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ALICE COATALEM

**GAMIFICATION AS A LEVER OF INFORMATION
SYSTEMS SUCCESS:
AN ACTION RESEARCH ENQUIRY IN BUSINESS TO
BUSINESS SALES**

JURY

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Abstract

In spite of the billions of euros companies spend on information systems (IS) projects, companies are still struggling – when they do not fail, to achieve expected return on investment from their internal IS implementations (R. R. Nelson 2005). In the meanwhile, the computer gaming industry attracts millions of regular users, and hedonic information systems, developed for pleasure and enjoyment, have rapidly gained popularity among a very large and engaged audience from all ages and backgrounds. In fact, researchers have noticed that the game industry is able to tap into human psyche to get players to engage voluntarily with some unparalleled intensity and duration (Przybylski, Rigby, and Ryan 2010). In this context there is growing interest on how organizations can learn from gaming to foster similar levels of interest, enjoyable experience and commitment in non-gaming Information Systems (Robson et al. 2015a; Arai et al. 2014). In response to this, this paper examines how gamification of utilitarian information systems in B2B contexts can contribute to achieve greater benefit from IS investments.

Originated from the digital media industry (Deterding, Dixon, et al. 2011), the concept and practice of Gamification consist in applying game artifacts to utilitarian applications. First developed as a software market and consulting practice, gamification has now become a popular academic research topic. However despite a growing base of empirical research, there is still only piecemeal evidence to confirm that gamification is more than a new hype, and there is a call for more academic research to offer a conceptual framework to better understand gamification impact and derive conditions for successful adoption, (Seaborn and Fels 2015a), (Hamari, Koivisto, and Sarsa 2014a).

In this context, this thesis therefore answers the following questions: How does Gamification impact utilitarian Information Systems Success? What roles do motivation levers play in that process? What are the design principles for the effective gamification of utilitarian IS? In order to respond to those research questions, we use a 2 cycles Canonical Action Research design to introduce gamification features in a customer relationship management (CRM) software utilized by a European sales organization at Hewlett Packard Enterprise.

In order to respond to those questions, we collect and analyze qualitative information. We then triangulate it with CRM quantitative usage data. Those analyses resulted in the conceptualization and adjustment of a conceptual model based on the Information Systems Success Model (DeLone and McLean 2003). It further introduces the motivation levers from Self Determination Theory (Deci and Ryan 1985a).

The resulting conceptual model highlights 4 main motivational affordances of gamification: team spirit, playfulness, competition and real time feedback which interact with each other, and impact positively intrinsic motivation. In addition, when employed with care and parsimony, extrinsic motivation from incentives and social recognition can be internalized and contribute positively to drive expected behaviours, namely enhanced system use, and better quality of information. It also impacts positively user satisfaction. As a result, several benefits are reported in this paper at the individual level, for users and first line managers, and at the organisation level. The detailed information collected and the model clarifying interrelations between concepts have been compiled in resulting design principles, which participate in the contribution of this work to practice and research.

Keywords : Gamification, Game elements, Motivational affordance, Information System Success Model, Self Determination Theory, Enhanced use, intrinsic motivation, extrinsic motivation

“It is easy to work when the soul is at play”

Emily Dickinson

1. Introduction

In 2014, Candy Crush revealed in its official filing that, only 2 years after its introduction, its online game reached an average of 93 million daily active users per month. More recently, in the first weeks after it was launched, Pokemon Go was downloaded by 30 Million users around the globe. In 2017, the global digital games market should exceed \$100B, growing >6% per year during the period 2015-2019 as per prediction of Newzoo Games, specialized in market intelligence on the segment (“The 2016 Global Games Market | Free Report” 2017).

While the gaming industry attracts millions of regular users, companies are still struggling to succeed in their internal applications implementations. According to the study from ANACT conducted in France in 2013, only a third of IS projects were considered successful (ANACT 2013). As reported by Gartner, nearly all cloud ERP projects will 'fail' by 2018 (Gartner 2016). In addition, the 2014 Altimeter’s research shows that only half of the enterprise collaboration tools implemented in organizations are regularly and effectively used by employees (Altimeter Group 2014). Billions of euros are spent in projects, which fail to deliver the expected returns on investments (R. R. Nelson 2005). Failure in the implementation of large IT projects can even be very risky for the survival of large companies (Flyvbjerg and Budzier 2011).

This challenge in the adoption and return on investment of B2B information systems has been at the core of research in Information Systems for years: *“Despite impressive advances in hardware and software capabilities, the troubling problem of underutilized systems continues. Low usage of installed systems has been identified as a major factor underlying the “productivity paradox” surrounding lackluster returns from organizational investments in information technology”*(Venkatesh and Davis 2000).

Despite decades of practice and rich academic research on the topic of Information Systems (IS) implementation success, numerous utilitarian IT implementations still fail to reach the expected levels of usage and eventually of return on investment. IS researchers argue that organizations often tend to focus overly on the system, the project and/or the organization and to neglect the role of the end-users while measuring their implemented IS success. In

consequence, they pay little attention to either how the system is used or to user satisfaction and to its outcomes (Petter, DeLone, and McLean 2012a).

Nevertheless, extensive research on IS quality (Sedera and Gable 2004)(J.-H. Wu and Wang 2006) shows that quality factors – such as information quality, system quality, and the quality of service as per Delone and McLean (2003) do impact IS adoption and use. Even when an organization makes the use of a utilitarian IS mandatory, users still have considerable discretion regarding their own use of the application features (Harwick and Barki 1994; Boudreau and Robey 2005). In order to improve IS benefit, prior research suggests that organizations can focus on inducing and enabling users to enrich their use of already implemented IS during the post adoption phase (Jasperson, Carter, and Zmud 2005). According to Jasperson et al.: *“organizations need aggressive tactics to encourage users to expand their use of installed IT enabled work systems”* (p.525).

Meanwhile, hedonic IS, developed for pleasure and enjoyment, have rapidly gained popularity among a very large and engaged audience from all ages and gender. In the gaming industry for instance, new games commonly catch the interest of millions of users in a very short time after their launch. According to the Entertainment software Association (ESA), the US gaming industry sold over 135 million games and generated more than \$22 billion in revenue in 2014 (ESA 2014). Games are attracting players of all age, gender and social group. They are particularly prevalent among the generation now moving into the workforce. As per ESA report, 42% of Americans play video games at least 3 hours per week. The average player's age is 35 and 59% of parents play video games with their children at least once a week.

In fact, the game industry is able to tap into human psyche to get players to engage voluntarily with some unparalleled intensity and duration (Przybylski, Rigby, and Ryan 2010). In contrast, in the non-gaming IS, traditional approaches such as adoption scorecards, newsletters or management role modelling, often fall short to generate the level of engagement that an organization expects from its workforce, communities or customers. In this context there is growing interest on how organizations can learn from gaming to foster similar levels of interest, enjoyable experiences and commitment to non-gaming Information Systems (Robson et al. 2015a; Arai et al. 2014).

A potential answer to this question emerged with the concept of “Gamification” which was first discussed in high tech at the intersection of the sectors of computer game, social media and cloud computing (Zichermann and Linder 2010b), before catching increasing interest from Academia (Deterding, Dixon, et al. 2011), and generating heated debates between supporters and detractors.

1.1. Emergence of the concept of Gamification in Business

The origin of the term Gamification is found in the digital media industry (Deterding, Dixon, et al. 2011). An essential Gamification principle consists in applying game artifacts to utilitarian applications. Typically, it aims to drive changes in behavior and increase user commitment and motivation towards the gamified application.

Nick Pelling, a programmer and video game designer, claims paternity for the neologism “gamification”, which he used already in 2002 and made public in 2003 on his company website with the meaning of “*applying game-like accelerated user interface design to make electronic transactions both enjoyable and fast*”. The concept and the company didn’t find their market at that time, and failed from being, as explained by its creator “*a decade too early*”(Nick Pelling 2017).

Richard Bartle, Professor at the University of Essex, and pioneer of multiplayer games, mentioned that gamification term has been used for decades in the game development community and means: “turning something not a game into a game”. (R. A. Bartle 2011).

Several researchers (Deterding, Dixon, et al. 2011) (Hamari 2013a) refer to the success of Four-square location-based services launched in 2009, which used a set of points, badges and leaderboards as a key influence for the growing interest for the topic.

During the same period, dedicated software companies were created such as Bunchball, launched in 2008, or BigDoor in 2009 or Badgeville in 2010. For example, Bunchball offers services with the promise of “integrating game dynamics into your website, service community, content or campaign, in order to drive participation” (<http://www.bunchball.com/nitro/>).

Gamification also quickly became a trendy business consulting practice, endorsed by Gartner in 2012 (Gartner 2012a). In 2013, Gartner included gamification in his “Hype Cycle” study bringing together the most significant technologies that have broad, cross-industry relevance, and are transformational and high-impact in potential (Gartner, 2013). In 2016 Market Watch forecasted the global gamification market to grow from USD 1.65 billion in 2015 to USD 11.10 billion by 2020, at a CAGR of 46.3%. (Marketwatch 2016).

It has been adopted at the core of the business model by prominent consultants like Gabe Zichermann, who popularized the term in a TED talk in 2011 (Zichermann 2011), and in his book “The gamification revolution how leaders leverage game mechanics to crush the competition” and made it the core practice of his creative agency Dopamine. Several other business books were concurrently published promoting gamification practices, including

“Gamify” from Gartner’s researcher Brian Burke (Burke 2014), “For the Win” from professors Kevin Werbach and Dan Hunter(2012), or “Loyalty 3.0 : how to revolutionize Customer and Employee Engagement with big data and gamification”, from Buchball’s founder Rajat Paharia (Paharia 2013).

The idea has since been spawning very rapidly in numerous sectors including education, health, sustainability, productivity, news and entertainment, for internal use as well as with customers or external users. An example of gamified services is Fitocracy, a gamified website that encourages users to exercise to improve their physical condition. Another one is Microsoft, who has gamified, for their internal workforce, quality check in windows 7. Microsoft awarded points and published leaderboard contributor lists of employees who volunteered to perform those checks during their spare time. On the well-known CRM SalesforceDotCom (SFDC) website, in April 2017, no less than 12 compatible gamification apps were referenced, including Bunchball Nitro, Leveleven, Badgeville, Spinify, Gameffective... (“Gamification Apps: Motivate, Improve Productivity with Mobile Apps” 2017).

While implementations spread across broad segments, in marketing, health and fitness, education, sustainability and enterprise employee engagement, the majority is using a variation of the points-badge-leaderboard model initiated by the precursor Four-square (Hamari, Koivisto, and Sarsa 2014b).

In a recent critical analysis of the business of gamification (Dymek and Zackariasson 2016) gamification is seen as :

“a practice has been most warmly welcomed by the world of business and management, whose enthusiasm regarding the notion has spread to all corners of societies. Gamification is here sometimes viewed as a truly revolutionizing concept that might change the way employees perceive work (as such) and as a direct consequence, might transform corporations and business in general.(..)Gamification thus introduces the coup de grace for the old and obstinate organizations of yore, by expunging outdated hierarchies and pointlessly excessive strictness, and instead installs play and games as a profitable and productive core dimension of the contemporary work life” (page 17-18).

While gamification has been adopted rapidly as a consulting practice and a new business segment for the software industry, it has also very early acquired some strong opponents in the game industry. Game designer and scholar Ian Bogost very early took position against gamification in his publication “Why Gamification is bullshit”. He proposed to rename

Gamification “exploitationware”, as a new way to dress up business consulting, with little in common with games, and mostly benefiting the purveyors of its solutions (Bogost 2011).

This tension between promoters and opponents of gamification is also reflected in the academic research, which began to take an interest in gamification soon after its emergence in business.

1.2. Highlights from literature review

Gamification was already broadly discussed in business and consulting when the concept started to gain in interest amongst academics. To our knowledge, the first structured academic attempt to provide a research-based definition of gamification (Deterding, Khaled, et al. 2011) based on work conducted jointly with industry practitioners and academics, defines gamification as : “ *the use of game design elements in non-game contexts*”.

1.1.1. Precursor of Gamification in Game studies

Gamification is connected and can be considered as an extension to the rich field of Game studies. Before the computer age, games were explored from an historical and sociological perspective by Johan Huizinga, who introduced the concept of “homo ludus”. Huizinga positioned play as critically important to humanity and culture, and separated play from ordinary living (Huizinga 2014). Roger Caillois further discussed the importance of gaming and play to a society's culture (Caillois and Barash 1961). Caillois furthermore defined game characteristics and offered a theory of the structural complexity of games: "paidea" are freely organized games, whereas "ludus" means highly organized games.

More recently, game studies have been centered around the emergence of video games and their immersive power with the concept of “flow” introduced by Csikszentmihalyi (1996), while research in Game Design and Funology has been informed by practices from star game designers. This stream of research has generated a number of constructs and frameworks (Hunicke, LeBlanc, and Zubek 2004; Reeves and Read 2013; Koster 2013) aiming to conceptualize the “fun” quality of good games. Gamification is picking in these game elements, those which can most easily be integrated in the process to gamify, like points, badge and leaderboards, but also game levels, activities under time limits or avatars (Zichermann and Cunningham 2011).

Expanding beyond game design to the broader area of ludification of culture (J. Raessens 2006) is defined as the manifestation of a broad evolution of western societies where games become the dominant form of culture because they match both the evolution of society and its information systems, as claimed by game designer Eric Zimmerman in his “Manifesto

for a Ludic century“ (Walz and Deterding 2015). As such, gamification can be viewed as an extension of 21st centuries companies mantra “ Work hard , play hard” and contribute to a more playful but productive society.

On the other hand, very early on, gamification has generated criticism about the scarcity of game content embedded in most gamification experiences, and the loss of the self-purpose and beauty of true games.(Robertson 2010).

1.1.2. Main insights from academic literature on Gamification

In one of the first literature reviews published on the topic (Hamari, Koivisto, and Sarsa 2014a), a search hit for “gamification” is catching almost no response before 2011. A growing number of papers with gamification mentioned both in the document and in the title can now be found. At the time of their search, and with relatively broad search criteria, they identified already 8050 papers or articles, including 809 peer reviewed academic papers. Most academic papers were published in various Computer Science/human Computer Interaction conference proceedings. Also a few of them have been published in management information systems-related journals like *Electronic Commerce research and applications* or the *International Journal of Information Management*. A search, on the same terms on Google scholar solely, generated 12.500 results on May 1st, 2017.

Gamification can refer to hedonic or dual-purpose information systems in voluntary use contexts, like Fitocracy, which is expected to drive adoption and sustained use over time. The concept can also be applied to utilitarian information systems, developed to improve individual and organizational performance (Van der Heijden, 2004). The use of those systems is often mandatory, and gamification is introduced either initially or after adoption, to impact positively the behavior and the performance of the users.

Gamification has been studied as a mechanism to engage customers and employees, providing richer and more appealing experiences (Robson et al. 2015a), as a way to improve workers performance, providing real time access to performance information and making task more enjoyable and “cool” (Cardador, Northcraft, and Whicker 2016), and as a way to increase learning motivation (Dicheva et al. 2015) and participation and compliance in health and wellness programs (Stinson et al. 2013).

Empirical studies tend to confirm that gamification has an impact on several behavioral outcomes, those outcomes are not always consistent. Some studies concluded that the effects are not always positive or that they seem to be dependent on the context or on the proficiency of users. Similar research on gamification in different domains seems to drive to different

results, which seems to make gamification outcomes very context-specific. Outcomes of gamification also seem to vary amongst individuals (Robson et al. 2015a).

Furthermore, current empirical research, while suggesting a positive-leaning impact of gamification, only provided piecemeal evidence so far to confirm that gamification is more than a new hype (Seaborn and Fels 2015a; Hamari, Koivisto, and Sarsa 2014b). Some studies for example raised concerns that the result of gamification may not be long term but could be caused by a novelty effect (Hamari 2013b) and can cause detrimental effects on users engaged in the gamification experience (Thom, Millen, and DiMicco 2012a).

Because of this, there is a call for more academic research to offer a conceptual framework to better understand gamification impact and derive conditions for successful adoption, (Seaborn and Fels 2015a; Hamari, Koivisto, and Sarsa 2014b).

These inconclusive results from gamification research are also problematic for practitioners who wish to leverage gamification. Many successful firms have tried to implement gamification features but failed to realize expected results (Robson et al. 2015a).

While gamification, using techniques from the computer gaming industry, typically relies on information technology (Robson et al. 2015b), it has not been evaluated specifically as a lever to achieve greater Information System Success (Przybylski, Rigby, and Ryan 2010). So far, previous research has hardly examined the potential contribution of gaming features to the enrichment of usage, enjoyment and IS success. Can gaming features like points, badge and leaderboard, which could be considered as relatively trivial, drive IS users to behavioral changes, to develop richer usage of IT and user satisfaction while fostering greater job performance and eventually contribute to IS delivering its expected returns?

1.1.3. Gamification as a factor of IS success

Information system Success Model (ISM) theory defines IS Success as the dependent variable for Information Systems Research (DeLone and McLean 1992). ISM offers an integrated model which initially articulated System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organizational impact, for better understanding of IS success determinants.

In 2003, in a follow up work analyzing 10 years of empirical studies, DeLone and McLean (DeLone and McLean 2003) have reviewed their original model, adding the dimension of Service Quality and introducing the variable of Net Benefits, which account for benefits at multiple levels of analysis, as the key IS success variable. Net benefits represents the IS contribution to the success of individuals, groups, organizations, or higher levels of analysis, resulting for instance from increased sales, cost reduction, or improved profit.

Gamification as such has not been taken into account in the ISM from DeLone and McLean success model specifically. However, arguably, it can potentially be seen as a facet of “**System Quality**”, defined as: “*the desirable characteristics of an information system. For example, ease of use, system flexibility, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility and response time*” (Petter et al. 2008 p 238).

As gamification also provides concise and timely information through real time scorecard and feedback, we expect that it will also improve “**Information Quality**”, while the quality is improved by the timeliness and accessibility of the information.

In a recent meta-analysis about the determinants of Information System Success (Petter, DeLone, McLean 2013), research on subjective variables have been compiled to summarize current academic understanding of the various factors of influence towards IS success. Among those, the “**Enjoyment**” variable has been identified as antecedent to IS success with strong evidence (Petter, DeLone, McLean 2013) and has been tested in empirical research (De Wulf et al. 2006)(Hackbarth, Grover, and Yi 2003). Enjoyment is one of the expected outcomes of games, and offers a potential connection between gamification and information success which I will explore in this research. Other user satisfaction related variables potentially impacted by gamification include “**Trust**” and “**User Expectation**”.

Beyond the positive feeling of enjoyment, we also look at the actual impact of gamification on **IS usage**. In the IS Success model, this variable is often differentiated as “Intention to Use” and “Use”. In Utilitarian IS, usage is often compulsory, and intention to use is not fully relevant, so in the context of my work I will focus on the impact of gamification

on *usage*. In order to define the most adequate usage metric in this specific context, I will refer to the conceptual model of Burton-Jones and Straub (2006) which proposes a 2 steps approach to select the right set of usage metrics and which they recommend to be as rich as possible (Burton John and Straub, 2006). I will also leverage the recent concept of **Enhanced Use** (F. F. Bagayogo, Lapointe, and Bassellier 2014) to categorize different types of extension of task and feature usage.

While ISM offers a rational model to conceptualize gamification impact on IS success, it doesn't address yet the question of the motivational mechanisms at play with gamification.

1.1.4. Academic theories mobilized to explain impact of gamification on motivation

The fields of economics, decision making, sociology and psychology share a common aim to understand human nature, and as a result a number of motivation theories coexist. Perhaps the only thing about motivation most researchers would agree on, is that, by definition, it refers to the direction and magnitude of human behavior that are related to the choice of a particular action, the persistence with it, and the effort expended on it. In other words, motivation is responsible for why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it. As gamification aims at increasing engagement in specific tasks and activity, motivation is a key concept to leverage and understand the mechanisms at play in gamified services.

Several motivation theories could be mobilized in this context, including Skinner's radical behavioral psychology (Skinner 1938), emphasizing the impact of reinforcement and punishment or more recent Duhigg's work on habits (2015). However those theories can only explain some aspects of gamification, focused on rewards and reinforcement, and do not bring much lights on the specific power of games.

One of the broadest and most powerful motivation theory in the context of games and gaming is the **Self Determination Theory**, from Ryan & Deci (1985). Also SDT has not yet been used to analyze gamification issues as such, it has been applied to video games successfully (Przybylski, Rigby, and Ryan 2010). It is referred to by several gamification scholar (Aparicio et al. 2012a)(Thom, Millen, and DiMicco 2012b), (Gnauk, Dannecker, and Hahmann 2012), (Hamari, Koivisto, and Sarsa 2014a), (Seaborn and Fels 2015a) for providing a solid framework. SDT is particularly useful to analyze how specific gamification artifacts (e.g., badges, game levels, leaderboards etc.) may impact intrinsic and extrinsic motivation of individual users and therefore behaviors. Indeed, some gamification elements can be related

to several SDT concepts such as *need for competency*, *autonomy* and *relatedness* or to *intrinsic* and *extrinsic motivation* (Aparicio et al. 2012a).

The following table 1 summarize main concepts from SDT that I have mobilized in this research.

Theory	Concepts	Contribution
Human Psychological needs	Competence, Relatedness, Autonomy	If satisfied, allow optimal function growth, and wellbeing. Gamification influences the social environment which can either facilitate or block satisfaction of those needs.
Motivation	Intrinsic, Extrinsic, amotivation	Intrinsic and extrinsic motivation are levers to drive behaviors changes expected from gamification. Intrinsic comes from internal sources, related to satisfaction of the 3 psychological needs. Extrinsic comes from external sources. Amotivation correspond to lack of motivation.
Cognitive Evaluation Theory – CET	Controlling aspects and informational aspects of events	Highlights the importance of the perception of external intervention and the risk that rewards impact negatively motivation if perceived as controlling strategies
Organismic Integration theory (OIT)	Continuum of four level of integration : Externally regulated behavior, Introjected regulated behavior, Regulation through identification, Integrated regulation	Analyze how different type of external motivations, like those generated by gamification, can be integrated in human psyche. Activities fully integrated with own personal goals and needs are more likely to seen as positive.

Table 1: Summary of main SDT concepts and their contribution to this research

In order to understand the contribution of gamification to IS success, my research intends to combine the ISM model and SDT theory and to build a conceptual model showing the psychological mechanisms at play in gamification which can be leveraged to improve the impact on workers' motivation to use utilitarian IS in the long run. ISM provides a comprehensive understanding of IS success by identifying, describing, and explaining the relationships amongst the most critical dimensions of success along which information systems are commonly evaluated, while SDT offers a framework to analyze IS impact on motivation.

This model puts forward that internal and external motivation can be positively impacted when introducing game elements in an existing information system. Gamification also increases Information Quality. Increased motivation will impact the Usage of the IS and

User satisfaction in the form of enjoyment, trust and matching of expectations. As a result, the organization and the individual users achieve greater net benefit from the IS.

While confronting this conceptual model to the empirical data from my AR, I also intent to identify the conditions for success in gamification implementation. Gartner predicted that 80% of gamified application will fail to meet their objectives, primarily because of inappropriate gamified processes (Gartner 2012b). With a better understanding of motivation levers at play, my research also intends to identify design principles for gamification.

1.1.5. Summary of main concepts from literature mobilized in this research

The Table 2 below summarizes main insights from literature review:

Concept or Theory	Main Reference	Main Contribution
Gamification definition	(Deterding, Khaled, et al. 2011)	“ the use of game design elements in non-game contexts”
Homo Ludens	(Huizinga 2014)	Play defined by its voluntary nature and fun-element, in opposition to seriousness of normal life
Paida vs Ludus	(Caillois and Barash 1961)	gamification takes elements of “ludus” type of games mostly in the form of competition play
Flux	(Csikszentmihalyi 1996)	flow as a subjective state of optimal experience, afforded by activities structured in a game-like manner
Game Design frameworks	(Hunicke, LeBlanc, and Zubek 2004; Koster 2013; Reeves and Read 2013; Przybylski, Rigby, and Ryan 2010)	Game elements including feedback, levels, avatars, time constraints, virtual economies, players reputations, ranks or teams
Ludification of culture	(J. Raessens 2006)	
ISM	(DeLone and McLean 2003)	Conceptual model to understand and measure information system success
Hedonic IS	(Van der Heijden 2004a)	Introduction of pleasure and enjoyment in IS
Reconceptualization of System usage	(Burton-Jones and Straub Jr 2006)	Methodology to customize usage metrics
Enhanced use	(F. F. Bagayogo, Lapointe, and Bassellier 2014)	Typology of additional and existing tasks and features to map usage enrichment
SDT	(Deci and Ryan 1985a)	Intrinsic motivation including competence, autonomy, relatedness. Extrinsic motivation (rewards, social). OIT allowing internalization of extrinsic input in own goals and values and increase its impact on behaviors

Table 2: Summary of insights from Literature review

1.3. Research questions

Accordingly, in order to address those theoretical and practical gaps, this research explores how game elements, integrated to utilitarian IS in a gamification process, can impact user motivation and satisfaction, and therefore help to achieve a greater and richer use of IS and subsequently improve the benefit from IS projects. My research will address three underlying questions:

- Question 1: How does Gamification impact utilitarian Information Systems Success?
- Question 2: What roles do motivation levers play in that process?
- Question 3: What are the design principles for effective gamification of utilitarian IS?

In responding to those questions, my objective is twofold. First, I aim to provide a deeper understanding of mechanisms at play with gamification and derive from there some design principles for practitioners willing to take advantage of gamification features to improve their Information System Success. Second, I aim to contribute to academic research on gamification and more generally on motivation levers inspired from games in the context of the ludification of culture impact on adoption and infusion of information systems.

1.4. Research method

My research questions aim at solving a practical problem, leveraging well established SDT and ISM academic theories. I plan to provide answers through the introduction of gamification elements in a specific social setting. For this, the Action Research (AR) methodology is particularly well suited for conducting this research. AR aims at understanding complex human process rather than prescribing a universal social law (R. L. Baskerville 1999). Action researchers introduce change to resolve a practice problem and regard change as an important outcome of the research effort (Susman and Evered 1978).

The specific problem I aim to resolve with AR is situated in my own organization, which makes it an insider AR (Coghlan 2007). It relates to superficial adoption of SFDC CRM by my own sales organization, limiting the benefits of this application considered amongst practitioners as “state of the art”, user friendly, while it is expected to drive improved sales performance. Several years after its implementation, despite training efforts and traditional management tactics, most of my organization members are still using a limited set of features, often keeping their own records in separate spreadsheets or documents. This poor usage limits the impact of company investments in the new CRM. Gamification has emerged in the early

phase of the inquiry as the avenue I wanted to explore and as the change I intended to drive within this action research.

From the several variations of AR, I selected the *canonical* approach, which combines the rigor driven from iterative cycles with the relevance obtained through a collaborative process with the research participants. My research has been conducted in two cycles, the second integrating the insights from the shortfalls of the first cycle.

Being both, in the managerial team that implements gamified features to an IS and the principal investigator of this research helped ensure the alignment of objectives of the research. It allowed both advancing research in the field of IS and testing and probing for my company a potential solution to improve SFDC implementation success and beyond, greater returns on investments from utilitarian Information System). It led both advancing research in the field of IS and testing and probing for my company, towards a potential solution to improve SFDC implementation success, and beyond, to greater returns on investments from utilitarian Information System.

This particular context of Insider Action Research (Coghlan 2007) offers the benefits of access, deep knowledge of the organization researched, and ability to generate actionable knowledge. However, it comes also with specific challenges which I have identified and addressed. The first challenge relates to a possible bias from pre-understanding, which may result in over interpretation and not challenging own preconceptions. In order to reduce this bias, I have based my research effort on solid theoretical foundations, and used rigorous coding of the qualitative data collected. The second challenge is related to the duality of the role of researcher and manager, which could have resulted in political conflict. The nature of the topic, which didn't imply any organizational tension, has limited the impact of this second risk, and the research was conducted without any situation of role conflict.

1.5. Main results

Based on rigorous implementation of canonical AR design, my research confirms the positive impact of gamification on information quality, enhanced use and user satisfaction, as well as the materialization of net benefits for the user and the organization.

It also offers a better understanding of the mechanisms at play when introducing gamification in a utilitarian information system, and specifically the role of 4 motivational affordances of gamification including team spirit, playfulness, competition and real time feedback, and their impact on intrinsic motivation.

The research also provides some insights on the condition to leverage extrinsic rewards like incentives and social recognition to increase motivation rather than inhibit it.

Finally, reflecting upon and comparing the results from the two cycles and between sites and their contexts, this work also provides academic foundations for seven design principles for successful leverage of gamification for utilitarian IS.

1.6. Contributions

From an academic perspective, this research makes several contributions. First, this empirical study progress our understanding of gamification impact on business performance. This research fills a gap in the understanding of underlying psychological mechanisms at play in gamification, and derives from this additional insight some design principles for successful implementation. Further this work also contributes to the exploration of the recent concept of enhanced use and its operationalization.

More conceptually, this research provides an approach to integrate SDT theory in ISM, and therefore contributes to the academic research focusing on the role of motivation in user adoption and post adoption of IT.

Finally, by a rigorous execution of the canonical Action Research design, I wish to contribute to this growing practice and to reduce the gap between research and practice.

I can also foresee some significant contribution to practice. First, this research confirms the business case for gamification for existing internal information systems, while gamification is a growing topic in business literature and consultancy.

Then, it provides some design principles for organizations willing to gamify some information systems, based on the deeper understanding of underlying mechanisms and the conditions that are required for those mechanisms to generate a positive impact. Also resulting from a work focus on utilitarian IS, I believe my findings can be leveraged more broadly to discuss the best approach for gamification in the workplace.

Specifically, as my conclusions are based on AR using a relatively young population, results can be particularly relevant while companies are hiring a number of young employees, born within the digital age and members of the Millennials generation and following. My design principles can help organizations to leverage gamification as one of the levers to improve their engagement and adherence to standards and processes. It will also help them to adapt current practices to achieve the fit between the culture and the expectations of this new workforce, which will replace progressively retiring generations.

Finally, expanding beyond the concept of gamification, this research can contribute to challenge the myth of rationality as a key driver for behaviors at work. It suggests to further explore more managerial approaches including but not restricted to gamification, in order to drive engagement and call on intrinsic motivation.

2. Literature review

In order to explore academic knowledge and theories underlying my research, I will first summarize the short history of the concept of gamification, its predecessors in the study of games, funology and greater trend of “ludification of culture”, academic efforts to converge to a consistent definition, and how it is viewed by his critics.

I will next summarize the state of still nascent research on the concept of gamification. I will examine in particular findings from empirical studies compiled in three recent literature reviews and identify area for future research that will inform my own work. In particular, this exploration of empirical studies highlights that, also gamification typically relies on information technology (Robson et al. 2015b), it has not been evaluated as a lever to achieve greater Information System Success.

To address this gap and anchor my research in the broad field of information system research, I will then highlight established information systems theories which can be leveraged to assess the impact of gamification on utilitarian information success and infusion.

I will finally explore the motivation theories that offer theoretical foundations to the mechanisms of gamification. In particular, I will refer to Self Determination Theory (SDT) from Deci and Ryan. SDT offers a broad framework to understand human psychological needs which could be fulfilled by gamification. SDT is already the main theory reference for current research on gamification, as some of its concepts can be logically mapped to gamefulness attributes and elements.

2.1. Precursors of Gamification studies

While gamification is a relatively recent terms, it can be seen as the continuation on several active fields of research, which I will describe in this section.

2.1.1. Games Studies

As “Gamification” neologism is constructed on the term “game”, I will start by exploring Game studies and how it relates to the concept of gamification. This field of research is connected to the fields of anthropology, sociology and psychology, and examines aspects of the origin of games, the role the game plays in society or culture and the design of the game.

When looking at academic references on games studies prior to computer games, most authors refer to the work of Johan Huizinga and Roger Caillois who discussed the importance of gaming and play to a society's culture. .

For Dutch cultural historian Huizinga (Huizinga 2014), who coined the concept of “homo ludens”, play is older than culture and is not specific to human society as animals also play. Huizinga has defined the concept of play against previous attempts to define a biological function to play, like a discharge of superabundant vital energy or a form of training for young creatures, and characterize it by the fun-element, in opposition to seriousness.

Huizinga has established characteristics of play, as a voluntary activity, an interlude in our daily lives as follows:

« Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious", but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means”(Huizinga 2014)

As pointed by Huizinga, a lot of play elements in contemporary civilization (starting in 19th century as per Huizinga’s perspective at time), lost several elements of this definition, while sport games transitioned from occasional amusement to professional modern lucrative activity, as well as bridge or chess competitions, or more recently professional poker.

Building critically on the theories of Johan Huizinga, French sociologist Roger Caillois produced in 1961 a more comprehensive review of play forms (Caillois and Barash 1961) described by six core characteristics:

1. It is free, or not obligatory.
2. It is separate, occupying its own time and space.
3. It is uncertain, so that the results of play cannot be pre-determined and so that the player's initiative is involved.
4. It is unproductive in that it creates no wealth and ends as it begins.
5. It is governed by rules that suspend ordinary laws and must be followed by players.

6. It involves make-believe that confirms for players the existence of imagined realities that may be set against 'real life'.

Caillois furthermore provides a theory of the structural complexity of games: "paidea" are freely organized games, whereas "ludus" means highly organized games, and can take four play forms: "Agon", for competition, "Alea", for chance., "Mimicry" or "Mimesis", for role playing and "Ilinx" (Greek for "whirlpool"), for vertigo, in the sense of altering perception. Following Caillois' definition, gamification takes elements of "ludus" type of games, mostly in the form of competition play, however misses others elements as it is not unproductive and not fully separate in space and time but integrated in daily activities.

Separation of games from "normal life" has been challenged by scholars for several decades. The integration of games in social life has been theorized by anthropologist Victor Turner (Turner 1982), extrapolating from rituals in pre-modern societies including a form of play in crucial rituals of passage, to challenge the distinction between work and leisure. Use of games for productivity can even be traced back to the Soviet Union under Lenin, with "social competition" using points, banners and competitive goals between teams to replace capitalist monetary incentives (M. J. Nelson 2012). Today's gamification projects, like pre-modern rituals and Lenin "socialist competition", integrate games centrally in the social process.

Brian Sutton-Smith (Sutton-Smith 2009), acknowledging the variety of forms that play can take in modern society, argues in the "Ambiguity of play" that it is more or less impracticable to describe play and games in positive, non-paradoxical terms. At its most elementary level, he has defined game as:

"an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrium outcome".

Sutton-Smith details seven "rhetoric" of play, or ideologies that have been used to explain, justify, and privilege certain forms of play: progress, fate, power (community), identity, imaginary, self, and frivolity. Sutton-Smith identifies three of them - fate, power, and identity- as ancient but still active and links them with a more collective focus. Another three are more recent, associated with a modern focus on the individual: progress, imaginary, and self. In the case of gamification, the type of rhetoric most involved could be rhetoric of progress, when gamification is used to engrain new habits and behaviors, rhetoric of power, with the implied competition, and rhetoric of identity through communities of players.

Csikszentmihalyi (Csikszentmihalyi 1996, 2000) in his psychological studies of play at the workplace, added the important dimension of flow as a subjective state of optimal

experience, afforded by activities structured in a game-like manner. He defines the state of flow as a state of concentration or complete absorption with the activity at hand, during which temporal concerns (time, food, ego-self, etc.) are typically ignored.

Csikszentmihalyi characterized nine component states of achieving flow including challenge-skill balance, merging of action and awareness, clarity of goals, immediate and unambiguous feedback, concentration on the task at hand, paradox of control, transformation of time, loss of self-consciousness, and autotelic (containing its own meaning or purpose) experience. Gamification probably cannot in itself generate a state of flow for his users, however it can support some of the components required, including real time feedback and clarity of goals.

As video games became more and more popular in the 1980s and 1990s, the interest in studying games rose and focused more and more on new paradigms related to computer games and impact of technology. While computer games seem to be just like other games, they in fact modify the classic game model in that it is now the computer that upholds the rules while digital technology allows more flexibility, collaboration, and gives the possibility to extend the duration of games over periods of weeks, months or even years making the experience more immersive than ever.

2.1.2. Game Design and Funology

With the emergence of video games as a fast growing industry and a field of academic studies, game design experts and researchers started to focus on questions related to "What makes a game fun?" "How can we create better games?".

Neuropsychology has sought to identify the markers of fun, and found an activation of neurotransmitters in the form of dopamine in higher concentration when playing video games (Koepp et al. 1998). Neuropsychology provides biological evidence for an impact of games on our biological life, but doesn't provide much help to understand the circumstances and structure of games generating this engaging and rewarding impact of videogames.

Already in the early 1980s, during the first boom of computer games, Malone described "heuristics for designing enjoyable user interfaces" for video games (Malone 1981, 1982).

Along with advancement of computer gaming technologies, including advancement of graphical display, location based features, augmented reality extending the magic of play spatially, temporarily and socially, game design scholars developed more sophisticated methodologies, like the MDA framework (standing for Mechanics, Dynamics, and Aesthetics), developed and taught at the Game Developers Conference, San Jose 2001-2004 (Hunicke,

LeBlanc, and Zubek 2004). MDA is a formal approach to understanding games which attempts to model the iterative processes of developers, scholars and researchers alike, making it easier for all parties to break down, study and design a broad class of game designs and games. MDA describes the **Aesthetics** of a game, moving away from words like “fun” towards more directed vocabulary, such as “Fellowship” or “Challenge”, the **Dynamics** that create aesthetic experiences like time pressure and opponent play, and the **Mechanisms** which are the various actions, behaviors and control mechanisms afforded to the player within a game context i.e. rules, algorithms. As gamification is using game elements, game design theory is a source of inspiration for gamification. For instance, the notion of time limits, or the increasingly demanding and rewarding levels in gamification are directly mirroring concepts of game design.

Another framework has been proposed by Reeves and Read to achieve total engagement through 10 important components including feedback, levels, avatars, virtual economies, player’s reputations, ranks or teams. While providing an alternative approach to MDA, the contribution to gamification is similar, and the authors became advocates for the use of these game elements in business (Reeves and Read 2013).

While those frameworks are focused on the design of games, another interesting approach developed by Richard Bartle is to analyze the gamers of MUD (Multi Users Dungeons) immersive games and their characteristics (1996). The taxonomy is based on a character theory. This character theory consists of four characters: Achievers, Explorers, Socializers, and Killers. Also this theory may help to understand the variety of motives and responses to games which can be leverage for gamification, it will not help us much to define general principles for its mechanisms in the workplace, while we aim to reach all user types.

Those authors and concepts are illustrative of the various approaches and trends in game research which can turn the emerging field of “funology” into the science of enjoyable technology. As game design and funology tend to focus on computer games and human–computer interaction, relying on information technology, we will now consider the precursors of gamification research in the broader field of Information Systems

2.1.3. Precursors in the field of Information systems

Moving towards the field of Information Systems, the concept of Hedonic Information System can also be considered as an antecedent to gamification study. A common classification of services and systems is based on their objectives and functions: services aiming to fulfill objectives which are external to the service used itself has been referred to as utilitarian (Davis

1989) while services used for entertainment purposes and for the sake of using the service itself have been called hedonic (Van der Heijden 2004a).

In a meta-analysis on Utilitarian, Hedonic and dual purposed information systems research (J. Wu and Lu 2013), J Wu and X Lu have established that utilitarian systems and hedonic systems have different determinant of usage intention, and introduced a third category, dual purposed information systems, which includes systems which can be used either in a professional or non-professional context like instant messaging. This category, while coming closer to the gamification concept, is nevertheless different. Dual purposed information systems are defined as being alternatively hedonic or utilitarian, while the gamification ambition is to combine utilitarian and hedonic dimensions simultaneously.

In the domain of Human-Computer interactions studies, several concepts can be related to gamification, including “motivational affordance” defined as properties that determine whether and how an object can support one’s motivational needs (Zhang 2008), “hedonic attributes” like novelty and beauty (Hassenzahl, Schöbel, and Trautmann 2008) and “pleasurable products” (Jordan 2002), generating feelings of security, confidence, pride, excitement and satisfaction.

2.1.4. Precursors in Marketing

Gamification associated with digital technology, has had some predecessors in marketing in non-digital forms for decades (e.g., as Frequent Flyer Programs, stamps books), with the exact same reasons as gamification today, such as increased awareness, sales and consumer activation by game play participation (Dymek and Zackariasson 2016).

2.2. Academic definition of Gamification

The first structured academic attempt to provide a consistent and differentiated definition of gamification (Deterding, Khaled, et al. 2011), based on joint work between industry practitioners and academics, define gamification as : “ *the use of game design elements in non-game contexts*”.

As per Deterding, gamification refers to games, not play. In game studies, this distinction between game and play is tied to Caillois’ concept of “paida” (or playing), characterized by freedom and improvisation, versus “ludus” (or gaming) structured by rules and competitive strive towards goals (Caillois and Barash 1961).

Deterding also highlights the use of game elements as opposed to full-fledged games. The notion of elements is important in the definition to differentiate gamified application, using

some game design elements for non-entertainment purposes, from serious games, which are full-fledged games also for non-entertainment purposes, such as simulators for pilots or surgeons.

Typical elements of gamification include challenges, points, badges, leaderboard, and feedback messages, for purposes other than their normal expected use as part of an entertainment game, meaning that entertainment is not the primary purpose of the application. Joy of use, engagement and generally speaking, improvement of the user experience, represent the current predominant use case of gamification.

See the figure 1 below for gamification position according to the two axis of gaming vs playing, and whole games vs parts of games.

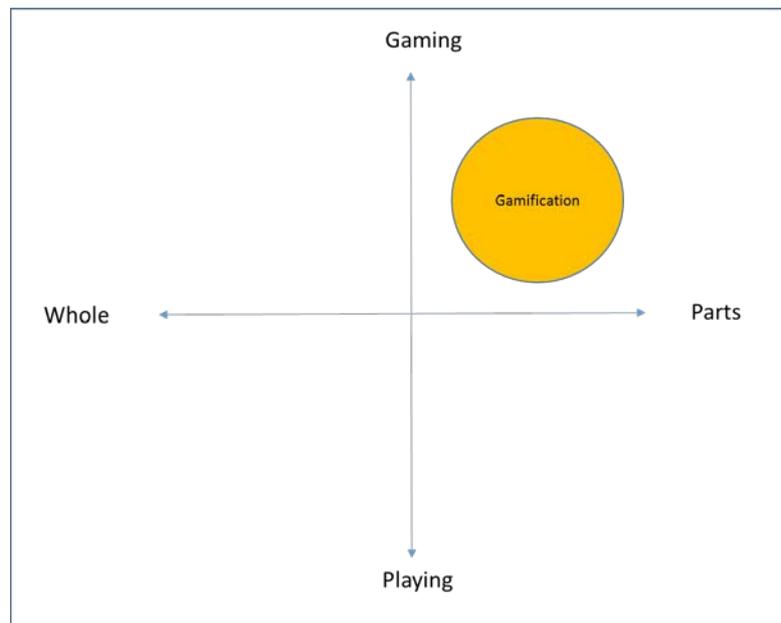


Figure 1: Gamification between game and play, whole and parts. Adapted from Deterding (2011)

Deterding also introduced the notion of gamefulness, related to live experience and behavioral quality, gameful interaction, referring to the artifacts – objects, tools, contexts that bring about the experience of gamefulness, and gameful design, relating to the design intended to achieve the gameful interaction using game design elements.

The Table 3 below summarizes the different elements of gamefulness by level of abstraction.

Level	Description	Example
Game interface design patterns	Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implementations	Badge, leaderboard, level
Game design patterns and mechanics	Commonly reoccurring parts of the design of a game that concern gameplay	Time constraint, limited resources, turns
Game design principles and heuristics	Evaluative guidelines to approach a design problem or analyses a given design solution	Enduring play, clear goals, variety of game styles
Game models	Conceptual models of components of games or game experience	eMechanics–Dynamics–Esthetics (MDA); challenge, fantasy, curiosity; game design atoms; Core Elements of the Gaming Experience(CEGE)
Game design methods	Game design-specific practices and processes	Playtesting, play centric design ,value conscious game design

Table 3: Taxonomy of game design elements by level of abstraction from Deterding (2011a, p.12)

Deterding eventually introduced the concept of situated motivational affordance, transferred from the established definition of affordance as the actionable properties between an object and an actor. When perceived, affordance allows actors to take action and may satisfy certain needs. (Zhang 2008). Transferred to the domain of motivation, motivational affordances are actionable properties able to satisfy motivational needs. Deterding’s contribution is in situating the motivational affordance in a specific social context which allows to differentiate motivational affordance from game elements in a game context (Deterding 2011). For example, the motivational affordance of a leaderboard in a game environment, free of consequence, is different from the same leaderboard in a work context with social implication and potentially incentives at stake.

Contesting Deterding’s definition, Werbach (Werbach 2014) claims that not every use of game design elements should be called gamification, and requires in addition a gameful or

playful intention. He proposes a definition of gamification as “a *process of making activities more gamelike*” (page 6).

Coming from the field of service marketing, Huotari and Hamari (Huotari and Hamari 2012) proposed a slightly different definition, putting the focus on the user experience, as “*a process of enhancing a service with affordances for gameful experiences in order to support user’s overall value creation*”.

Robson (Robson et al. 2015a) uses a similar but less precise definition of gamification as “*the application of lessons from the gaming domain to change behaviors in non-game situation*”.

Clearly the pervasive nature of mobile, social and web based technologies has created the condition for the emergence of gamification. Nevertheless, while the overwhelming majority of examples are digital, the term should not be restricted to digital technology.

Analyzing these various perspectives both from industry and academia in a recent review of literature, Seaborn and Fels (Seaborn and Fels 2015a) have summarized the emerging definition of gamification as :

“The intentional use of game elements in a gameful experience of non-game task and contexts. Game elements are patterns, objects, principles; models and methods directly inspired by games.” (p17)

The Table 4 below summarize academic definitions of gamification so far.

Author, date	definition
Deterding et al., 2011	the use of game design elements in non-game contexts
Huotari and Hamari, 2012	a process of enhancing a service with affordances for gameful experiences in order to support user’s overall value creation”.
Werbach, 2014	a process of making activities more gamelike
Robson, 2015	the application of lessons from the gaming domain to change behaviors in non-game situation
Seaborn and Fels, 2015	The intentional use of game elements in a gameful experience of non-game task and contexts. Game elements are patterns, objects, principles; models and methods directly inspired by games.

Table 4: Summary of academic definitions of gamification.

For the purpose of this thesis I will retain the definition from Seaborn and Fels, as the most recent and complete.

2.3. Gamification in context of ludification of Culture

On a broader scale, game studies and gamification can be positioned in the context of what media scholars have observed as “ludification of culture” (J. Raessens 2006; J. F. F. Raessens 2012; Deterding, Dixon, et al. 2011; Walz and Deterding 2015) while video games become a cultural medium and influence literature, cinema and television, accelerated by younger generations who spent more time in their childhood playing computer games than reading books or watching television, and nurtured a “gamer generation” (Beck and Wade 2013).

This invasion of games can be seen as the expression of a ‘ludic’ century as described by Zimmerman (Walz and Deterding 2015), enabled by progress in digital technology but also responding to deep, inner human needs in our postmodern society. As stated by Minnema (Minnema 1998):

“recent Western scientific interest in play as a phenomenon and as a metaphor is characteristic of the way in which contemporary (post) modern culture sees itself: as a game without an overall aim, as play without a transcendent destination but not without the practical necessity of rules agreed upon and of (inter) subjective imagination; as a complex of games each one having its own framework, its own rules, risks, chances,” (Minnema 1998)

Games have penetrated the industrial world through practices, attitudes, languages and concepts coming from digital computer games with playful design applied by companies like Apple (Sicart 2014). It has also influenced the artistic world, with performances and installations leveraging playful aesthetics that permeate popular culture (Flanagan in (Walz and Deterding 2015), like the creation of Art collective “One Life Remains” and their creation “Generations” exploring the notion of playing a game for a life time and passing this to their heirs, or “Brainball”, installation from the Sweden’s Interactive institute, from 1999 where one must compete to relax.

The manifestation of play in our social environment can be approached through the concept of “playfulness” as a desirable user experience or mode of interaction in our modern societies. Playful refers to the quality of the objects surrounding us, empowered by technology to deliver much more than their initial purpose (like a smart phone being much more than a phone) and to the experience we aspire to live. Playfulness can be defined as the “attitude of play” without the “activity of play”, or the capacity to use play outside the context of play, while respecting the purpose and goals of that object or context (Sicart 2014). When ludic

elements are used in structured games rather than free play, we can refer to gameful design and gamefulness (Walz and Deterding 2015)

While ludification of culture refers to the increasing penetration of games in our everyday life, we can also speak about its counterpart : ‘the cultivation of ludus’ (Walz and Deterding 2015), which refers to the way companies and social actors are harnessing play and games for their own purpose and alter some of their characteristics on the way.

One of the manifestations that games could be used for a serious purpose in education is the use of serious games, we are considering fully developed games, while gamification in its current definition only refers to the games’ elements. The first documented instance of games used for an educational purpose is dated around 475 BC with China’s game weiqi (Go) used to teach the art of war ((Halter 2006). In the early 2000s , with the progress of digital technologies, renewed interest for serious games could be observed, particularly in the fields of education and therapy, which led subgenres including news games, pervasive games, exertion games to emerge (Sawyer and Rejeski 2002). Another indication can be found in serious toys, which are toys designed for non-entertainment purposes, typically learning purposes.

The following figure 2 positions the various forms of games and toys in our lives towards ludification of culture and cultivation of ludus, still with reference to the concept of game as per Caillois’ concepts of paida and ludus (Caillois and Barash 1961).

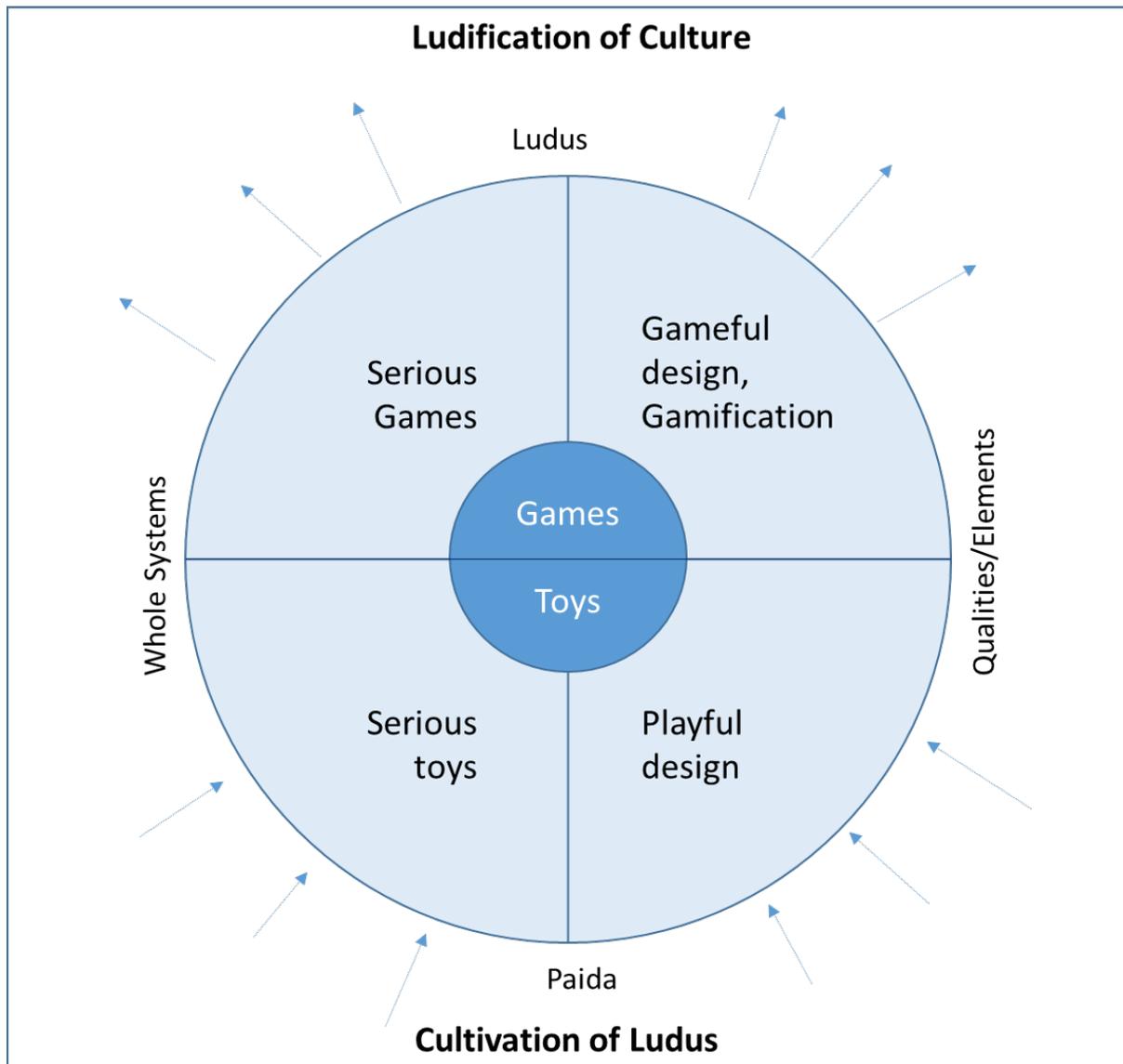


Figure 2: Positioning gamification in the field of ludification of culture and cultivation of ludus. Adapted from Walz and Deterding (2015)

2.4. Criticism about gamification

While capturing a lot of interest, gamification also has several critics especially from the game industry and the game studies community. Some criticism is based on the fact that gamification mostly relies on points and badges, which can be considered a very narrow interpretation of gamefulness.

As per game designer Margaret Robertson (Robertson 2010), gamification is “taking the thing that is least essential to games and representing it at the core of the experience”. Gamification is painted as missing the nature of the game, which is created for its own purpose and designed and developed from the ground up.

Gamification can also be criticized as a form of soft power, or instrument of social control, creating the condition for a play-like activity that is ultimately still productive (PJ Rey in (Walz and Deterding 2015)). Whereas gamification academics seem to accept the notion of using games and play towards corporate or communities given ends, some game scholars see the proper function of play and games as an escape from or a challenge to society (Walz and Deterding 2015).

Games scholar and designer Bogost (Bogost 2011) recommended replacing the term “gamification” with the term “exploitationware” claiming that the intent behind gamification is to replace real incentives with fictional ones, and pointing to the manipulation by marketers and big businesses for the purpose of easy profit. Bogost compared gamified application to “Chocolate-covered broccoli”.

Gamification is sometimes also perceived by business observers as a new panacea to fix all the dysfunctions observed in organizations, driving to hyperbolic expectation in business, and therefore resulting disappointment may result not from gamification itself, but rather from unrealistic demand and failure to implement. As per Gartner’s prediction, 80% of gamified applications will fail to meet their objectives, primarily because processes have been inappropriately gamified (Gartner 2012b).

This criticism might be responsible for the slightly delayed and partially skeptical but increasingly solid and stringent academic interest in business gamification’s growth in academia (Dymek Zachariasson 2016)

2.5. Challenges highlighted by research on gamification

Most of the current and worthwhile gamification research is generated from fields of game studies, media studies, user interface/experience design and service marketing. Gamification has been studied as a mechanism to engage customers and employees, providing richer and more appealing experiences (Robson et al. 2015a), as a way to improve workers performance, providing real time access to performance information and making tasks more enjoyable and “cool” (Cardador, Northcraft, and Whicker 2016), as a way to increase learning motivation (Dicheva et al. 2015) or participation and compliance in health and wellness programs (Stinson et al. 2013).

Gamification is attracting a growing number of academic research. In one of the first literature reviews published on the topic (Hamari, Koivisto, and Sarsa 2014a), a search hit for “gamification” is catching almost no response before 2011. At the time of their search, and with relatively broad search criteria, they identified already 8050 papers or articles, including

809 peer reviewed academic papers. Most academic papers were published in various Computer Science/human Computer Interaction conference proceedings. A few of them have also been published in management information systems journals like Electronic Commerce research and applications or the International Journal of Information Management.

Empirical studies cover a variety of contexts including gamification in the workplace (Arai et al. 2014; Cardador, Northcraft, and Whicker 2016; Robson et al. 2015a), in education (Dicheva et al. 2015), for crowdsourcing (Morschheuser, Hamari, and Koivisto 2016; Prandi, Salomoni, and Mirri 2015; Sigala 2015), in health (Arakawa and Matsuda 2016; Blohm and Leimeister 2013), marketing (Huotari and Hamari 2012; Hamari 2013b), in social networks (Thom, Millen, and DiMicco 2012a), in software development (Dorling and McCaffery 2012), and in environment protection (Fijnheer, van Oostendorp, and Veltkamp 2017; Janson 2016). Also gamification using techniques from the computer gaming industry typically relies on information technology (Robson et al. 2015b), it has not been evaluated yet as a lever to achieve greater Information System Success. This gap has been the focus of this research effort.

Three recent papers have summarized the status of academic research on gamification (Seaborn and Fels 2015a; Hamari, Koivisto, and Sarsa 2014b; Ferreira et al. 2017). In the first paper, the authors have analyzed 24 peer reviewed empirical studies aiming, generally speaking, to check whether gamification “works”. In the second paper, the authors have retained 30 peer reviewed empirical studies to compare their theoretical foundations, domain of application, purpose of gamification, and effectiveness. In the third paper, the authors have analyzed 35 relevant articles.

The conclusion of the two analysis have a lot of commonalities:

- A large majority of the papers analyzed are quantitative or mixed, very few use a qualitative approach
- They confirm a leaning-towards-positive impact of gamification, despite some caveats. Some studies concluded that positive effect exist only in part or seem to be dependent on the context or on the quality of the users. More research is needed to determine if those results are significant and reproducible
- They emphasize the limitations of current studies’ validity - in term of sample size, duration, control groups
- They identify many opportunities for further research.

Meta-analysis from Seaborn and Fels analyzing academic empirical enquiries highlight the mixed picture and positive leaning towards effectiveness of gamification. Impact of gamification seems to be very context dependent and may vary as per each individual. Some studies showed that age and familiarity with gaming influenced the effectiveness of gamification (Bagley 2012). This meta-analysis confirms the interest of studying gamification in its social context, which has guided this research design.

In the Hamari et al literature review, a parsimonious model is provided, differentiating 3 concepts:

- Motivational affordance (i.e. points, leaderboards, badges, feedback, rewards...)
- Psychological Outcome (both independent and dependent variables)
- Behavioral Outcomes (dependent variables)

Their analysis shows that, although all affordances are represented, some are more represented than others, and more research should be done to identify the impact of each affordance.

Also, while most studies examined behavioral outcomes, only a few investigated psychological outcome like motivation, attitude and enjoyment. Findings from qualitative or mixed studies that considered psychological outcomes identified both positive and negative perceptions regarding studied gamification implementation. There is a call here for further research on psychological mechanisms involved in gamification which is addressed by this AR research.

Furthermore, Hamari considered in an empirical study of gamification of peer-to-peer trading services, that the result of gamification may not be long term but could be caused by a novelty effect ((Hamari 2013b). An empirical study highlighted detrimental effect of removing a gamified internal social networking system on users engaged in the gamification experience (Thom, Millen, and DiMicco 2012a). The design of this AR, in 2 consecutive cycles covering a period of more than 2 years, has been guided by this call to consider gamification impact over time.

The third analysis from Ferreira, Araujo, Ferandes and Miguel (Ferreira et al. 2017), was published in a very recent collective book on Recent Advances in Information Systems and Technologies and focused on gamification in the workplace, and highlight the gap between the scarce and exploratory state of academic knowledge on gamification in the workplace, and the rapid advance of business practices increasing the gap between research and practice.

On this last point, one interesting angle of research aims to identify and recommend game design principles that will achieve the expected fun and enjoyment. This type of research has been explored by Robson (Robson et al. 2015b) in his paper from 2015 already mentioned. Robson et al refers to MDE framework – Mechanics, Dynamics and Emotions (or Aesthetics) already mentioned in the previous section (Hunicke, LeBlanc, and Zubek 2004).

Based on their analysis of the example of American Idol Game using the MDE framework, the authors concluded the following principles:

- A process should be gamified for clear purposes that can be financial, social or environmental,
- Analysis should focus on the different roles – not only designer and user, but also spectators and observers. Users may try to cheat the gamified process by colluding or breaking the rules, this should be considered as part of the dynamics,
- Gamification experience will constantly need to be monitored and adjusted,
- End of game should be managed.

Those recommendations are useful recommendation for practitioners, and gamification applications developers, and will be considered to guide my action research effort. However, they don't yet provide a solid instrument to understand the contribution of gamification to information system success.

The following table summarize learning and identified gaps from gamification literature which have been addressed by this action research effort.

Finding	Implication
Positive leaning but inconsistent confirmation of impact of gamification, call for more academic research (all 3)	Justification for further academic research on gamification
Highlight the gap between the scarce academic knowledge on gamification in the workplace, and the rapid advance of business practices (Ferreira et al.)	Provide addition academic knowledge regarding gamification in the workplace with aim to contribute to bridge the gap from research to practice
Gamification has not been studied yet as a lever for IS Success (all 3)	Gamification studied as a lever to achieve IS success
Gamification impact seems to be context dependent (Seaborn and Fels)	AR conducted in a specific, situated social context
Gamification impact may not sustain over time (Hamari et al.)	AR with 2 cycles, over >2years
Limited academic knowledge to guide practitioners in their gamification project (Robson)	Research aim to provide design principles for practitioners

Table 5: Summary of findings and gaps of academic research addressed in this AR

In summary, this analysis of those 3 recent literature reviews confirms that, although they lean towards a positive confirmation of gamification's impact, there is a call for further academic research to solidify initial findings. There is a call for some solid academic evidence on the longer term effect of gamification, and for greater understanding of psychological mechanisms at play and conditions needed for successful implementation. Furthermore, although gamification, using techniques from the computer gaming industry, typically relies on information technology (Robson et al. 2015b), it has not been sufficiently evaluated as a lever to achieve greater IS success. Those gaps will be the focus of my research effort. For that purpose I will introduce now the well establish ISM model.

2.6. Anchoring gamification in Information System Success Model

Some authors classify IS from Hedonic IS, developed for pleasure and enjoyment, to Utilitarian IS, developed to improve individual and organizational performance (Van der Heijden 2004b). In this research I have examined the potential contribution of gamification to the success of Utilitarian information technologies. In this section, I will highlight contributions from IS research my research question, and select a few key concepts and models to frame my research.

According to Keen's, the IS mission is " the effective design, delivery, use and impact of information technologies in organization and society" (Keen 1981). Following Keen, DeLone and McLean have defined a conceptual framework to evaluate the effectiveness and

success of information systems. DeLone and McLean suggested that the dependent variable for Information Systems Research is IS Success (DeLone and McLean 1992). In 2003, DeLone and McLean have reviewed their model ((DeLone and McLean 2003) on the basis of 10 years of empirical studies.

The ISM establishes relationships between six critical dimensions of IS success: information quality, system quality, service quality, system use/usage intentions, user satisfaction, and net system benefits.

System quality refers to the desirable characteristics of an information system, for example, ease of use, reliability, or response time. *Information quality* refers to the quality of the information that the system is able to store, deliver, or produce. *Service quality* refers to the quality of service that users receive from IT department and support personnel. *Intentions to use* an information system and actual system *Use* are well-established constructs in the information systems literature. In the IS success model system use and usage intentions are influenced by information, systems, and service quality. *User Satisfaction* refers to the extent to which a user is pleased or contented with the information system. The *net benefit* that an information system is able to deliver is an important facet of the overall value of the system to its users or to the underlying organization.

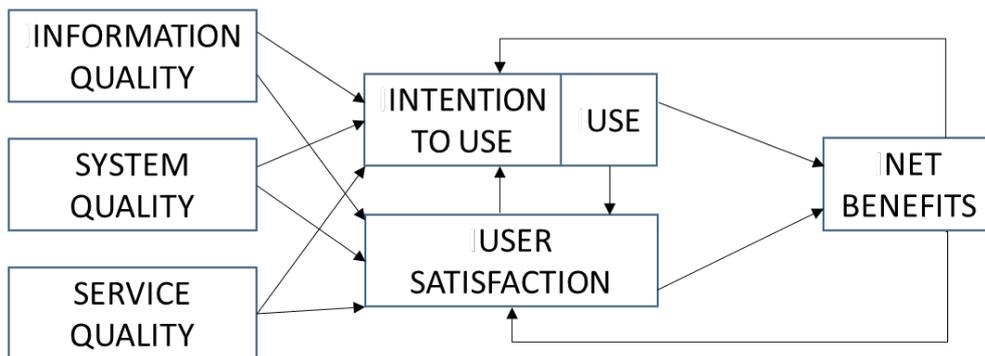


Figure 3: Updated DeLone and McLean IS Success Model (DeLone and McLean 2003)

Since the nature of information systems has evolved in time, they have outlined specific measures of information systems success for each of the 5 eras of the short history of information systems, from the “data processing era” (1950-1960) to the “Customer focus Era” (2000 and beyond). In the most recent “Customer-focused era”, information systems are no longer for business and productivity alone, but also have a hedonic facet. Prior approaches for evaluating IS success, including system and information quality, use, user satisfaction,

individual benefits and organizational impacts are still relevant. However, as per Petter, DeLone and McLean (Petter, DeLone, and McLean 2012b), in this new age of information systems, success measures should also consider factors like enjoyable, easy to use, usefulness. Therefore we have considered those dimensions when building the conceptual model for this research. In addition, while information systems become more personal and customized, individuals' perception varies amongst user groups and even between individuals. Therefore we have considered gamification impact at individual level, and considered both individual and organization level benefits.

ISM has been used as a relevant framework for research on CRM systems (Lal and Bharadwaj 2015; Khodakarami and Chan 2011). So far the research on CRM systems has not focused yet as gameful elements nor gamification as such.

At a higher, conceptual level, ISM model can be depicted as articulating 3 “holistic” variables as follows:

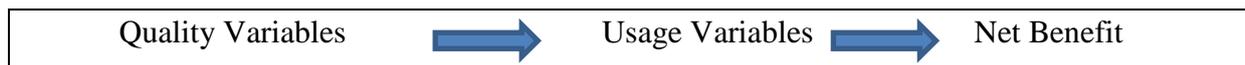


Figure 4: High level conceptualization of ISM

For each one of these 3 conceptual variables, I will select the most relevant variables for my analysis, looking specifically at the context of a customer focus information system, an enterprise CRM, which will be gamified within my action research study.

2.6.1. Quality variables

Gamification as such has not been taken into account in the ISM from DeLone and McLean success model specifically. However, arguably, it can potentially be seen as a facet of System Quality, defined as

“The desirable characteristics of an information system. For example, ease of use, system flexibility, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility and response time” (Petter, DeLone, Mclean 2008 page238).

In Enterprise Systems, System Quality can be measured in term of ease of use, ease of learning, user requirements, system features, flexibility, sophistication, integration and customization (Sedera and Gable 2004). Game elements can be considered here as an additional system feature, contributing to system quality.

System Quality has been established as an important factor in CRM IS by some recent empirical research (Khodakarami and Chan 2011) highlighting the specific importance of system integration which greatly affects the availability of customer information. In addition

to system integration, system flexibility affects the availability of customer information, allowing users to define their specific information requirements and get access to that information. In the case of gamification of an existing CRM, the requirement for integration and flexibility will be taken into account in the choice of the applications considered in action research implementation.

Quality of Information produced by a CRM is also crucial as this information will enable users to improve their productivity and customer experience, and managers and organizations to leverage it to make decisions and design strategies. (Khodakarami and Chan 2011). In Enterprise IS, typical measures of quality of information are availability, usability, understandability, relevance, format, or conciseness. One of the game elements, the production of real time feedback, can also impact the quality of information perceived by users both from availability and usability perspectives. Quality of information produced by gamified CRM systems can also be assessed in terms of relevance according to organizational requirements and for the end-users so that they can make operational as well as managerial decisions.

Service Quality is expected to play an important role in usage and satisfaction of CRM. However, in the case of gamification of an existing CRM, we expect that the service quality will not be impacted as the solution will be serviced as part of the CRM service, with the same resources and processes, and will be considered as invariant and excluded from our simplified model.

2.6.2. Main IS theories connected to information system usage

Usage variable, identified as determinants of IS success by DeLone and McLean, have also been analyzed at length by TAM studies with the constructs of perceived usefulness and perceived ease of use. The Technology Acceptance Model (Davis 1989), which has been described as the “most influential and commonly employed theory in information systems (Lee, Kozar, and Larsen 2003), models how individual users come to accept and use a technology.

The origin of TAM can be traced to the preceding Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975), derived from social psychology which studied the prediction of behavioral intention as depending on the person's attitude about behavior and subjective norms. Ajzen (Ajzen 1991) improved the predictive power of TRA by including perceived behavioral control in the Theory of Planned behavior (TPB) to account for the assertion that behavior is not wholly voluntary. Davis model (Davis 1989) proposes a simplification of the theory of planned behavior adapted to the IS context and based on 2 constructs, perceived usefulness and perceived ease of use, as key determinant of user acceptance of technology.

TAM has been continuously studied and expanded-the two major upgrades being the TAM 2 (Venkatesh 2000) and the Unified Theory of Acceptance and Use of Technology or UTAUT (Venkatesh et al. 2003). A TAM 3 has also been proposed in the context of e-commerce with an inclusion of the effects of trust and perceived risk on systems (Venkatesh and Bala 2008). The TAM model, alone or in combination, has been mobilized by several academic research projects; relative to CRM adoptions (Buttle, Ang, and Iriana 2006; Vella and Caruana 2012; I.-L. Wu and Wu 2005; Karjaluoto et al. 2014).

One identified limitation of TAM is that the concept of perceived usefulness which is well established in utilitarian systems may not be prominent in the case of hedonic systems, developed for leisure and fun. In the context of games, enjoyment from using the system has been shown to be an important predictor of use while perceived usefulness makes it lose its dominant predictive value (Van der Heijden 2004a). As gamification is calling on hedonic attributes, this limit would be detrimental and doesn't speak in favor of leveraging TAM framework for this analysis.

Another limit is that the TAM model focuses on individual level analysis, while we are exploring the impact of gamification both at individual and organization level. For those reasons, I didn't select TAM as the best theory to support my investigation on gamification.

Adding gamification features on existing utilitarian IS typically happens past the initial adoption phase of the IS. Therefore, rather than referring to the cumulative tradition of technology adoption (Cooper and Zmud 1990b), we have rather relied on the field of research on post adoption with a focus on "factors that influence users to (continuously) exploit and extend functionality built into IT applications" (Jasperson et al. , 2005).

The concept of infusion was initially articulated by Cooper and Zmud (Cooper and Zmud 1990a) as "*increased organization effectiveness (..) obtained by using the IT application to its full potential*". In other words, Information System Infusion captures the degree to which the system is used deeply, or to his full extent, for improving organizational and individual performance (Fadel 2012) In the case of CRM systems, are users capturing only the minimum mandatory information to proceed with the customer request, or are they using the full functionality of the CRM as a guide to organize their work as a central repository of information and communication tool?

The concept of infusion captures the qualitative notion of use. Main constructs of IT use going beyond initial intention to use are IS use-related activity (ISURA) (Barki, Titah, and Boffo 2007) and effective use (Burton-Jones and Grange 2013). Effective use has been defined as "using a system in a way that increases achievement of the goal for using a system".

Initial research on infusion focused on organization or technological configuration level. For example Cooper and Zmud (Cooper and Zmud 1990a) identified 5 level of ERP systems relative to their functions and performance, and classified only the top 3 as having the potential to achieve infusion.

More recent research (Fadel 2012) is looking at individual level infusion, assuming that infusion is influenced by the degree to which individuals engage in various type of adaptation behaviors. In his work, Fadel is drawing from Coping Model of User Adaptation (CMUA) (Beaudry and Pinsonneault 2005), to provide a theoretical framework for users adaptation to an IS and their outcomes. As per his result, problem focused adaptation behaviors, directed toward changing the self-dynamic work system, promote infusion, while avoidance-oriented emotion-focused adaptation behaviors tend to diminish infusion. From this perspective, as gamification intends to increase user engagement with the IS and generate positive emotions, it is plausible to assume that gamification can positively impact infusion of information system. However, focused on the individual level adaptive behaviors, this framework doesn't yet bring much light on the relevant measures of usage in the infusion phase of information systems.

2.6.3. System Use variables

System Use has been a key concept in IS research for decades. System Use is defined by DeLone&McLean (Petter et al., 2008) as “*the degree and manner in which staff utilize the capabilities of an information system* ».

This concept seems more appropriate than intention to use when talking about mandatory systems, where the user's decision is not related to using or not but more related to their qualitative, deep use of the system functionalities in order to improve their business outcomes. It is also more relevant when considering gamification as an additional feature to existing systems to improve usage post adoption.

As per DeLone& McLean (Petter, DeLone, and McLean 2008), the measure of system use had been overly simplified. Intensity, purpose, sophistication, extents and more should be considered to build a satisfactory use variable.

In order to define the most adequate usage metric in this specific context, I will refer to the conceptual model of Burton-Jones and Straub (2006) which has been built on previous academic conceptualization from IS Success (DeLone and McLean, 2003) and other domains including IS acceptance, IS implementation and IS for decision making. Burton Jones and Straub define individual system usage as “individual user's employment of one or more features of a system to perform a task”. Their framework proposes a 2 steps approach to select

the right set of usage metrics which they recommend to be as rich as possible, within a large set of long standing measures including features used, tasks supported, extend of use, use or nonuse, heavy or light use, frequency of use and duration (Burton John and Straub, 2006).

The first step of this process is the Definition stage, where researchers should establish specific characteristics of system usage, and the second step is the Selection stage where researcher will chose the best measures relative to research context, balancing completeness with parsimony.

Options for type and richness of measures are summarized in the following table 6:

Richness of Measures	Lean	Somewhat Rich	Rich	Rich	Very Rich
Type	Extent of use	Extend to which the system is used	Extent to which the user employs the system	Extent to which the system is used to carry out the task	Extent to which the user employs the system to carry out the task
Domain of content measured	Usage	System	System & User	System & Task	System & User & Task
Example related to experiment	Duration of use of CRM	Number of CRM features utilized	Cognitive absorption of underlying sales process by users	Variety of subtasks performed at expected level in CRM	None-difficult to capture

Table 6: Rich and Lean measures of System Usage, adapted from Burton-Jones & Straub, 2006

This framework supports the development of a set of usage metrics specific to the case studied. Gamification is applied to specific features used to perform tasks which we try to encourage as contributing to expected ROI. Most relevant rich set of measures considering the tasks performed using the system is highlighted in bold in the table above. The addition of the user dimension, while bringing some interesting aspects of cognitive absorption, would be, as stated by Burton Jones and Straub, very difficult to capture and could be the subject of further research work.

Very recently, the concept of “enhanced use” (F. Bagayogo, Lapointe, and Bassellier 2015) refers to novel ways of employing IT features, using IT for additional tasks and/or using

extensions of IT features and attributes. This model combines the 2 dimensions of system use (through its features formerly used, formerly unused and extended) and tasks (current or additional), as represented in table 7.

		Features		
		Current	Additional	Extended
Task	Current	Continued use: Using a <i>formerly used set of features</i> for current task	1. Using a formerly unused set of available features for current tasks	2. Using feature extensions for current tasks
	Additional	3. Using a <i>formerly used set of features</i> for additional tasks	4. Using a <i>formerly unused set of available features</i> for additional tasks	5. Using <i>feature extensions</i> for additional tasks

Table 7: Five possibilities of Enhanced use (F. F. Bagayogo, Lapointe, and Bassellier 2014)

I chose to adopt this taxonomy as a good fit with my research work, as it offers a meaningful framework to map and classify increased usage of features supporting existing and new tasks execution to capture impact of gamification on information system usage. The following table 8 illustrates the cases with examples related to the case of CRM features and tasks.

		Features		
		Current	Additional	Extended
Task	Current	Filling mandatory CRM fields	Adding competitor information, adding partner opportunities	Use of dashboard and reports for existing tasks like sales forecasting
	Additional	Using call notes to prepare customer calls	Linking calls notes to opportunities	Use of dashboard and reports for additional tasks like targeting customers to contact

Table 8: Applying Enhanced use possibilities table to CRM context

2.6.4. User Satisfaction variables

User satisfaction is usually measured using well established instruments like Doll et al End-User Computing Support (EUCS)(Doll, Xia, and Torkzadeh 1994) or User Information Satisfaction (UIS)(Ives, Olson, and Baroudi 1983). However those instruments are much broader than user satisfaction, including several quality variables.

In the context of adding gamification to an existing CRM, my focus will be on items relative to the gamification features alone rather than the overall satisfaction with the CRM.

Enjoyment is one of the expected outcome of games, and offers a potential connection between gamification and user satisfaction.

In a recent meta-analysis about the determinants of Information System Success (Petter et al. 2013), research on subjective variables have been compiled to summarize current academic understanding of the various factors of influence towards IS success. Among those, the “Enjoyment” variable, has been identified as antecedent of IS Success with strong evidence (Petter et al. 2013) and tested in empirical researches (De Wulf et al. 2006); (Hackbarth, Grover, and Yi 2003) . We will consider user Enjoyment, defined by the level of pleasure or enthusiasm often expressed as “fun”, with the gamified features as a key metric of user satisfaction with gamified applications.

Other characteristics suggested by literature review upon previous research (Petter, DeLone, and McLean 2013a) include trust and user expectations. Trust can be connected to the notion of fairness which emerged from exploratory interviews as critical to the gamification users. User expectations refers to the degree in which the user’s perception about IS is consistent with the actual IS. Gamification, considered as a modern “cool” technology, can positively impact the user’s perception of IS and should be considered as well.

Other gamification features that may impact end user satisfaction will be the availability of real time information, already included in the Information Quality variable.

2.6.5. Net Benefits variables

Net benefits represent the IS contribution to the success of individuals, groups, organizations, or higher levels of analysis, resulting for example from increased sales, cost reduction, improved profit. Net Benefit replaced Benefit in D&ML model in 2003 to include potential negative impacts. Net benefit should represent the net impact of positive and negative consequences on end users, managers and the organization. (DeLone and McLean 2003)

In the case of CRM, literature reviews summarize typical benefits by stakeholders as follows:

- Salespeople: shorter sales cycles, more closing opportunities, higher win rates
- Sales managers: improved salesperson productivity, improved customer relations, accurate reporting, reduced cost-of-sales
- Senior management: accelerated cash flow, increased sales revenue, market share growth, improved profitability (Buttle, Ang, and Iriana 2006)

If gamification accelerates usage of the CRM features for additional tasks, we can expect to observe some of those benefits at employee, manager and organization level. However, it will be important to differentiate benefits from the CRM itself from benefits coming from gamification. When adding gamification in the workspace, we can also impact more personal benefits like monetary or not monetary rewards, and feelings like happiness.

While gamification could drive other benefits related to workforce enjoyment and motivation, it may also generate some negative impact if it is perceived negatively as controlling or manipulative, distracting or driving some gaming of the gamification while users adopt unwanted behaviors in order to win points at the cost of the work performance.

2.6.6. Preliminary conceptual model applying ISM to gamification

Based on previous analysis, I have developed a preliminary conceptual model as represented in Figure 5:

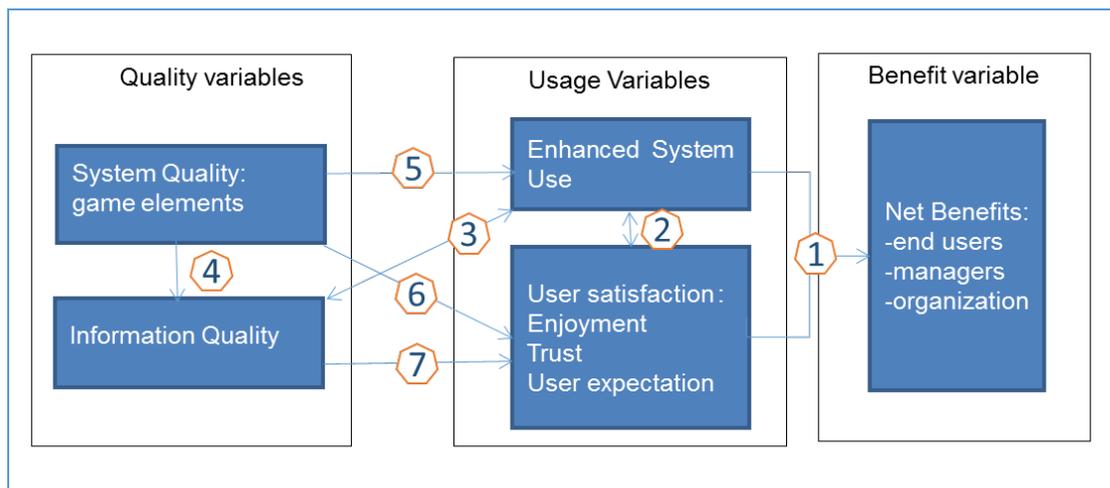


Figure 5: Preliminary Conceptual model adapting ISM to gamification context

Quality variables have an impact when introduced gamification include System Quality improved by game elements and Information Quality.

Enhanced Use goes beyond system use and refers to novel ways of employing IT features, using IT for additional tasks and/or using extensions of IT features and attributes which is typically required for IS to deliver expected results. It will be assessed using the 5 categories of Bagayogo, Lapointe, and Bassellier.

In term of user satisfaction, I have retained the three main dimension impacted as defined previously, namely Enjoyment, Trust and User Expectation.

The Dependent variable remains Net Benefit, defined as “the extent to which IS is contributing to the success of individuals, groups, organizations, industry and nations” (Petter, DeLone, Mclean 2008). In the context of gamification of utilitarian IS, we will focus on the individual and group levels.

At the individual level, net benefit from gamification can encompass improved job performance and monetary or non-monetary rewards. As in gamification we consider both individual users and first line managers with potentially different benefits, we will consider those roles separately.

At the organizational level, net benefit can also encompass increased organizational performance as well as improved productivity and predictability, resulting from better adherence to business process underpinning utilitarian systems in scope of gamification.

At the organizational level, the net benefit of gamification should also take into account the time and resources implied in setting up and maintaining gamification systems. However, the cost of implementing gamification applications on top of CRM is limited in proportion to the costs involved in the CRM environment overall and, as it leverages existing CRM resources and processes, it is difficult to differentiate from overall enterprise CRM costs. This is why I didn't consider it within this academic analysis.

Based on available literature, we can describe the hypnotizing relationship between those variables as follows:

Influence of Usage and User Satisfaction on Net benefits can be expected from a broad base of academic work based on the ISM Model (Petter, DeLone, and McLean 2008; Delone and McLean 2003). In the case of gamification, Enhanced System Use is expected to improve returns on the CRM investment at organization level and productivity of individual users and managers. User Satisfaction is expected to drive the engagement and motivation of users impacting positively sales performance at organization level and returns on company CRM investments.

Proposition 1: Enhanced System Use and Use Satisfaction improve Net Benefits

Influence of Use on User satisfaction and vice versa has been established by strong academic evidence (Petter, DeLone, and McLean 2008; Delone and McLean 2003).

Proposition 2 Enhanced System Use and User satisfaction reinforce each other

Information quality impact on Use has been shown with moderate evidence (Petter, DeLone, and McLean 2008). In the case of gamification, the enhanced used implies capturing more information and updating more regularly, which results in more complete and accurate information. The richness of information can also incent the users to consult the CRM more frequently.

Proposition 3: Enhanced System Use and Information Quality reinforce each other's.

As per a meta-analysis published in 2013 (Petter, DeLone, and McLean 2013b), there is still a gap in ISM research related to antecedents for Information Quality. Empirically, as gamification includes features like scorecard and visual representation, we expect that it will improve the information quality by their real time nature and conciseness.

Proposition 4: Game Elements improve Information Quality

Gamification contests and metrics aim to drive changes in behavior to achieve a deeper CRM usage. Points and badges will be attributed based on CRM hygiene and adoption. As per Petter, Delone and McLean meta-analysis (2013), the use of incentives and policies implemented by manager to encourage use are a strong predictor of use of an IS.

Proposition 5: Game elements drive Enhance System Use

User involvement is associated with the use of IS (Petter, DeLone, and McLean 2013b). Gamification can be seen as increasing user involvement as it is expected to increase the “fun” element in the sales team, generating enjoyment. It is also expected to improve user's perception of the CRM environment as “cool” and “friendly”. If not implemented with care, gamification can also generate concerns on fairness and loss of time, which would have a negative impact on user satisfaction. So the overall impact will be the net effect, which we expect to be generally positive as observed in most empirical studies compiled in several meta-analysis on gamification (Seaborn and Fels 2015a; Hamari, Koivisto, and Sarsa 2014b).

Proposition 6: Game elements increase User Satisfaction

Information Quality impact on User satisfaction has been strongly established by ISM academic research (Petter, DeLone, and McLean 2008; Delone and McLean 2003)

Proposition 7: Information Quality drives User Satisfaction

At this stage, this conceptual model offers an adaptation of ISM in the context of implementation of gamification on a utilitarian CRM in order to measure contribution of game elements to IS success through their impact on Enhanced Use and Enjoyment, in a variance model.

However, its rational perspective doesn't yet provide any elements to explain how gamification works at a more granular level. There is still no information in this model to articulate how these simple game elements – points, badges, leaderboard, can generate fun and motivation in the workplace, better than traditional management tactics existing for years like incentives or role modeling. It doesn't help either to understand the varied levels of success of gamification experimentations and the conditions for successful implementation. In order to fill this gap, we will now explore motivation theories which we can leverage to enrich and complement this model and give it a stronger explanatory dimension.

2.7. Theoretical foundations for gamification in Self Determination Theory

As gamification aims at increasing workforce attention and efforts to specific tasks and activity, motivation is a key concept to explore in order to understand the mechanisms at play in gamified services. The word motivation derives from the Latin verb “movere” meaning ‘to move’. What moves a person to make certain choices, to engage in action, to expend effort and persist in action – such basic questions lie at the heart of the motivation theory and research. The fields of economics, decision making, sociology and psychology share a common desire to understand human nature, and as a result, a number of motivation theories coexist. They have in common to concern the direction and magnitude of human behavior, that are related to the choice of a particular action, the persistence with it, and the effort expended on it. In other words, motivation is responsible for why people decide to do something, how long they are willing to sustain the activity, how hard they are going to pursue it.

A first category of motivation theories are focusing on human needs. One of the best known theory is Maslow (“Classics in the History of Psychology -- A. H. Maslow (1943) A Theory of Human Motivation” 2015) needs hierarchy. Maslow's precursor work has been extended by the work of Herzberg (Herzberg 1968) and his Two-factors theory which differentiate motivators providing job satisfaction and what he called “hygiene” factors which are driving job dissatisfaction if they are not met. These theories cover all scopes of human needs, including basic needs for food and safety, while exploring gamification requires a framework more focused and granular on psychological and self-fulfillment needs.

Beginning around the 60's, the shift towards cognitive theory began. It de-emphasized the concept of human needs to highlight the concept of goal as the dominant motivational concept. One of the best known contribution is Vroom Expectancy theory (Vroom 1964), based on the notion that humans will be motivated to exert a high level of effort when they see the relationship with the performance they will achieve and the outcome or rewards they will receive. Vroom theory has been challenged by academia and is not fully confirmed by empirical studies (Van Eerde and Thierry 1996; Wabba and House 1974).

Continuing this exploration of motivation theories, I want to highlight Self Determination theory (SDT)(Deci and Ryan 1985a)(Deci and Ryan 2002), a macro theory of human motivation and personality. SDT belongs to the Aristotelian tradition which proposes that people are assumed to possess an active tendency towards psychological growth and integration. As such, the Self Determination Theory is connected to the school of positive psychology. However, SDT also acknowledges the manifold indications of fragmentation and conditioned responses from behavioral and cognitive theories. SDT posits also that human natural aspirations are development and integration. There are some clear and specific social and contextual factors that either support this innate tendency or on the other hand thwart or hinder this process resulting in highly fragmented and sometime passive or alienated individuals.

SDT key assumption is that humans are inherently proactive, have a tendency towards growth development and integration of their psychic elements into a unified sense of self and integration of themselves into larger social structure, however this is thwarted if basic needs are not fulfilled by social-contextual factors. Main concepts of SDT are summarized in the table 9 below:

Concept	Definition	Sub-concepts
Human basic psychological needs	Innate needs universal across time, gender and culture that, if satisfied, allow optimal function and growth, and well-being. Differs from the idea of conscious personal motives organizing behaviors which can be detrimental to satisfaction on inner psychological needs or developed as a substitutes. Basic needs are universal however there is a great cultural variability in the behaviors displayed to fulfill those needs. Social environment can either facilitate or block satisfaction of those needs.	Competence: feeling of being effective and able to express his or her capacities Relatedness: feeling connected to others, care for and being cared for Autonomy: being the perceived origin or source of one's behavior, acting from interest and integrated values
Intrinsic and Extrinsic motivation, Amotivation		Intrinsic motivation is the natural, inherent drive to seek out challenges out of interest and inherent satisfaction. Extrinsic motivation comes from external sources. Amotivation correspond to lack of motivation
Cognitive Evaluation Theory – CET	Factors that explain variability of intrinsic motivation and reward effect. The needs for competency and autonomy are integrally involved in internal motivation, and contextual events such as rewards, positive feedback or imposition of a deadline are likely to affect sense of autonomy and therefore impact negatively intrinsic motivation, while if perceived as increasing feeling of competence it may tend to enhance internal motivation	Controlling aspects and informational aspects of events Functional significance, to convey the idea that individuals will actively construe social contextual inputs in term of their informational and controlling meanings.
Organismic Integration theory (OIT)	Subset of SDT that focuses on how different type of external motivations can be integrated in human psyche. Continuum of four level of integration. A person that has fully integrated an activity initially externally controlled along with his own personal goals and needs is more likely to see the activity as positive.	Externally regulated behavior, Introjected regulated behavior, Regulation through identification, Integrated regulation

Table 9: Main concepts from SDT theory

The competency need of SDT, that is our fundamental need to feel effective and successful, to seek out challenges, is close to the notion of “just right challenge” as described by Csikszentmihalyi (Csikszentmihalyi 1996). The need for autonomy, reflecting our will to determine our own path, is contradicted when we feel controlled by others or by circumstances. Relatedness is satisfied in relationships when we feel we matter and we are supported and integrated in a group.

SDT theory is leveraged by several fields of research, including psychotherapy and counseling (Lynch et al. 2010), Education (Van den Berghe et al. 2014), Healthcare (Ng et al. 2012), Virtual environments and Video games (Rigby, Ryan 2011). In the field of Organization and work, SDT research explore impact of motivation drivers and behavioral controls on employee outcomes with specific populations including Senior executives (Mueller and Lovell 2015), Lawyers (Krieger and Sheldon 2015), Chinese workers (Nie et al. 2015), or in specific context including workplace Bullying (Trépanier et al. 2014), Mentoring (Janssen, van Vuuren, and de Jong 2014), or Burnout (Fernet et al. 2013).

Recently, SDT has been applied to game studies (Rigby and Ryan 2011; Ryan, Rigby, and Przybylski 2006). SDT explains how video games capture players because they fulfill intrinsic human needs of competence, autonomy and relatedness. Good games make us feel competent and give us a sense of mastery by facing and overcoming challenging problems. Autonomy exists when we feel our actions are freely chosen, when we feel we have a sense of mission and purpose. Relatedness involves knowing who we are and feeling that what we do matters to others and to the world. SDT's theorized needs for autonomy, competence, and relatedness which predict enjoyment and future game play.

SDT was therefore a strong option to explore the motivation impact of game elements included in gamification. SDT has been mentioned as foundation for gamification by several scholars (Aparicio et al. 2012a) (Thom, Millen, and DiMicco 2012b), (Gnauk, Dannecker, and Hahmann 2012), (Hamari, Koivisto, and Sarsa 2014a), (Seaborn and Fels 2015a). In the Seaborn and Fels survey, particular attention was given to the supporting theory used in the studies. Authors concluded that most of them are not sufficiently grounded in theory. However those that included a solid theoretical framework all pointed towards the self-determination theory and the concepts of intrinsic and extrinsic motivation.

Game elements can easily be related to the 3 human needs from SDT. According to SDT theory, if game elements contribute to fulfilling human needs for autonomy, competence and relatedness, gamification can as a result, increase intrinsic motivation and therefore impact individual behaviors towards greater usage and adoption.

The table 10 below provides some mapping of specific game elements leverage in gamification to each one of the human need as per SDT theory.

Autonomy	Competence	Relatedness
Profiles, avatars, macros, configurable interface, alternative activities, privacy control, notification control	Positive feedback, optimal challenge, progressive information, intuitive controls, points, levels, leaderboards.	Groups, messages, blogs, connection to social networks, chat

Table 10: Game elements by self-determination theory concepts in Aparicio& al.'s (2012) framework

An empirical study recently conducted (Sailer et al. 2017) has analyzed separately game elements to confirm their individual impact. The results confirmed that badges, leaderboards and performance graphs impacted positively competence and autonomy, while avatars, meaningful story and teammates impacted positively relatedness. Perceived decision freedom was not impacted by any of the game elements.

One of the most debated topic is the role of rewards in gamification. Badges and points are typically at the core of gamification and often associated with financial or non-financial rewards. A specific emphasis is given to social recognition rewards, with the leaderboards and the celebration of contests' winners made highly visible in the workplace.

As rewards can be perceived as the exertion of a control, even if positive, it can be expected to have a negative impact on autonomy and therefore on intrinsic motivation. A meta-analysis (Deci, Koestner, and Ryan 2001) on 128 studies that examined motivation in an education setting has found that almost all forms of rewards, except non-controlling verbal rewards, reduce internal motivation. Further analysis found that if the task was already uninteresting, the reward system did not reduce internal motivation as there was very little motivation to start with. In that case the rewards may facilitate user understanding of the importance of the activity itself while this internalize its regulation which increases internal motivation. Therefore, when applied to relatively dull tasks like filling in CRM information, the potential negative impact of rewards may be mitigated by the impact of increased importance given to those tasks.

As per Zichermann (Zichermann and Linder 2010a) perspective, intrinsic motivation is unreliable and variable and cannot be trusted. Therefore he advises to consider both extrinsic and intrinsic motivators, and to use both monetary and non-monetary incentives. So clearly, the impact of extrinsic rewards in gamification of CRM is still to be clarified.

Contrary to full-fledge games which are played fully voluntarily and for their own sake, gamification is defined in a context where the voluntary dimension, while still existing, is moderated by the social context, and where a positive impact is expected on organizational goals. As such, it could be classified as leveraging extrinsic motivation while pursuing activities for its instrumental value.

Another concept of SDT, OIT, explains how externally defined goals can be internalized and merged into our own values and objectives, and as a result drive our behaviors and generate well-being similarly to intrinsic motivation (Walz and Deterding 2015).

Nicholson (Nicholson 2012) suggested an additional link between SDT and in particular OIT sub theory and gamification, highlighting the importance of being meaningful in gamification and relevant to the users to gain sustainable interest. Nicholson completes the foundation of OIT with the notion of “situated motivational affordance” introduced by Deterding (Deterding, Dixon, et al. 2011). This concept relates to the principle that users are motivated only when there is a match between the systems or that part of the system, and their background and role. Nicholson also highlighted the risk of using monetary rewards.

A recent paper (Hamari and Koivisto 2015) is building on the Utilitarian and Hedonic classification of information systems, and combining TAM with SDT theories. While Utilitarian and Hedonic systems definitions are similar to those already mentioned above, the authors have added a third category which relates to Social information systems. Hamari and Koivisto have run a quantitative research with users of fitness application, Fitocracy, applying this framework they demonstrated that the use of gamification systems is strongly driven both by utilitarian and hedonic benefits and motivation. However, there is an interesting distinction about their effect. The results show that the more effective frame of enjoyment has a direct relationship with willingness to use, while perception of usefulness has a stronger impact on behavior of actually using the game. Enjoyment and ease of use are both determinant of the continuation of use of service.

The relative profusion of academic contributions concerning SDT in the context of gaming and gamification confirms the good fit proposed by the SDT model which offers a broad range of motivation concepts to explain psychological mechanism at play, but still leaves a space for further confirmation through empirical studies and clarification of the impact of incentives and rewards and of conditions for successful implementation.

While Self-Determination Theory is strongly established and referred to by a number of empirical studies, it is nevertheless important to acknowledge its epistemological limits. For

researchers that do not believe that free will exists, but rather are fully conditioned by the social context, then the main assumption of self-determination would be implausible.

In this research, I also consider gamification in a social context and highlight managerial implications, I make the epistemological assumption that users of the CRM make choices which are not fully determined by social environment, but are also driven by their inner motives and needs, along the lines of the SDT theory.

2.8. Alternative views: Reinforcement Theory and Extrinsic rewards

While most studies on gamification that referred to motivation models adopted SDT framework, another option is to consider Skinner Operant Conditioning and his theory of reinforcement (Skinner 1953). Skinner belongs to the field of behavioral psychology which attempts to understand all behaviors, in term of interactions of an organism in and with its environment (Hayes 1993). Skinner considers free will as an illusion and human action dependent of previous actions. If the consequences are bad, there is a high chance that the action will not be repeated.

From Skinner's school perspective, both positive and negative reinforcements encourage repetition of behaviors, as operant conditioning (Skinner 1938). Skinner's view is sometimes simplified to the "skinner box" used in animal experiments to analyze impact of rewards and punishments, and the basis for his model of antecedent, response and consequence. Behavior changes can be motivated either through positive or negative reinforcements, punishments or avoidance.

A key concept for reinforcement of expected behaviors is the interval, or amount of time between two feedbacks, and the ratio or amount of work it takes to earn a reinforcement (Ferster and Skinner 1957).

Skinner's reinforcement general principles are at work in many gamification applications, with positive reinforcement of points and badges, or progression through levels in exchange of certain activities. (Walz and Deterding 2015).

Also this approach helps to analyze the impact of rewards. It doesn't help to capture what is new and specific about gamification which involves more complex emotions related to the "fun" of playing. Reducing gamification to the rewards and points would ignore a whole facet of the phenomena. While external factors such as money or fame can certainly motivate human behavior, emotions are also powerful motivators for behavioral change.

Another interesting perspective to consider is Duhigg's work on habits ("The Power of Habit" 2015). Gamification involves the repetition of desired outcomes, which involves the formation of habits by reinforcing the reward and emotional response of the individuals involved. As per Duhigg, through the motivational mechanisms of reinforcements and emotions, desired outcomes become automatic behavioral processes or habits, forming a behavioral loop that requires less and less cognitive resources as the desired behavior is repeatedly reinforced.

This concept can be connected to the integration concept of SDT, as Duhigg describes how individuals can change their behaviors through progressive integration of behaviors. This can be connected to SDT OIT and the conception of the continuum of internalization. Duhigg theory of habits underlines the time dimension and directs us towards a longitudinal study design to assess whether time would reduce the impact of gamification due to the fading of the novelty effect or strengthen it through the anchoring of new habits which may remain even when the gamification stimulus has stopped.

Also, while those concepts highlight interesting aspects of gamification, they do not capture the specificity of games mechanisms and the breath of the motivation levers and mechanisms provided by SDT. For that reason, I have selected SDT as the main theory I will leverage for analyzing the motivation impact of gamification.

2.9. Conceptual model linking gamification, motivation and IS success

In order to respond to our research question, and leveraging the learning from my first exploratory findings, I have integrated the SDT motivation levers in my initial conceptual model based on ISM.

At high level of conceptualization, ISM posits that quality variables drive usage variables generating net benefits. In this model, we introduce a concept of motivation inspired by SDT, and use SDT lenses to analyze the impact of gamification on both intrinsic and extrinsic motivation. This model posits that game elements are expected to impact Intrinsic and Extrinsic Motivation. Intrinsic and extrinsic motivation themselves will impact Enhanced Use and User Satisfaction. As already stated in the preliminary model, Enhanced use and enjoyment both reinforce each other, and together, they contribute to net benefits at the individual and organization level.

Therefore the modified conceptual model can now be summarized as per following figure 6:

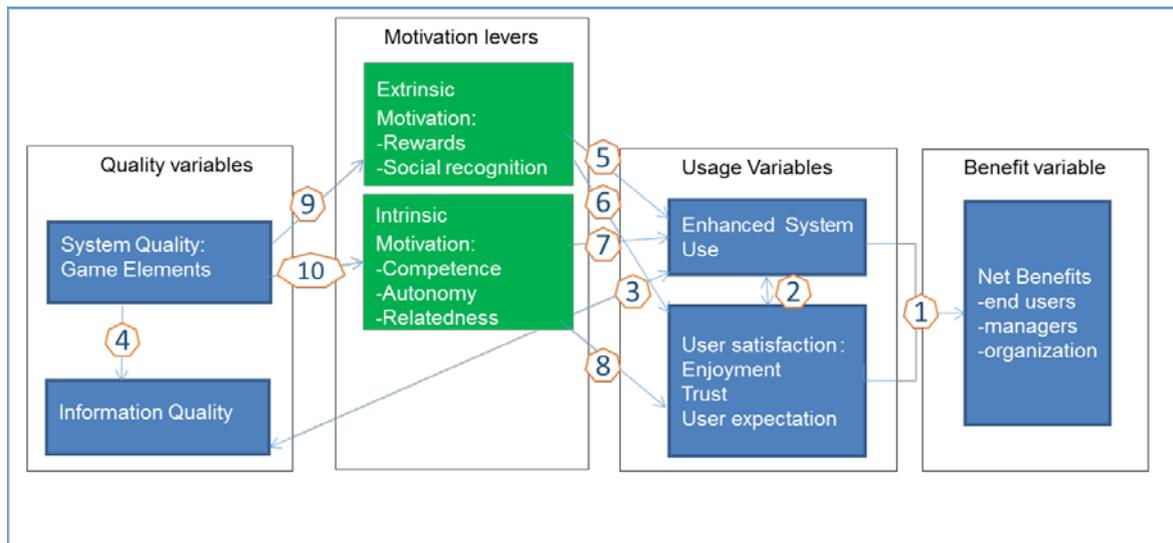


Figure 6: Modified Conceptual model including SDT levers

Proposition 1: (unchanged) Enhanced System Use and Use Satisfaction improves Net Benefits

Proposition 2 (unchanged) Enhanced System Use and User satisfaction reinforce each other

Proposition 3 (unchanged): Information Quality drives Enhanced System use

Proposition 4 (unchanged): Game elements increase Information quality

Extrinsic motivation provided by incentives or rewards offered by management to encourage users to use an IS has been mapped as an organizational antecedent of IS Success. Extrinsic motivation is a strong determinant of Use (Petter, DeLone, and McLean 2013b).

Proposition 5: Extrinsic motivation drives Enhanced use

Extrinsic motivation has been established as a strong predictor for IS success (Petter, DeLone, and McLean 2013b). Even though we lack empirical studies on relationships with User satisfaction, we can hypothesize that the influence of extrinsic motivation on Net benefits happens through User Satisfaction as much as through Use.

Proposition 6: Extrinsic motivation drives User Satisfaction

Prior research suggests that intrinsic motivation can impact usage (Agarwal and Karahanna 2000), (Venkatesh 1999). Empirical research also supports a correlation between enjoyment and system use (Venkatesh and Johnson 2002)

Proposition 7: Intrinsic motivation drives Enhanced use

Intrinsic motivation leads to satisfaction of the human fundamental needs and generate wellbeing and positive emotions (Deci and Ryan 1985b), therefore we expect that intrinsic motivation will be a source of enjoyment.

Proposition 8: Intrinsic motivation drives User satisfaction

Gamification elements may also include monetary rewards or public recognition which can be associated with Extrinsic Motivation (Zichermann and Linder 2010c). Extrinsic motivation may also act as an inhibitor of internal motivation as per SDT, therefore, using extrinsic motivation drivers may result in an ambivalent impact which we assume to result in a net positive impact overall, based on overall positive leaning of previous empirical research compiled in 2 meta-analysis (citation)

Proposition 9: Game elements increase Extrinsic Motivation

Previous gamification research (Aparicio et al. 2012b; Hamari, Koivisto, and Sarsa 2014b) suggests that gamification impacts internal motivation positively by satisfying the human need for Autonomy, Competence and Relatedness.

Proposition 10: Game elements increase Intrinsic Motivation

This conceptual model, integrating two well established theories, at the intersection of the field of Information System and Social Psychology, has guided my data collection and analysis during the second phase of my study and will be informed and further adjusted by the outcome of my research work as presented in section 4.

3. Research Method

To address my research questions with both my researcher and practitioner perspectives, I have chosen an Action Research (AR) design. AR is a type of research that focuses on business problems in their natural settings and which is considered as one of the 4 main type of research in Engaged Scholarship (Van de Ven 2007). I will start by a summary on action research methodology and epistemology prior to discuss how it fits my research questions.

3.1 Action Research methodology

3.1.1. Origin of Action Research

AR has emerged as a structured type of enquiry after World War 2, some predecessors can be identified in the Science in Education Movement in which the scientific method was applied to education, notably in the work of Bain, Boone and Buckingham (Masters 1995). It can also be related to the work of John Dewey, who applied the inductive scientific method of problem solving to the resolution of problems in the fields of aesthetics, philosophy, psychology and education (Dewey, Hester, and Talisse 2007)

Kurt Lewin is often credited as the initiator of AR for his work in the field of social psychology at the University of Michigan. He first coined the term ‘action research’ in his 1946 paper “Action Research and Minority Problems” characterizing AR as “a comparative research on the conditions and effects of various forms of social action and research leading to social action”(Lewin and others 1951). He developed a learning strategy of both engaging with and intervening in the client’s social setting. The foundation of this learning process is the participation of clients in problem solving using systematic methods of data collection, feedback, reflection, and action (Lewin and others 1951).

During the same period, Eric Trist and the Tavistock Institute were other major contributors to the field in that immediate post-war era. Initially they supported the civil repatriation of German prisoners of war, by dealing with psychological and social disorders resulting from battlefield trauma with researchers intervening in experimental cases by changing some aspects of the patients beings or surroundings and studying the effects of those actions (Trist 1976)

A major contribution to the foundations of AR was made by Susman and Evered (Susman and Evered 1978) with a focus on the cyclical nature of AR and the definition of a 5 steps process now considered as the core of canonical AR, and Hult and Lennung produced a very precise set of definitions (Hult and Lennung 1980). This framework has guided my research effort to achieve expected academic rigor and produce relevant knowledge.

From there, two main streams developed, one building on the work of Argyris and Schön (Argyris and Schön 1978) on double loop organization learning, the other converging with System Sciences as combined by Checkland (Checkland 1981). The work of Mumford of ETHICS action-oriented socio-technical information systems development method (Mumford 1983) was first introduced in the field of Information Systems by Wood-Harper, who developed a methodology for system development called Multiview (R. Baskerville and Wood-Harper 1998).

AR is now accepted as a valid research method in many field of social sciences including information Systems to develop knowledge useful to both research and practice (R. Baskerville and Myers 2004) . The importance of AR in the field of Information Systems has been recognized, but the shortage of published AR research has been highlighted in special issues of Information Technology & People in 2001 and MISQ in 2004. Typical instances of AR research are studies of asynchronous groupware support effect on process improvement groups (Kock and McQueen 1996) and design of competence management systems study (Lindgren, Henfridsson, and Schultze 2004).

3.1.2. Definition of Action Research

As per Rapoport (Rapoport 1970), AR aims to contribute both to the practical concerns of people in an immediate problematic situation, and to the goals of social sciences by joint collaboration within a mutually acceptable ethical framework. An Action researcher introduces change to resolve a practice problem and regards change as an important outcome of the research effort (Susman and Evered 1978), which resonate perfectly with my objectives as practitioner researcher.

One of the most thorough definition of AR has been provided by Hult and Lennung (Hult and Lennung 1980) as follows:

“Action research simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhances the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change process in a social system and undertaken within a mutually acceptable ethical framework” (p247).

AR is sometimes chosen by practitioners-researchers to conduct research in their own organization aiming to produce actionable knowledge useful for their organization, other practitioners and the academic community (Coghlan 2007).

They are several forms of Action Research, including Canonical AR, Information System Prototyping, Soft Systems; Action Science, Participant Observation, Action learning , Multiview, Ethics, Clinical field work and Process consultation (R. Baskerville and Wood-Harper 1998). I selected the canonical AR (CAR) method as the most widely adopted in social sciences (Davidson and all 2004) and as a way to increase rigor in a positivist sense with an iterative approach (Kock Jr, McQueen, and John 1997).

3.1.3. Canonical Action Research

Canonical Action Research (CAR) methodology achieves a great level of rigor and relevance by an iterative process which implies the collaboration of the researcher and the client. Principles of CAR methodology have been consolidated in 2004 (Davison, Martinsons, and Kock 2004).

The Principle of researcher –client agreement ensures the full collaboration during the research process, and involves distinct but compatible objectives. The principle of cyclical process improves rigor by progressing through a sequential and systematic manner. The principle of theory highlights the importance of using academic theories to guide the intervention and relate the findings to academic conversation. The principle of change through action is one of the main differentiations of AR versus other qualitative enquiries. And finally, the principle of learning through reflection, to identify implications for other situations and research contexts.

CAR process include 5 phases repeated in each cycle

1. Diagnosis refers to a joint identification of the problem
2. Action planning refers to specification of the action
3. Action taking refers to the execution of the intervention
4. Evaluation consists in a joint assessment of the outcome
5. Reflection and specifying learning

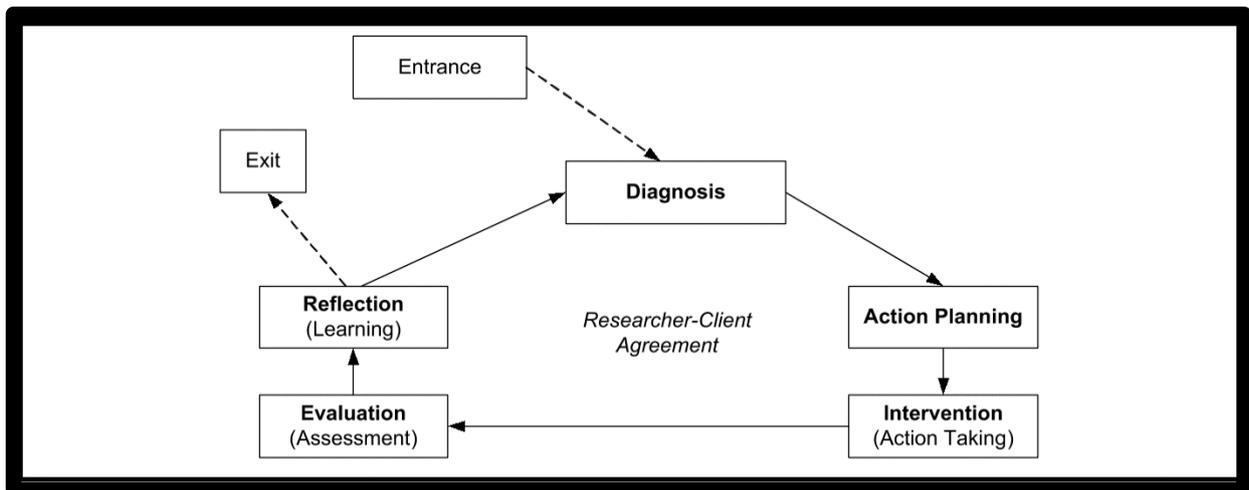


Figure 7: CAR Process Model (Based on Davison et al. 2004; Susman and Evered 1978)

CAR is considered as a rigorous design for AR as it allows the strengthening of research findings by building on evidence gathered in the previous iteration of the AR cycle (Kock Jr, McQueen, and John 1997).

3.1.4. Epistemology of Action Research

AR has been emerging in reaction to positivism's perceived shortfalls in social sciences. Lewin was concerned with the limits of traditional approaches for helping to solve critical social problems and wanted to study how social change can be facilitated. However AR as such can be seen as a methodology rather than an epistemology and underlying epistemological assumptions can be positivists, interpretivists or critical in nature (Klein and Myers 1999).

AR can be labeled as a post-positivist social scientific research method (R. L. Baskerville and Wood-Harper 1996). Post-positivism has positivist roots, but with greater acceptance of some researcher's influence on what is observed while knowledge is based on human conjuncture rather than intangible truth. Action research assumes that human organizations can only be understood as whole entities and its complexity cannot be reduced (R. L. Baskerville 1999) The researcher is part of the study and his personal understanding will invade the recording of observations and deduction that follow. Knowledge produced is valid in a specific social setting, and the same stimulus in a different setting may produce a different response.

This point of view is particularly relevant in the case of gamification, which can take many different forms and purposes. I intend to conduct my research as an Insider AR, being an actor of the process I study, and influencing the reality observed by my actions and my pre-understanding. My research work aims to lead to a detailed understanding of a specific gamification experience in a particular context, from which my influence cannot be isolated nor fully controlled as per a lab experiment. Although some of my conclusions can be extrapolated to similar contexts, my intent is not to reach a general truth but rather to participate in the current academic conversation with some valid but situated insights.

AR is also described by Susman and Evered as using an interpretative philosophical framework (Susman and Evered 1978). Since action researchers adopt an interpretive approach, they should also adopt qualitative analysis as the methodology best suited to adhere to the cognitive structure of subjects (R. L. Baskerville 1999). In my case, I used a qualitative enquiry including semi structured interviews and focus groups, triangulated by quantitative information on CRM use.

As research is conducted through change experimentation, it is also an empirical in its method and can be related to Pragmatism underlying tenets (R. Baskerville and Myers 2004). In particular, AR shares with Peirce (1839-1914) the idea that human concepts are defined by

their consequences, with James (1842-1909) that truth is embodied in practical outcomes and that human thought can only be revealed in human action, with Dewey's (1859-1952) that it is controlled enquiry from formulation of the problem to determination of a solution through reasoning, and experimentation, and with Mead (1862-1931) the conviction that the social settings will shape human actions.

In summary, from post-positive epistemologies I will take the cumulative nature of sciences and the imperative need to build on previous academic knowledge, the importance of the social setting and the concern to limit as much as possible the unavoidable influence of the researcher on his field of research. From pragmatism epistemology I will use the principles of experimentation through change, and the concept of assessing the value of those changes through the reality of their outcomes.

3.2 Applying AR to my research problem

3.2.1. Fit of research design with my research question and field access

Engaged Scholarship offers several forms of design. As per Van de Ven (Van de Ven 2007), in order to select an appropriate method, you need to consider 2 main dimensions in a 4x4 model. One of the dimensions is the type of question – is the purpose to describe or explain or is it to design a solution or a policy. The second dimension relates to the position of the researcher, as an external observer or from inside. In this research, I was clearly in the bottom boxes of the square, in box 2 or 4, both having some practical merits and bringing some contributions to academic conversation.

		Research Question/Purpose	
		To Describe/Explain	To Design/Intervene
Research Perspective	Detached Outside	Basic Science With Stakeholder Advice 1	Policy/Design Science Evaluation Research For Professional Practice 3
	Attached Inside	Co-Produce Knowledge With Collaborators 2	Action/Intervention Research For a Client 4

Figure 8: Alternative forms of engaged scholarship. Source: Van de Ven (2007: 27)

In the early phase of this research investigation, I considered a “box 2” approach, with a positivist experimental design, introducing gamification as a quasi-experiment (Shadish, Cook, and Campbell 2002), yet defined as an experiment – studying of interventions is deliberately introduced to observe its effect – in which units are not assigned randomly to a condition.

While working along that path, I faced some issues that drove me to reconsider my design approach and reformulate the research question with a more interpretivist mindset.

At first, I couldn't match the design criteria for a full experimental design which requires random sampling of the participants and full control of the environment. In my case, I needed to work with volunteering managers who were interested in the gamification concepts and willing to invest time and energy in the experiment. In addition, the experiment would last over a period of time when I would not be able to control other parameters as it would then happen in a real business environment and not in a lab.

Second, I was faced with the problem of reflexivity since my role as the researcher and as the leader of the organization under study was generating some potential serious bias, especially if I needed to put pressure on the participants to complete the survey in order to ensure sufficient data for later solid statistical analysis.

Thirdly, my field of study was very specific, in a single organization, with a young population, and that would question the generalization of my findings. While progressing in

my work, I became more and more aware of the importance of the social setting while exploring the impact of gamification.

On the other hand, these weaknesses become fundamental part of research design when approaching the problem with AR, positioned in box 4 of Figure above. As per Baskerville and Wood-Harper (R. L. Baskerville and Wood-Harper 1996), the ideal domains for AR are where:

- the researcher is actively involved, with expected benefits for both the researcher and the organization
- the knowledge obtained can be immediately applied
- the research is a cyclical process linking theory and practice.

In an AR design, the intervention of the researcher is not a threat to research validity but part of the design as it is expected that the researcher will introduce change. Being at the same time in the research team and a stakeholder for the research has ensured alignment of objectives between the researcher and the organization. It has allowed both advancing research in the field of IS and testing and probing for my company a potential solution to improve SFDC implementation success, and beyond, greater return from utilitarian Information System. AR will allow a strong collaboration and a potential for immediate application in the organization and across the participating company.

Also, as AR findings are clearly situated in a given social context, generalization is not a primary objective for the research even if it can lead to knowledge which can be applied in similar contexts.

My research questions also have other characteristics that make AR a very adapted approach. First, while AR aims to solve current practical problems by expanding scientific knowledge, in my case the practical problem of lack of CRM diffusion in work practices results in limited return from information systems investments. It must be noted that my literature review resulted in a set of theories and concepts which I have mobilized to analyze the impact of the change introduced with gamification. Finally, my project operationalization includes two cycles, with learning and adaptation in between.

Within AR design, I selected canonical research for the rigor of the cyclical process and clear evaluation metrics. CAR offers characteristics of rigorous research if it stick to its discipline construct of activities, including cyclical theoretical infrastructure, data collection and evaluation.(R. L. Baskerville and Wood-Harper 1996). I have conducted my research

applying this framework in two cycles, and evaluated my work according to CAR principles described in a following section.

While using the CAR principles as guide to my research work, I need to nevertheless acknowledge and account for potential limits of AR research in IS, as identified by Kock et al. (Kock Jr, McQueen, and John 1997), when considered from a positivist perspective.

The first limit resides with the contingency of the research findings. As my AR is conducted in a specific organization, conclusions are not generalizable across different types of organization or use cases.

The second limit is related to the low control on the environment, and therefore the research design will not allow me to isolate precisely particular variable and measure precisely its influence on a causal model.

The third limit relates to the risk of personal over-involvement, which may introduce bias in the conclusion. This particular limit is reinforced in my case by the specific setting of Insider Action research described in the next section.

3.2.2. Research field

The study has been conducted in the organization I personally led, within Hewlett Packard Enterprise (HPE). HPE is a global company providing a broad range of IT solutions, including hardware, software and services, to companies who wish to modernize their IT and take advantage of digital transformation to accelerate their business. Within HPE, my organization's mission is to sell a broad range of relatively simple HPE's IT solutions to B2B clients of all size in Europe, Middle east and Africa. It operates from 3 sales centers, with most of the interaction with clients taking place over the phone, and limited face to face interaction.

The organization studied, named Inside Sales Europe, Middle East and Africa, comprises 700 individuals located in 4 main locations in Europe. The employee base of this organization is pretty young, with an average age of 31 years old, and typical background of higher education in business management or IT.

This organization, as well as the rest of HPE sales force, has been using a core utilitarian system for several years, a CRM from SFDC implemented across the whole HPE Company. SFDC was introduced in 2012 as a replacement of Siebel CRM, with high expectations regarding user adoption and productivity improvement. Much greater ease of use, mobility features, and greater self-service reporting capabilities for managers were expected to help achieve those objectives. It was also expected to be a communication media to engage with other members of the sales team through the embedded chatter functionality.

However, two years later, the CRM was still considered by most sales people as a bureaucratic system. Many users felt that documenting the CRM takes a lot of time away from more rewarding tasks rather than consider it as a tool to assist them in the various steps of the sales process, and provide them all the information they need to do their job. The case is therefore well situated in the post adoption phase of an IS. The CRM works but has not reached its full potential yet from the stakeholders perspective. It has not faced any other major transformation in its core functionalities during the research.

In agreement with HPE stakeholders from Global sales and Business IT, I planned to introduce gamification features to the SalesforceDotCom (SFDC) CRM. In addition to my research purpose, from a stakeholder's perspective, the experiment is also a pilot phase to test the impact and return on investment of gamification features, before making a decision to adopt it – or not – on a greater scale. The gamification tool selected for the test has changed in the course of the project and will be described in section 4.

My own involvement in the project will be both from a stakeholder's perspective, amongst other company executives, and from a researcher's perspective. This specific context of AR, sometimes called Insider Action Research (Coghlan 2007) allow the manager-researcher immersed in the studied organization to call on his pre-understanding from being an actor in the process studied.

My insider position gave me the advantage to understand in details the environment of the pilot, the internal jargon, processes and values of the organization. I nevertheless run the risk of being influenced by my preconceptions in the interpretation of the data, so I paid specific attention to the interpretation of the information shared to avoid over-interpretation and stick to the information captured. This requires a rigorous introspection to expose underlying assumptions (Coghlan 2007).

This combination of the action research role and management role can also create potential conflict with hierarchy or ambiguity for fellow organizational members. In my case, the topic of my research didn't carry a heavy political charge and my level of autonomy allowed me to conduct the study with minimum political interference. My personal participative management style and open door practice has also helped me to establish the dialog with project participants. During the interaction with project team and project participants, I have made specific efforts to create a non-threatening and open atmosphere to minimize the impact of my personal status and reduce possible alteration of the objectivity of the data collected.

3.2.3. Project process and timeline

My research has been conducted in two cycles as per Figure 9.

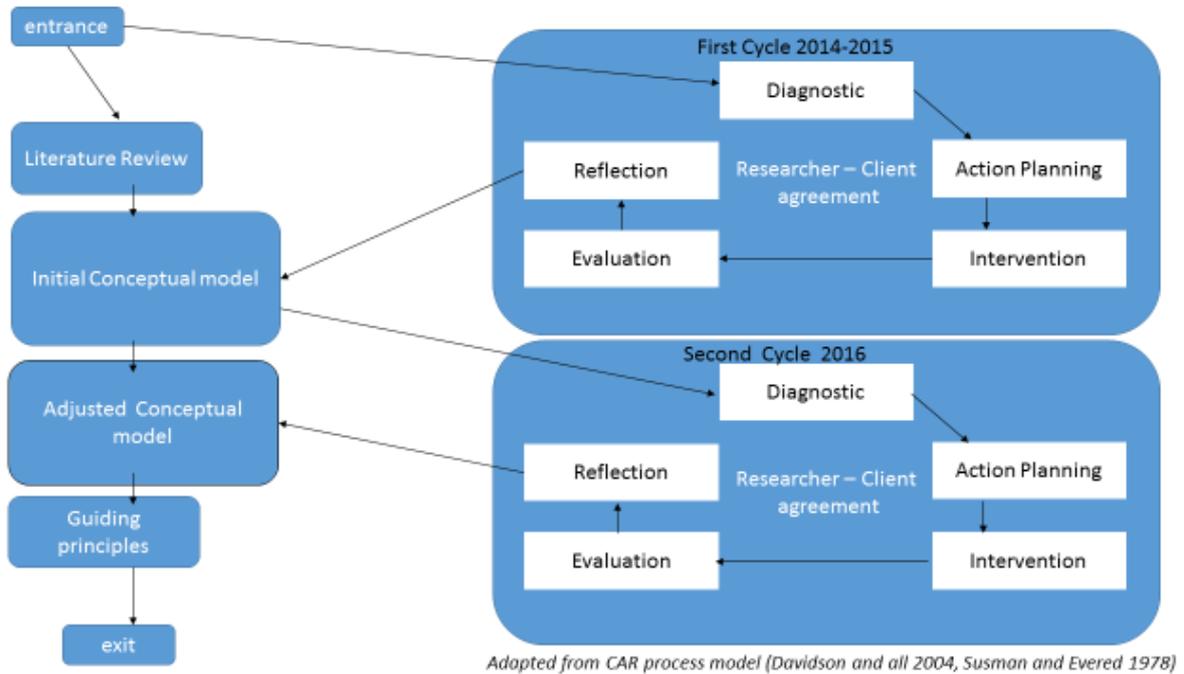


Figure 9: Research design summary and timeline

The investigation on gamification of CRM post adoption started in spring 2014 while I gained support from my internal stakeholders for a gamification pilot. I decided to approach this project not only from my usual manager's perspective, to achieve expected business results, but also from a researcher's perspective, to produce actionable academic knowledge. While already initiated during the summer of 2014, the researcher-stakeholder agreement for a gamification pilot based on Bunchball software requires several loops and was finalized late in the action planning phase, in March 2015. The first intervention took place from June 2015 to October 2015, in an exploratory mode as my literature review was still in its early phase. The first phase was inconclusive due to several issues I will develop in section 4, however I gathered some information which, combined with my complete literature review informed the conceptual model presented in section 2.9.

I reached a revised researcher agreement in February 2016, with another round of pilot now leveraging the software from Level eleven as we couldn't easily resolve the issues identified in the first cycle with Bunchball software. The software testing was done with more diligence in the second cycle, and the actual release of the features to users happened in September 2016. The design of the pilot as well as my research interviews and focus groups

have been designed on the basis of the conceptual model, which I expect to confirm or amend depending on the findings from my inquiry. The intervention phase started in September 2016, with ongoing evaluation during implementation. While the gamification pilot was still in progress in the organization, I considered that I had collected sufficient data, reaching saturation in my last interviews in March 2017, and I started the evaluation in April 2017. As a result of this analysis and reflecting on the information emerging from the field work, I have adjusted my initial conceptual model to reflect this information from AR. Timeline of the AR project is summarized in following figure 10.

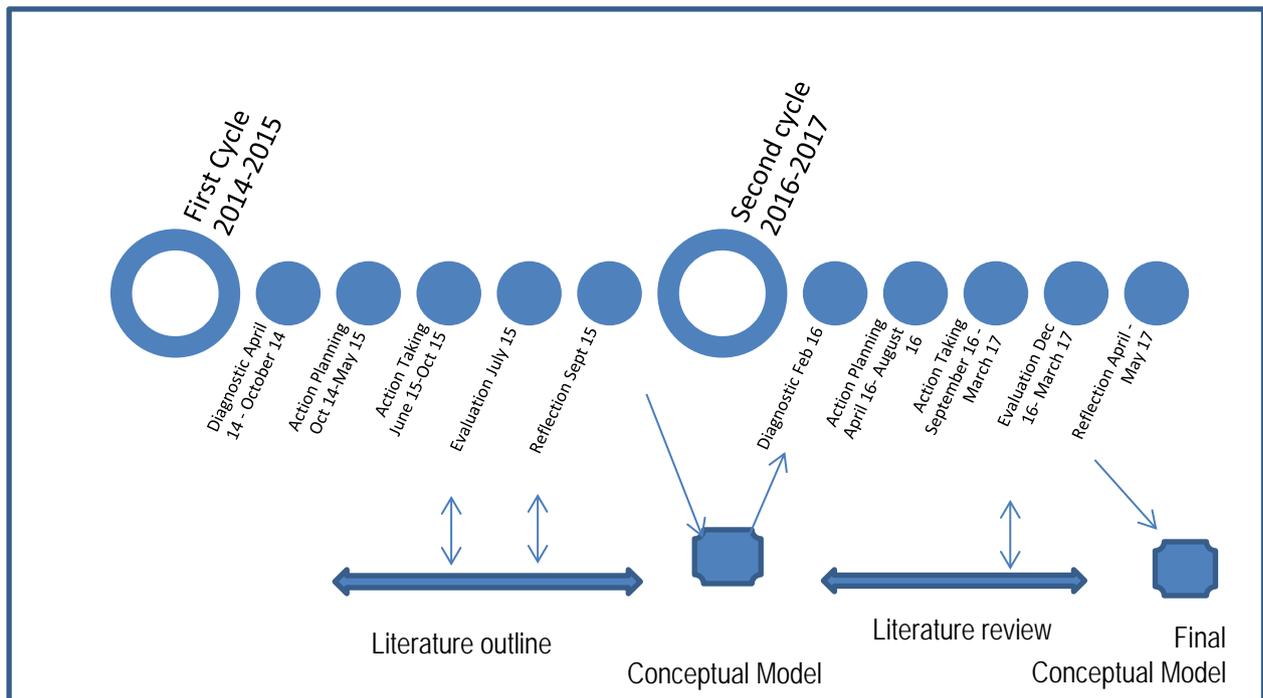


Figure 10: Timeline
summary AR cycles 1 and 2

3.2.4. Qualitative data collection and analysis

During Cycle 1, a subset of the team, including 72 participants, from 3 locations: Erskine (Scotland), Prague, Barcelona, were in scope to see their CRM enriched by gamification features. The pilot included entire teams of 8 to 12 members, all covering the SMB customer segments and holding similar job roles. The average age was 28 years old, the gender mix 75% male and 25% female, and the average seniority in the company 24 months, which was fairly representative of the overall organization which was relatively recent, created in November 2013 with a large proportion of external hiring of graduates and early career professionals. Demographic information is included in appendix 1.

In this phase of the research, I conducted one focus group and 12 exploratory interviews with first line managers and end users available during my visits and selected by local project managers. The gender mix in the interview list at 74% male, 26% female, is close to the mix of the targeted population (75%-25%). I conducted those interviews with an interview template of broad questions related to their perception of the CRM before and after the gamification, their perception of the gamification pilot and suggestions for improvement. At this stage, this template was not yet related to the conceptual model, which was constructed later in the research work. Average duration per interview or focus group was 31 minutes. List of interviews with information on participants and duration is included in appendix 2.

In the proceeding of the research, I followed carefully the recommendation from Coghlan on insider's research (Coghlan 2007) to produce rigorous academic results. One of the risks related to insider position comes from the social constraint and desirability, if information provided in interviews is influenced by the participants desire to please me or impress the leader of the organization. In order to limit this risk, first, I didn't select the individuals myself, but required the local project manager to find a mix of profiles including early adopters and individuals more reluctant to change. Interviewees were offered the option to accept or decline the invitation without my knowledge nor justification, to ensure that they contributed voluntarily and not under social pressure. Then, to further limit this bias, I clearly positioned myself as a researcher on this particular topic working on a personal project, and positioned the interview as fully voluntary and confirm their agreement to proceed. I didn't fully disclose the specific research questions, so it was not clear to them whether their answer would please me or not, and I maintained a neutral attitude to avoid giving them clues regarding what I was looking for.

In this setting, also I followed the recommendations from Fontana and Frey for unstructured interviews (Fontana and Frey 1994) . From my insider position, I understood the language and culture from the respondents and I was naturally part of the setting. I also established trust and confirmed the private nature of the discussion, and established rapport I made sure the set up in the room was fairly informal, and when possible used a dress code more casual than my normal business style. I started the conversation with small talk prior to recording to make the atmosphere as relaxed as possible and non-threatening. I always asked for explicit permission for recording the sessions. I started my interviews with factual questions with low emotional implication before moving to questions more revealing about the interviewee when they were well engaged in the conversation.

Despite all these efforts, I have certainly not fully controlled the impact of my dual role of researcher and manager, however I have most likely minimized it. As the data was fairly limited and exploratory, I didn't perform a structured coding but picked directly some significant quotes from interview transcripts and grouped them by themes.

For Cycle 2, I implemented some different gamification software, with characteristics supporting recommendations from cycle 1 and with a larger user group as the budget, funded by the corporation, allowed for a higher number of licenses.

Thanks to the integration potential of the soft telephony platform in the gamification application providing additional features, I decided to make this telephony integration a requirement for the second pilot but they couldn't implement the second pilot in the Barcelona site as it was not equipped with this telephony platform. Therefore the pilot was run only in Erskine and Prague, with a total of 159 users across the 2 sites, fairly distributed between the 2 sites. The teams selected for the pilot were still covering SMB customers segment as for cycle 1, and we added the teams covering Public Sector in Erskine and Commercial and Public Sector in Prague

In cycle 2, the average age was 30 years old, and the average seniority 31 months which is consistent with the 2 years interval between the 2 pilots which resulted in a slightly more mature organization. The gender mix, with 32% of female, reflects the efforts deployed during the interval to improve the gender mix of our hiring. Details of the demographics are included in Appendix 3.

I have run 6 focus groups and 42 interviews during this second cycle, and recorded close to 900 minutes of discussion. The total number of participants was 96, including a few individuals participating twice, at different times of the project. The gender mix in the participants is 71% male, 29% female, close enough to the gender mix of the group (68%-32%). I decided to run interviews at different phases of the project, starting during the action planning and continuing during the intervention and evaluation, as I wanted to approach this second cycle with a longitudinal perspective.

All participants, with a single exception, had experienced a gamification tool before the discussion took place, 2 of them only with Nitro at the beginning of cycle 2, most of them with Leveleven (35) or a mix of the 2 (10). The Table showing participants experience per interview is included in Appendix 6. The majority of interviews (62%) took place during the Action Taking intervention phase, some (26%) in the Action Planning phase and a few (12%) at the end of the project, with a reflective focus. See details in Appendix 11.

Selection was done by local project leads, with the request, when the leaderboard was implemented, to select 1/3 of the participants in the top of the leaderboard, 1/3 in the middle, and 1/3 at the bottom. In the course of the project, I also interviewed all the first line managers involved.

I applied same guidance from Fontana and Frey (Fontana and Frey 1994) as in cycle 1. Interviews were done with volunteers and recorded with their active consent. I applied the same tactics to make the interviews non-threatening and without professional consequence. The discussions with managers in the early stages helped the project to progress too and some of the ideas emerging in the focus groups triggered actions from others managers to test new ideas with their teams which participated to the momentum around the gamification project.

To prepare my interviews, I have defined a set of topics to cover in semi-structured interviews and focus groups, but didn't follow a constant interview guide. I rather adapted my questions to the flow of the discussion, to the role of managers vs. users, and to the progress of the implementation at different points in time and with different teams. Interviews were relatively short, with an average of 18 minutes, starting the recording after small talk. This short duration is a benefit coming from my insider position which means that I know the role and position of interviewees already and implies that I understand all the internal jargon, therefore needing less clarifying questions than I would otherwise. Aware of the risk linked to my pre-existing knowledge (Coghlan 2007), I was particularly careful not to over-interpret the answers I captured, and asked additional questions when answer could carry different meaning.

In order to analyze the qualitative data collected, I used nVivo software version 11 to code the information. I started with coding derived from my conceptual model and added new categories to capture new concepts emerging from the field data analysis. My final node structure is described in Appendix 7 and the case structure in Appendix 8.

3.2.5. Quantitative data collection and analysis

In both cycles, I triangulated the qualitative information collected through interviews with quantitative analysis of data recorded in the CRM during the gamification pilot.

During cycle 1, the pilot was set up with a small user group and a control group. I collected information from Nitro gamification software during a silent period of 2 months and then during the tool's live period, in the format of points acquired by each user from pilot group and control group. While Nitro challenges included metrics and challenges both on business

goals and SFDC featured utilization, my analysis focused mainly on SFDC features. The results of this analysis is presented in section 4.1.4.2.

For cycle 2, the extension of the pilot group reduced the option to run a comparable control group. Indeed, the rest of the users on the 2 targeted sites were working in different business segments and wouldn't have been fully comparable while I couldn't capture the same information in Barcelona due to the missing telephony platform. Therefore the quantitative analysis could only be done comparing before and after, rather than pilot and control groups. The data analyzed was collected directly from LevelEleven for part of it and from SFDC for the rest.

The following table summarize qualitative and quantitative data collection and analysis from both cycles.

	Cycle 1	Cycle 2
Sample	72 participants in 3 locations	159 participants in 2 locations
Gamification Tool	BunchBall Nitro	LevelEleven
Average age	28 years	30 years
Gender	75% Male, 25% Female	68% Male, 32% Female
Qualitative data sources	12 exploratory interviews, one focus group	42 semi structured interviews and 6 focus groups
Coding	Manual	Nvivo
Quantitative data sources	SFDC usage of gamified features	SFDC usage of gamified features
Control group	Silent monitoring prior to gamification. Control groups on same site not using gamification	SFDC usage outside of and during contests involving SFDC usage gamification

Table 11: Summary of Quantitative and Qualitative data collection and analysis

3.2.6. Evaluation of AR design

I will rely on evaluation criteria established by Davison et al in 2004 which have been specified for canonical AR and described in a previous section. I have completed a pre-evaluation of the research design between the 2 cycles, and at the end of the second cycle. This evaluation is captured in following table 12.

1 - Principle of Researcher-Client agreements

Criteria	First evaluation	Second evaluation
1a Did both the researcher and the client agree that canonical action research was the appropriate approach for the organization situation?	The agreement to allow me to run a research based on gamification pilot has been formally achieved with my employer early in my doctoral course My manager-researcher status simplified the Researcher-Client agreement on the design of the research.	
1b Was the focus of the research project specified clearly and explicitly?	I started the first cycle with an exploratory approach, my research model and question was progressively shaped during the first cycle	The focus of the research was clearly formulated as a result from first cycle learning
1c Did the client make an explicit commitment to the project?	Beyond my personal commitment as manager-researcher, my company has also agreed to fund 2 gamification application pilots and staffed the IT project team	
1d Where the roles and responsibilities of the researcher and the client organization members specified explicitly?	The project team had permanent members with a clear charter and less clearly defined support roles. My researcher role was clearly explained and defined to project team	The project team structure was clarified between the 2 cycles and confirmed in a meeting at the beginning of the second cycle
1e Where project objectives and evaluation measures specified explicitly?	We defined distinct but overlapping objectives for business stakeholder and academic contributions. Business objectives were to measure return on investment for gamification and recommendation to expand or disengage. Academic contribution was not defined very specifically initially as I started with an exploration phase.	Project objectives and evaluation measures were clearly defined at the beginning of the second cycle, still distinct and overlapping. Academic objectives were very specific and based on the conceptual model defined during and after the first cycle.

Researcher – Client was reached in both cases with clarity of the pursuit of separate but overlapping goals on the client side and on the research site. My position of researcher and manager of the organization gave me a lot of freedom to shape the project to support both goals.

2 - Principle of the cyclical process model

Criteria	First evaluation	Second evaluation
2a Did the project follow the cyclical process model or justify any deviation from it?	My project encompasses two cycles following canonical AR process with information from the first cycle embedded in the design of the second cycle	
2b Did the researcher conduct an independent diagnostic of the organization situation?	The decision to change the CRM to add gamification features was the result of the researcher's diagnostic as a manager and interest as a researcher	I conducted a diagnostic following the first cycle collectively with the project team
2c Where the action planned based explicitly on the results of the diagnosis?	Yes, insight gained in the diagnostic phase informed the intervention in both cycles	
2d Where the planned action implemented and evaluated?	Yes, the gamification pilot was implemented and evaluated in both cycles	
2e Did the researcher reflect on the outcome of the intervention?	We evaluated the outcome of the first cycle in collaboration with the project team	I evaluated the outcome of the second cycle when I considered I had collected enough information for my research purpose. The Pilot is still under way and final business evaluation will take place later on.
2f Was this reflection followed by an explicit decision on whether or not to proceed through an additional process cycle?	After the disappointing outcome of the first pilot, the additional cycle was discussed and approved including additional funding	Yes, the decision is to not proceed with an additional cycle
2g Were both the exit of the researcher and the conclusion of the project due to either the project objectives being met or some other clearly articulated justification?	N/A	The reason to finalize the research work is that the findings from the first 2 cycles allowed us to address the 2 research questions

The project has followed the canonical design with two cycles, each of them following the 5 steps, and ended when the information collected was sufficient to address the initial research questions.

3- Principle of Theory

Criteria	First evaluation	Second evaluation
3a Where the project activities guided by a theory or set of theories?	The first cycle started in an exploratory way, allowing me to I test the SDT concepts and confirm their relevance in the context of gamification. ISM theory was introduced as a basis for my conceptual model as a result of the first cycle.	The second cycle was informed by my conceptual model combining ISM and SDT
3b Was the domain of investigation and the specific problem setting relevant and significant to the interest of the researcher's community of peers as well as the client?	The gamification pilot attracted significant interest from business stakeholder funding the two pilots. It was also very relevant to me personally and generated interest from fellow academic students and from the faculty in front of whom I defended my research topic and proposal	
3c Was a theoretical based model used to derive the causes of the observed problem?	I initiated the first cycle prior to defining my theoretical model	The conceptual model was based on findings from the first cycle, and adjusted to reflect the findings from the second cycle
3d Did the planned intervention follow this theoretically based model?	N/A	Yes, the semi structured interviews used in the second cycle were build following the conceptual model
3e Was the guiding theory or any other theory, used to evaluate the outcomes of the intervention?	The first cycle outcomes were inconclusive both from the stakeholder and the academic points of view	The concepts of SDT at the core of the conceptual model have been the main lenses (viewpoints ?) to analyze and understand the information collected

The project has been conducted in two cycles. The first cycle was exploratory and contributed to the selection of the most pertinent theories and concepts to approach the research questions. Based on the learning from cycle 1, a conceptual model was built and used to frame the second cycle evaluation, while still allowing concepts to emerge. The model was then refined to reflect findings from cycle 2.

4 - Principle of Change through Action

Criteria	First evaluation	Second evaluation
4a Were the researcher and client motivated to improve the situation?	My combined manager-researcher position doubled my motivation for this project	
4b Were the problem and its hypothesis causes specified as a result of the diagnostic?	I was faced with a behavioral problem towards CRM in my management organization, common to many sales organizations, and rebellious to traditional approaches	The short falls from cycle 1 have been evaluated in the learning phase and input to the diagnostic of cycle 2
4c Were the planned actions designed to address the hypothesized cause(s)?	Gamification is intended to motivate individuals to change behaviors and therefore addressed the problem.	
4d Did the client approved the planned actions before they were implemented?	The gamification action was approved and funded by my organization	
4e Was the organization situation assessed comprehensively both before and after the intervention?	The organization situation was very well known prior, during and after the intervention due to my insider position	
4f Where the timing and nature of the actions taken clearly and completely documented?	The project plan has been fully documented during the 2 cycles	

The research was framed around the action to introduce gamification to improve CRM infusion. This action was taken in cycle 1 with a first pilot and again in cycle 2 with a second pilot.

5 - Principle of Learning through Reflection

Criteria	First evaluation	Second evaluation
5a Did the researcher progress reports to client and organizational members?	In my specific case I was both the researcher and the main stakeholder. The other client stakeholders in the organization were regularly informed by the project manager in charge	
5b Did both the researcher and the client reflect upon the outcomes of the project?	A debriefing for the first pilot has taken place including project team, funder and researcher	The debriefing for the second pilot with the other client stakeholders will take place at the end of the pilot

5c Were the research activities and outcomes reported clearly and completely?	The research activities are documented in this document and will be shared with client stakeholders	
5d Where the results considered in terms of implications for further action in this situation?	The first cycle was not conclusive.	Design principles are included in the learning section of cycle 2
5e Where the results considered in terms of implication for action to be taken in related research domains?	This step has not been considered yet as the results have not being published yet	
5f Where the results considered in term of implication for the research community?	Those considerations are including in the contribution section of this document	
5g Where the results considered in term of general applicability of canonical action research?	Those considerations are included in the contribution section of this document	

The research includes a learning section and consideration on contribution to academia and practice.

Table 12: CAR Evaluation Model (Davidson and all 2004)

4. Research implementation and Results

4.1 First cycle AR

4.1.1. Diagnosis

I started the first AR cycle in April 2014. While a new CRM was fully deployed across the company for more than a year, I was confronted to disappointing scores in adoption metrics across my organization as well as more generally in the region. All traditional recipes have been mobilized in the roll out of the application, including senior leadership vision, commitment and exemplary use of the information from the tool, training, user groups leveraging social communities, mobile solutions, and inclusion of metrics in performance dashboards. It was clear that changing behaviors and habits would take time and effort despite the greater user interface of the new application.

From discussion with the internal IT department the idea emerged to test gamification as a concept getting some traction in the industry, and specifically in the Silicon Valley where HPE has his headquarters. Gamification was a topic mobilizing interest with believers and detractors and a clear desire to explore and assess its potential both for IS adoption and work performance. Another department in a different business unit has already started to test the Bunchball Nitro application in their sales centers to drive productivity and was encouraged by

initial results. My own organization had tested some features relatively closed to gamification including user recognition through badges prior to my appointment as the leader of this organization.

Thanks to my interest and willingness to engage in the project, and the appropriateness of my organization to test expected gamification outcomes, my organization was selected for the test of a gamification solution connected to company CRM. The shareholder agreement was that the funding for a pilot would be provided by the IT department so that my organization could experiment the solution during a period of six months and provide benefit analysis in the form of a return on investment, learning and recommendation for further adoption. At this stage, in October, we decided to select Nitro, the gamification solution of Bunchball based on its technical characteristics allowing full integration in SFDC, and on the previous experience of the solution within our company. Bunchball was able to provide additional sidebar in the CRM application, and to use information captured in SFDC by the sales team in their normal activities to generate points, badges, teams and individual leaderboards.

Nitro for Salesforce



SFDC persistent sidebar

- Points Total
- Featured Challenges
- Team Summary

Nitro tab

- All your Challenges
- Points Total
- Badges
- Team Standings
- Leaderboards

Figure 11: Screenshot of Bunchball integration in SFDC CRM from HPE.

This extended diagnostic phase took place between April and October 2014, and was conducted in 8 conference calls, rather than face to face meeting due to the distribution of participants in several countries on both side of the Atlantic. Data source was internal information on CRM deployment and adoption, and external information on gamification

solutions available in the marketplace as well as business and consulting articles and books published on gamification (Werbach and Hunter 2012; Paharia 2013; Burke 2014).

4.1.2. Action planning

Action planning involved a number of participants to join the project team, as described in the table below, and took place during October 2014 and Mai 2015. While the decision and selection was relatively fast, from the very first discussion in April to the final decision and commitment in August, the action planning took longer than expected as we faced unexpected issues to connect the gamification application with the CRM information, and bandwidth issues with the IT project team involved in the meantime in a major effort triggered by HP's decision to split into two companies.

My personal research commitment was shared and agreed during that phase, in March 2015. I was able to combine this professional project with an academic investigation, providing additional insights and rigor to the project and learning. Also academic progress was not initially the driver for the project from the company's perspective, I didn't face any objection but rather interest to apply rigorous research design this work, and share back the information with the project team. Clearly my research objectives were overlapping but partially different from the business objectives. While the business objectives was primarily focused on analysis of outcomes and recommendations, my research objectives also included a deeper understanding of the mechanisms at play and conditions of success.

My own role in the project was then both a business sponsor, and manager of organization receiving the gamification application, and researcher. The following table 12 lists the members of the project team and their role either in the Europe, Middle East and Africa team (EMEA) or in the Worldwide (WW) team.

Name	Role	Region	Company / Area	Comments
Susan	EMEA Project Lead	EMEA	EMEA Inside Sales	
Kevin	WW Project Lead	WW	WW Sales Strategy & Operations	Replaced Dan July 2015
Catalin	EMEA Project Team	EMEA	EMEA Sales Operations	Replaced Ric Aug 2015
Gerlinde	EMEA Project Team	EMEA	EMEA Sales Operations	Replaced Rachel Aug 2015
Christine	WW Capability Lead	WW	WW Sales Strategy & Operations	Joined Aug 2015
Marie	Bunchball Account Manager	WW	Bunchball Account Manager	Replaced by Dawn L July 2015
Sean	Bunchball Project team	WW	Bunchball	
Alice	EMEA Sponsor & Researcher	EMEA	EMEA Inside Sales	

Figure 12: Project team involved in cycle 1

In the project team, Inside Sales organization, sales strategy and sales operations were well represented, and the link with the internal Information Technology (IT) organization was expected to happen through Sales Operations. This lack of direct involvement of IT was a root cause for problems that we experienced during the planning and execution phase, related to software integration between SFDC and Nitro. In addition, several organization changes took place during the project, including a major company spin off which mobilized most of IT resources and generated a number of role changes in the course of the project, with an impact on the planning phase duration.

Gamification objectives were discussed in the light of vendors input as well as consulting and business articles and books which flourished on this topic. In this initial cycle, contribution of academic theories was limited, nevertheless, emphasis was from the beginning given to employee motivation to mobilize human drive and achieve business priorities related to CRM adoption and sales productivity. Figure 13 shows internal communication of gamification project objectives.

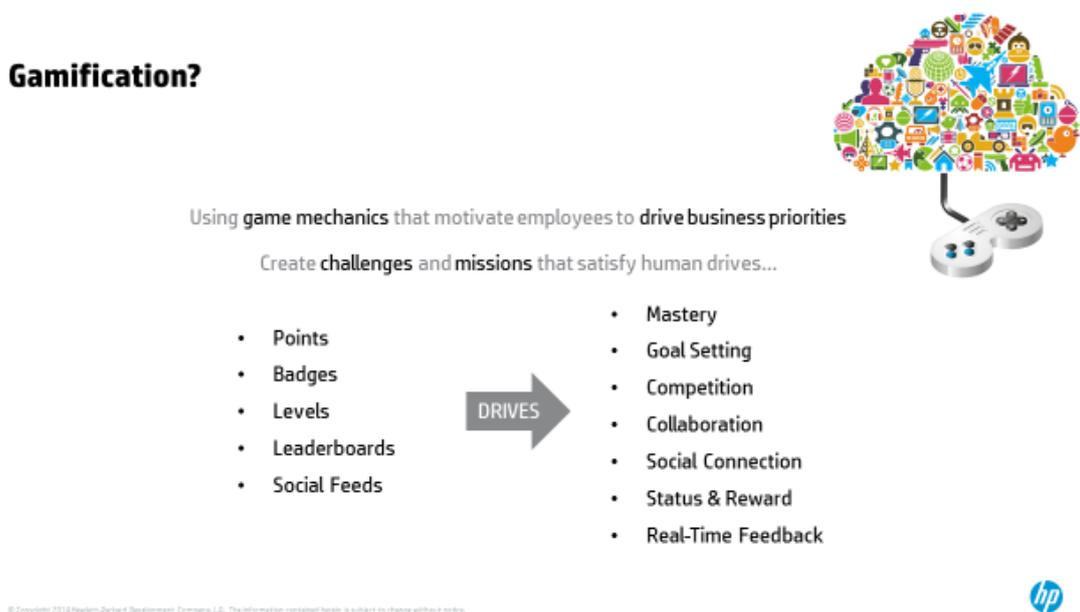


Figure 13: Objectives of first cycle gamification pilot

In this phase, we identified some challenges that could be implemented in the tool, and identified the teams included in the pilot. Based on the social dimension of the gamification experience, we chose to bring entire teams in the pilot rather than pick some participants from various teams, and to select one team in each of the 3 main locations, in Barcelona, Glasgow and Prague, to get some diversity of culture and experience in our user base.

We established as a principle for the selection of challenges that they would be technically implementable with reasonable effort and linked to organization business goals well identified by sales involved in the pilot. After a couple of meetings a first set of goals was defined by the project team as well as associated challenges to be set up in the tool. Table 14 below represent the initial objectives as captured at that stage of the AR.

Biz Objective	Behavior to Change/Impact	Challenges
Primary Objective – improve customer documentation	Know our customers: Enter Profiling data in Profiling screens for all our assigned customers	100 % of my assigned accounts have profiling screens filled in
	Know our Contacts Who they are, what they do: increase contacts accuracy in SFDC	Increase Number & accuracy of Contacts vs my assigned accounts
	Drive one a quarter touch point with each customer	Profiling Data is kept up to date for each assigned accounts every 3 months
Biz Objective	Behavior to Change/Impact	Challenges
Secondary Objective – Improve opportunity documentation	No deal at risk on close dates No overdue opportunities (*Measure only if Close Date is more than 7 days past due (7 day grace period)(*Renewals and run rate to be excluded)	Increase sale stage check vs ship date Reduce Overdue to 0
	Deals progressing through sales cycle	Increase deals velocity
	Opportunity Updates (*applied after aged 30 days and \$50K value) and Close Plans input are kept up to date (*Opp Value >=\$500K, Sales Stage 4a+) (*Renewals and run rate to be excluded)	Opportunity updates field comments and kept up to date
Biz Objective	Behavior to Change/Impact	Challenges
Third Objective – Improve sales productivity	Increase Conversion to Revenue of Pipeline created through Sales Campaigns	Increase Conversion to "Won" stage the open Campaign Pipeline
	Increase "portfolio" deals: i.e with more than 2 business lines included	Increase Nb of deals with several BU included
	Increase our capabilities to sell networking solutions to targeted accounts	Booster for selling HPN on targeted accounts

Figure 14: Initial objectives defined for gamification in cycle 1

Those challenges were then confronted to nitro capabilities and availability of required information in SFDC. This phase was relatively long and required several cycles of adjustments. As a result, we had to significantly adjust the challenges to the capabilities and minimize the complexity of the SFDC interface because of limitations in our internal IT bandwidth. Figure 15 shows the challenges communication chart shared with the project teams and later on with pilot participants.

* Badge awarded after level is complete

How to Play... Carry out actions within the Challenges below to gain Points

#	Challenge Name	Badge *	Action	Base Points	Points Frequency
1	Share IT		Share useful information with colleagues in Chatter using #ShareIT	20	Per Post
2	Date IT		Keep close dates current	150	Per Month, if no overdues
3	Close IT		Add Close Plan to Opportunity	80	Per Close Plan
4	Wrap IT		Complete the win/loss assessment	60	Per Assessment
5	Win IT		Win an Opportunity	150	Per Closure
6	Connect IT		Build HPN Pipeline	80	Per PL added
7	Store IT		Build HP Storage Pipeline	80	Per PL added
8	Educate IT		Build TS Education Pipeline	100	Per PL added

Figure 15: Gamified challenges as defined during planning phase of cycle 1

The reasons to mix CRM adoption challenges with job performance challenges were two folds. On one hand, it made the pilot more relevant to the participant, with metrics reflecting both how they performed their tasks and the results they were achieving, and therefore maximized the chances to catch their interest. On the other hand, it was giving us useful information for our return on investment calculation. Roughly half of the challenges were associated with the use of the CRM (1, 2, 3, 4) while the other half (5, 6, 7, 8) was related to sales performance. While progressing on the challenges, employees were earning points, with the number of points increasing when they reach a higher level of game, and those points were captured in a leaderboard comparing individual and team performance.

Those challenges were common to the 3 locations involved in the pilot, however we left each team define whether they wanted to associate individual or collective rewards to the challenges. It was agreed that we would run a period of silent monitoring in the 3 locations to capture baseline of CRM usage and job performance as a comparison basis. We also agreed to capture this information for the entire organization to allow a comparison with teams not included in the pilot.

We also developed a communication package and engaged with first line managers involved in the pilot to brief them and collect their input for the tuning of the challenges and communication. As part of the brief, we gave some flexibility to involved managers to decide whether they wanted to associate rewards for the winners of contests in each of the location. In

the 3 sites, managers chose to include some small rewards to challenges, either individual or collective, like tickets for sport events or team dinners.

I engaged personally in those briefings and encouraged the managers involved to play an active role and to define their tactics to engage their teams and capture their interest. This level of autonomy in the implementation was intended to allow a broader set of tactics to emerge and compare.

4.1.3. Action taking

The Nitro gamification application was announced to the teams in scope on May 20th, and launched on June 1st. The communication insisted on the game dimension, with a sport analogy, and expected benefits for users. Figure 16 pictures one of the communication messages to the pilot participants.

NITRO – Get Your Game On! 

Coming soon...
Get ready for a new experience that will motivate you and your colleagues beyond the wildest dreams.

Accept the challenges, get the points and you will win the game.
It is all about ... **Competition!**

NITRO

Performance → Real-time Feedback → Transparency

Achievement → Badges → Leveling

Social Interaction → Competition → Teamwork

Figure 16: Nitro pre-launch communication message cycle 1

A conference call was set up with the project team in each of the hubs between May 20th and June first, to review the details with each of the teams. Players were distributed in teams, with a maximum size of 8 players per team, and teams were encouraged to pick nick names and team pictures, like they would use avatars in a gaming context.

Following launch it took several days to identify and fix immediate problems related to the tools. These problems were escalated to the regional project manager from my team who could raise them to support from the vendor and/or business IT.

After a couple of weeks main escalations were resolved and we started to track progress with users collecting points and progressing in the leaderboard. At the end of June, I was able to recognize winners at an employee meeting in Barcelona for the first time.

Early June, we started to get alerts from project owners about issues in the scoring systems which showed some extreme variation between individuals. Some analysis quickly showed that some of the business rules implemented in the CRM were driving this gap rather than individual contribution to the challenge. This problem and potential avenues for resolution were raised with the IT department, which in the meantime was fully focused on the company split and didn't have the bandwidth to implement required changes. Therefore for the rest of the pilot we operated with a gamification application which, for specific challenges and specific users, was not offering a fair chance to all players. This was particularly impacting the Prague and Barcelona sites, for a few impacted challenges.

We also discovered through user feedback that our challenges were too easily gamed by users wanting to cheat the system. For instance, one of the challenges was about publishing and forwarding messages through internal social networking Chatter, using a specific hashtag. Some users were reported for publishing a lot of empty or meaningless messages just for the sake of earning points.

The pilot continued nevertheless until the end of October, which is also the end of the fiscal year at HPE. Monthly updates were provided, and when promised, rewards were offered as per initial commitment.

4.1.4. Evaluation

Evaluation of the pilot was conducted through 2 complementary approaches.

During the pilot, in July 2015, I conducted a focus group and 12 exploratory interviews with employees and first line managers in pilot scope to capture qualitative information on their experience and motivation.

As per Frey and Fontana (Frey and Fontana 2005), I was particularly attentive careful to conduct them in a non-threatening atmosphere, and shared with the interviewees that the interview was part of a research project and that their input wouldn't be used or shared with their direct manager.

This qualitative data gave me some insights about the level of attention they gave to each of the challenge and whether they experienced any change in their work experience since the gamification started. I also used those interviews to collect some feedback on the tool itself, training and communication, and their suggestion for further improvements. I consolidated the feedback and suggestions and shared it with the project team. This helped us to identify the technical issue already mentioned early in the implementation.

At the end of the pilot, we collected the actual use of data regarding the challenges from all users and control groups to run some analysis comparing usage from the test group prior and during gamification, and comparing the test group with the control group.

The vendor involved in the project also provided an evaluation of the pilot, which I will not refer to in this evaluation as it was based on a very short period within the pilot timeframe, and I could not control the accuracy of their analysis as they didn't share the data file used to generate it.

4.1.5. Qualitative Evaluation

In this section I will cover the qualitative evaluation based on qualitative information collected in interviews and focus groups, in order to progress toward answers to my research questions and feed a conceptual model.

I ran a series of exploratory interviews and a focus group in July 2015, to collect qualitative feedback from Nitro users and managers in the 3 locations involved in the pilot. A summary of interviews is included in Appendix 1.

I chose to interview all first line managers available during my visit, and ask project manager to select participants showing a wide range of attitude from the most positive to the most negative. Rather than individual interviews, I tested the focus group format to find out whether it would be less intimidating for the participants, as I would be outnumbered by the participants therefore in some way compensating for the unbalance from status power. Indeed I collected more concerns and critical feedback from the focus group than through personal interviews. However, it has to be pointed out that these good results rather than being based on this choice of a focus group format itself, could be based on the fact that the focus group was conducted in Prague where the team was most affected by issues affecting points.

I collected information from users on frequency of consultation of their Nitro scores. Most users were reporting using Nitro once a day, with few users keeping an eye on the side bar all day long, and a few looking at it only occasionally.

In the 3 locations, most users mentioned their interest for the gamification tool, mostly targeted at mechanism to win points in the game independently of benefits on quality of work. From the interviews and focus group, only one user came with a clear feedback that he was not interested. This individual explained that he was very confident in his ability to achieve his goals based on his track record, and would only be interested in the tool if it had a material impact on his pay. This attitude regarding rewards was not shared broadly. Several users, when asked about their feedback on the rewards offered, admitted they didn't pay attention to the rewards or ignored their existence, while still feeling engaged with the tool.

Many respondents acknowledged a better utilization of SFDC since the gamification pilot started to improve their contribution. Several highlighted the impact on team dynamics as a key outcome of gamification, present or expected. Some users acknowledged an impact on their enjoyment at work. When asking about the fairness of the challenge, many concerns were raised, fairness was raised as a critical quality for gamification.

The following table provides most relevant input collected through interviews and focus group, categorized by perceived impact from gamification.

<p>Greater visibility of metrics improves attention to task</p>	<p><i>“I studied the rules and for instances started to use chatter more often” (user from Barcelona)</i></p> <p><i>“You are getting points when you are in the sales team, so I keep track of all opportunities and add myself to the sales team to earn points” (User from Barcelona)</i></p> <p><i>“I didn't change my work habits. I just looked at it for curiosity. Now I wonder how I can get more points” (User from Barcelona)</i></p> <p><i>“Lots of people start using it. Myself not, I am very focused on closing business and it doesn't affect my pay” (User from Erskine)</i></p>
<p>Perceived impact on better utilization of SFDC</p>	<p><i>“I fill better the opportunity information, for instance I started to fill in the win-loss analysis. I put more focus to fill in information in the right way” (User from Barcelona)</i></p>

	<p><i>I keep up to date my call notes and record them in the opportunity so everybody can see them (User from Erskine)</i></p> <p><i>“I started to do lots of share in chatter , it is a very good way to reach people” (User from Barcelona)</i></p> <p><i>“It could happen that I forgot to update SFDC, and have overdues for instance. I am more strict now” (User from Prague)</i></p> <p><i>“I pay more attention to close plans. I didn’t do it before” (User from Barcelona)</i></p> <p><i>“I spend more time in SFDC, I know my opportunities better than before“(User from Barcelona)</i></p> <p><i>“One of my qualities is proper management in SFDC. Nevertheless I am now able to manage SFDC better. You can look at my SFDC opportunities and you will see Nitro had an impact (Erskine User)</i></p>
Employees reported more fun at work	<p><i>“It created a very fun thing with something as boring as SFDC “(user from Erskine)</i></p> <p><i>“It is fun when you are the first “(User from Prague)</i></p> <p><i>“Nitro brings a bit more fun definitively (User from Erskine)</i></p>
Employees are interested to compare their performance with others	<p><i>“I pay more attention to results from my team members. It is a little game between us, to show who is doing the best job” User from Barcelona</i></p> <p><i>“I feel more engaged because I have a concrete proof of how I am doing compared to others” (User from Barcelona)</i></p> <p><i>“I would like Nitro to show me where I stand versus my colleagues “((Barcelona User)</i></p>
Gamification improved team dynamics	<p><i>“Team spirit as elevated for teams really involved” (User from Prague)</i></p>
Importance of fairness and risk	<p><i>“As soon as launched, I could see that the system can be manipulated by sales representatives.</i></p>

of “gaming” the gamification	<p><i>Some things where you get points are not best practices” (User from Erskine)</i></p> <p><i>“You can win points for deals you haven’t contributed to, it may send the wrong message” (User from Barcelona)</i></p> <p><i>“Groups should have similar sizes to make them more comparable “(User from Prague)</i></p> <p><i>“It is frustrating when people on top are not those contributing the most “(user from Prague)</i></p>
Tangible rewards do not seem to be the main driver for engagement in gamification	<p><i>“I’m not fully informed on the rewards” (User from Barcelona)</i></p> <p><i>“I didn’t find any interesting price for me” (User from Erskine)</i></p> <p><i>“Rewards do not need to be extravagant” (User from Erskine)</i></p>

Table 13: Summary of findings from exploration interviews and focus group

I also interviewed managers asking their perceptions on their team’s reaction to Nitro and discussing on identified improvement points. Managers input were fairly consistent with their team inputs. I summarized the results from manager’s feedback below so it could be discussed in the following project calls. The figure 17 below reflects the points captured from

interviews and shared with the project team in July 2015.

July Nitro Feedback (Interviews by Alice)

Barcelona

- Need a report that shows how we acquired the points (ie details per activity that generated the points)
- Initial communication was good but we should do more – i.e .weekly updates/status
- Would be good to get messages from Nitro from time to time ie "congratulations, you have reached this level" - you have improved this or that" as an encouragement (like in games)
- Good to see your individual score – but would be good to also see real time as your team is doing and how you compare with colleagues within team and between teams with simple visuals
- Would be good to get more updates/news to fuel the competition and keep the fun



Prague

- Points bug impact – interest has decreased since the points started to bubble up last few weeks while in June it seems the issue was not visible yet
- Functionality suggestions:
 - a management dashboard for the mgr, to be able to use in 1-1 coaching, ability to set some local , short term challenges .
 - program the tool to deliver some messages of recognition and encouragement when people achieve certain levels like in gaming
 - Comms feedback was not very positive – engagement of mgrs, too late in the process, still very little understanding by the rep on how you get points and rewards associated the points.

Erskine

- Excitement at launch is starting to worn out
- Some sales reps are finding ways to fool the system ie chatter messages not really meaningful to get points
- Some ISRs who are not doing well on points have given up – need more communication and new challenges to bring them back in.
- Introduction was last minute and would have benefited

Figure 17: Summary of manager feedback discussed with project team discussion

At the end of the pilot, another round of feedback was collected from the first line managers by the project lead, and discussed in a project call.

In summary, the managers were very positive about the gamification concepts but frustrated by the implementation. They raised 3 main areas for improvement to consider for the following cycle:

First, on metrics and challenges, they recommended to offer a smaller number of challenges, better controlled to avoid bugs and manipulations, and to offer customization to first line sales managers to adjust the challenges to their team context and priorities.

Second, on communication and deployment, they recommend a reduced pilot group for testing, and more communication both online in Nitro, like pops ups, and off line under the control of the first line managers.

Thirdly, they recommended to include more real time information in visual format, like leaderboards to compare between teams.

4.1.6. Quantitative Evaluation

In this section I have triangulated the qualitative information collected in interviews and focus group, with actual usage data from SFDC.

We recorded all the actions related to the challenges during 2 months prior to publishing the challenges, and during the challenge as well, that is during the period from April to October 2015. No major change took place during this period at organization level nor in work process, which could impact the activity, except the seasonal variation during summer holiday (mostly July in Erskine and August in Prague and Barcelona), and the traditional peak of activity at close of the fiscal year in October.

The number of actions recorded increased drastically at the beginning of the challenge, and tended to stay stable during most of the pilot, with a slight decline towards the end of the period. Except for the drop of actions in France during the month of August due to holidays, the number of actions per region stayed relatively stable during the period, with a slight peak of activity at the beginning of the gamified period, associated with novelty effect, and a slight decrease towards the end of the pilot. The following graph in figure 18 represent the amount of actions captured over time, during the silent tacking and the live pilot.

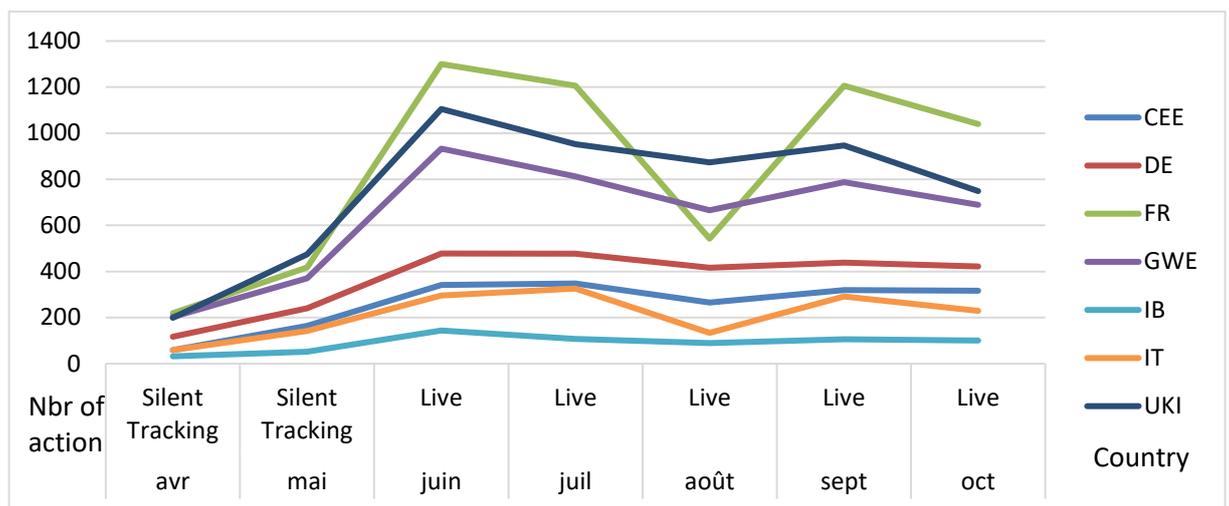


Figure 18: Number of actions captured during silent tracking and live pilot

The variation per region needs to be considered in proportion to the number of participants from each region. However even with that caveat, we observed high variation in the number of action per users between country teams, as illustrated in the following table.

Table 14: Average number of action per user per geographical area

	Central Eastern Europe	Deutschland	France	General Western Europe	Iberia	Italy	UK & Ireland	Grand Total
Nbr of actions	1815	2588	5930	4463	632	1479	5302	22209
Nbr of users	14	11	14	21	11	8	28	107
Actions per user	130	235	424	213	57	185	189	208

There is a significant discrepancy between the various countries represented, 3 geographical areas (France, Deutschland, and General Western Europe) above average and the other below. Neither the interviews, nor the primary data from the project provide any explanation for these discrepancies. It could be related to the teams dynamics – when an opinion leader in a team get engaged with the gamification tool, the rest of the team may be influence, while if this is not happening, the impact is more limited.

I compared the number of actions taken by the pilot group and the control group, during the silent period and during the live gamified experience. The table below records the number of actions taken by each of the groups and the average by user.

Group/Period	avr	mai	juin	jul	août	sept	oct	Grand Total	Nbr of users	avg/user	Growth live vs silent
Control group	1445	2865	3394	3527	2524	3167	2970	19892	151		
Silent Tracking	1445	2865						4310		14	
Live			3394	3527	2524	3167	2970	15582		21	45%
Gamified group	892	1875	6187	5638	4042	5375	4612	28621	113		
Silent Tracking	892	1875						2767		12	
Live			6187	5638	4042	5375	4612	25854		46	274%
Grand Total	2337	4740	9581	9165	6566	8542	7582	48513	264		

Table 15: Comparison of number of actions between test group and control group

While the number of actions increased between the silent tracking and the live period for both groups, the increase is much greater for the gamified group, where actions per user almost quadrupled, from an average of 12 to an average of 46 per month.

The absolute number of actions in the control group, which was very close to that of the gamified group during the silent period also increased, however only by 45%. The increase of the number of actions in the control group cannot be directly explained by the gamified experience as the control group didn't have visibility for the gamified features. It may results from general actions to improve SFDC usage continuing during that period, or from a halo effect from the gamified team in social interaction with colleagues from the control group. No other major external potential cause for this increase could be identified.

The data collected on those specific SFDC features do not allow us to draw solid conclusion for various reasons.

One of the challenges was related to posting or forwarding chatter messages to share ideas or best practices. We recorded a large number of chatter posting with the specific hashtag related to the challenges, however this challenge was too easily manipulated to earn easy points, and we found a lot of posting with little or not content. Therefore we cannot consider those activities as illustrative of better use of the CRM.

For two other challenges, “documenting close plans” and “documenting win loss analysis”, the evolution of actions recorded is summarized in the following table 16.

Close Plans	April	May	June	July	Aug	Sept	Oct	Grand Total
Control Group	8	6	3	4	1	1		23
Live			3	4	1	1		9
Silent Tracking	8	6						14
Pilot Group	2	2	6	2			2	14
Live			6	2			2	10
Silent Tracking	2	2						4
Grand Total	10	8	9	6	1	1	2	37

Win-Loss analysis	June	July	Grand Total
Control group	1	1	2
Live	1	1	2
Pilot Group	2	3	5
Live	2	3	5
Grand Total	3	4	7

Table 16: Actions recorded on documenting close plans and documenting win-loss analysis.

We have seen a slight increase of those actions in the pilot group during the live period, however the total number of activities stays extremely low and therefore the increase is marginal compared to our expectation from the challenges.

This quantitative analysis based on SFDC use of primary information is not fully conclusive on the impact of gamification on SFDC adoption. Also the data shows an increase in the number of actions recorded in SFDC. This could be partially linked to users “gaming” the CRM to earn points rather than truly improving utilization. Also, the volume of actions captured for gamified SFDC features (close plan and win loss analysis) are not sufficient to draw conclusions.

4.1.7. Specifying learning

The project outcomes were discussed in a number of conference calls by the project team during October 2015 and January 2016. The discussions covered mostly two areas: findings related to the technical dimension of the project and findings related to user attitude towards challenges. Both were translated in inputs for the next steps of the project.

4.1.8. Technical learning

As we faced some technical limitations during the Nitro pilot, those challenges were captured in order to be discussed with the vendor to understand whether they could provide some fixes or workaround. The main issues were documented as follows in figure 19:

#	Issue	Details	Impact	Date Raised	Current Situation
1	Raw Data reports not capturing HP Opp IDs	HP Opp ID needs to be added to the output captured in Nitro console, it is not possible to track actions that are deleted as no reference point	Unable to perform full audit on products that are deleted from Opps	Jul-15	No change
2	Products being added then removed by ISRs	PL's can be removed by ISRs	Points incorrectly awarded	Jul-15	No change
3	UNISON – Quote Sync doing a Flush and Fill of products results	When a quote is refreshed the system performs a flush and fill of PLs on the Opp	Points incorrectly awarded	Jul-15	No change
4	ISRs added to Sales Teams for visibility are receiving points	ISRs can be defaulted on Sales Teams without direct engagement	Points incorrectly awarded	Jul-15	No change

Figure 19: Lessons learned log – technical issues

As a result, some changes requests were discussed with the vendors during several weeks with no satisfactory solutions to the problems raised. We took away from those interactions that our challenges were probably too complex, that we needed to simplify our approach and go for simpler challenges. We also decided to go through a more robust testing before exposing the tool to a large audience to find out potential problems prior to making the tool visible to users.

In December, a new Director in charge of tools and processes for Inside Sales at Global level got involved in the discussion and ran some calls both internally and with the vendors. He pointed out some project management challenges in the staffing and the continuity of the project team, and clarified governance for the continuation of the project. Following discussions with Bunchball, he took the decision to explore other tools available on the marketplace.

4.1.9. Learning from participants attitude

Based on many users feedback, we have seen a real interest for Nitro at the time of the launch, probably supported by a strong communication campaign. In the first month of the pilot, most users interviewed reported a change in their practices regarding SFDC, and this was correlated by the noticeable level of activities in SFDC. Several users mentioned this change

was related to the team dynamics and internal competition, some others by the availability of the metric which increased their attention to the task. So this first cycle confirmed that gamification deserves our attention as a potential approach to improve CRM usage.

We also learned that if not fully controlled, gamification can generate some frustration and that interest can fade away over time. Regular communication online and offline seems a strong requirement. While online communication can be programmed within the tool, managers' attention is required for effective offline communication.

In our first cycle, first line managers complained about not getting sufficient communication and didn't put in enough effort to maintain a momentum around the tool. Also, managers mentioned that the challenges were not renewed much during the period, which would help to sustain interest, and requested the ability to customize them. We therefore decided to look for a tool that would be easy enough to use for managers to be fully empowered to define and set up appropriate challenges for their team by themselves.

Information from interviews tended to de-emphasize the impact of rewards in gamification describing them as not critical to achieve user engagement in the game. We decided to keep the possibility of adding incentives to the gamification contests, but to make them optional and at the discretion of each hub while each team could allow more customization to fit the specific team expectations.

4.1.10. Confrontation of learnings to research questions

As a conclusion for this initial cycle, the relevance of my research topic was confirmed. However the results from the first cycle didn't allow me to provide yet a solid and comprehensive answer to my research questions.

Question 1: How does Gamification impact utilitarian Information Systems Success?

The first cycle of AR has brought to the surface a number of impacts from gamification on IS success, emerging from exploratory interviews and focus groups. These include a greater visibility of metrics improving the attention to tasks and resulting in better utilization of SFDC while reflecting in greater number of actions recorded in CRM. Those results were still only partially confirmed by triangulation using primary data, and the variation between teams' calls for further analysis.

Question 2: What roles do motivation levers play in that process?

My initial results highlight some subjective comments from users about experiencing more fun at work, and made comments which could be hypothesized as having a potential

impact on motivation, including improved team dynamics and ability to compare their performance with their peers. This seems to confirm pertinence of SDT concepts to analyze gamification impact on motivation, however further analysis is required to confirm the precise articulation between gamification attributes and motivation concepts.

Question 3: What are the design principles for effective gamification of utilitarian IS?

During cycle 1 we have faced many challenges impacting negatively the long term effect of the tested application. The role of tangible rewards was not perceived as critical in the first cycle and will be de-emphasized in the next cycle. Users have stressed the importance of fairness and the risks to “game the gamification”. We have also experienced the requirements to be able to monitor and adjust constantly the gamification, as also recommended in literature by Robson et al. (Robson et al. 2015b). This has resulted in a number of recommendations which will be tested in the next cycles, including a simplification of the challenge, a small number of challenges changed on a frequent basis, real time visibility of performance by users, and empowerment of first line managers.

4.2 Construction of conceptual Model

As a researcher, the result from this phase was that I needed a conceptual model to guide me in the exploration of motivation impact from gamification. Based on the literature reviews which took place in parallel to the first cycle, I was convinced that the lenses of SDT would provide the best framework, and tested whether the findings from the first cycle would support this assumption. The following table 17 highlights the links between my findings and SDT concepts.

Finding from Cycle 1	Quote	Related SDT concepts	Comments (Deci and Ryan 2002).
Greater visibility of metrics improves attention to task	“I pay more attention to close plans. I didn’t do it before” (User from Barcelona)	Competency	While all jobs include routine chores and tasks, the need to experience challenges and progress can be fulfilled by completing challenges (p265)
Employees reported more fun at work	“It created a very fun thing with something as boring as SFDC “(User from Erskine)	Internal motivation	Being given an exciting assignment, with no undue pressure to succeed, can be challenging and carry with it a satisfaction that is distinctly enjoyable (p 256)
Gamification improved team dynamics	“Team spirit as elevated for teams really involved” (User from Prague)	Relatedness	Experience in mutual reliance and respect (p266) is achieved through working on team challenges. On the other end SDT do not encourage competition between individuals or teams (p267)
Employees are interested to compare their performance with others	“I feel more engaged because I have a concrete proof of how I am doing compared to others” (User from Barcelona) “I would like Nitro to show me where I stand versus my colleagues “(User from Barcelona)	Competence Extrinsic Motivation OIT	Leaderboard can be seen as a form of real time feedback, encourage self-discovery of performance gaps (p265) Completing a task to achieve recognition is a form of extrinsic motivation (p257), Game context reduces pressure and employees can decide to participate or not, therefore it can be considered as self-regulated therefore a source of self-motivation.
Importance of fairness and risk of “gaming” the gamification	“You can win points for deals you haven’t contributed to, it may send the wrong message” (User from Barcelona)	Autonomy A motivation	Optimal employee control/influence over how his work is done. If points are not credible, employees may feel a sense of futility in engagement not valuing the activity or not expecting desired outcome from having done it (p258)
Tangible rewards do not seem to be the main driver for engagement in gamification	“Rewards do not need to be extravagant” (User from Erskine)	Intrinsic Motivation CET	When intrinsically motivated, there is no preoccupying concern with the possibility of attaining a reward other than the satisfaction of doing the activity itself (p256) Tangible rewards have a controlling functional significance which can be detrimental to motivation (p 12)
Need to allow first line manager to customize the	“ need to involve the hub team to select the contests” (Manager in Barcelona)	Autonomy	Offer lever of control and choice to first line manager. (p262)

challenges and drive the communication	“I would like to be able to set up challenges in the area my team needs to focus” (Manager in Prague)		Agree on achievable goals , preferably discussed with employees (p265)
Preference for less challenges, tuned to performance level and renewed more frequently	“ we should have less challenges but focus on running the extra mile” (Manager in Prague)	Competence	Allow self-selection of task (p263) Provide optimal challenge (p265)
Need better visibility on metrics gamified, real time and graphical	“ we don’t know how points are earned”(manager in Prague) “ we’re missing a real time dashboard” (manager in Prague)	Competence	Encourage self-discovery of errors , allowing the person to address them on his or her own whenever possible (p265) Allow feedback to occur regularly (p265)

Table 17: Mapping cycle 1 findings to SDT

This mapping comforted me in my decision to leverage SDT in the second cycle of my research as lenses to analyze the motivation impact for gamification.

Another input from cycle 1 learning was to measure the impact on SFDC adoption on features embedded in the challenges. In order to address this challenge, I decided to adopt the Enhanced Use model (F. F. Bagayogo, Lapointe, and Bassellier 2014), which proved to be a good fit to map the specific features impacted by the Nitro pilot, as captured in Table 18 below.

		Features		
		Current	Additional	Extended
Task	Current	Using a formerly used set of features for current task: Keep close dates current	Using a formerly unused set of available features for current tasks Chatter posting	Using feature extensions for current tasks
	Additional	Using a formerly used set of features for additional tasks : Chatter sharing of best practices	Using a formerly unused set of available features for additional tasks : Win-Loss analysis Close plans	Using feature extensions for additional tasks: Consult gamification menu to check on scores

Table 18: Mapping cycle 1 findings to Enhanced use taxonomy

On the challenges related to CRM adoption, all except one could be mapped to a type of enhanced used. The exception was the challenge related to keeping opportunity close date, where the objective was to continue to use the existing feature for a current task, but to do it with more rigor and promptitude. The gamification menu itself could be classified as an extension utilized for an additional task consisting in competing in the challenge and checking

scores. Therefore my Cycle 1 analysis provide an additional empirical validation of this model in my particular setting.

In order to progress in this understanding, I have leveraged the conceptual model built based on literature and positively confronted to my preliminary findings in a second AR cycle.

4.3Second cycle AR

4.3.1. Diagnosis

I started the second AR cycle February 2016. As the Nitro pilot was considered promising but inconclusive, it took me some time to secure a renewed stakeholder agreement to continue to explore gamification of the CRM building on the learning of phase 1. At the same time the company went through a split at the end of Oct 16 and restarted on November 1st with a new name and new organization. The fact I could, despite all those changes, secured the second phase of the pilot is a testimony of the interest of the company for the gamification approach and for achievement CRM better utilization.

The stakeholder agreement with WorldWide lead for Enterprise group tools and processes was based on the following relaunch guiding principles jointly agreed, directly derived from learning from cycle 1. Those principles emphasized steps to avoid the technical and project management difficulties faced during Nitro's implementation.

Relaunch Guiding Principles

1. Keep it simple
2. Empower managers to create their own challenges to encourage buy-in
3. Avoid or minimize being reliant on IT support
4. Robust testing in production (not sandbox) crucial prior to go-live

Figure 20: Cycle 2 Stakeholder agreement

As a next steps, those guiding principles were translated in more granular requirements discussed in project team calls mostly between the WW project owner and the local owner, who participated to cycle 1 learning phase and well as Cycle 2 diagnosis. The following table 19 illustrate the mapping of findings from Cycle 1 and requirements from Cycle 2.

Findings from Cycle 1	Requirements	Importance
Greater visibility of metrics improves attention to task	Real Time	High
Employees reported more fun at work	Based on key metrics that mean something to the business (not always points)	High-Medium
Gamification improved team dynamics	Visually attractive	High
Employees are interested to compare their performance with others	Visible through the sales floor (big screens)	High-Medium
Importance of fairness and risk of “gaming” the gamification	Constant on the SFDC sidebar	High
Tangible rewards do not seem to be the main driver for engagement in gamification	Standardized metrics across hubs but with option to customize locally with minimal IT support	High
Need to allow first line manager to customize the challenges and drive the communication	Top 10 x team/hub/emea	Low
Preference for less challenges, tuned to performance level and renewed more frequently	Pop ups to ensure constant focus and reminders of key metrics progression	Medium
Need better visibility on metrics gamified, real time and graphical		

Table 19: Requirements mapping to cycle 1 findings

As illustrated by the graphs, the recommendations from previous cycles were all addressed, often with more than one solution, except the topic of tangible rewards which we decided to de-emphasize as agreed at the end of previous cycle. Three requirements relates to

contingencies of the new project were added, related to cost, minimal administration, and availability of reports for ROI calculation.

4.3.2. Action Planning

We then went to the market to evaluate software packages available that would meet the best the requirements. Those requirements as well as the mapping of 3 gamification platform is summarized below:

Vendor Requirements Comparison

KEY REQUIREMENTS	PRIORITY	BUNCHBALL	AMBITION	LevelEleven
Real time	HIGH	YES	YES	YES
Based on key metrics that mean something to the business (not always points)	HIGHMEDIUM	?? – points based system but unsure on flexibility	?? – demo showed accumulation of individual metrics but unsure consolidated view	?? – demo showed accumulation of individual metrics but unsure consolidated view
Visually attractive	HIGH	YES	YES	YES
Visible throughout the sales floor (big screens)	HIGHMEDIUM	?? – need confirmation on visual input	YES – live feed from Ambition console via web	YES – live feed from LevelEleven console to multiple screens. Can add in other content as well and can manage remotely
Constant on the SFDC sidebar	HIGH	YES	NO	Yes
Standardised metrics across the hubs/EMEA but with option to customise locally (minimal IT support)	HIGH	NO – APEX triggers required	?? – advised no APEX triggers but need to further investigate with IT	?? – advised some APEX triggers needed but need to further investigate with IT
Minimal administration	HIGHMEDIUM	?? – guidance on console management	?? – guidance on console management	?? Management necessary but inconclusive on LOE – guidance on console management
Top x per team/hub/EMEA	LOW	NO – can only see top 10	??	Yes
Pop-ups to ensure constant focus and reminders of key metrics progression	MEDIUM	YES	NO	Some – and big screens can have ticker type scroll
Cost			\$25K for	\$25k for 100 user POC
Reporting/ROI tracking	HIGH	YES	YES – need confirmation on export	YES – need confirmation on export

Figure 21: Requirements and vendor comparison

As the result of this process, the project team selected the solution from Leveleleven for the second phase of the project in April 2016. The software was selected for his capabilities in real time information sharing and visual display, including on big screens as illustrated below



Figure 22: LevelEleven screenshot and TV display

4.3.3. Action taking

The Action taking phase started on June 1st with the communication of the project to the inside sales management team and identification of a project lead per site.

As per agreed principles, the implementation of LevelEleven started by a technical phase of set up and silent testing, to avoid the discovery of technical bugs during the deployment. As a result, we didn't experiment the same troubles at the time of the move to production than in previous round. If we discovered some limits to what metrics could be gamified, it was mostly due to difficulties in our internal IT department to open some interfaces with internal systems, rather than from the tool itself.

While we were still in test mode, a soft telephony solution has been rolled out in Prague and was on plan to implement in Erskine, which could easily be integrated with LevelEleven

to increase the possibilities of gamification, taking into accounts information on calls integrated in SFDC. We decided then to focus Level eleven pilot on those 2 sites until the solution would get deployed in Barcelona. As a result, the implementation of the project was delayed by a few months to September 1st to give priority to the telephony deployment. From September, the ramp up was progressive, bringing the teams on board during the months of September, October and November. By September 30th, 30 users were active, and by Nov 4th, 147 users. By the end of phase we reached 159 users.

Opposite to Nitro launch, that included a strong communication plan and central planning for the challenges and competitions, and in line with our guiding principles, we decided to empower the first line managers to drive the deployment in their teams. The implementation started with the most motivated first line managers volunteering to lead the way, and the communication to their team was left to them as well as the proposition of metrics and contests which they could discuss with their local project lead for validation of feasibility and execution. In addition to empower the managers, this set up allowed us to test a number of different approaches to leverage the software package and offers some comparison points between teams.

During that phase I ran some interviews with managers involved in the project to capture their initial thoughts and expectations, which will be included in the qualitative analysis in evaluation phase.

4.3.4. Qualitative Evaluation

In this section, I will analyze the qualitative information collected during the second cycle, to confirm and challenge the conceptual model, in order to answer research questions.

During the action planning and action taking phase, and right to the beginning of Evaluation, I performed 48 semi- structured interviews and focus groups with 96 users and first line managers, as described in section 3.2.4.

This time the interviews were more structured and connected to the conceptual model established between the 2 cycles. The table linking questions to each concept is included in Appendix 5. This guide was applied with flexibility and adapted to follow the flow of the discussion and allow ideas to emerge outside of the framework based on conceptual model. In action planning phase, questions were more prospective regarding gamification, and more retrospective when moving to evaluation phase. When interviewing a manager, questions were targeted on progress and challenge in the implementation, impact on their team, ideas to extend usage to new metrics and new contests. In addition, towards the end of the period, feedback and suggestion for improvement were collected and captured by program manager.

The table 20 below recap each of the concept, with their weight in the information captured expressed in number of references, as well as a significant quote to illustrate related concepts.

Node name	# ref	% ref	Quote example
Gamification experience			
Competition	65	11,9%	I know when I was doing it, 'cause I was really competitive, another guy on my team, Ken. Me and him were really competitive, and when we were using the previous tool, me and him were staying past half five, trying to update our Salesforce, trying to update our opportunities, trying to generate as much pipeline as possible because we could monitor ourselves against the team and see who was top.
Team spirit	32	5,9%	What it was, was people saying, "I've closed this. Catch me if you can." It was a bit of fun, a bit of camaraderie
Playfulness	22	4,0%	We are a generation of guys who played video games in the past, or at least that was valid for me. And I know how it's very addictive, or how the motivation works when you have something measured and you get scores for it, and points. It makes the whole work or whatever, whatever interaction people have together, it makes it more fun
Real time information	23	4,2%	Everybody really likes it, everybody really appreciates it now they can see live results and data as they are progressing throughout the day.
Motivation			
intrinsic motivation - competency	39	7,1%	When I'm really behind in a call time or something like that, I'm trying to be a little bit more effective. It's pretty difficult to explain, but you probably have the feeling as well that sometimes you can do a little bit more. You can fit a little bit more in the day that you previously wanted to.
intrinsic motivation - relatedness	12	2,2%	It also gives you a space for discussion, let's say. Then I can approach of my colleagues and say, "Look, you're doing really, really good today, so have you had any troubles, or how did you plan your call time, which is now three hours?" et cetera, et cetera
intrinsic motivation autonomy	30	5,5%	That's what I like, you're kind of the master of your own fate.
extrinsic motivation reward	45	8,2%	For now, we have the small, symbolic things. I think it should more or less stay like that. The awards shouldn't be so big because people can then envy or be jealous.

extrinsic motivation social recognition	26	4,8%	Every time you pass the TV if you go for tea or something, you can see it. You can see it, you can see that you are in the top or you are in the bottom in the call time or opportunities. That stimulates a lot. At least on me, it really works, I know that. I'm 100% confident that in my colleagues as well, because I see them quite a lot that they're stopping by. They had a long call, 20-minute call. After minutes, you see them, "Ah, is it counted?"
Type of Regulation			
Positive pressure, integrated in values	18	3,3%	There is a lot of pressure there. I'm not going to pretend that I don't ... I get told I'm doing really well, I'm on the right trajectory, but I do stress out, I do go home and think. It is a stressful job at the end of the day, but I knew that when I took the role, and I wouldn't want a job where I just come in at nine, do what I have to, just the amount I have to do, go home, and forget about it. This is my career, this is not just my job. If I didn't have it as, literally, a massive majority of my life, I wouldn't feel like I was pushing myself enough anyway.
Pressured, introjected	10	1,8%	maybe that the hesitation of rolling this out fully, with standard metrics across the center, creates a bit of nervousness within the team
Do not feel pressured	10	1,8%	Even if we are losing, we can prove it that we did our best to get the deal. I guess this is a good thing as well.
Information quality			
Information quality	13	2,4%	Now, we're actually going that step beyond, and we're actually implementing it. Looking at the opportunity updates, adding the competitor, linking, sinking and quotes the other opportunities
Enhanced System Use			
Using a formerly used set of features for current task	3	0,5%	I'm probably using the dashboards and reporting tabs slightly more
Using a formerly used set of features for additional tasks	1	0,2%	I log every conversation I've had, and the context of that conversation, so I know when I re-engage with the customer, or re-engage with the partner, that I'm exactly at the same point that I left off, and I don't have to go back a step, or go back two steps, because I haven't done the due diligence to remember what stage I'm at.
Using a formerly unused set of available features for current tasks	7	1,3%	Yes, before Level 11. We weren't disciplined at all. We've followed steps to make sure our deals had closure, were audited, and passed. Now, we're actually going that step beyond, and we're actually implementing it. Looking at the opportunity updates, adding the competitor, linking, sinking and quotes the other opportunities.

Using a formerly unused set of available features for additional tasks	6	1,1%	In the beginning I didn't use the reports, now I use many kinds of reports, I cut it into all kinds of reports
Using feature extensions for current tasks	8	1,5%	Now, every time I've come off a call, there'll be notes attached to the call with the person's name, and our calls
Using feature extensions for additional tasks	3	0,5%	The part that level 11 could do for myself is actually using it as a customer, relationship management tool. Opposed to just forecasting or attaching things as part of the other criteria. I want to be able to take away the hunting specific criteria and actually make it SFDC as being the main tool that they use.
User Satisfaction			
Enjoyment	15	2,7%	It definitely creates kind of a buzz in the team. Yeah, a 100%.
User Expectations	17	3,1%	I think that the in-sales environment could really need something like that, which can show us what is happening with our deals, with whatever is active
Net benefit			
sales rep	36	6,6%	It's important for me to have it clean because otherwise I will get lost. It's important for me of course to know, to make the best for my pipeline, it good for me, good for company, good for everyone, for my managers, for you, for everyone. It's good, it's good thing to have on the side.
manager	25	4,6%	Rather than me, in the morning putting it up on the board. "Right guys, we've got to hit on however many million to go until the weekly incentive." I could use it for that
organization	11	2,0%	the discipline is a lot better than it was six months ago across the board
Success factors			
Fairness	23	4,2%	If you're competing with the likes of, maybe global, on certain things, then it's not going to be a competition really. Because they might be working on big, massive financial sized deals. Depends on what you're competing with each other on
Empowerment, customization	13	2,4%	I think it's part of the success of the tool was that the first line manager really take ownership for it. I think this tool can only work if the first line manager make it their tool.
Communication	12	2,2%	Any team communication links to this. Any team meeting, any team briefing, any focus update, we will always cover this
Legitimate purpose	10	1,8%	It needs to be driving stuff that they can influence. Rather than having a situation where somebody is topping the leader board, but with no behavior they've driven themselves.

Creating habits	5	0,9%	We have managed to make it a daily habit. Five minutes, check it when you come in the morning in the office or when you leave the office you check your scorecard. So, at least we have seen a down trend in the Salesforce Hygiene to reach below waterline
Workforce characteristics	4	0,7%	Because you know, we are a generation of guys who played video games in the past, or at least that was valid for me.
Maintain interest over time	3	0,5%	I think as long as everyone knows the expectations and it's consistent, you know, it doesn't drop away for a couple of months and come back and there's a big rara about it and then it disappears again. I think if there are certain things and things we should be doing, as long as it stays that way and it continues month on month or quarter on quarter it just keep everyone interested and that's the main thing.

Table 20: Recapitulative of coverage per concept with main reference

Looking at the differences by site (see table in Appendix 9), while the number of references is fairly equivalent in the 2 sites (51% from Erskine and 49% from Prague), a few concepts are showing a significant variance in their distribution per site.

Playfulness was mentioned much more in Prague (77% of the references) than Erskine (23%). This discrepancy could be related to the way the tool was presented to the teams by their respective managers, or to the fact that Prague hub has ran some cross team contests and used the visual displays more than Erskine where the competition was rather within each team. Perception of the playfulness as an important dimension of gamification seems to be subject to the extent of use of playful elements like contests between teams, on the utilization of visual displays on screens, and to the tone given by first line managers when communicating about the project.

It could also be explained by the slightly older average age of the population in Erskine (32.7 years old versus 28.2 years old):

“Because you know, we are a generation of guys who played video games in the past, or at least that was valid for me” (user from Prague)

“I have more experience so I have family and it's different. The first thing is as you know, to have nice salary to bring home, and second thing is to think about the future in the company, and maybe to finish one, two, three whatever years in this position then step forward to another position and that's it. In my age we are looking at those things “(user from Erskine)

“the most experienced of my SMB guys, he's usually very, very dismissive about all these initiatives. He say, "Okay, you guys, you go play your games, and I'm going to earn money. I'm not here to play. I'm here to sell." I noticed he was actually once looking at his list of accounts in SFDC, and he was checking the win/loss ratio, and for him it was very important that those are very high numbers, so he was like, "Okay. I'm winning 80% of the deals which I'm involved, or 90%, so it means I'm super-cool sales” (manager from Prague)

At the same time, the number of references to “not feeling pressured “was also greater in Prague, which could be related to higher perception of playfulness. As per SDT, pressure can be detrimental to internal motivation, so playfulness seems to make a positive contribution to release the tension in the organization.

Need for legitimate purpose was much more of a concern in Erskine than in Prague (9 of the 10 references). This can be seen as the other side of the coin for being less sensitive to playfulness – as playfulness is not a justification as such, gamification need to be justified by sound business reasons to be valued.

“these tools, I think, should be creating the right behaviors” (manager from Prague)

“I think for me the only thing I would say to it is probably we all know what the job is, is hitting quota so I think maybe we divert away from awarding points for closing business “(manager in Erskine)

Motivation levers mix were also slightly different per site. Items related to need for competence was higher in Prague (62%) and extrinsic rewards was higher in Erskine (64%), while the ratio of mention of competition, which is connected to both, is more balanced between hubs. The higher focus on competence in Prague may be related to the population been slightly more junior in their role, with average 21 months of seniority versus 42 months in Erskine.

On extrinsic rewards, the input provided was much contrasted in both sites, few giving high attention to rewards and many recommending to keep it light and symbolic. Team incentives were often mentioned as most valued.

“I'll set the guys a weekly target to hit. Then we'll do something stupid like an early finish, or something like that, and it drives them to work as a team, together” (manager in Erskine).

“It's something small, it's not even tangible, but for me it has kind of this spiritual value that somebody sees that when I'm doing something, it's been at least recognized somewhere “(user in Prague)

“You're seeing them chatting about it and looking at it, because we've actually put prizes in place as well.” (manager in Erskine)

“I think a good way to do it would be to do incentive parts. One for the whole team, for instance my market. And one for the individual. So then, not only the individual tries to do as best as possible, but then he also encourages the whole team” (user in Prague)

“It might be a little bit more interesting if let's say ... I know that there is a budget behind for every campaign, but if we can regroup the budget and try to give one big reward” (user in Prague)

“Small rewards, yes. Of course, it's like, I don't know. I think sometimes like we're like kids, so actually, we have some rewards and maybe because we're here all young. I don't know, but I like it” (user in Prague)

“The main thing was they had to hit the close target, and they get away at 4 o'clock, but if they hit the close target and the ISR pipeline generation target, they got to get away a little bit earlier as well. Something as simple as that. We got feedback from when we did the team board, where they're all asking about what incentives they like an early finish on Friday. They seemed to really like that one” (manager in Erskine)

“Now that I can see tangible rewards, IE, Apple Watches and pens and nice things, then I will be probably more interested in it” (user in Erskine)

It seems hard to find a rewards strategy that will fit everyone expectations, as they are so diverse and even contradictory. In order to minimize the risk to impact negatively intrinsic motivation, a strategy can be to use incentives with parsimony, including team rewards as much or rather than individual rewards, and making sure they are not taking the precedence

on recognition for their core job contribution. Another approach can be to involve the users and get their advice on incentives best fit to their expectations within budgetary boundaries.

Enhanced System Use cases were more frequent across the categories in Erskine. This can be connect with the contests running in Erskine which included a number of items driving use of new functionalities (linking the call record to the opportunity and flagging calls for coaching) or more frequent use of existing functionalities (adding competitor information in the opportunity, adding comments on the call to capture key information , using reporting).

“I've been doing notes since the beginning, I've just not long ago started actually linking to my opportunities” (User in Erskine)

““What is good, which kind of links in with Level 11, ring DNA, now we've got the call notes on it; as soon as I've finished that call, or while I'm on that call, I can link it by pushing one button, and write my notes straight in there. (...)Now, every time I've come off a call, there'll be notes attached to the call with the person's name, and our calls, where they were at. (..) So, there's actually stars on the calls, you can star a call, so, call coaching. (...) we get points for starring them” (User in Erskine)

“Yes, before Level 11. We weren't disciplined at all. We've followed steps to make sure our deals had closure, were audited, and passed. Now, we're actually going that step beyond, and we're actually implementing it. Looking at the opportunity updates, adding the competitor, linking (..) the other opportunities”. (User in Erskine)

“Because initially you get points for logging our calls and logging our activity. That was something I never used to do. I used to just put notes in the opportunity but I would never actually log a call in the activity history. I think with the introduction with Level 11, it is kind of motivated me to use that function” (User in Erskine)

Those contests seems to be a good approach to get traction with the users to test a new functionality or a functionality they didn't use much so far.

"Health check would be good because I think once you've done five or six health checks, it starts to get ingrained in your brain" (manager in Erskine).

"We have managed to make it a daily habit. Five minutes, check it when you come in the morning in the office or when you leave the office you check your scorecard. So, at least we have seen a down trend in the Salesforce Hygiene to reach below waterline" (manager in Prague)

If they see the value for them after testing it, there is a fair chance they will adopt it and continue to use it over time.

"I log every conversation I've had, and the context of that conversation, so I know when I re-engage with the customer, or re-engage with the partner, that I'm exactly at the same point that I left off, and I don't have to go back a step, or go back two steps, because I haven't done the due diligence to remember what stage I'm at". (User in Erskine)

"I've had call coaching with Andrew, where he's listened back to a call that I've starred. He's given me tips about my cold-calling and my pitching" (User in Erskine)

"I think that allows to fill in all of your notes. I think that's great. It's obviously easier than flipping back in a notebook to a date that you thought you called somebody" (User in Erskine)

Every week I'm getting report from Israel about cleaning your sales force. Yesterday I called Israeli manager for that. I ask, "Hey. You didn't send me the report." He said, "You don't have any opportunities to fix." I told him, "You see? That's good." (User in Prague)

Another condition for achieving Enhanced Use is a deep integration of the gamification platform in the CRM, so the users can directly click on the scorecard information and be directly able to take action on the information in the CRM.

What is good, which kind of links in with Level 11, ring DNA, now we've got the call notes on it; as soon as I've finished that call, or while I'm on that call, I can link it by pushing one button, and write my notes straight in there (User in Erskine)

No need to search. No need to find, no need to do a cross check they just see the list of the entries they need to fix (Manager in Prague)

The feedback from the guys is, it's good for them that they don't need to go in to the dashboard to look for the opportunities that are going to be overdue so I think basically for them it's the same, they have one source of information, they have stagnant opportunities. Just click on it, find which one they are and they can update them (Manager in Prague)

Net benefits

28 out of the 48 sources mentioned at least one benefit from the experiment. A total of 72 coded references refers to an identified net benefit, 50% of those for the users, 35% for the first line managers, and 15% for the organization (see table in Appendix 11)

An interesting comparison is related to the coding per role (see table in Appendix 10), with a comparison between managers and users. 60% of the references to net benefits were expressed by managers, and 40% by users. In general, managers mention more “serious” concepts relative to access to real time information, creating right habits and on benefits, observed or expected. They are also more vocal about the need for empowerment and customization (85% of the references) and communication (92% of the references).

Users reported benefits relates to improvement of their productivity at work. On the 29 references, only 2 were skeptical or negative. Positive feedback refers to improved performance due to the better visibility on their progress and priorities, to easy access to information, to the benefit on job performance of sales force discipline, and to the extra effort they put in their work stimulated by the competition and visibility of their performance. Four of them reported pressure perceived negatively, which could impact negatively net benefits, 12 of them reported stimulating, positive, pressure, and 8 no pressure at all.

Comparing the information capture over time (See table Appendix 12), I found that interviewees generally over emphasized expected net benefits during action planning phase, compared to what they experienced in later phases. This may be linked to the greater proportion of managers interviewed in that specific phases, while managers in general over emphasized net benefits compared to sales reps users.

4.3.5. Quantitative Evaluation

In this section I have triangulated the qualitative information collected in interviews and focus groups with actual CRM usage information.

At the end of the pilot, we collected as well the actual usage data both from Level eleven and directly from SFDC. This data gives us a good basis to triangulate the qualitative information collected in interviews with information less subjective.

As in cycle 2 we have let each manager set up their own metrics and challenge, we don't have consistent data across all teams have several contests cases to review. Those contests consist in setting a competition within the team or between teams on a set of metrics for a given period of time. They were defined by first line managers for their teams or jointly by several sales managers between their teams, and given code names inspired by gaming culture. The managers involved chose to run contests on three type of goals:

- sales related goals, like number of opportunity created or won on a certain product line or during a certain campaign,
- operational metrics, like number of customer calls or number of calls longer than a certain duration
- SFDC metrics, like “hygiene” score for keeping opportunity current in term of target close date or updated regularly, or use of specific functionalities like call coaching flag or attaching notes to calls

In the context of my project I will focus on the contests including at least one SFDC related metric. The key metrics analyzed in this section are summarized in the table following.

Metric	Definition
Call linkage	Calls recorded in SFDC, linked to a SFDC opportunity
Call notes	Calls documented in SFDC with call notes
Calls with contacts >5 minutes	Calls recorded with SFDC contact details, lasting more than 5 minutes
Call coaching flag	Calls flagged with a request for coaching
Overdues opportunities	Opportunities having past its close date , and not moved to status a closed status yet i.e. won, lost or cancelled
Stagnant opportunities	Opportunity untouched in SFDC for 30 days

Table 21: Definition of metrics used in quantitative analysis

Erskine Public Sector War Room and Power House contest.

Those 2 contests, “War room” and “Power House” were set up and sponsored by the 2 managers for the public sector segment in Erskine, under code names “War room” for the first one in December and January, and “Power House” for the second one from February to April.

Four metrics related to SFDC adoption were gamified in War room contest:

(1) Number of calls linked to the related opportunity in SFDC (“Call linkage”), selected to motivate users to functionally link their call information to the relevant SFDC opportunity so that the outcome of the call is visible to all CRM users involved in this specific opportunity.

(2) Number of calls with sales notes (“Call notes”), selected to motivate SFDC users to capture in SFDC their call notes rather than keep their own record separately on notebooks or excel, so it is readily accessible to them in their further contact with this client, and to other users involved with this client.

(3) Number of calls above 5 minutes with contacts documented in SFDC (“Calls with contacts over 5 minutes”), selected to motivate user to enter their contacts information in SFDC and call directly from there, so the contacts can be leverage by other users, and information of contacts called stored for various analysis.

(4) Number of calls flagged by the user to their manager for coaching (“Call coaching flag”), was selected to put an emphasis on this new functionality which allows users to flag some calls to their manager can listen the recording and discuss it with them in coaching sessions or praise them if they are particularly proud of a specific customer conversation.

In Power House contest, the metrics (1) and (2) were dropped, metrics (3) and (4) retained.

The following graphs in figure 24 represent the usage trend during this period for the first 3 metrics (Call linkage, Call notes, Call with contacts over 5 minutes). The forth metric will be analyze in a separate graph later in section. The 2 contests are represented in the following graph with a black line at the time of the transition between the 2 contests which took place consecutively.

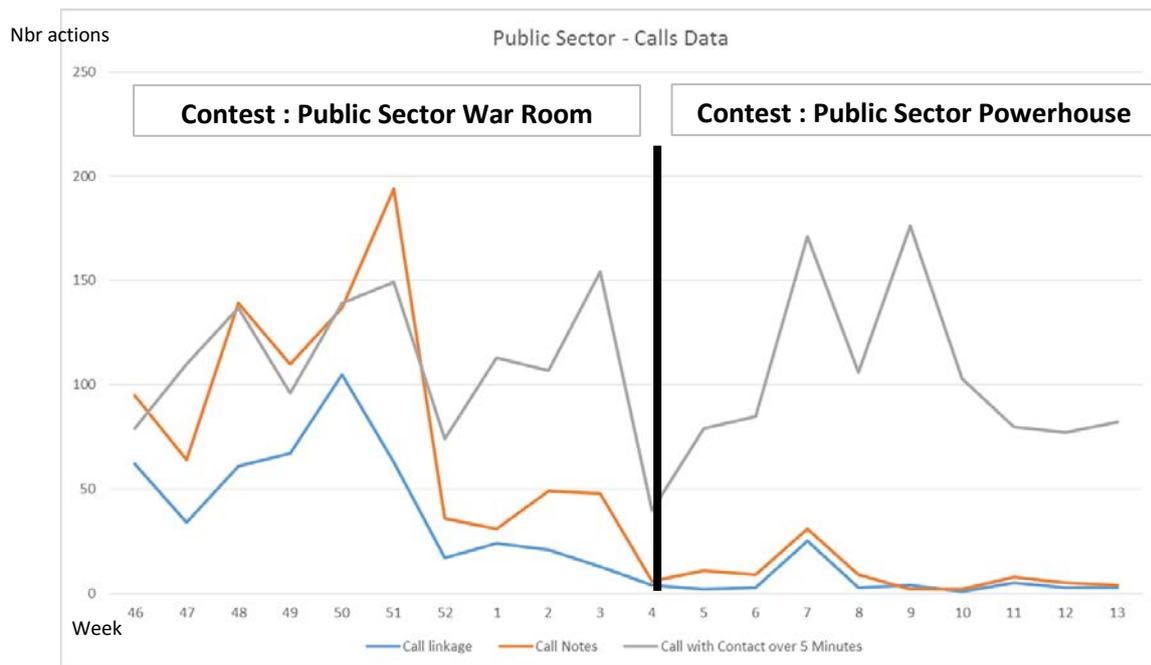


Figure 24 Graph of activity on selected SFDC features included in PS team contest

For the 2 metrics “Call linkage” and “Call notes”, we observe a significant increase of the number of actions performed in the last weeks of the calendar year, raising up to 100 actions per week for call linkage and 200 actions per week for call notes. This surge of activity was followed by a drop during the holidays of week 52 and a stabilization at lower levels between 20 and 50 action per week, until the end of contest. At the end of the quarter, the metrics was removed from the contest, and during the following months, the number of actions reported on those features remained close to zero. On the opposite, for the metric (3), “Calls with contacts over 5 Minutes”, which was included in both contests, we observe that it kept a relatively high volume of activity during both contests, except the week of the transition between the 2 contests represented by the vertical black line.

In comparison, the SMB team, also in Erskine, ran a contest called “Battlefield” including “Calls with contacts above 5 minutes”, but not “Call notes” and “Call linkage”. This contest ran from week 46, 2016 to week 13, 2017, with an interruption during week 4 to 8, during which data was not captured. The graph in figure 25 represents captured usage of those features.

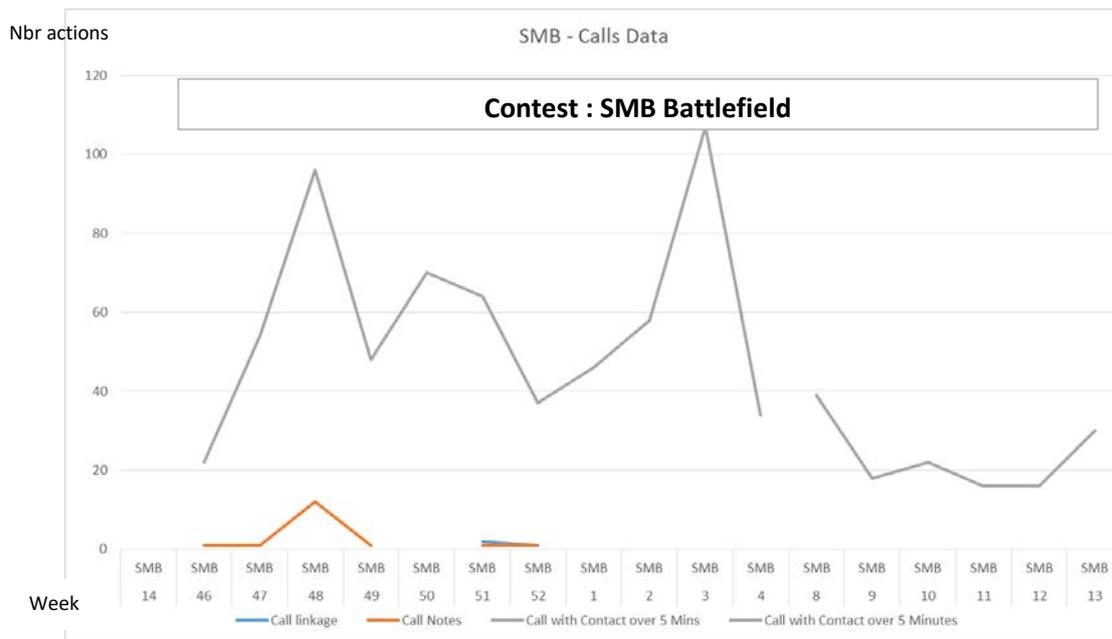


Figure 24: Graph of activity on selected SFDC features in SMB (Small Medium Business) team

This graph shows that the features from the PS contests, used by the PS team during the PS contest, and which were not included in the SMB Battlefield contest, were not used by the SMB team during the Battlefield contest period. On the opposite, the metric gamified “Calls with contacts above 5 minutes” included in contest shows a significant level of activity during the whole contest. This activity raised to more than 100 actions per week at the peak, during the first phase of the SMB contests, while during the second period it stabilized around 20 activities per week.

Regarding the last metric of the Public Sector team challenge, “Calls flagged for coaching, included in the two contests, the trend has been fairly dramatic, as per following figure 26.

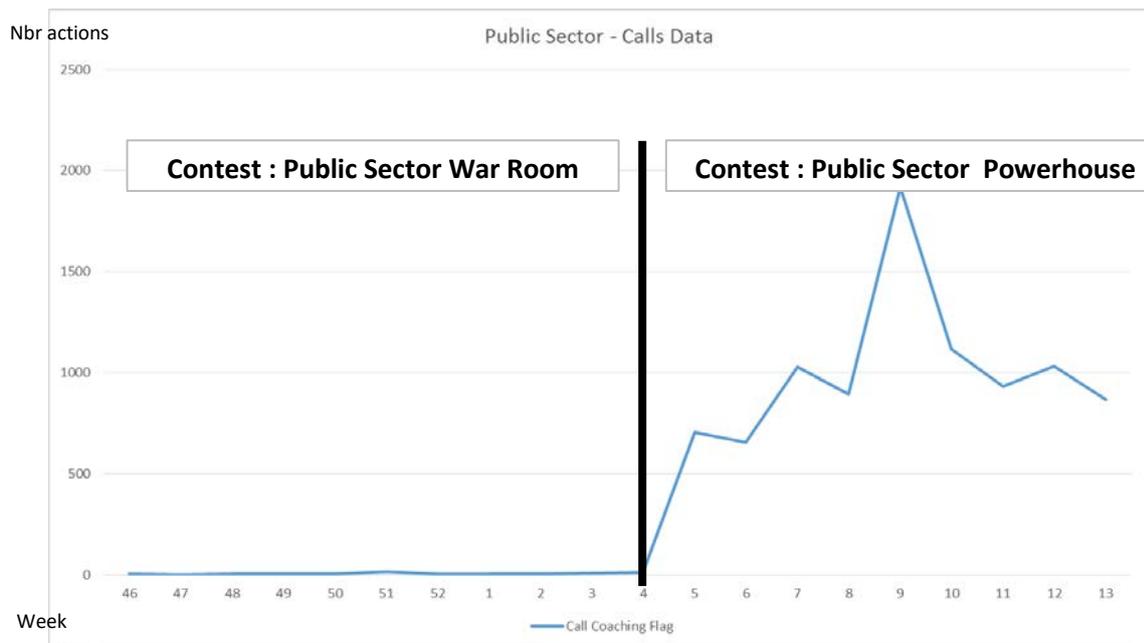


Figure 25: Graph of calls flagged for coaching in Public Sector team

This unreasonable amount of calls flagged for coaching – more than 100 calls per team member on the peak, representing more than thousand calls per first line manager per week was not intended when setting the contest. The manager setting the contests intend was to get their team to select specific difficult calls that would be useful for their manager to analyze and provide coaching feedback upon. However, as many team members started to flag all calls to maximize their points, it became materially impossible for him to perform this volume of call coaching and the purpose of the flagging was lost. This is a manifestation of the phenomena of a team starting to “game” the system, as they have found a simple way to earn points. The role of the first line manager is key here to identify those behaviors and change the rules to re-establish the fairness and legitimacy of the contest.

This analysis confirms the positive impact of inclusion of metrics in the contests on the level of activity involved in the gamified functionalities. It also questions the longer term impact of gamification while impact of the contests seem to diminish overtime, is subject to be gamified by the users and may stop with the incentive.

Prague Hygiene scorecard

In December 16, the project manager for Leveleven in Prague encouraged a couple of first line managers to set up a challenge across the hub to improve SFDC hygiene. Initial focus was on overdue opportunities, which are opportunities that have passed their due date without being updated, neither won, lost nor postponed, and later on adding stagnant

opportunities, defined as opportunities untouched for greater than 30 days. The launch email for this initiative can be found in appendix 16, and some screen shot captures from leveleven on appendix 17.

This contest give us the possibility to compare the number of overdue opportunities in Prague, where this challenge was set, to Erskine, where this metrics didn't get any particular additional focus beyond normal management tracking.

The number of overdue in the two sites during this activity is reported in the table 22 and graph 27 below.

Date	Number of overdue	
	Prague	Erskine
15/12	68	208
5/1	118	142
19/1	69	104
2/2	14	109
16/2	84	151
2/3	215	362
16/3	105	223
30/3	88	150
10/4	117	184

Table 22: Number of opportunities overdue by site

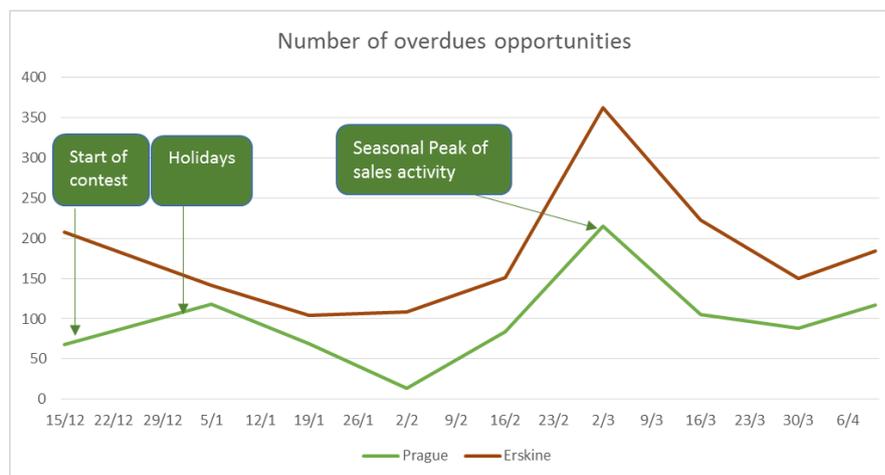


Figure 26: Graph of opportunities overdue in Prague and Erskine

This analysis shows that, for a comparable number of users, Prague users have constantly kept their number of overdue cases below Erskine. In the first months of the contest, the impact was maximum towards the quasi disposition of overdue. Mid-February and early March, both teams reduced their focus on overdue in context of a seasonal pick of activities related to sales campaign calendars. After this peak, in both sites; overdue are back to normal

level, with a remaining advantage to Prague. The impact of the gamified feature in Prague seems to have been nevertheless diminished. This can be explained by the fact that a number of other contests have been launched in Prague related to other business objectives which seem to have captured the attention of the team at the detriment of the initial challenge.

In January, an additional metric was added to the hygiene contest in Prague relative to the number of opportunities untouched since more than 90 days, which we wanted to reduce to the minimum. For this metric, I don't have a comparison basis available in Erskine, however the trend in Prague is generally encouraging with a reduction of stagnant opportunities from the start of the contest in January, and persisting over time except during the peak of activity. The table 23 following captures the number of stagnant opportunities over time in Prague, and is followed by a graphical representation in figure 28.

	Number of stagnant opportunities
Date	Prague
15/12	160
5/1	161
19/1	126
2/2	119
16/2	173
2/3	186
16/3	120
30/3	138
10/4	116

Table 23: Number of stagnant opportunities



Figure 27: Graph of opportunities overdue in Prague and Erskine

We have observed that the reduction of stagnant opportunities was sustained for a longer period, except the peak of activity due to quarter closing, compared to the reduction of overdues. This resilience of the impact of the contest may be linked to the difference of their impact on business performance. While cleaning overdues have benefits in term of visibility on sales forecast, it doesn't impact much sales performance. Working on stagnant opportunities, in contrast, has the potential to reactivate some dormant opportunities with clients and drive better sales performance. So according to OIT, it is more likely to be integrated in the sales reps own values and habits.

This quantitative triangulation, while confirming the qualitative analysis on the impact of the gamification on user behaviors, also highlight the challenges to set the right challenge and keep the competition fair and maintain motivation over time, and highlight the very dynamics at play in gamification.

4.3.6. Additional insight from project team debriefing

In addition to the analysis of data collected during the action taking phases, the project manager was able to consolidate feedback from the project team and first line managers in order to share it with our Worldwide stakeholders. While conducted independently from my academic analysis, some of the findings and recommendations are very consistent with what has been described already in this section.

The tone is very positive about the project, despite the various challenges faced.

The two most popular features are the possibility to set up contests with real time feedback and the display on big screens. I've included the feedback deck in appendix17.

4.3.7. Specifying learnings

Unlike the first cycle, the second cycle was conducted on the basis of a conceptual model, I will therefore start by confronting the analysis from the cycle 2 evaluation with the propositions of the conceptual model.

Proposition 1: Enhanced System Use and Use Satisfaction improves Net Benefits

Qualitative results highlight a number of benefits from the users and managers perspective and very few expressed a negative impact. Particularly, some end users expressed the benefits for their productivity in keeping their data clean, the time saved to retrieve information when

documented in one place in the CRM rather than multiple places outside the system, and having it at their fingertips when calling their clients (*“Julian set me a target I need to hit in order to catch up on my storage number.” And then I’ll set that goal live in the Level 11 tool, and they can see where they’re progressing towards it, and then I could see visibility as well.”*). Managers also mentioned the time saved for their personal access to the information in real time rather than through reports, and by avoiding the distribution of reports with the information now constantly available to their team (*“from a management point of view it’s fantastic, because I can set up a meeting to discuss what I want to drive activity, and then it does seem to take care of itself within the team because the leadership table’s all accessible to them, and there’s obviously the LevelEleven TV as well”*).

Proposition 2: Enhanced System Use and User satisfaction reinforce each other

This proposition based on solid literature evidence, didn’t find a strong illustration in the data collected. However several users expressed the fact they were more likely to keep their data current while they valued the real time visibility and the ability to access the flagged data directly when an update was needed (*“I think it’s the best advantage for us because before it wasn’t so clear how can we check how many calls we did, how many call time as spent, and maybe sometimes we didn’t care about it so much because the access to the data was a little bit tricky in the Sales Force. No one really wanted to spend the time how to find it. Now when we can self track ourselves, it’s much better”*).

Proposition 3: Information Quality drives Enhanced System use

The relationship between availability of information in the CRM and use of the CRM is confirmed by the data collected. However, the relationship seems to be bidirectional with a positive reinforcement loop : while it enhances the use of the CRM through capturing more information such as competitor information or call notes, the users improve information quality in term of completeness and accuracy, which itself triggers the users to consult the data more frequently and motivate them to continue to enhance their data entry in the CRM (*“ it shows you a log of the other calls you made to either partners or clients and goes with that particular opportunity”*).

Proposition 4: Game elements increase Information quality

Several users highlight the added value of real time feedback included in the gamification, giving them a much better access to information from the CRM customized to their need and refreshed permanently (*“it's really important to me to be able to track my progress during the day in real-time. That was a very very crucial part, and very crucial benefit”*). . Managers especially rated this functionality as the highest.

Proposition 5: Extrinsic motivation drives Enhanced use

Extrinsic motivation stimulus, including incentives and social recognition, was mentioned by a number of participants as adding to the interest of the gamification. Some users articulated clearly the connection between incentives and their enhanced use of the CRM (*“my kind of Salesforce hygiene is definitely improved, especially after the Level 11 dashboard was on my screen because I didn't realize that when you enter new comments in the opportunity update, I didn't realize that that actually then gets you points as well on the leaderboard”*). Triangulation from quantitative data shows a clear impact on CRM use. However, the information collected doesn't inform us on the extrinsic or intrinsic nature of the motivation lever. Nevertheless, in some cases, this impact can be only short term and is not necessarily driving a permanent behavior change unless the users realize the inner value of their effort on legitimate objectives. Enhanced use driven by extrinsic motivation not internalized by the users has disappeared or been significantly reduced as soon as the contest stopped in two cases analyzed in quantitative triangulation.

Proposition 6: Extrinsic motivation drives User Satisfaction

Both small material incentives and social recognition were used during the pilot, and both were valued and enjoyed by some users, while others were indifferent. The fairness of the contests was expressed as a strong condition for the appreciation of extrinsic rewards by the users (*“One pushback I did have was the fairness of it. It was really hard to think of how to make it as fair as possible for all the different people in the team working on different territories”*).

Proposition 7: Intrinsic motivation drives Enhanced use

Several users have expressed that they were stimulated by gamification and pushed to increase their effort to run the extra mile (*“Every time you pass the TV if you go for tea or something, you can see it. You can see it, you can see that you are in the top or you are in the bottom in the call time or opportunities. That stimulates a lot. At least on me, it really works, I know that. I’m 100% confident that in my colleagues as well, because I see them quite a lot that they’re stopping by. They had a long call, 20-minute call. After minutes, you see them, “Ah, is it counted?”*). This calls on their need for competence, in conjunction with the availability of real time information on CRM data needing updates and on the ease of taking action. This additional motivation was driving them to increase their use of CRM. The link between other levers for intrinsic motivation (autonomy and relatedness) and enhanced used is not clearly coming up from the data analyzed. Triangulation from quantitative data shows a clear impact on CRM use, however the information collected doesn’t inform us on the extrinsic or intrinsic nature of the motivation lever.

Proposition 8: Intrinsic motivation drives User satisfaction

Several users mentioned positive emotions like “fun” and “enjoyment”, (*“it brings some new fun, let’s put it this way”*) often in the context of competition (*“I think for me it’s fun when you can compete”*), as long as it stayed emulative, or “healthy”, and related to team spirit (*“I think that LevelEleven makes it a little bit more enjoyable in the terms of my colleagues, team, internally”*). Several also mentioned they enjoyed having autonomous visibility on their scorecards rather than relying on manager’s reports and cadence, which also participates to user satisfaction with the CRM (*“It’s only better maybe for myself, that I can check by myself.”*)

Proposition 9: Game elements increase Extrinsic Motivation

Game elements offer a platform for managers to offer incentives attached to contests as well as social recognition through leaderboards and the celebration of winners. However this impact varies depending on the individual and on the way it is communicated and perceived by the users (*“I participate in everything, but I don’t have the incentive actually in mind, to be really honest”*). Some expressed that more than symbolic incentives would be detrimental to their overall job motivation (*“For now, we have the small, symbolic things. I think it should more or less stay like that. The awards shouldn’t be so big because people can then envy or be jealous”*),

and others recommend team incentives (*"I think a good way to do it would be to do incentive parts. One for the whole team, for instance my market. And one for the individual. So then, not only the individual tries to do as best as possible, but then he also encourages the whole team"*).

Proposition 10: Game elements increase Intrinsic Motivation

Users expressed the impact of gamification on their intrinsic motivation as related to the ability to measure their own progress and compare themselves to their peers (*"we see kind of how each other progressed, I think it's a very good thing because then I can see "Oh I need to keep up with Jani or whoever else is making a bit more calls". And at the same time I see how they are standing, so that's also a very important kind of indication for me, because when you're just hearing talking you often don't realize what time are they spending talking, you know?"*). This contribute to competence, to the team spirit and social interactions with the buzz created contributed to relatedness, and with the ability to drive themselves their scores without relying on managers reports and control. Competition was highlights in a number of case as stimulating and healthy, while some others experienced increased pressure.

Also the elements of the model are consistent with the data collected during the action research and seems to confirm the theoretical foundations, it doesn't offer a very fluid explanation at that stage, and do not reflect all the facets emerging from qualitative analysis, including most cited attributes like playfulness, competition, team spirit and real time feedback, or some critical factors like fairness. Therefore I have revisited the conceptual model in the light of cycle 2 findings.

4.4 Adjusted conceptual Model

While the analysis of the qualitative information collected supported the relevance of all the concepts from the conceptual model, it also highlighted that the relationships between them was more complex than assumed initially. Rather than a feature one can switch on to obtained expected behaviors, gamification as painted by this analysis is a complex social phenomena which needs to be considered in its context and rely on a number of conditions for

success. For instance, rewards could impact positively under certain circumstances, and negatively under other circumstances, if they are perceived as controlling by the users.

In order to reflect those interactions, I decided to take more of a process view in the construction of the model. As per Newman and Robey ((Newman and Robey 1992), “ process models provide the story that explains the degree of association between predictor and outcomes” (p250). While a variance model would provide a partial understanding of the phenomena, like pieces of the puzzle leaving the implementer to his own resources to put the puzzle together (Swanson 1988), a process model focuses more on the dynamics of social change, explaining how and why results are achieved (Van de Ven and Huber 1990). Process research in IS is established since the 90s and has been defined by the work of Newman and Robey or Sabherwal and Robey (Newman and Robey 1992; Sabherwal and Robey 1995).

In the case of gamification, the AR results have highlights the importance of those dynamics and the sequence of events resulting in the expected outcome. However, the model is not organized by stage as often in process research (Hirschheim, Klein, and Newman 1991), as there is not linear sequence of action but rather a parallel and iterative set of events. I therefore retained the concepts from initial conceptual model, and reorganized the model in of events, starting with the introduction of the game elements, generating a number of parallel effects, resulting overtime, in a specific social setting, in greater use of IS, enjoyment and quality of information, which helps to produce the expected impact on net benefit.

I also introduced in the model the 4 main attributes of gamification that I could relate to findings emerging from cycle 2 evaluation. I relied on the concept of motivational affordances (Deterding 2011; Zhang 2008), as per Deterding’s definition : Motivation is afforded when the relation between the features of an object and the abilities of the a subject in a defined social context allows the subject to experience the satisfaction of motivational needs.

In this case, the feature of the object are the gamification features of CRM, including the contests, scorecard or leaderboard, the defined context is the use of CRM in the workplace, and the abilities of the subjects are the abilities of the CRM user in this social context, like experiencing competition or obtaining real-time feedback,. The introduction of affordance adds to the explanatory value of the conceptual model.

I have also qualified the impact of the various concept on each others, describing their nature more precisely to enrich the explanation value of the model. The following table summarize the different quality of impacts utilized in the model.

Impact	Application
Activate	The game elements activates the abilities of the CRM to generate team spirit, enjoy playfulness, competition and real-time feedback
Contribute to	Team spirit is an important factor to intrinsic motivation through fulfillment of need for relatedness. Real-time feedback is an important contribution to information quality.
Keep healthy	Playfulness maintains good team spirit and emulative competition
Stimulate	Competition incite to efforts to fulfill need for competence. Extrinsic motivation, if integrated, can also spur on similar efforts
Fuel	Real time feedback supplies information to activate need for competence and autonomy.
Inhibit	Extrinsic motivation, if perceived as controlling can restrain intrinsic motivation
Drive	Intrinsic motivation cause the movement of the users towards enhanced use, enjoyment and contribution to information quality
Reinforce each other	Enhanced use, Enjoyment and information quality strengthen each other's
Result in	Improvement in Enhanced use, enjoyment and information quality produce net benefits

Table 24 Description of the nature of impact involved in conceptual model

The adjusted model is represented below in figure 29:

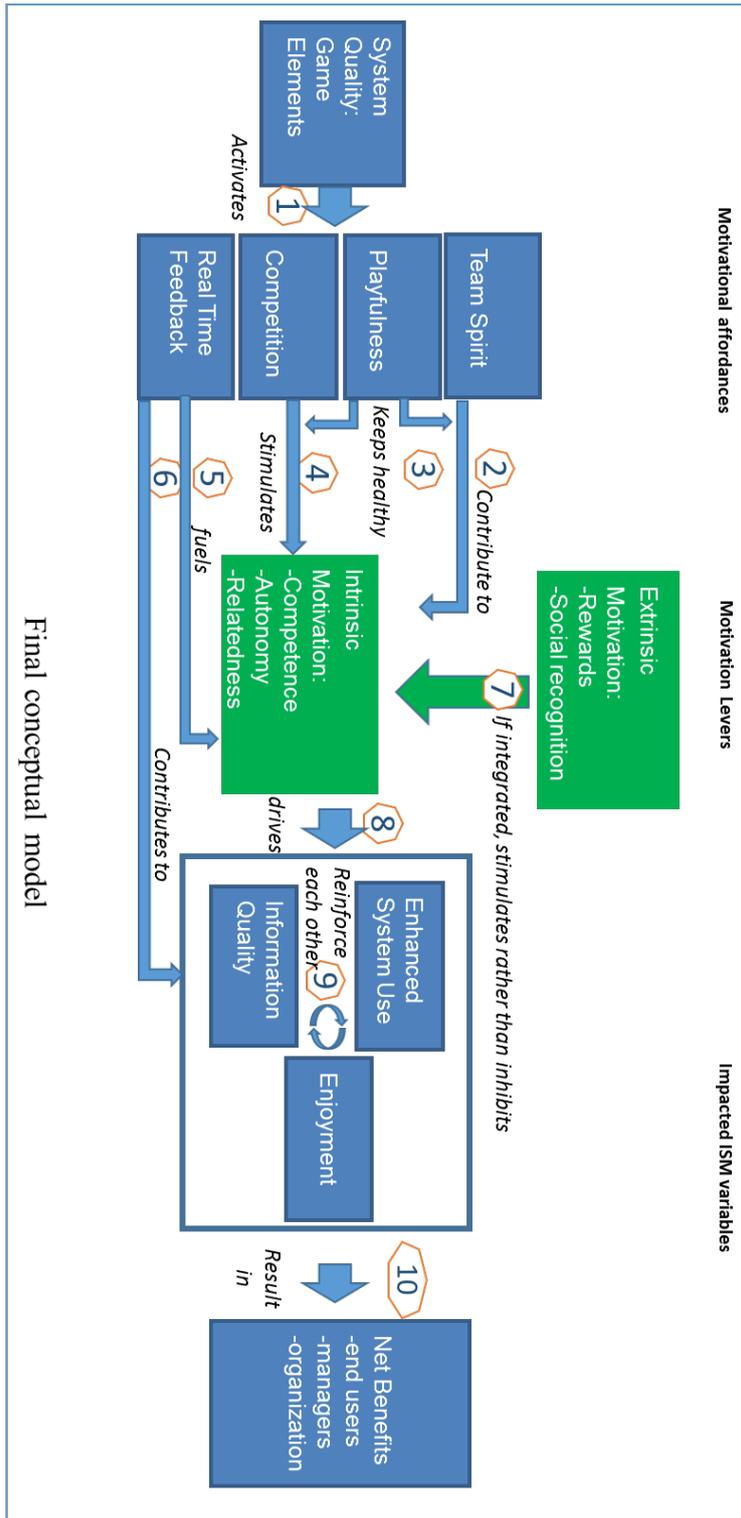


Figure 28: Adjusted Conceptual model

In this model, the relations between concepts are not simply defined as cause to effect but qualified to better understanding of their effects, as described as follows (numbers are reported in the model) :

1: Game elements from gamification (in our case, teams, points, contests with time constraints, scorecard updated real time, leaderboard, TV display with pictures and sounds, platform) enable 4 main motivational affordances of gamification. The most mentioned dimension is competition, which is mostly mentioned positively, the second is team spirit, then close behind playfulness, often mentioned as “fun”, and eventually real time information.

2: Team spirit contributes to intrinsic motivation by fulfilling the need for relatedness.

3: Playfulness alone doesn't seem directly connected to motivation in the workplace however it seems to act as an “adjuvant” to the team spirit and competition. It helps for example, to keep the competition emulative, or “healthy” rather than fierce

4: Competition (if not taken too seriously thanks to the playful context) stimulates intrinsic motivation for competence

5: Real time feedback fuels the intrinsic motivation, both for competence by providing visibility on performance against targets and against peers, and for autonomy by making users more independent from managers' feedback and able to drive their trajectory by themselves

6: Real time feedback also contributes to the CRM information quality by providing up-to-date and concise information

7: Extrinsic rewards can either stimulate or inhibit the motivation depending on whether it is integrated in individual motivation systems, and whether they are not taking too much importance. If individuals feel controlled and pressured, we can expect that their intrinsic motivation will be negatively impacted. In our case, we got more comments tending towards a positive perception of the pressure, as stimulating, rather than negative.

8: Increased motivation drives concurrently three positive consequences. First is the Enhanced system use of the CRM, on the gamified features. Here we hope to create some healthy habits during the contests, which will be retained over time if the users realize that this discipline is beneficial to them. Second is Enjoyment, which makes routine tasks in the CRM less boring and work more interesting. There is the idea that, as a result of the collective improvement of CRM use, the information quality will improve with the more frequent and qualitative updates from the users.

9: Those concepts have the potential to reinforce each other, with better information quality driving more usage.

10: Assuming the CRM is a valuable asset for a sales team, better utilization should result in net benefits for individuals, managers and the organization. In addition, the gamification can include, like in my case, some challenges directly targeted at improving sales and business performance.

This adjusted conceptual model will be the basis for design principles towards a successful gamification of utilitarian IS.

4.5 Design principles for effective gamification of utilitarian IS

In order to build a bridge between this conceptual model and practitioner's challenges when considering the design of a gamification of utilitarian IS, I have summarized key insights from this academic research in 7 guiding principles which capture main decision points in the design phase of the project, both from a technical perspective and managerial perspective.

4.5.1. First principle: Activate all 4 motivational affordances

My AR intervention has contributed to identify four distinct motivational affordances at play when gamifying an enterprise information system, namely team spirit, playfulness, competition and real time feedback, with some interdependence between them. Playfulness is important to keep the competition "healthy". Real time feedback is important to fuel the interest of the participant players but also impact positively their intrinsic motivation for competence. Team spirit is stimulated by Competition between teams, and within the team, as long as it is playful and contributes to the need for relatedness. As these 4 affordances matter to the motivation impact, it is important to check that the design for the gamification will not omit any of them.

For instance, a gamification design that would solely rely on badges and leaderboard but not include elements allowing playfulness, like contests or avatars, may not generate the same level of interest and be perceived as controlling rather than stimulating. Playfulness will not only result from the gamification elements in the design, but also on the situated context, including the age of participants or the ability to display the results on large screens in the workplace. Competition will best operate if the contest users are kept engaged by regular feedback, and will stay positive if gamification includes team elements reinforcing team spirit.

In addition, we have seen that real time feedback, as well as contributing to increased motivation, is also an important contribution to information quality and therefore should be a critical component of the solution.

4.5.2. Second Principle: Keep participation Voluntary

As per Huizinga (Huizinga 2014), “*first and foremost (..) all play is a voluntary activity. Play to order is no longer play*”. While the gamified enterprise system is a utilitarian information system, it is often mandatory, so the organization may be tempted to force the participation to gamification feature. This would be detrimental to our intrinsic motivation for autonomy to feel volitional in what we do (Deci and Ryan 1985b). In this context gamification is likely to be perceived as a new type of control system and “kill the fun” from gamification. So communication for gamification should display a light and positive tone and not carry social and management pressure to take part in the contests.

4.5.3. Third principle: Empower teams to customize their game

While the first cycle of the AR implied a centralized design, the second cycle was designed to allow deep customization and empowered first line manager to shape the usage of gamification in their site and with their team. That second approach has been much more efficient than the centralized design, with less effort from the central project team to drive the engagement and provide guidance, better results in term of sustained impact over time, and fairness perceived by the participants. Empowerment allows managers to set the “right challenge” (Csikszentmihalyi 1996) and offers quick feedback loops to adjust and tune on the basis of the progress of teams or individuals, and when users have found a way to “game” the gamification and divert it from its legitimate goal.

Managers play also a central role in communication around gamification, to set the tone and achieve a good level of acceptance and participation, while giving them some autonomy on the use of the tool favors their personal commitment to the gamification approach.

Although the project design was focused on manager empowerment, progressively some users have also expressed in both sites the wish to be part of the design of the contests and to contribute with ideas. The empowerment of managers and users to take ownership of the contests can contribute to satisfy their need for autonomy as much as the gamification itself, and sustain their interest over time.

4.5.4. Forth Principle: Keep a light hand on rewards

My Action Research didn't provide a black-and-white answer about whether material rewards have a positive impact on motivation, as you could expect from behaviorist psychology (Skinner 1938), or negative due to the negative impact of feeling controlled by others which is detrimental to the need for autonomy as per SDT (Deci, Koestner, and Ryan 2001).

Some of the interviews showed that material rewards can be a key motivator for some participants giving them a little nudge to try a new feature of the CRM that they would otherwise consider as unimportant. As per Deci, Koestler, and Ryan (Deci, Koestner, and Ryan 2001), incentives on dull tasks did not reduce internal motivation as there was very little motivation to start with, but may facilitate user understanding of the importance of the activity itself and this internalize its regulation which increases internal motivation.

On the opposite, the lack of resilience of enhanced use when the contest stopped could be a consequence of the adaptation triggered by incentives and which stop when the extrinsic factor –in this case the contest – stops. This confirms a previous empirical research on gamification of an enterprise social network service which showed that the removal of a points system made a significant negative impact on the user activity and that contribution of content significantly decreased after the deactivation of the points system (Thom, Millen, and DiMicco 2012a).

While consistent with SDT and OIT, this finding contradicts the theory on habits from Duhigg ("The Power of Habit" 2015), which states that through the motivational mechanisms of reinforcements and emotions, desired outcomes become automatic behavioral processes or habits forming a behavioral loop that requires less and less cognitive resources as the desired behavior is repeatedly reinforced.

As Scott Rigby in "the gameful world" (Walz and Deterding 2015), my recommendation is to avoid putting tangible incentives at the core of gamification and to keep them rather trivial, use them mostly to give importance to behaviors that would otherwise be likely neglected, and to favor team incentives as much as possible, so those incentives don't undermine intrinsic motivation.

4.5.5. Fifth Principle: full integration in the Enterprise Information System is required

As we aim to achieve better utilization of a utilitarian information systems, it is critical that the gamification application is fully integrated. It allows the critical mechanism of real

time feedback, and makes the action of adding or correcting information in the enterprise system very easy. In some way, gamification provides a partial solution to the complexity common in enterprise systems by providing some short cuts for the users to access the features which are gamified. Without this simple access, the impact of gamification will most likely be limited to the higher game addict profiles in the organization.

4.5.6. Sixth Principle: Fairness is key and requires permanent attention

Fairness has been raised repetitively as critical from both cycles to sustain interest in participants. Fairness can be related to the concept of trust which is mentioned as a dimension of user satisfaction in ISM (Petter, DeLone, and McLean 2008).

In the second cycle, the empowerment of the first manager to set up the contests and metrics for their team has contributed to make the competition fairer compared to the challenges set up by the project team equally for all teams. For instance in Prague the Russia team decided it would be more balanced and motivating to set up a challenge with the team covering Austria, because of the nature of their markets and size of the teams, and agreed the criteria between the teams.

The risk for participants to “game the gamification“, and circumvent the system to gain points and badges, has not disappeared with empowerment. In fact it has materialized clearly in one of the Erskine’s team, with the call coaching flag. However it has been identified and could be more easily fixed by the involved manager. The first line managers are best positioned to identify these behaviors and adapt the rules frequently to keep up the interest.

4.5.7. Seventh principle: Gamification requires a legitimate purpose

Opposite to play which has been defined historically as without purpose and with no material interest (Huizinga 2014), gamification in the workplace needs to be legitimated by a valid objective explicit and shared with the users. Gamification is by nature an external intervention. In order to drive sustainable behavior change, it is subject to the process described in SDT as internalization (Deci and Ryan 2002). Most efficient integration is the integrated regulation, achieved when a particular activity has value and meaning. If internalized, gamification goals can be integrated as intrinsic goals and contribute to personal growth, health and wellness, and developing stronger ties with one’s community (Walz and Deterding 2015)..

Intrinsic goals of the gamified application should be explained and emphasized to participants to achieve positive outcomes. Gamified behaviors must drive positive and

legitimate outcomes: if the gamified features are perceived as mostly targeted at internal compliance and not associated with meaningful professional or well-being objectives, it is likely that it will remain an externally controlled behavior which will stop as soon as the incentive will stop. This finding is consistent with finding from Robson et al. (Robson et al. 2015c) empirical study which highlights that a process should be gamified for clear purposes that can be financial, social or environmental.

The following table 25 summarize the 7 Design principles.

	Design Principle	Justification
1	Activate all 4 motivational affordance	Team spirit, playfulness, competition and real time feedback were identified as most effective motivation affordance and are subject to interdependence between each other.
2	Keep participation voluntary	Gamification relies on playfulness, which requires a voluntary participation. Communication for gamification should not carry social and management pressure.
3	Empower teams to customize their games	Teams are best position to set the “right challenge”. Empowerment also allow them to adjust and tune quickly to retain users interest.
4	Keep a light hand on rewards	Rewards can catch user attention but also be detrimental to intrinsic motivation. Avoid putting tangible incentives at the core of gamification and keep them rather trivial
5	Full integration in the Enterprise IS is required	Integration is required to allow real time feedback, seen as one of the key motivational affordances
6	Fairness is key and requires permanent attention	Fairness has been seen as critical to retain interest in both AR cycles. Fairness can be related to the concept of trust which is an antecedent of IS success.
7	Gamification requires a legitimate purpose	To achieve a persistent impact, gamified behaviors must be internalized in user values. This is more likely to happen if they drive positive and legitimate outcomes.

Table 25 Summary of 7 design principles

The guiding principles impact our conceptual model at different points. The following figure 30 represents them situated in the adjusted conceptual model.

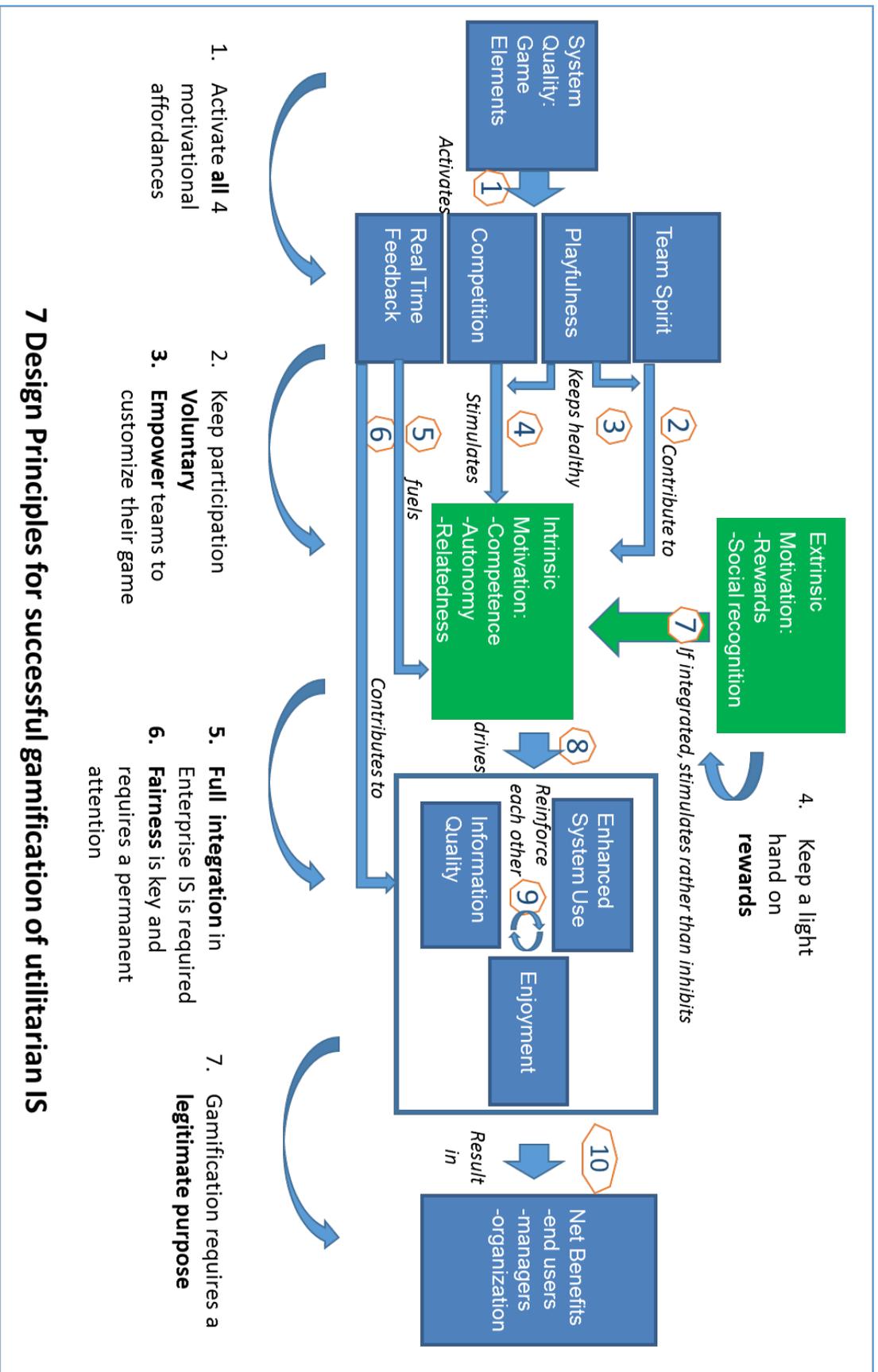


Figure 29: Design principals mapped to final conceptual model

5. Discussion

In this section, I would like to go back to my research questions and connect them to the findings from my action research so far, then expanding the discussion to considerations regarding potential limits, contributions of this study to practice and academia and further avenues for research.

5.1. Gamification impact on Utilitarian Information Systems Success

The action research evaluation has confirmed a tangible impact of gamification towards enhanced use and user satisfaction, clear perceived benefits at user, manager and organisation level. This positive impact has been perceived by participants, and expressed in a number of interviews and focus group and has been triangulated on several SFDC usage metrics.

This research has also confirmed the potentially volatile nature of the gamification impact, which was already identify as a limit in previous research (Hamari 2013b). In this AR, some results initially obtained on enhanced use seem to disappear when the gamification trigger stops, even so the enjoyment impact remains.

More generally, it is putting the lights on the managerial dimension of the gamification process. Gamification success depends on managerial decisions related to its implementation, which can impact strongly, both negatively and positively, the success of the experience. For instance, the level of empowerment of the teams involved, or the type of rewards offered. As such, this research confirms ISM theory which identifies several social and organisational variables as antecedents to the information system success, including visibility of usage to peers, involvement of users in the development of IS, or management support to champion and promote an IS (Petter, DeLone, and McLean 2013a).

One of the unexpected discoveries was the importance of the real time feedback and visual representation. Not only this feature contributes to the motivation dynamics, but it also contributes directly to the quality of the information provided to the user which is a strong determinant of the Information System Success (Petter, DeLone, and McLean 2008). Here gamification is filling a gap in traditional Enterprise Systems compared to user expectations coming from the consumer world where everything is visual and real time.

5.2. Motivation levers explaining the potential impact of gamification

My second research question was related to the motivation levers which explain the potential impact of gamification on utilitarian IS success. On the foundations of the literature analysis documented in section 2, I have built and tested the gamification of a CRM in a sales

team over two successive periods of roughly 6 months, following the steps of Canonical Action Research (Davison, Martinsons, and Kock 2004).

This effort was based on a conceptual model introducing the Self Determination Theory concepts (Deci and Ryan 1985b, 2002) in the Information System Success Model (Delone and McLean 2003). This conceptual model (posits that the introduction of game elements in an existing CRM impacts the intrinsic motivation of competence, autonomy and relatedness, which themselves impact Enhanced System Use, a rich measure of usage defined by F. F. Bagayogo, Lapointe, and Bassellier (F. F. Bagayogo, Lapointe, and Bassellier 2014) . It also impacts user satisfaction which itself impacts net benefit for individuals as well as for the organisation.

As a result of the AR learning, this concept has been developed to introduce 4 motivational affordances which connect the game elements with the motivation levers of SDT in our particular context. I have proposed 4 main motivational affordances in the context of gamification of utilitarian IS which concur to action the motivation levers from SDT:

- The team spirit, reinforced by competition both between the teams and within the team, which creates a greater bounding within the team members involved in the gamification and contributes to relatedness
- The competition driven by the contests and leaderboards, and reinforced by incentives and social recognition, contributes to the drive for competence as well as for relatedness since they contribute to the bounding of teams.
- The playfulness of the game-like environment, which gives a light touch, keeps the competition emulative and limits the risk for gamification to be perceived as a control mechanism
- The real time feedback which is instrumental to keep up the interest in the competition and fuels the need for competence

The qualitative analysis performed in the two cycles of AR have confirmed that gamification, through the intermediation of those contextual motivation affordances, can stimulate the three levers of intrinsic motivation:

- Competency, with the possibility to assess your effectiveness in real time against your goals and your peers, to identify the best players you can learn from, and to get stimulation from playful competition

- Autonomy, through the empowerment to contribute to the design of the contests and the ability to act more independently on real time information without being dependant on manager feedback
- Relatedness, with the team spirit resulting in the feeling of being part of a community and increasing playful interaction within teams and between teams

The conceptual model has also been enriched by some more qualitative characterisation of the relationships between the various elements of the model. Far from being a simple correlation, this research has shown that the impact of gamification on motivation and ISM is a complex mechanism very sensitive to the conditions of the implementation.

For instance, Gamification's contribution to the need for competence is dependent on the inclusion of real time feedback in the design of gamification, which offers both an individual assessment of the progress against goals, and a comparison to peers, allowing users to identify best performers and mirror their best practices. It also depends on the ability to set "just right challenges". As defined by Csikszentmihalyi (Csikszentmihalyi 1996), challenges should achieve a balance between the perception of one's skills and the perception of the activity's level of difficulty. By definition, the right challenge may differ per user or team, and therefore the impact of gamification to fulfil the need for competence will depend on the ability of managers and team to define collaboratively those challenges and adjust them as needed. Those challenges also need to be perceived as legitimate by the participants to justify the internalization of the external intervention in the user's values and goals.

My investigation has also confirmed that extrinsic rewards in the form of incentives can play a role, even though they are not central and need to be used with care as they could be detrimental to intrinsic motivation (Deci, Koestner, and Ryan 2001). Social recognition provided by public praise and the visibility of winners and leaderboards on individual and public screens is also contributing to the impact of gamification.

These mechanisms, while powerful, are not necessarily coming to life automatically when switching on the gamification platform. My research has shown that they are rather fragile and volatile, and depend to a large extent on the way the gamification project is approached and implemented. I have summarized my findings from this experiment under the chapter design principles described in the next section.

5.3. Design principles for effective gamification of utilitarian IS

To answer my third research question, building on my findings from the two cycles of action research, and on the sum of academic knowledge summarized in my literature, I have summarized 7 Design Principles to maximize the impact of gamification of utilitarian IS.

7 Design Principles for successful gamification of Utilitarian IS

1. *Activate all 4 motivational affordances : Team spirit, Playfulness, Competition, Real Time feedback*
2. *Keep participation voluntary*
3. *Empower teams to customize their games*
4. *Keep a light hand on rewards*
5. *Full integration in Enterprise IS is required*
6. *Fairness is key and requires permanent attention*
7. *Gamification requires a legitimate purpose*

These design principles, justified in section 4.5, include an IS architecture dimension through the integration in the Enterprise IS, and have some implications on the selection of the gamification software platform which needs to allow the manifestation of the 4 attributes.

However, the main contribution of these principles happens at managerial level. Gamification should be looked at as a complex social process, rather than a technical capability added to the IS. It requires a sustained effort and participation from the teams in scope to achieve its great potential and pulls on deep inner motivation while changing the workplace dynamics. Achieved through technologies from the 21st century, gamification also requires a modern, participative style of management to benefit the organizations who want to leverage it in their workplaces.

5.4. Contribution to academia and practice

At academic level, my aim is to add to a growing basis of research aiming to confirm the impact of gamification on business performance in the workplace, and explain the

psychological mechanisms at play, which has been highlighted as an area for future research (Hamari, Koivisto, and Sarsa 2014b)

This is a gap that I have addressed in my efforts to open the box of human motivation with the Self Determination Theory toolset (Deci and Ryan 1985). My research confirms the relevance of SDT in the context of gamification while qualitative information collected during the AR confirmed the impact of gamification on the 3 human psychological needs of competence, autonomy, and relatedness. Users expressed the impact of gamification on their need for competency as related to the ability to measure their own progress and compare themselves to their peers. They also mentioned the team spirit and social interactions with the buzz created which contribute to relatedness. And some expressed their increased ability to drive themselves their scores without relying on managers' reports and control, which fulfill their need for autonomy.

This AR also mobilized the concept of internalization of extrinsic stimulation in particular when studying the ambivalent impact of rewards, which has been perceived either as an additional stimulus or as a demotivating external imposition of the users. OIT theory can bring some lights to the limits and conditions to lavage of rewards to drive behavior changes in a gamification context. So, as a result, two major constructs from SDT, psychological needs and OIT, have confirmed their value in explaining the psychological impact of gamification.

Furthermore, the introduction of concept of motivational affordances, defined as per Deterding (2011), , offers deeper insights into the relation between game elements and motivation levers. The 4 motivation affordances identified during the AR, Team spirit, Competition, Real time feedback and Playfulness, provide the logical link between gamification features and ability of the users to experience the satisfaction of their psychological needs, as defined by SDT, in this specific social context. Also those affordances have been identified for this specific context of gamification of CRM, the approach could be replicated in other contexts.

Building on those findings, this research propose a conceptual model which articulates two major theories, ISM from DeLone and McLean in the field of IS (2003) and SDT from Ryan and Deci (1985) in the field of psychology. ISM theory has proven through years of empirical testing its value to measure IS success. It can offer a solid framework to the impact of gamification on IS success, which has not been subject to much academic work so far. However, it doesn't provide much support to understand the impact of gamification on motivation, which is at the core of gamification promise. Introducing SDT in ISM model fills this gap, providing a theoretical framework to connect gamification features to motivation. The

various and sometimes conflicting impact of gamification on motivation, as explained by SDT, could explain the inconsistency of results observed by previous empirical research (Hamari, Koivisto, and Sarsa 2014; Seaborn and Fels 2015).

This model, constructed during the AR in several cycles, and adapted to the specific context of gamification of CRM, could be a basis for further research on gamification of utilitarian IS. It can also be helpful to address other research problems related to the role of motivation in user adoption and post adoption, like introduction of moderated or non-moderated user forums and chat groups, or more traditional management scorecard and stack ranking which are deployed with various level of success in organizations.

In addition, anchored in the field Information System, this work will contribute to the exploration of the recent concept of enhanced use (F. F. Bagayogo, Lapointe, and Bassellier 2014) which provide a typology of use which helps to quantify progress in IS usage beyond the minimum adoption of mandatory functionalities in context of utilitarian systems. A pure compliant adoption kept to the minimum is likely to defeat the purpose and challenge the expected return on investment. Organization tend to aim for richer usage of the IS, which is more complex to measure (Burton-Jones and Grange 2013). This AR provides indeed an operationalization of Enhanced use classification which confirm the applicability of this academic concept in the context of an enterprise CRM.

Finally, this research wishes to contribute to the growing basis of Action Research academic work in the field of Information Systems. To ensure the academic validity of my approach, I have conducted a rigorous implementation of the Canonical Action Research Design, including the full evaluation against its 5 principles (Davison, Martinsons, and Kock 2004), and highlighted the beneficial impact of both theoretical and empirical experimentation driven by the action researcher.

I can see as well some strong contributions to practice.

First, this research has confirmed the interest of gamification for corporations who wish to boost the existing internal information systems infusion within their organization. It also demonstrated the sensitivity required to achieve the expected benefits. With my final conceptual model, I hope to be a good guide for practitioners willing to understand the underlying mechanisms at play. For those willing to adopt gamification of utilitarian information systems in their organization, my proposed design principles offer a clear path for achieving the expected impact from gamification.

Furthermore, my analysis can also be leveraged for other usage of gamification in the workplace. The gamification approach is particularly attractive while companies are

onboarding a number of young employees, born within the digital age and part of the Millennials generation and following. Gamification may be one of the levers for companies to improve their engagement and adherence to standards and processes, and to adapt current practices to best fit culture and expectation for this new workforce, replacing progressively retiring generations. This research highlights some important principles to consider when planning a gamification experience in the workplace. In particular, the voluntary dimension of the participation, the importance to limit extrinsic rewards, pay high attention to fairness and ensure the legitimate purpose is present and understood, will be key to all gamification efforts, even outside of the context of utilitarian IS.

Finally, beyond the relatively narrow concept of gamification, I wish to contribute further to challenge the myth of rationality as the key driver for behaviors at work and incense managers to explore participative managerial approaches including but not restricted to gamification, in order to drive engagement and call on employee's intrinsic motivation. While the problem identified at the start of this AR could be approach in a rational, centralized approach, even supported by powerful communication messages, like in the first cycle of the AR, the results have been stronger in the second cycle while empowering managers and teams to customize their solution. Taking this participative approach can be challenging for a leadership team which expect quick and measurable results, however in this case it has proven to drive stronger involvement and support, initially from first line managers, and progressively from the users themselves taking ownership for their contest and rules. So this research highlights the benefits to organization performance of providing empowerment and room for customization and appropriation rather than relying solely on controls and incentives.

5.5. Research Limitations

Despite the epistemology and conceptualization efforts of academics invested in AR, this methodology still faces some critics from classical positivists for its perceived lack of rigor.

The main concerns are as follows:

- A lack of external validity coming from outside the project context
- The collaborative framework and natural setting which diminish the researcher's ability to control the research process and its outcomes
- The risk of personal over-involvement from the researcher with the client organization

Pushed to the extreme, AR which is not conducted rigorously, lacks academic theoretical foundations, or is not based on a clear ethical framework, can be classified as consulting rather than academic research. Therefore it is critical to evaluate AR validity according to established criteria. In the case of CAR, I will refer to the 5 principles established by Davison and all (et al). (Davison, Martinsons, and Kock 2004). The evaluation summarized in the related section (3.2.5) of this document demonstrate that my effort meets most of the requirements of CAR.

Nevertheless I want to put forward that my results are valid in a very specific context and therefore generalizability is restricted to similar cases and contexts. Particularly, the users operate in a single company with a strong culture and are younger than the average workforce in Europe. The same AR may result in different outcome in a different social context and with older users.

My research design implies an insider position, which has the benefit of predefined knowledge and helped me to understand the details of the context and vocabulary used by the gamification users and allowed deeper analysis of the information collected. On the other hand, this pre-understanding can also have its limits if it becomes a filter that distorts the information captured as based on pre-conceptions (MacIntosh, Bonnet, and Coghlan 2007).

To avoid this distortion, I worked applying a rigorous process for the qualitative information, asking interviewees clarification questions during the interviews, and considering various possible meanings from the information collected during analysis.

Another impact on my dual role could come from my established status in the company. As a result, the employees I have interviewed may not have been willing to disclose fully their thinking and may have filtered their information to tell me what they assume I would like to hear.

I don't see this risk as particularly high for several reasons. First, while leading the organization, setting strategies and providing general guidance, I don't play a direct role in their day to day management, performance evaluation and promotion, therefore, the interviews do not interject in an active subordination relationship. Second, the topic discussed doesn't have major political implication and is not considered as highly sensitive by most participants so there is no obvious reason for them to hide their thoughts. Then, in order to minimize the intimidation coming from my status, I made clear the research purpose in each interview. Also, I used the focus group format when appropriate so that the number of participants present could make the discussion less personal while in this setting participants can be emulated by other

more active participants. Finally, I have also triangulated the qualitative analysis with the primary data on usage capture before and during the pilot.

One of the questions raised by literature is the long term impact of gamification and whether its impact may be temporary, the result of a novelty effect (Hamari, Koivisto, and Sarsa 2014b). My research covers a relatively long period, from the first experimentation in May 2015 to the end of the second cycle in April 2017, which gives me some longitudinal information to consider impact of gamification over time.

5.6. Avenues for further research

Although I considered that the second cycle of the AR was sufficient to address my research questions as I reached saturation in my qualitative evaluation, I can foresee several opportunities to extend this work in the future.

First, the model was elaborated through action research and is therefore specific to the case studied. It would be interesting to confront this model to other comparable contexts and check whether its validity can be confirmed outside the targeted organization. In particular, it would be valuable to test the model with cases offering different ages profiles, and with users in non-sales roles. Also, the motivation affordances are dependent on the game elements included in the design, and it would be interesting to test the model with gamification cases using elements not included in this case, like avatars, 3D visualization or/and narrative stories.

Second, the proposed conceptual model emerging from this AR is mostly based on qualitative research even if triangulated on specific dimensions by usage data. It would be interesting to build a quantitative model to test it. The rewards question particularly remains relatively open, and it would be interesting to differentiate between the impacts of different types of rewards and to quantify the impact of rewards on different types of users.

More generally, the question of user profiles has not been explored in this research. It would be interesting to expand the investigation in this direction, leveraging the work of Richard Bartle (R. Bartle 1996).

Finally, this piece of research has confirmed the importance of information quality for gamification and more broadly for IS success. However the interaction of information quality with usage and user satisfaction has not been fully articulated. The impact of real time information provided by gamification seems to be greater than the motivational impact of gamification and this could be an avenue to explore and contribute to the development of the ISM model.

6. Conclusion

More than ever, companies need to achieve a full return from their utilitarian information systems and should consider gamification as a toolset which can help them accelerate infusion of existing information systems, or include it in the design of new solutions. Leveraging from the booming sector of the game industry which is influencing our culture, this approach is particularly attractive to young generations who grew up surrounded by computer games and who are currently joining the workforce

This action research enquiry confirms the impact of gamification in IS success through enhance use, user enjoyment, and better information quality. It offers a conceptual model articulating IDS and SDT theories, which provides some lights on the sensitive and fragile psychological mechanisms at play, through contextual motivation affordances. This granular understanding supports the proposal of seven design principles which can be leveraged by practitioners willing to adopt the gamification practice in their organization.

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7. appendixes

Appendix 1 : Demographics of participants of Cycle 1

Age

Site	Average of Age
Barcelona	25
Erskine	32
Prague	27
Average	28

Seniority

Site	Average of Seniority in months
Barcelona	12
Erskine	52
Prague	8
Average	24

Job role

Site	Inside Sales Manager	Inside Sales Rep	Total
Barcelona	2	34	36
Erskine	2	20	22
Prague		14	14
Total	4	68	72

Gender

Row Labels	Female	Male	Grand Total
Barcelona	7	29	36
Erskine	5	17	22
Prague	6	8	14
Grand Total	18	54	72
	25%	75%	

Appendix 2: Summary of Cycle 1 Interviews and Focus Group

Site	date	Type	Nbr participants	prenom	role	Duration '	M	F
Barcelona	20/05/2015	Planning meeting			project te	31		
Prague & Erskine	20/05/2015	Planning meeting			project te	30		
Prague	22/05/2015	launch meeting			mgrs	13		
Barcelona	26/05/2015	launch meeting			mgrs	14		
Barcelona	01/07/2015	Interview	1	Dencil	user	18	1	
Barcelona	01/07/2015	Interview	1	Joan	mgr	23	1	
Barcelona	01/07/2015	Interview	1	Hugo	user	18	1	
Barcelona	01/07/2015	Interview	1	Sanni	user	22		1
Barcelona	01/07/2015	Interview	1	Maria Jose	user	26		1
Barcelona	01/07/2015	Interview	1	Jean Luc	mgr	25	1	
Barcelona	21/07/2015	Interview	1	Otto	mgr	30	1	
Barcelona	21/07/2015	Interview	1	Jirka	mgr	32	1	
Prague	21/07/2015	Focus Group	6		users	45	4	2
Prague	24/07/2015	Interview	1	Damien	mgr	21	1	
Prague	24/07/2015	Interview	1	Dyonis	user	32	1	
Erskine	24/07/2015	Interview	1	Moir	user	23		1
Erskine	24/07/2015	Interview	1	Greg	user	24	1	
Erskine	24/07/2015	Interview	1	Jeffrey	user	15	1	
Total			19			442	14	5
							74%	26%

Appendix 3: Exploratory interview template cycle 1

Date :

Location:

Name of interviewee :

Length in position:

Role : Nitro User First line mgr Nitro pgmgr other

Prior to Nitro launch:

1. Describe your main business objectives (or your team members main business objectives for mgr)
2. How often did you use to check where your stand versus those objectives?
3. How much did you use to know about other team members progress versus objective?
4. How confident were you about reaching/exceed each of those objectives?

Since Nitro launch :

5. Has anything changed in your work habits?
6. Please comment about which of the challenges matters on a scale from 1 (the less) to 10 (the most):
 - a. Share info through Chatter
 - b. Keep close date current
 - c. Add close plan to opties
 - d. Complete win/loss assessment
 - e. Win an opportunity
 - f. Build HPN pipeline
 - g. Build storage pipeline
 - h. Build TS education pipeline
7. For the challenge that matter (6 and more) : can you explain why those challenges matter much to you and what you are doing practically to win points?
8. For the challenges that do not matter (4 and less): can you explain why this challenge(s) do not matter much for you?
9. How often are you checking your nitro status?
10. Would you say that you feel more engaged to reach those business goals since you are using Nitro?
11. Would you say that you feel more confident about reaching your goals since you are using Nitro?
12. Do you think that the Nitro's score are giving a fair image of your contribution to those challenges? Do your contribution in general?
13. Do you have recommendation for future Nitro development :
 - a. To improve the Nitro sidebar and functionalities?
 - b. To improve the Nitro Challenges?
 - c. To improve the Nitro communication?
 - d. To improve the Nitro rewards?
14. Anything else you would like to share with me regarding Nitro?

Appendix 4 : Demographics of participants of Cycle 2

Gender

Site	Female	Male	Total
Erskine	28	48	76
Prague	23	60	83
Total	51	108	159
	32%	68%	

Age

Site	Average Age
Erskine	32,7
Prague	28,2
Average	30,4

Seniority

Hub	Average Seniority in months
Erskine	42
Prague	21
Grand Total	31

Site	Inside Sales managers	Inside Sales reps	Support roles	Total
ERS	9	63	4	76
PRG	8	73	2	83
Total	17	136	6	159

Appendix 5: Summary of Cycle 2 Interviews and Focus Groups

Site	date	Type	Nbr partici pan	First Name	Role	Duration	M	F
Erskine	05/10/2016	Interview	1	Julian	mgr	38	1	
Erskine	05/10/2016	Interview	1	Fraser	mgr	24	1	
Erskine	05/10/2016	Focus group	10	Brian, Ben, Laura, Jacqueline, Robbie, Peter, David, Ken, Bradley, Lauren	users	27	7	3
Erskine	05/10/2016	Interview	1	Andrew	mgr	30	1	
Erskine	06/10/2016	Focus group	14	Nicola, Irene, Anthony, Moira, Alexander, Claire, Ross, Paul, Alice, Pamela, Graeme, Hazel, Billy, Aimee	users	20	7	7
Erskine	06/10/2016	Focus group	11	Hammy, Kerri, Eoin, Richie, Nicola, Greg, David, Hillie, Alastair, Louise, Carol	users	23	7	4
Erskine	12/10/2016	Interview	1	Jirka	mgr	21	1	
Erskine	12/10/2016	Interview	1	Agata	user	5		1
Prague	12/10/2016	Interview	1	Jani	user	15	1	
Prague	12/10/2016	Interview	1	Arlind	user	19	1	
Prague	12/10/2016	Interview	1	Jan	user	23	1	
Prague	12/10/2016	Interview	1	Jacek	user	10	1	
Prague	12/10/2016	Interview	1	Stefan	user	5	1	
Prague	12/10/2016	Interview	1	Joanna	user	15		1
Prague	07/12/2016	Interview	1	Steven	user	15	1	
Prague	07/12/2016	Interview	1	Niels	user	17	1	
Prague	07/12/2016	Interview	1	Tzachi	user	14	1	
Prague	07/12/2016	Interview	1	Kamil	user	19	1	
Prague	07/12/2016	Interview	1	Olean	user	18	1	
Erskine	12/01/2017	Interview	1	Frazer	mgr	14	1	
Erskine	12/01/2017	Interview	1	Julian	mgr	16	1	
Erskine	12/01/2017	Interview	1	David	mgr	21	1	
Erskine	12/01/2017	Focus group	2	Andrew+Kevin	mgrs	30	2	
Erskine	12/01/2017	Interview	1	Ques	user	36	1	
Erskine	12/01/2017	Interview	1	Ben	user	21	1	
Erskine	16/01/2017	Focus group	10	Brian, Ben, Laura, Jacqueline, Robbie, Peter, David, Ken, Bradley, Lauren		23	7	3
Prague	01/02/2017	Interview	1	Jirka	mgr	12	1	
Erskine	07/02/2017	Interview	1	Laura	user	14		1
Erskine	07/02/2017	Interview	1	Lauren	user	18		1
Erskine	07/02/2017	Interview	1	Moira	user	17		1
Prague	07/02/2017	Interview	1	Peter	mgr	12	1	
Prague	07/02/2017	Focus group	7	Piotr, Irina, Martin, Gorana, Romain, Hayate, Peter	mgrs	47	5	2
Erskine	07/02/2017	Interview	1	Ross	user	17	1	
Prague	08/02/2017	Interview	1	Gorana	mgr	16		1
Prague	08/02/2017	Interview	1	Hayate	mgr	17	1	
Prague	08/02/2017	Interview	1	Irina	mgr	17		1
Prague	08/02/2017	Interview	1	Martin	mgr	10	1	
Prague	08/02/2017	Interview	1	Romain	mgr	8	1	
Prague	09/03/2017	Interview	1	Michael	mgr	12	1	
Prague	22/03/2017	Interview	1	Izaac	user	14	1	
Prague	22/03/2017	Interview	1	Seedi	user	9	1	
Prague	23/03/2017	Interview	1	Ahmad		24	1	
Prague	23/03/2017	Interview	1	Jakub		10	1	
Prague	23/03/2017	Interview	1	Merve		10		1
Prague	23/03/2017	Interview	1	Deniz		21	1	
Prague	23/03/2017	Interview	1	Nadav		13	1	
Prague	23/03/2017	Interview	1	Sabina		14		1
Prague	23/03/2017	Interview	1	Tchachi		9	1	
Total			96			860	68	28
							71%	29%

Appendix 6: Experience of gamification of participants of interviews

Nitro refers to the tool used in Cycle 1

Leveleleven refers to the tool used in Cycle 2

Mixed refers to participants having experienced both

None refers to participants who didn't have the opportunity to experience the tool at time of interview

	A : Leveleleven	B : Mixed	C : nitro	D : none
1: 1 cycle 2 001 julian Oct 516	0	0	1	0
2: 10 cycle 2 010 Arlind Oct12	1	0	0	0
3: 11 cycle 2 011 Jan Oct 12	1	0	0	0
4: 12 cycle 2 012 Jacek oct 12	1	0	0	0
5: 13 cycle 2 013+14 Stefan oc	1	0	0	0
6: 14 cycle 2 015 joanna oct 12	1	0	0	0
7: 15 cycle 2 016 steeven oct1	1	0	0	0
8: 16 cycle 2 017 Niels dec7	1	0	0	0
9: 17 cycle 2 018 Tzachi dec7	1	0	0	0
10: 18 cycle 2 019 kamil dec 7	1	0	0	0
11: 19 cycle 2 020 olean dec 7	1	0	0	0
12: 2 cycle 2 002 fraser oct5	0	0	0	1
13: 20 cycle 2 024 frazer jan12	1	0	0	0
14: 21 cycle 2 025 julian jan12	0	1	0	0
15: 22 cycle 2 026 david jan12	0	1	0	0
16: 23 cycle 2 027 andrew+ke	1	0	0	0
17: 24 cycle 2 028 ques jan12	1	0	0	0
18: 25 cycle 2 030 Ben Jan12	1	0	0	0
19: 26 cycle 2 hunters meetin	0	1	0	0
20: 27 cycle 2 jirka 1 février 2	0	1	0	0
21: 28 cycle 2 laura 7 février 2	1	0	0	0
22: 29 cycle 2 lauren 7 février	1	0	0	0
23: 3 cycle 2 003 focus group 1	0	1	0	0
24: 30 cycle 2 moira 7 février	0	1	0	0
25: 31 cycle 2 Peter S 7 fevrie	1	0	0	0
26: 32 cycle 2 Piotr mardi 7 fé	1	0	0	0
27: 33 cycle 2 ross 8 fevrier 20	1	0	0	0
28: 34 cycle 2 Gorana 8 fevrie	1	0	0	0
29: 35 a cycle 2 Hayate P1 8 fé	1	0	0	0
30: 35b cycle 2 Hayate P2 8 fé	0	0	0	0
31: 36 cycle 2 irina 08 Februar	1	0	0	0
32: 37 cycle 2 martin D 8 févr	1	0	0	0
33: 38 cycle 2 Romain - 08 Feb	1	0	0	0
34: 39 cycle 2 Mido 9 mars 20	1	0	0	0
35: 4 cycle 2 004 andrew oct5	0	0	1	0
36: 40 cycle 2 031 izaac 2203	1	0	0	0
37: 41 cycle 2 032 seedi 2303	1	0	0	0
38: 42 cycle 2 033 Ahmad 2303	1	0	0	0
39: 43 cycle 2 034 Jakub 2303	1	0	0	0
40: 44 cycle 2 035 Merve 2303	1	0	0	0
41: 45 cycle 2 036 deniz 2303	1	0	0	0
42: 46 cycle 2 037 nadav 2303	1	0	0	0
43: 47 cycle 2 038 sabina 2303	1	0	0	0
44: 48 cycle 2 039 Tsachi 2303	1	0	0	0
45: 5 cycle 2 005 focus group 1	0	1	0	0
46: 6 cycle 2 006 focus group 1	0	1	0	0
47: 7 cycle 2 007 jirka oct12	0	1	0	0
48: 8 cycle 2 008 Agata oct 21	1	0	0	0
49: 9 cycle 2 009 Jani oct21	0	1	0	0
	35	10	2	1

Appendix 6bis: Guide for semi structured interviews cycle 2

Construct	Concept	Questions
Game elements	contests	What do you see about level11? Are you participating in Level11 contest? Which one?
	points	Are you aware of your score in Level11 contest?
	leaderboard	Are you aware of your position in the leaderboard? How do you feel about it? How important is it to you?
	real time information	Do you think you have enough information to track how you are progressing against your goals?
User satisfaction	User expectation	What do you think about SFDC? It is useful to you? What's your experience with level11?
	Enjoyment	Have gamification impacted your enjoyment at work? Do you see a fun element in it? More generally would you say that your role overall is enjoyable? What do you enjoy the most? What do you enjoy the less?
	Trust	(combined monetary rewards question)
Enhanced use		What features of SFDC do you use today? Have you recently started to use a feature in SFDC that you didn't use before, and which one? Are you using SFDC for additional tasks, and which one?
Intrinsic Motivation	Autonomy	Do you think you can make enough inputs to deciding how your job gets done?
	Competence	Do you enjoy the challenges that your work provides?
	Relatedness	Do you get along with people at work?
	Pressure	Do you feel pressure at work?
Extrinsic Motivation	Rewards	What do you think about the rewards and incentive we offer? How important is it to you? Do you think they are fair?
	Social recognition	(combined with leaderboard question)
Net benefits		Compared to one month ago, would you say that you are performing better/same/less in your role?

Appendix 7 :Nvivo List of Nodes with number of sources and references

Node name	Sources	Reference	% ref
Gamification experience			
Competition	32	65	11,9%
Team spirit	22	32	5,9%
Playfulness	16	22	4,0%
Real time information	9	23	4,2%
Motivation			
intrinsic motivation - competency	24	39	7,1%
intrinsic motivation - relatedness	9	12	2,2%
intrinsic motivation autonomy	21	30	5,5%
extrinsic motivation reward	25	45	8,2%
extrinsic motivation social recognition	14	26	4,8%
Type of Regulation			
Positive pressure, integrated in values	14	18	3,3%
Pressured, introjected	10	10	1,8%
Do not feel pressured	10	10	1,8%
Information quality			
Information quality	10	13	2,4%
Enhanced System Use			
Using a formerly used set of features for current task	3	3	0,5%
Using a formerly used set of features for additional tasks	1	1	0,2%
Using a formerly unused set of available features for current tasks	5	7	1,3%
Using a formerly unused set of available features for additional tasks	4	6	1,1%
Using feature extensions for current tasks	6	8	1,5%
Using feature extensions for additional tasks	2	3	0,5%
User Satisfaction			
Enjoyment	13	15	2,7%
User Expectations	11	17	3,1%
Net benefit			
sales rep	23	36	6,6%
manager	10	25	4,6%
organization	8	11	2,0%
Success factors			
Fairness	15	23	4,2%
Empowerment, customization	7	13	2,4%

Communication	6	12	2,2%
Legitimate purpose	6	10	1,8%
Creating habits	4	5	0,9%
Workforce characteristics	4	4	0,7%
Maintain interest over time	3	3	0,5%
Total	347	547	

Appendix 8:Nvivo List of Cases with number of sources and references

Case	Sources	References
Gamification experience	48	48
Levellevelen	35	35
Mixed	10	10
nitro	1	1
none	2	2
Phase	48	55
ActionPlanning	8	8
Intervention	39	39
Reflection	8	8
Site	48	48
Erskine	17	17
Prague	31	31
Type of source	48	48
Manager	16	16
User	32	32

Appendix 9:nVivoReferences per Node and per Site

	Erskine	%	Prague	%
Gamification experience				
Real time information	10	43%	13	57%
Playfulness	5	23%	17	77%
Team spirit	17	53%	15	47%
Competition	27	42%	38	58%
Motivation				
intrinsic motivation autonomy	10	33%	20	67%
intrinsic motivation - relatedness	6	50%	6	50%
intrinsic motivation - competency	15	38%	24	62%
extrinsic motivation social recognition	14	56%	11	44%
extrinsic motivation reward	28	64%	16	36%
Type of Regulation				
Do not feel pressured	3	30%	7	70%
Pressured, introjected	6	60%	4	40%
Positive pressure, integrated in values	9	53%	8	47%
Information quality	8	62%	5	38%
User Satisfaction	0		0	
User Expectations	1	6%	16	94%
Enjoyment	7	47%	8	53%
Enhanced System Use				
Using feature extensions for additional	3	100%	0	0%
Using feature extensions for current tas	6	75%	2	25%
Using a formerly unused set of availabl	4	67%	2	33%
Using a formerly unused set of availabl	6	86%	1	14%
Using a formerly used set of features fo	1	100%	0	0%
Using a formerly used set of features fo	2	67%	1	33%
Net benefit	0		0	
organization	6	55%	5	45%
manager	21	84%	4	16%
sales rep	19	53%	17	47%
Success factors				
Maintain interest over time	2	67%	1	33%
Workforce characteristics	1	25%	3	75%
Creating habits	2	40%	3	60%
Legitimate purpose	9	90%	1	10%
Communication	8	67%	4	33%
Empowerment, customization	11	85%	2	15%
Fairness	13	57%	10	43%
Total	280	51%	264	49%

Appendix 10:nVivoReferences per Node and per Role

	Manager	%	User	%
Gamification experience				
Real time information	17	74%	6	26%
Playfulness	8	36%	14	64%
Team spirit	8	25%	24	75%
Competition	22	34%	43	66%
Motivation				
intrinsic motivation autonomy	6	20%	24	80%
intrinsic motivation - relatedness	5	42%	7	58%
intrinsic motivation - competency	7	18%	32	82%
extrinsic motivation social recognition	7	28%	18	72%
extrinsic motivation reward	17	39%	27	61%
Type of Regulation				
Do not feel pressured	2	20%	8	80%
Pressured, introjected	6	60%	4	40%
Positive pressure, integrated in values	5	29%	12	71%
Information quality	5	38%	8	62%
User Satisfaction				
User Expectations	10	59%	7	41%
Enjoyment	3	20%	12	80%
Enhanced System Use				
Using feature extensions for additional tasks	2	67%	1	33%
Using feature extensions for current tasks	2	25%	6	75%
Using a formerly unused set of available features for additional tasks	1	17%	5	83%
Using a formerly unused set of available features for current tasks	2	29%	5	71%
Using a formerly used set of features for additional tasks	1	100%	0	0%
Using a formerly used set of features for current task	0	0%	3	100%
Net benefit				
organization	8	73%	3	27%
manager	23	92%	2	8%
sales rep	12	33%	24	67%
Success factors				
Maintain interest over time	1	33%	2	67%
Workforce characteristics	2	50%	2	50%
Creating habits	5	100%	0	0%
Legitimate purpose	5	50%	5	50%
Communication	11	92%	1	8%
Empowerment, customization	11	85%	2	15%
Fairness	13	57%	10	43%
Total	227	42%	317	58%

Appendix 11 :nVivo references per for net benefit node per source

	A : sales rep	B : manager	C : organization	At least 1 referenc
1 : 1 cycle 2 001 julian Oct 516	8	10	2	Y
2 : 10 cycle 2 010 Arlind Oct12	1	0	0	Y
3 : 11 cycle 2 011 Jan Oct 12	0	0	0	N
4 : 12 cycle 2 012 Jacek oct 12	0	0	0	N
5 : 13 cycle 2 013+14 Stefan oct 21	0	0	0	N
6 : 14 cycle 2 015 joanna oct 12	1	0	0	Y
7 : 15 cycle 2 016 steeven oct12	0	0	0	N
8 : 16 cycle 2 017 Niels dec7	1	0	0	Y
9 : 17 cycle 2 018 Tzachi dec7	1	0	0	Y
10 : 18 cycle 2 019 kamil dec 7	1	0	0	Y
11 : 19 cycle 2 020 olean dec 7	1	0	0	Y
12 : 2 cycle 2 002 fraser oct5	1	3	1	Y
13 : 20 cycle 2 024 frazer jan12	0	1	0	Y
14 : 21 cycle 2 025 julian jan12	0	1	0	Y
15 : 22 cycle 2 026 david jan12	1	0	1	Y
16 : 23 cycle 2 027 andrew+kevin jan12	0	3	2	Y
17 : 24 cycle 2 028 ques jan12	2	1	0	Y
18 : 25 cycle 2 030 Ben Jan12	0	0	0	N
19 : 26 cycle 2 hunters meeting dec	0	0	0	N
20 : 27 cycle 2 jirka 1 février 2017 12.02.13	1	0	0	Y
21 : 28 cycle 2 laura 7 février 2017 11.45.38	1	0	0	Y
22 : 29 cycle 2 lauren 7 février 2017 11.17.4	1	0	0	Y
23 : 3 cycle 2 003 focus group 10 hunters o	0	0	0	N
24 : 30 cycle 2 moira 7 février 2017 10.34.0	0	0	0	N
25 : 31 cycle 2 Peter S 7 fevrier	1	2	0	Y
26 : 32 cycle 2 Piotr mardi 7 février 2017 14	0	1	2	Y
27 : 33 cycle 2 ross 8 fevrier 2017 10.47.42	2	0	0	Y
28 : 34 cycle 2 Gorana 8 fevrier 2017	0	0	0	N
29 : 35 a cycle 2 Hayate P1 8 février 2017 14	0	0	0	N
31 : 36 cycle 2 irina 08 February 2017 17.27	0	0	0	N
32 : 37 cycle 2 martin D 8 février 2017 09.0	0	0	0	N
33 : 38 cycle 2 Romain - 08 February 2017 1	0	0	0	N
34 : 39 cycle 2 Mido 9 mars 2017 17.05.07	0	0	0	N
35 : 4 cycle 2 004 andrew oct5	1	2	0	Y
36 : 40 cycle 2 031 izaac 2203	2	0	1	Y
37 : 41 cycle 2 032 seedi 2303	2	0	0	Y
38 : 42 cycle 2 033 Ahmad 2303	0	0	0	N
39 : 43 cycle 2 034 Jakub 2303	1	0	1	Y
40 : 44 cycle 2 035 Merve 2303	0	0	0	N
41 : 45 cycle 2 036 deniz 2303	0	0	0	N
42 : 46 cycle 2 037 nadav 2303	2	1	0	Y
43 : 47 cycle 2 038 sabina 2303	0	0	0	N
44 : 48 cycle 2 039 Tsachi 2303	1	0	0	Y
45 : 5 cycle 2 005 focus group 14 smb oct 6	0	0	0	N
46 : 6 cycle 2 006 focus group 11 public sec	2	0	0	Y
47 : 7 cycle 2 007 jirka oct12	0	0	1	Y
48 : 8 cycle 2 008 Agata oct 21	0	0	0	N
49 : 9 cycle 2 009 Jani oct21	1	0	0	Y
Total references	36	25	11	72
%	50%	35%	15%	100%

Appendix 12:nVivo references per AR phase

	A : ActionPlanning	%	B : Intervention	%	C : Reflection	%
1 : Gamification experience						
2 : Competition	15	20%	49	64%	12	16%
3 : Team spirit	6	18%	26	79%	1	3%
4 : Playfulness	4	15%	17	65%	5	19%
5 : Real time information	11	37%	12	40%	7	23%
6 : Motivation						
7 : intrinsic motivation - competency	10	25%	29	73%	1	3%
8 : intrinsic motivation - relatedness	5	42%	7	58%	0	0%
9 : intrinsic motivation autonomy	3	10%	25	81%	3	10%
10 : extrinsic motivation reward	15	33%	30	65%	1	2%
11 : extrinsic motivation social recognition	9	33%	17	63%	1	4%
12 : Type of Regulation						
13 : Positive pressure, integrated in values	4	21%	13	68%	2	11%
14 : Pressured, introjected	3	27%	6	55%	2	18%
15 : Do not feel pressured	1	10%	8	80%	1	10%
16 : Information quality	1	7%	11	73%	3	20%
17 : Enhanced System Use						
18 : Using a formerly used set of features for	0	0%	3	100%	0	0%
19 : Using a formerly used set of features for	1	100%	0	0%	0	0%
20 : Using a formerly unused set of available	2	29%	5	71%	0	0%
21 : Using a formerly unused set of available	1	17%	5	83%	0	0%
22 : Using feature extensions for current task	0	0%	8	100%	0	0%
23 : Using feature extensions for additional t	2	67%	1	33%	0	0%
24 : User Satisfaction						
25 : Enjoyment	1	6%	14	88%	1	6%
26 : User Expectations	1	5%	12	55%	9	41%
27 : Net benefit						
28 : sales rep	12	32%	24	63%	2	5%
29 : manager	15	56%	9	33%	3	11%
30 : organization	4	33%	6	50%	2	17%
31 : Success factors						
32 : Fairness	9	36%	11	44%	5	20%
33 : Empowerment, customization	6	40%	7	47%	2	13%
34 : Communication	5	31%	7	44%	4	25%
35 : Legitimate purpose	8	50%	7	44%	1	6%
36 : Creating habits	3	50%	2	33%	1	17%
37 : Workforce characteristics	0	0%	4	80%	1	20%
38 : Maintain interest over time	2	67%	0	0%	1	33%
Total	159	26%	375	62%	71	12%
% references during each phase	26%		62%		12%	

Appendix 13 : Activities recorded in Public Sector Erskine contests

Week Number/ Team	Call Coaching Flag	Call Linkage	Call Notes	Call with Contact > 5'	Grand Total
46					
Public Sector	6	62	95	79	242
47					
Public Sector	1	34	64	110	209
48					
Public Sector	4	61	139	137	341
49					
Public Sector	5	67	110	96	278
50					
Public Sector	6	105	137	139	387
51					
Public Sector	17	63	194	149	423
52					
Public Sector	4	17	36	74	131
1					
Public Sector	3	24	31	113	171
2					
Public Sector	5	21	49	107	182
3					
Public Sector	8	13	48	154	223
4					
Public Sector	14	4	6	40	64
5					
Public Sector	705	2	11	79	797
6					
Public Sector	657	3	9	85	754
7					
Public Sector	1028	25	31	171	1255
8					
Public Sector	896	3	9	106	1014
9					
Public Sector	1917	4	2	176	2099
10					
Public Sector	1119	1	2	103	1225
11					
Public Sector	931	5	8	80	1024
12					
Public Sector	1032	3	5	77	1117
13					
Public Sector	868	3	4	82	957
Grand Total	9226	520	990	2157	12893

Appendix 14 : Activities recorded in SMB Erskine during PS contests

Row Labels	Call linkage	Call Notes	Call with Contact over 5'	Grand Total
46				
SMB	2	1	22	25
47				
SMB		1	54	55
48				
SMB		12	96	108
49				
SMB	2	1	48	51
50				
SMB			70	70
51				
SMB	2	1	64	67
52				
SMB	1	1	37	39
1				
SMB			46	46
2				
SMB			58	58
3				
SMB		1	107	108
4				
SMB			34	34
8				
SMB			39	39
9				
SMB		4	18	22
10				
SMB			22	22
11				
SMB			16	16
12				
SMB			16	16
13				
SMB		1	30	31
14				
SMB			6	6
Grand Total	7	23	783	813

Appendix 15 : Mail communication to managers at launch of hygiene contest in Prague – Dec 19th

Dear colleagues,

This week you will see in your LevelEleven Scorecard a new metric. It will be called “**SFDC Hygiene**” and will be an indicator of a maximum number of “incidents” related to ISR-OWNED opportunities allowed in current period of time that you should not go above (so called „waterline”). This metric is very useful as whenever you see any incident you will have a tool with all the information about opportunities so you can act immediately. Ultimately you will be able to better manage your sales pipeline.

As per now SFDC Hygiene metric will consist of two sub-metrics:

- a. Number of overdue opportunities
- b. Number of zero \$ opportunities (**based on Total Value to HPE** – this metric is taken for forecasting)

In the future there might come new sub-metrics. You will be notified once it happens.

The “waterline” (maximum amounts of incidents ISR can have) is the same for all the teams and is set at 2 incidents per person. The rule is simple – you see green when it’s below 2, you see red when it’s above.

Please see below a short instruction showing how you can use this metric to better control your Salesforce.com records.

1. Once you click on a Scorecard tab you will see this additional box showing the new metric. In this metrics the lower number you have the better. Ideal is “0”😊



- When you click on the the metric you will see a leader board of your team with average number of “incidents” in certain period (in example below 7 days). The same here, the lower number the better. If in your situation “0” is not a case please click on the icon “” next to “SFDC Hygiene and you will see all your opps with no value and/or overdue ones, you just need to click the individual entries listed and fix the opportunity.

Records Update Table

▼ Select Fields

Select Fields

- None--
- Deleted
- Account ID
- Record Type ID
- Name

▼ Record Results - Page #1

Opportunity Description
0062700000gZxYyAAK Roche is planning to purchase servers for local projects. It will be partner-led opp.

Appendix 16 : Screen capture – first line manager view on hygiene metric Prague Feb 1st

The screenshot shows a Salesforce Scorecard dashboard for user Jirka Matouch. The dashboard is titled 'SCORECARD' and displays three primary metrics:

- SFDC HYGIENE:** 17 / 28 (Target: +11)
- STAGNANT OPP:** 4 / 134 (Target: +30)
- # CALLS DAILY:** 123 / 240 (Target: / DAY)

Below the metrics, there is a section for 'STAGNANT OPP' with a 'PROGRESS CHART' showing a line graph with a shaded area. The chart shows a significant drop in the number of stagnant opportunities over time.

To the right, a 'LEADERBOARD' for 'CEEI SMB ISR' is shown for the 'last 30 days' period:

Rank	Name	Score
1st	Laura Lasakova	0
2nd	Igor Pater	0
3rd	Eyal Frayden	0.16
4th	Mihajlo Savic	0.65
5th	Nadav Botzer	1.10

At the bottom of the dashboard, there is a copyright notice: 'Copyright © 2000-2017 salesforce.com, inc. All rights reserved. | Privacy Statement | Security Statement | Terms of Use | SMB Confidentiality'.

Appendix17 : Feedback consolidated by project manager to WW stakeholder

EMEA Status...

Type	Erskine	Prague	Overall
Scorecard	Erskine are not leveraging the Scorecard	Prague are actively using the scorecard to drive behaviour and receiving positive feedback from ISRs	EMEA IS Reporting team (in Bertrand's organisation) have asked to take control of the Scorecard element in order to ensure that the filters and metrics relate to the correct business priorities and the data is correct
Contest	18 live contests Consistently used by Managers with very positive feedback. Managers have stated that they cannot live without this ability to drive and track ISR	12 live contests Used across the hub for all Campaigns, 1 Manager has access to set up his own contests (at his request) with support from the hub	Most popular usage of the tool, irreplaceable and by some managers. Best gamification tool used so far but room for improvement
Channel 11	Mainly used on Campaign days for the full centre. Managers use the Leader TV function for daily contests but will use Channel 11 if/when set up	Used daily for all comms on all screens in Prague	Very popular for hubs comms and real time leaderboards

Areas for improvement...

Type	Area	Feedback
Contest	Guidance Material	No material has been provided to suggest contests or how to set them up in Level 11. Many of the contests we use today rely on testing by our interns/hub leads in order to check the filters and accuracy of the contests. This level of expertise and time taken to test has meant that we are not able to allow managers to set up their own contests until we have a full catalogue of tried and tested contests that they can clone together with instructions of how to set it up.
Contest	Parent Contest functionality	We require more functionality at Parent Contest level. At the moment we can group child contests but there is no consolidation at the Parent Contest level. We need to be able to launch and export data at the Parent contest level. Also the child contests should have the ability to not be visible in the Level 11 console (left hand pane) as this can be confusing.
Contest	Reporting	Require more reporting functionality, currently the reports available within SFDC are very basic and only cover the set-up of the contests and none of the actions within the contests. We need to be able to pull reports on the actions recorded within the contests and then associate that to data within SFDC to analysis the impact and ROI of the contest.
Contest	Audit Data	Currently data is deleted after 30 days of finalizing the contest - this is not acceptable as we require data to be retained for audit reason when a prize of large value is awarded
Contest	Prize	It would be good to be able to automatically link prizes awards to recognition points
Contest	Notifications	Notifications are not well received, they are automatic from the system and can appear like spam. Some notifications are standard and cannot be turned off, this means that Observers to a contest (Manager) get several emails during the course of the contest (notifications for ending soon and for contest finalisation are daily)

Areas for improvement...

cont.

Type	Area	Feedback
Scorecard	Profile structure	Currently a Rep can only be assigned to one profile, EMEA EG are doing this at hub level which means that the hub decide on the most appropriate metrics. As there is a limited count of metrics it would be beneficial for an ISR to see additional metrics that they can prioritise which are in their constant view – so the business choose 6 metrics to drive, an ISR is performing well in 4 so they choose 2 to be prominent to help provide focus
Scorecard	Visibility	Managers across the hub have visibility of all the Reps if they drill into the detail, this information should be locked to the manager. Also it means that the manager has additional steps to drill into data instead of a clean and clear view
Scorecard	User friendly?	The set up, layout and actionable areas (data points to drill into) are not user friendly. The user interface changes and the page views are not clear. Feedback from Managers is that they do not like this view
Scorecard	Users	When setting daily metrics for ISRs the goals roll up to team level and then hub level, when ISRs are off this is not taken into account and therefore goals can appear unattainable at a hub level, it would be good to account for this anomaly when goals are shown on a wider level
Channel 11	Content	The majority of Comms content used in Inside Sales is PowerPoint Slides, this format is not compatible and therefore every individual slide needs to be saved as an image and uploaded. This means that the slides are segmented when viewed in Channel 11. It would be very beneficial if this format could be supported.

Manager feedback

Erskine – Public Sector Manager

Its been really good and made a huge difference to every day management. L11 has formed a core part of Public sector weekly structure. Have copied in Kevin for any of his comments also:

- live - instant reward for reps
- ability to pivot on key focus areas as when required. Now much quicker to setup, maintain and reward reps.
- BU buy in for incentives - feedback is very good from BU on the simple approach and live of L11. As a result its been much easier to secure find's for incentives.
- time saver, taken a lot of the manual reporting out and is now a very quick check. One of the biggest killers for previous campaigns was a leaderboard or lack of it.
- coaching - with the ability to measure almost anything it is fantastic at revealing areas that need coached.

Future consideration

- live feed on wins and build in team summaries. Reps love to win on their own but also as a team. E.g. thermometer count down to \$20m etc.
- this might be less L11 and note general but a dashboard that shows calls, Opps as PPO, opps with activities, campaign codes etc. Perhaps one more for Austin
- badge system - bit like fitbit bit a bit of fun on the side. Champion talktime, calls made, SFDC discipline etc.

Manager Feedback

Erskine – Public Sector Manager

To add some of my observations:

- Excellent flexible tool- quickly allows sales managers to isolate weaker embers of team for coaching while rewarding sales reps for right behaviours. Perfect to drive sales culture.
- Needs to be very simple - effectiveness of L11 diluted when too many centre/team campaigns. Guys can get confused.
- In addition to the team prizes - could have a centre "Premier League" i.e parallel competition that rewards the best of the best creating inter team rivalry and competition.
- On the theme of competition can we VS the other hubs? Pipeline generation to audited close of breakthrough technologies/focus areas (Synergy, Nimble, Simplivity etc)
- Add bonus points for completed and audited signature deals/video references etc- encourages right behaviour.

Manager feedback

Erskine – SMB Manager

Over Q2 I have used Level 11 to drive pipeline build, Deal closure, call logging, opportunity velocity and call activity. ALL of these areas have seen improvement since instigating the competitions using level 11.

It allows the ISRs to compete "in team" which works very well for short term weekly prizes. We are also enjoying our inter team competition with SMB1 and Hunting on both a weekly and quarterly basis.

Having level 11 on the screens, especially at the beginning of the quarter, gives the team a real focus point. While its often too early to crank up any sort of management pressure, the team will respond to each other's results allowing me to simply monitor the growth!

Particular highlights have been the weekly Extreme Pipebuilding competition, and Race to the Door.

Level 11 has become part of my management toolkit – It saves me A LOT of time in administering and reporting incentive results, and is a consistently visible to the team to allow them to drive their own behaviors.

Without this vital tool, I feel we would be much worse off both in time, and results

I hope these comments help. Please let me know if you would like anything more