamified enterprise application, most of those developed a custom set by researching the needs of their target audience rather than use industry models.

19. **A significant proportion do not use personas.** A significant proportion of organisations are not developing personas or player types for their gamified applications (29%) which by industry standards is not advisable for any forms of software or system design.

20. **Privacy, security, ethics, values were considered important.** The majority of organisations indicated that they had spent a significant amount of time on issues relating to security, privacy, ethics, values and collaboration when developing their gamified enterprise application. Only a small number indicated that they spent a moderate amount of effort or no/low effort.

21. **The expectation to play is largely optional.** For internal gamification projects, the majority of participants 62% ran their gamified projects as completely optional to participation. A further 23% said the gamified application was optional to participate, but there was an implied expectation to participate, and 8% said it was mandatory to participate.
d. Technology, design and management: The capability paradigm

22. The role of technology is problematic. Not only did technology feature low on being critical to the overall success factors, it appeared to top the key barriers to success list. Technology as a barrier to project success comprised of 38% of all mentions, followed by project management at 26%.

23. Management is critical. It is of central importance of getting project management right for gamification projects, particularly in relation to the unique needs of managing a gamification project relative to other change management, IS or IT implementation projects.

24. Design is key. Design was considered to be one of the major success factors for a gamification project, as well as one of the key barriers to success if organisations did not get design right. Issues relating to design appeared to be a product of frustration with understanding the design issues that provide the bridge between the business problem, and the technology front and back-ends that are developed as part of the solution.

Conclusions for Research Module 3

Organisations are rising to the challenge of managing the development, implementation and integration of enterprise gamification projects. They are achieving positive results but see room for improvement across many operational areas. There are effectiveness issues associated with technology and vendor maturity at this early stage of the development of the enterprise gamification domain. However, respondents remain optimistic about the
further development of the industry, based on the positive results that have been achieved with early project implementations.

The tripartite approach of reviewing combined competencies in the three areas of Technology, Design, and Management may enable both organisations and vendors to use frameworks and benchmarks to guide future project development that would enable them to minimise project risks and benchmark performance. It can also be used to inform the development of a capability framework and this will be presented in the next chapter.

Insights from this survey can be used to build upon the conceptual design framework in Research Module 1, and the substantive theory of an enterprise gamification taxonomy developed in Research Module 2.

**Chapter summary**

Chapter 9 presents a detailed discussion of the field research undertaken in Research Module 3: The Enterprise Experience with Gamification which addresses Research Question 3. In this research module, I surveyed 25 organisations on their direct experiences in designing and implementing a gamification projects. These projects that have affected over 11 million users worldwide and forms a significant piece of research of its kind. Arising from the survey a list of 23 key findings were developed that provide insight into strategic, operational, design and capability issues surrounding enterprise gamification implementations.
Chapter 10: Research Module 4: Towards a capability framework

This chapter addresses Research Question 4: *What are the future implications for the design, implementation and management of gamified application in the enterprise?*

The findings of Research Module 3 presented in the previous chapter surfaced many varied and complex issues surrounding the experiences of the 25 organisations that participated in the survey. The results of this survey has contributed in answering the Research Question 3 by identifying (a) the management experience to date with enterprise gamification, and (b) the enablers, barriers and capabilities required for successful implementations.

The objective of this chapter is to extrapolate from the findings on Chapter 9 and also draw in related findings from the other research modules, to build insight into what we can learn from the experiences of enterprises with gamification to date. The purpose was to develop a conceptual capability framework that identifies the core capabilities that are required by organisations when designing and implementing enterprise gamification projects.

Apart from this being a valuable tool in this own right, the capability framework closes the loop on the conceptual design framework that I developed on Research Module 1. It does this by providing a framework and tools that can be applied in phase 4 of the design process. This artefact also closes the loop on the Taxonomy that was developed in Research Module 2 in terms of providing deeper management insight into the design decisions for enterprise gamification interventions.
Towards a capability framework – three key nodes

As discussed throughout this thesis, my research has focused on the key meta categories of technology, design and management as a means to deconstruct and analyse how enterprise gamification has been designed, developed and implemented. As detailed in earlier chapters, the outcomes of Research Module 2 provide a rich source of data across a wide spectrum of strategic and operational elements. These elements will be extrapolated to develop the capability framework in this chapter.

Capability is defined in my thesis as a set of skills, knowledge, abilities, behaviours and resources required for the successful design, development and implementation of an enterprise gamification project. It is important to note that this definition of capability is not restricted to individual or staff capability, but organisational capability as a whole.

My definition has been informed by the theory of dynamic capabilities (Teece et al. 1997) which emphasises the importance of a holistic approach to strategic management in adapting, integrating and reconfiguring internal and external organisational skills, resources and functional competencies to achieve organisational goals. Dynamic capabilities are embedded in an organisation’s performance routines, processes, and are conditioned by its culture. They are the key driver of organisational performance and competitive advantage (Teece and Pisano 1994).

In developing the capability model for enterprise gamification, I reflect on what I have learned about the capabilities of the organisations that were surveyed in Research Module 3, particularly given the depth of responses to the open questions on enablers, barriers, and recommendations of best practices. From these insights I have developed and am proposing a framework that reflects the lessons learned by these organisations, in
particular the capabilities that are required to make gamification work in an enterprise, as a contribution to knowledge in the domain.

The proposed capability framework is illustrated below:

![Figure 37: Conceptual capability framework](image)

The key features of each of the three modules are detailed below:

**Management elements node**

Management elements comprise of factors that relate to how the leadership or project management teams of an enterprise manage their stakeholders and resources to optimise project outcomes. While there are overlaps, elements that directly relate to technology or design are treated separately, as the
management node relates to the capability of management decision making, collaboration, communication and execution.

In the table below, I have gathered all the management elements from the survey questions pertaining to enablers (see Table 29 in Chapter 9), barriers (Table 30) and best practice (Table 31) to give us an overview of the nuanced feedback from survey respondents.

Table 33: Management node elements

<table>
<thead>
<tr>
<th>Enablers (T29)</th>
<th>Barriers (T30)</th>
<th>Best Practice (T31)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project management (10)</strong></td>
<td><strong>Project management (13)</strong></td>
<td><strong>Project management (2)</strong></td>
</tr>
<tr>
<td>- Stakeholder engagement</td>
<td>- Not having a clear strategy at the start</td>
<td>- Set realistic expectations</td>
</tr>
<tr>
<td>- Stakeholder management</td>
<td>- Internal resistance to gamification</td>
<td>- Offer a protected space to allow freedom to explore design</td>
</tr>
<tr>
<td>- Persistence</td>
<td>- Ineffective communication</td>
<td>- Procurement process cumbersome</td>
</tr>
<tr>
<td>- Build internal networks</td>
<td>- Clear project communication</td>
<td>- Lack of organisational priority</td>
</tr>
<tr>
<td>- Making it personal for stakeholders</td>
<td>- Managing expectations</td>
<td>- User angst</td>
</tr>
<tr>
<td>- Supportive sponsors</td>
<td>- Concerned stakeholders</td>
<td>- Concerned stakeholders</td>
</tr>
<tr>
<td>- Strong launch campaign</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>- Clear project communication</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>- Managing expectations</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td><strong>Teamwork (5)</strong></td>
<td><strong>Measurement (4)</strong></td>
<td><strong>Learning (2)</strong></td>
</tr>
<tr>
<td>- Teamwork with the supplier</td>
<td>- Hard to measure success</td>
<td>- Provide for structured learning experiences</td>
</tr>
<tr>
<td>- Interdepartmental co-operation</td>
<td>- Lack of solid KPIs</td>
<td>- Actively share lessons learned</td>
</tr>
<tr>
<td>- Active participation of all stakeholders</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>
From this table we can see the high-level recurring themes of project management, measurement, metrics, teamwork and learning that cover all of the 38 items that were mentioned in the survey. Using the card sorting technique again on the individual 38 items, however this time asking the question of ‘what does this tell us about the kind of overall management capabilities that are required to design, develop and implement an enterprise gamification project?’ a more nuanced list was developed which effectively ‘unpacked’ the generic project management category. This provided more detail on the types of management capabilities that would be required.

The key capabilities for management that emerged were as follows (it should be noted that there would be a high level of interrelatedness between all these variables):

- **Strategic Focus.** Being strategic about the project, which implies a clear vision and direction of what the project is working towards.

- **Measurement.** Setting clear goals, metrics and KPIs for the project and measuring key progress along the way.

- **Stakeholders Engagement.** Stakeholder management includes engaging them on the project, managing expectations, seeking their cooperation, managing resistance.

- **Sponsorship Support.** This includes engaging an internal project sponsor for the project, as well as leveraging networks and building teamwork and co-operation.
• **Communication.** Communication campaign, ongoing project communication and communication with users were considered important to keep stakeholders engaged, and to manage angst, fears and concerns.

• **Establish a Process.** Establishing a process for the project where one does not exist or caters for the unique requirements of a gamification project.

• **Providing a Space.** Provide a safe space where the project can be nurtured and given the freedom to explore and develop.

• **Continuous Learning.** Provide learning experiences and opportunities, and actively share lessons learned.

Taking a critical review of this list, it is evident that respondents to the survey treated and perceived an enterprise gamification project like any other business transformation project, given that the language and concepts are typical of the project management domain (Kotter 2008). Given that the majority of respondents had a positive experience and outcome from their gamification project, the implication is that astute and proactive project management is a key factor in the success of these projects. While Gartner (2012) has not provided the full research details behind their claim of an 80% failure rate of gamification projects, we can only assume that perhaps those projects may not have been managed by experienced project managers.

There is the implication that survey respondents may have limited the full potential of a gamification project by restricting it to existing management and organisational constructs of project management. Furthermore, the positive project experience may not be attributed to gamification alone, as it
could have been a product of the special attention being paid to a business problem that has in reality benefitted from the investment of resources and management attention rather than the application of gamification. This is an opportunity for further deeper research.

**Design node elements**

Design elements refer to the skills and process by which an organisation uses design practices and methods to solve a business challenge, or in the words of Hevner et al. (2004) and Zimmerman et al. (2007), ‘wicked problems’. The focus of design in the design professions can be used to inform how I believe we can approach gamification design, as the notion of ‘making the right thing’ as an artefact (Zimmerman et al. 2007) that transforms a problem from its current state to a future state. Philosophically, artistically, and practically, the focus of gamification design in the enterprise is just that. This has also been borne out of Research Module 1 in the development of the conceptual design framework, and has now been validated by the respondents’ feedback in the experience survey in their answers to questions on barriers, enablers and best practice recommendations. Consistent with the method I used for the management node above, I extracted the design elements from Research Module 3 and compiled them into the table below; note that I have referenced the source tables in the header column:

<table>
<thead>
<tr>
<th>Table 34: Design node elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enablers (T29)</strong></td>
</tr>
<tr>
<td><strong>Design elements (10)</strong></td>
</tr>
<tr>
<td>- Clear design objectives</td>
</tr>
<tr>
<td>- Game design skills</td>
</tr>
<tr>
<td>Enablers (T29)</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Understanding of motivational psychology</td>
</tr>
<tr>
<td>Thoughtful gamification design principles</td>
</tr>
<tr>
<td>Design, test, iterate</td>
</tr>
<tr>
<td>Use design thinking</td>
</tr>
<tr>
<td>Focus on core game mechanics</td>
</tr>
<tr>
<td>Non-manipulative mechanics</td>
</tr>
<tr>
<td>Game elements aligned to goals</td>
</tr>
<tr>
<td><strong>Target audience (5)</strong></td>
</tr>
<tr>
<td>Understanding of target audience and culture</td>
</tr>
<tr>
<td>Deep analysis of players</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Design (6)</strong></td>
</tr>
<tr>
<td></td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

When reviewing this survey material, I asked the question of ‘what does this tell us about the kind of overall design capabilities that are required to
design, develop and implement an enterprise gamification project?’ The key capabilities for design that emerged were as follows:

- **Design Goals.** Setting clear project and design goals at the outset of the project. This also includes the clarification, establishment and alignment of design goals with the overall business goals.

- **Customer Focus.** Focusing on the target audience, players or users in terms of identifying who they are and what motivates them, as the focus of all subsequent design decisions. This is also extended to include the consideration of the culture of the organisation that is developing the gamification project.

- **Design Process.** The need to establish a design process that consists of structured elements of ideation, design, prototyping, testing and iterating, as well as showcasing examples and achievements.

- **Design Skills.** Creating real and tangible design skills in the organisation to improve staff expertise, confidence and understanding of gamification design. This is not only in directly applying these skills to a project, but to also manage different vendors during the design, prototyping and testing phases of a project.

- **Design Approach.** The need to establish a meta view or approach on a way of thinking about design and the use of design principles such as scaffolding in applying gamification to the enterprise.

- **Selective Gamefulness.** The ability to select appropriate and meaningful game elements such as gameplay, game mechanics, storylines and narratives, that are aligned to the design goals. This also includes avoiding simple and overused mechanics and striving to be more innovative.
The elements that were identified by survey respondents covered issues that were similar to those found in Research Module 1 in the development of the conceptual design framework, and this capability framework works as a compendium to this design framework. Furthermore there is alignment with the key findings of the enterprise gamification taxonomy in Research Module 2. The taxonomy provides an objective overview of what key elements are commonly used in enterprise gamification projects and provides a high level guide on the possibility space or the boundary conditions. The capability framework compliments the taxonomy by providing an overview of the key capabilities and direct actions required for development and execution.

**Technology node elements**

Technology was one of the most contentious and surprising issues that came out of Research Module 3, particularly in terms of the suboptimal performance of the technology itself and of the vendors providing the service as reported by respondents in the experience survey. As we have learned from the taxonomy, there is a variety of different primary and secondary technologies that are employed in executing gamification in an enterprise, and the capability elements give us an overview of the range of competencies required to manage the technology side of an enterprise gamification project.

Consistent with the method I used for the management and design nodes above, I extracted the technology elements from Research Module 3 and compiled them into the table below. When reviewing this survey material, I asked the question of: *What does this tell us about the kind of overall technology capabilities that are required to design, develop and implement an enterprise gamification project?* The key capabilities for the technology node that emerged were as follows:
## Table 35: Technology node elements

<table>
<thead>
<tr>
<th>Enablers (T29)</th>
<th>Barriers (T30)</th>
<th>Best Practices (T31)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agile development (5)</strong></td>
<td><strong>Technology (19)</strong></td>
<td><strong>Technology (5)</strong></td>
</tr>
<tr>
<td>- Learn from mistakes</td>
<td>- Vendor capability</td>
<td>- Reduce, avoid, manage technical limitations of existing technologies</td>
</tr>
<tr>
<td>- Flexible development approach</td>
<td>- Vendor solutions not mature enough</td>
<td>- Build our own custom platform</td>
</tr>
<tr>
<td>- Iterative approach</td>
<td>- Technical difficulties</td>
<td></td>
</tr>
<tr>
<td>- Support/freedom to implement the right solution</td>
<td>- Limited gamification platforms on the market</td>
<td></td>
</tr>
<tr>
<td>- Usability testing</td>
<td>- Platform restrictions</td>
<td></td>
</tr>
</tbody>
</table>

**Technology (4)**

- Experience of vendor
- Flexible gamification platform

**Technology (19)**

- Vendor capability
- Vendor solutions not mature enough
- Technical difficulties
- Limited gamification platforms on the market
- Platform restrictions
- Under-planned for internal IT support
- Limited reporting capabilities
- Data integrity issues
- Scalability
- On time delivery

A summary of the key capabilities for technology that emerged were as follows:

- **Agile development.** Agile development offers a viable development methodology given the amount of unknowns in a gamification project. Elements such as flexibility, freedom, iteration, prototype testing and ongoing learning featured highly amongst experienced project leaders.

- **Vendor capability.** There is a perceived limitation in the capability and experience of gamification vendors as advisors (separate from the
technologies that they are selling). Therefore, the ability of organisations to select, monitor and manage vendors becomes a crucial one.

- **Platform capability.** There is a perceived limitation of the number, range and differences with the platforms that are on the market. The ability to distinguish between them, or to make a call to invest in ‘building your own’ is crucial one given the investment of organisational resource that are required.

- **Technology robustness.** There is also a perceived limitation with the gamification technologies that are on the market that are related to product immaturity. Issues that need to be proactively managed include scalability, systems integration and meeting enterprise specifications.

- **Data integrity and reporting.** While this may be considered a subset of platform capability and technology robustness, data integrity and reporting warrants a separate mention as a unique capability due to its importance as an input into management decision making. Gamification is making a promise of data analytics in its value proposition, however experience to date suggests that this is an area that requires improvement.

- **Internal IT support.** Many organisations underestimate the amount of internal and cross-function teamwork and resources that are required to design and deliver a gamification project. One of the most crucial requirements is for internal IT support for the project given the requirement for specialist knowledge on the gamification technology that is being used, and most importantly, how to integrate that technology with existing enterprise systems.

The technology node of the capability framework provides important information that can be used throughout the design process to enable project
leaders to make better decisions. For example, in **Phase C: Envision** and **Phase D: Create** of the conceptual design framework, critical decisions are being made about the selection, design and development of gamification technology that can benefit from the guidance that has been provided by this node in terms of the experiences of project leaders that contributed to the survey.

**Summary of the capability framework**

An overall summary of the full range of capabilities across all three nodes that have evolved out of Research Module 3 (which also build upon, and extend the research outcomes for Research Modules 1 and 2) are outlined in the table below:

<table>
<thead>
<tr>
<th>Management Node</th>
<th>Design Node</th>
<th>Technology Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Focus</td>
<td>Design Goals</td>
<td>Agile Development</td>
</tr>
<tr>
<td>Measurement</td>
<td>Target Audience</td>
<td>Vendor Capability</td>
</tr>
<tr>
<td>Stakeholder Engagement</td>
<td>Design Approach</td>
<td>Platform Capability</td>
</tr>
<tr>
<td>Sponsorship Support</td>
<td>Design Skills</td>
<td>Technology Robustness</td>
</tr>
<tr>
<td>Communication</td>
<td>Design Process</td>
<td>Data Integrity and Reporting</td>
</tr>
<tr>
<td>Process</td>
<td>Selective Gamefulness</td>
<td>Internal IT Support</td>
</tr>
<tr>
<td>Provide a Space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Learning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are also common themes that were raised that were common between the key nodes that appear to be ‘**enablers**’ of the capabilities. From the
survey findings I have found that there are three enablers that act as the conduits between the three key capability nodes to produce tangible action and outputs. These enablers are depicted in the figure below:

![Figure 38: Capability framework: Enablers as conduits](image)

For example, common to both the Design and Technology nodes is the enabler of **iteration**. This entails the use of agile development, frequent prototyping and testing to get the solution right. It is the key activity that engages capabilities into definitive action and delivering tangible prototypes. The enabler that is common to both Design and Management is the enabler of **participation**. Respondents mentioned the need for participatory and consultative practices to develop deep insight in the problem and to engage internal works teams and stakeholders affected by the project. Finally, the
enabler common to both the Technology and Management nodes is integration. This means that without attention to the integration of the gamified solution within existing enterprises systems and processes, the solution may not be optimal as it could be.

The importance of the enablers in this framework is that they assist in the execution of all other capabilities to ensure the best outcome possible for the enterprise. Capabilities across all three nodes can be viewed as static competency contained in an organisation, and the enablers can be viewed as a dynamic competency which is the key action that sets the capabilities in motion during a project development implementation (to produce tangible outcomes). The capability framework therefore provides a practical tool for project leaders. Each of the elements, enablers and nodes can be used as a check-list of items that project leaders can use when designing and implementing their gamification project to minimise project risks and enhancing the full potential of a holistic design process. It is also a framework that provides a tool for due-diligence when developing a project proposal, business case or a health-check for a project that has already commenced.

This proposed framework shows that there are many elements that are involved in ensuring a successful enterprise gamification application that goes beyond motivational affordances and gameful design. This is supported by several IS researchers who have evaluated implementation success models for enterprise applications (DeLone and McLean 1992; Infinedo et al. 2010; Sedera et al. 2002; Van der Heijden 2004; Venkatesh et al. 2003) that all agree that motivational affordances only partly determine user engagement and acceptance and use of a new enterprise system.

For example, the enterprise resource planning (ERP) implementation success model (Infinedo et al. 2010) shows us that many different variables
determine the success for enterprise systems that go far beyond design and motivational affordances that is common in gamification research. Infinedo et al. (2010) maintain that there are six success dimensions that include: system quality, information quality, service quality, individual impact, workgroup impact, and organisational impact. The authors also identified 46 individual measurement scales between these six dimensions that explain 69% of the variance in the performance data of user acceptance – one of the highest statistical explanation rates for extensive works of this kind.

In terms of a unified theory on user acceptance of information technology, Venkatesh et al. (2003) the authors found four key determinants of whether users will accept and use technology in the enterprise. These are:

- **Performance expectations.** Whether the technology will help them improve their workplace performance.

- **Effort expectancy.** The amount of effort required to learn or relearn the technology is worth the investment of their time.

- **Social influence.** Whether their peer group or leadership team is using the new technology.

- **Facilitating conditions.** The degree to which individuals believe that the organisation supports the use of the system.

There are also four moderators to these factors that include gender, age, pre-existing user experience and voluntariness of using the technology.

These results are also consistent with research on user acceptance of hedonistic information system (Van der Heijden 2004) where three key elements determined user acceptance. These are perceived enjoyment, perceived ease of use and perceived usefulness to getting the job done.
My argument in using these IS research works is that they support my thesis that enterprise gamification is in part an information system, and research to date has not considered a holistic approach to designing and implementing a gamified application in the enterprise. Research in enterprise IS and IT show us that there is a complex array of factors that need to be considered that go beyond the motivational affordances that are so prevalent in gamification research.

The outcome of my survey in Research Module 3, bears out that experienced project leaders see an equally complex array of factors and capabilities that need to be considered for enterprise gamification applications that are consistent with the findings in IS and IT research. This in part validates the findings for this research module, and also opens opportunities for further research to aligning enterprise gamification with IS research.

**Chapter summary**

This chapter synthesises the findings of the experience survey to address the research question of the implications for the design, implementation and management of gamified enterprise applications. The importance of capabilities is central to answering this question, and to this end a capability framework was developed that arises from industry experience with gamification. This capability framework has also informed the further development and enhancement of the preceding research artefacts by providing guidelines of how capability is a core enabler of gamification design and technologies in the enterprise.
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Appendices
## Appendix 1: Workshops for Research Module 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Workshop location and date</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A:</strong> Design Framework plus Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Germany, November 2012</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>2. Sydney, September 2012</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3. Sydney, April 2012</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Melbourne, April 2012</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>5. Melbourne, June 2013</td>
<td>6</td>
<td></td>
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<tr>
<td>6. Canberra, January 2013</td>
<td>16</td>
<td></td>
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<tr>
<td><strong>Group B:</strong> Design Framework plus Template</td>
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<td></td>
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<tr>
<td>7. Sydney, February 2013</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>8. Melbourne, June 2013</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>9. Sydney, April 2013</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>10. Sydney, March 2013</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>11. Germany, October 2013</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Group C:</strong> Framework, Template and Cards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. New Zealand, September 2013</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>13. Sydney, April 2014</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>14. Sydney 2014</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>15. Germany, October 2014</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>16. Brisbane, June 2015</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>256</td>
</tr>
</tbody>
</table>
Appendix 2: Audit questions for the taxonomy in Research Module 2

Gamification Taxonomy Audit Questions (download from Qualtrics)

Q1 Name of organization that ran the gamification project

Q2 Name of the gamification project

Q3 Web link to the case study

Q4 In which industry classification is the business situated?

- Agriculture, Hunting, Forestry and Fishing (1)
- Mining, Quarrying, Oil and Gas (2)
- Manufacturing (3)
- Electricity, Gas and Water (4)
- Building and Construction (5)
- Government and Public Administration (6)
- Wholesale and Retail Trade (7)
- Travel, Accommodation and Food Services (8)
- Transport, logistics and warehousing (9)
- Telecommunication and Information Services (10)
- Finance and Insurance (11)
- Real Estate, Rental and Leasing (12)
- Professional, Scientific, and Research Services (13)
- IT and other Technical Services (14)
- Education, Training and Development Services (15)
- Health-care (16)
- Community, Social and Personal Services (17)
- Arts, Entertainment and Recreation (18)
- Other (19)
Q5 Who was the primary target audience for the project?
- Internal Staff (1)
- Customers, clients or patients (2)
- Suppliers in our value chain (3)
- Industry or community (4)
- Government (5)
- General public (6)
- Other (7)

Q6 What was the primary purpose of the gamification project?
- Education (1)
- Training and skill development (2)
- Information and awareness (3)
- Problem solving (4)
- Innovation (5)
- Motivation and morale (6)
- Staff productivity (7)
- Build community (8)
- Sales and marketing (9)
- Customer loyalty (10)
- PR/Promotions (11)
- Events (12)
- Recruitment (13)
- Safety and compliance (14)
- Operational process efficiency (15)
- Social or community good (16)
- Other (17)
Q7 Which geographic region did the gamification project take place?

- Africa (1)
- Asia (2)
- Central America (3)
- Eastern Europe (4)
- European Union (5)
- North America (6)
- Middle East (7)
- Australia/New Zealand/Oceania (8)
- South America (9)
- Caribbean (10)
- Global (11)
- Not sure (12)

Q8 Which gamification strategy was used for the project?

- Digital game (1)
- Digital simulation (2)
- Gamified platform A: Installed vendor API, plugin on our enterprise platform, application or website (e.g. Bunchball, Badgeville, Spigit, etc - please note that there are over 80 vendors on the market!) (3)
- Gamified platform B: Custom Build: We had specialist software or features written into our existing enterprise platform, application or website (4)
- Incorporated a few gamified features in our product or service (but did not change the nature of the product or service e.g. Nissan Leaf dashboard) (5)
- Incorporated a significant amount gamified features in our product or service (that altered the nature of the product or service e.g. Dev Hub online web development service) (6)
- Playful experiences or events for occasional workshops, seminars, meetings, promotions or campaigns (7)
- Other (8)
Q9 If the project involved a digital game or simulation, please indicate the platform and technology used

<table>
<thead>
<tr>
<th>Platform</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom Build (1)</td>
<td>Used or modified an existing game or sim (2)</td>
</tr>
<tr>
<td>Digital game (1)</td>
<td>○</td>
</tr>
<tr>
<td>Digital simulation (2)</td>
<td>○</td>
</tr>
</tbody>
</table>

Q10 What is the core gameplay used in the gamification project? Please pick one. [Core gameplay is the type of game genre that was designed to be the core experience for users]

- ○ Territory acquisition (1)
- ○ Prediction (2)
- ○ Spatial navigation (3)
- ○ Survival (4)
- ○ Destruction (shoot, bomb, etc) (5)
- ○ Building (6)
- ○ Collection (7)
- ○ Chasing or evading (8)
- ○ Racing (9)
- ○ Trading (10)
- ○ Social 'sims' game (11)
- ○ Puzzle solving (12)
- ○ Other (13)
- ○ Not sure (14)
Q11 What are the core game mechanics used in the gamification project? Pick a maximum of three. [Core game mechanics are the main game tools or techniques used to score, provide user feedback, or otherwise engage players].

- Status and success (1)
- Points (2)
- Leaderboards (3)
- Social (friending, connecting, etc) (4)
- Progression (5)
- Experience (6)
- Narrative (7)
- Missions and quests (8)
- Achievements (badges, trophies, etc) (9)
- Currency or rewards (10)
- Other (11)
- Not sure (12)

Q12 What is the most significant, unique or stand-out feature of this gamification case study?
Appendix 3: Experience Survey Questions for Research Module 3

Enterprise Gamification Global Survey (download from Qualtrics)

Q1 This survey is part of a doctoral research project into enterprise gamification undertaken by Marigo Raftopoulos at GEELab, RMIT University. The university has granted ethics clearance for this survey to take place. Your input will remain anonymous and strictly confidential. Survey data will be aggregated to develop insights into the formation of a gamification taxonomy and design guidelines in developing responsible and sustainable enterprise gamification strategies. Please indicate that you understand the purpose of this survey and that you agree to participate.

☐ Yes, I agree to participate in this survey (1)

Q2 Name of your organization

Q3 Name of your gamification project

Q4 Please provide a brief description of your gamification project.
Q5 In which industry classification is your business situated?

- Agriculture, Hunting, Forestry and Fishing (1)
- Mining, Quarrying, Oil and Gas (2)
- Manufacturing (3)
- Electricity, Gas and Water (4)
- Building, Engineering and Construction (5)
- Government and Public Administration (6)
- Wholesale and Retail Trade (7)
- Travel, Accommodation and Food Services (8)
- Transport, logistics and warehousing (9)
- Telecommunication and Information Services (10)
- Finance and Insurance (11)
- Real Estate, Rental and Leasing (12)
- Professional, Media, Scientific, and Research Services (13)
- IT and other Technical Services (14)
- Education, Training and Development Services (15)
- Health-care (16)
- Community, Social and Personal Services (17)
- Arts, Entertainment, Sport and Recreation (18)
- Other (19) ____________________

Q6 Who was the primary target audience for your project?

- Internal Staff (1)
- Customers, clients or patients (2)
- Suppliers in our value chain (3)
- Industry or community (4)
- Government (5)
- General public (6)
- Other (7) ____________________
Q7 What was the primary purpose of your gamification project?

- Education (1)
- Training and skill development (2)
- Information and awareness raising (3)
- Problem solving (4)
- Innovation (5)
- Motivation and morale (6)
- Staff productivity (7)
- Build community (8)
- Sales and marketing (9)
- Customer loyalty (10)
- PR/Promotions (11)
- Events (12)
- Recruitment (13)
- Safety and compliance (14)
- Operational process efficiency (15)
- Social or community good (16)
- Entertainment (18)
- Other (17) ________________

Q8 In which geographic region did your gamification project take place?

- Africa (1)
- Asia (2)
- Central America (3)
- Eastern Europe (4)
- UK and Europe (5)
- North America (6)
- Middle East (7)
- Australia/New Zealand/Oceania (8)
- South America (9)
- Caribbean (10)
- Global (11)
- Not sure (12)
Q9 Which gamification strategy did you use for your project?

- Digital game (1)
- Digital simulation (2)
- Gamified platform A (vendor supplied): We installed vendor API or plug-in onto our enterprise platform, application or website (e.g. Bunchball, Badgeville, etc) OR used an external vendor platform (e.g. Kaggle, Spigit etc) (3)
- Gamified platform B (custom build): We had specialist software or features written into our existing enterprise platform, application or website (4)
- Gamified product features (minor): We incorporated a few gamified features in our product or service (but did not change the nature of the product or service e.g. Nissan Leaf dashboard) (5)
- Gamified product features (major): We incorporated a significant amount gamified features in our product or service (that altered the nature of the product or service e.g. Dev Hub online web development service) (6)
- Playful experiences or events for occasional workshops, seminars, meetings, promotions or campaigns (can be digital or offline, or using high or low levels of technology) (7)
- Other (8) _______________
- Not sure (9) _______________

Q10 Why was this strategy chosen for your project? Please pick one key reason.

- We were advised by our consultants, game designers or vendors (1)
- We were influenced by other similar gamification examples (2)
- We researched what would appeal to our target market (3)
- It was a good fit for our organization culture (11)
- Internal pressures to run with this option (7)
- Not sure (5) _______________
- Other (6) _______________
Q11 What is the core gameplay used in your gamification project? Please pick one. [Core gameplay is the type of game genre that was designed to be the core experience for your users]

- Territory acquisition (1)
- Prediction (includes idea generating gameplay) (2)
- Spatial navigation (3)
- Survival (includes management gameplay) (4)
- Destruction (shoot, bomb, etc) (5)
- Building (6)
- Collection (includes scavenger/treasure hunts, hide n'seek, loyalty programs, gamified platforms/API) (7)
- Chasing or evading (8)
- Racing (9)
- Trading (10)
- Social, 'Sims' or role-playing type gameplay (11)
- Puzzle or problem solving (12)
- Other (13) ____________________
- Not sure (14) ____________________

Q12 Why was this gameplay chosen for your project? Please pick one key reason.

- We were advised by our consultants, game designers or vendors (1)
- We generated this idea ourselves (7)
- We were influenced by other similar gamification examples (2)
- It was a good fit for our organizational culture (12)
- We researched what would appeal to our target market (3)
- Not sure (5) ____________________
- Other (6) ____________________
Q13 What are the core game mechanics used in your gamification project? Pick a maximum of three. [Core game mechanics are the main game tools or techniques used to score, provide user feedback, prompts, or otherwise engage your players].

- Status, success, recognition (1)
- Points (2)
- Leaderboards (3)
- Social (friending, connecting, etc) (4)
- Progression (5)
- Experience (6)
- Narrative (7)
- Missions and quests (8)
- Achievements (badges, trophies, etc) (9)
- Currency or rewards (real or virtual) (10)
- Chance, random or lottery mechanics (13)
- Other (11) _________________
- Not sure (12) _________________

Q14 Why were these game mechanics chosen for your project? Please pick one key reason.

- We were advised by our consultants, game designers or vendors (1)
- We generated this idea ourselves (9)
- We were influenced by other similar gamification examples (2)
- It was a good fit for organizational culture (14)
- We researched what would appeal to our target market (3)
- Not sure (4) _________________
- Other (5) _________________

Q15 Part 2 of this survey is about your experiences with the development, implementation and management of your gamification project.

Q16 What is your definition of gamification?
Q17 What motivated your organization to try gamification? Please pick one key motivator.

- We wanted to experiment with something different (1)
- We wanted to be seen as being creative or innovative in our field (2)
- We wanted to improve our performance or bottom line in a particular area (3)
- We wanted to motivate and engage with our target audience (10)
- We wanted to learn how we may change the way we do things (7)
- Nothing else seemed to work (14)
- Other organizations in our industry were using it, so we thought we'd try it (17)
- Other (8) ____________________
- Not sure (9) ____________________

Q18 Did you develop player types or user personas for your gamification project?

- No, it wasn't raised (1)
- No, we decided against it (2)
- Not sure (3)
- Yes we did. We used an industry model, or a method recommended by our developers, vendors or consultants (4)
- Yes, we did. We developed a custom set by researching our target audience (5)
- Other (6) ____________________
Q19 Please rate your organization's overall level of satisfaction with your gamification solution.

<table>
<thead>
<tr>
<th></th>
<th>Completely dissatisfied</th>
<th>Somewhat dissatisfied</th>
<th>Satisfied</th>
<th>Mostly satisfied</th>
<th>Completely satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of set up and integration (2)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Customization and flexibility of the solution (3)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Ease of use for our target audience (12)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Data and analytics (13)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Pricing (value for money) (14)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Licensing arrangements (15)</td>
<td>♿</td>
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<tr>
<td>Project administration (16)</td>
<td>♿</td>
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<td>Ongoing maintenance (17)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Project management by vendor or consultant (18)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
</tr>
<tr>
<td>Customer service by our vendor or consultant (21)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Overall return on Investment (19)</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
<td>♿</td>
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<tr>
<td>Impact on</td>
<td>♿</td>
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<td>♿</td>
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<td>♿</td>
</tr>
</tbody>
</table>
Q20 To what degree were the following items addressed during the development, design and implementation of your project?

<table>
<thead>
<tr>
<th>Item</th>
<th>Not at all (1)</th>
<th>Low degree (2)</th>
<th>Moderate (3)</th>
<th>High degree (4)</th>
<th>Extensively (5)</th>
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<tbody>
<tr>
<td>Data security (1)</td>
<td>○</td>
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<td>Privacy issues (2)</td>
<td>○</td>
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<td>Ethics issues (3)</td>
<td>○</td>
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<tr>
<td>Integration of organizational values (4)</td>
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<td>Issues on manipulation or channelling (5)</td>
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<td>○</td>
<td>○</td>
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<tr>
<td>Collaboration and co-design with key stakeholders (6)</td>
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<td>○</td>
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<td>○</td>
</tr>
</tbody>
</table>
Q21 Please indicate to what degree you agree or disagree on whether the following experiences applied to your gamification project

<table>
<thead>
<tr>
<th>Experience</th>
<th>Completely Agree (5)</th>
<th>Agree (4)</th>
<th>Neutral (3)</th>
<th>Disagree (2)</th>
<th>Completely Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project met our intended objectives</td>
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<tr>
<td>(1) Our staff were actively involved at each stage of the process</td>
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<td>(2) The final product came across as somewhat immature</td>
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<tr>
<td>(3) The final product was confusing for our target audience</td>
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<td>(4) There were many privacy concerns</td>
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<td>(5) There were some trust issues among target audience</td>
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<td>(6) We didn't explore issues deeply enough</td>
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<tr>
<td>(7) Our consultants or vendors gave us independent advice on</td>
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<tr>
<td>technology options (8)</td>
<td>Ethical issues were carefully considered in our strategy and design (11)</td>
<td>We learned a lot of useful things about our organization during the process (9)</td>
<td>There were some unexpected benefits (10)</td>
<td>It did not fit our culture (12)</td>
<td>The platform and or technology was restrictive (13)</td>
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</tr>
<tr>
<td></td>
<td>(Completely Disagree (1))</td>
<td>(Disagree (2))</td>
<td>(Neutral (3))</td>
<td>(Agree (4))</td>
<td>(Completely Agree (5))</td>
</tr>
<tr>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tr>
</tbody>
</table>
Q22 On the expectation to play or participate (please answer only for internal gamification projects)

- The gamified application was completely open and optional to participate (1)
- It was optional, but there was an implied expectation by management to participate (2)
- It was optional, but there was some peer pressure to participate (5)
- It was mandatory to participate (3)
- Other (4) ________________
- Not applicable (8) ________________

Q23 How would you describe your overall outcomes and business impact?

- We are in a worse position (1)
- No change at all (2)
- Achieved a short term improvement (it then dropped or tapered off) (3)
- Achieved a sustained improvement (4)
- Achieved an innovative outcome (5)
- Achieved sustained, breakthrough results (6)
- Too early to tell (8)
- Other (7) ________________

Q24 Please name three strategies that were key to the relative success of your project

Q25 Please name three barriers to success that you experienced during the project
Q26 Knowing what you do now, how would you create a better gamification design process?

Q27 On a scale from 0-10, how likely are you to recommend gamification to a friend or colleague?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q28 What was the size of your target audience? (number of people)

Q29 Duration of the project (all inclusive from inception to roll-out)?

- 0 - 3 months (1)
- 3 - 6 months (2)
- 6 - 9 months (3)
- 9 - 12 months (4)
- 12 - 18 months (5)
- 18 months + (6)
Appendix 4: RMIT Research Ethics Clearance

RMIT UNIVERSITY
Design and Social Context College Human Ethics Advisory Network (CHEAN)
Sub-committee of the RMIT Human Research Ethics Committee (HREC)

Notice of Approval

Date: 26 November 2013

Project number: CHEAN A 000015797-10/13

Project title: Using gamification to facilitate enterprise engagement and innovation

Risk classification: Low Risk

Investigator: Ms. Marigo Rafiopoulou

Approved: From: 26 November 2013 To: 30 December 2014

I am pleased to advise that your application has been granted ethics approval by the Design and Social Context College Human Ethics Advisory Network as a sub-committee of the RMIT Human Research Ethics Committee (HREC).

Terms of approval:

1. Responsibilities of investigator
   It is the responsibility of the above investigator/s to ensure that all other investigators and staff on a project are aware of the terms of approval and to ensure that the project is conducted as approved by the CHEAN. Approval is only valid whilst the investigator/s holds a position at RMIT University.

2. Amendments
   Approval must be sought from the CHEAN to amend any aspect of a project including approved documents. To apply for an amendment please use the ‘Request for Amendment Form’ that is available on the RMIT website. Amendments must not be implemented without first gaining approval from CHEAN.

3. Adverse events
   You should notify HREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.

4. Participant Information and Consent Form (PICF)
   The PICF and any other material used to recruit and inform participants of the project must include the RMIT university logo. The PICF must contain a complaints clause including the project number.

5. Annual reports
   Continued approval of this project is dependent on the submission of an annual report. This form can be located online on the human research ethics web page on the RMIT website.

6. Final report
   A final report must be provided at the conclusion of the project. CHEAN must be notified if the project is discontinued before the expected date of completion.

7. Monitoring
   Projects may be subject to an audit or any other form of monitoring by HREC at any time.

8. Retention and storage of data
   The investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

In any future correspondence please quote the project number and project title.

On behalf of the DSC College Human Ethics Advisory Network I wish you well in your research.

Suzana Kovacevic
Research and Ethics Officer
College of Design and Social Context
RMIT University
Ph: 03 9905 2974
Email: suzana.kovacevic@rmit.edu.au
Website: www.rmit.edu.au/dsc

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