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# Enterprise Gamification of the Employee Development Process at an Infocom Consultancy Company

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Faculty of Production Management, LTH

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**Keywords:** Gamification, Enterprise Gamification, Game Layer, Employee engagement, Behavioural change, Employee development



## Preface

This thesis is the final part of the authors' Master of Science degree in Industrial Engineering and Management at Lund University, Sweden. The thesis has been conducted on behalf of Lund University and Cybercom Group during the spring of 2012.

It has been an interesting and inspiring project, where we have learned a lot and also have had a lot of fun. We would like to dedicate special thanks to both our supervisors; Martin Olofsson at Cybercom for his continuous support and valuable comments, and Ola Alexanderson at Lund University for taking the time to supervise this thesis and giving feedback on our progress.

We would also like to extend our gratitude to all the employees of Cybercom that has helped us during the thesis with valuable input, but most of all, since they made sure we had a fun time.

With this thesis, our studies in Lund come to an end and there are too many people that have helped us during these last five years to be listed here, but we believe that you know who you are. Our sincerest thanks to you all.

Lund, June 2012

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Robin Mellstrand

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Kristoffer Frang



# Executive Summary

- Title:** Enterprise gamification of the employee development process at an infocom consultancy company
- Authors:** Robin Mellstrand and Kristoffer Frang.
- Supervisors:** Martin Olofsson, *Senior Consultant*, Cybercom.  
Dr. Ola Alexanderson, Department of Production Management, Lund Institute of Technology.
- Background:** Gamification is a new trend that seeks to engage people and change their behaviour by implementing game-design thinking in non-game contexts. Recent analytics predicts that more than 70 % of the world's 2000 largest organisations will have at least one gamified platform by 2014, which indicates that gamification is, and will continue to be, very important in the future of IT-strategy and digital marketing.
- Purpose and problem statement:** The purpose of this Master's thesis is to increase the knowledge of enterprise gamification, and to develop a proof of concept on how to apply gamification on Cybercom's internal competence model to increase usage and the employees' understanding of the model. The following research questions were formulated:
- How does gamification work and what are the underlying psychological factors?
  - How can Cybercom implement a game layer on their employee development process?
- Method:** This thesis has used a combination of a qualitative and a quantitative approach to accurately capture the complex relations of the employee's motivations and obstacles for using the competence model, which is their employee development process. Data was gathered through a thorough literature study, internal interviews with employees, meetings with companies, specialised at gamification, and internal quantitative surveys. The gathered data served mainly as input for psychological frameworks and frameworks related to game design.
- Results:** The analysis showed that the employees of Cybercom are motivated by self-actualisation but not by competition or status, which means that the game layer needs to focus on the individual development and not by comparing progress. By analysing the employee development

process, it was concluded that the main activity of the game should be to write a log of the employee's activities. The game layer also needs to focus on increasing ability (usability) since their motivation only can be raised to a certain degree due to limited in-system time. The results also include an account of the underlying psychological factors that explains the effect of gamification. The suggested game design is also presented in the proof of concept of this thesis.

**Keywords:**

Gamification, Enterprise Gamification, Game Layer, Employee engagement, Behavioural change, Employee development.

# Sammanfattning

<b>Titel:</b>	Gamification of a work-process in an infocom consultancy company
<b>Författare:</b>	Robin Mellstrand and Kristoffer Frang
<b>Handledare:</b>	Martin Olofsson, <i>Senior Consultant</i> , Cybercom  Ola Alexandersson, Universitetslektor, Avdelningen för Produktionsekonomi, Lunds Tekniska Högskola
<b>Bakgrund:</b>	Gamification är en ny trend som syftar till att engagera människor och ändra deras beteende genom att använda spelmekanismer i kontexter som inte har med spel att göra egentligen. Nya analyser menar att mer än 70 % av världens 2000 största företag kommer att ha minst en gamifierad plattform vid 2014, vilket indikerar att gamification är, och kommer fortsätta vara, mycket viktigt i framtiden inom IT-strategi och digital marknadsföring.
<b>Syfte och problemställning:</b>	Syftet med detta examensarbete är att öka kunskapen om gamification ur ett företagsperspektiv och att utveckla ett designförslag för hur man kan använda gamification på Cybercoms interna personalutvecklingsprocess, i syfte att öka förståelsen och användningen av denna. Följande forskningsfrågor formulerades: <ul style="list-style-type: none"><li>• Hur fungerar gamification och vilka är dess underliggande psykologiska faktorer?</li><li>• Hur kan Cybercom implementera ett spellager på deras personalutvecklingsprocess?</li></ul>
<b>Metod:</b>	Detta examensarbete har använt en kombination av en kvalitativ och en kvantitativ ansats för att på ett bra sätt fånga de komplexa relationerna mellan personalens motivationsprofiler och deras förhinder för att använda utvecklingsprocessen. Data samlades in genom en grundlig litteraturstudie, interna intervjuer med personalen, möten med företag som är specialiserade inom gamification samt genom interna kvantitativa studier. Den insamlade informationen användes främst som inmatning till psykologiska modeller, samt modeller relaterade till speldesign.
<b>Resultat:</b>	Analysen visade att Cybercoms personal är främst motiverade av självuppfyllelse och inte av tävling eller status, vilket innebär att spellagret behöver fokusera på den individuella utvecklingen och inte på

att jämföra utveckling. Genom att analysera personalutvecklingsprocessen bestämdes att spelets huvudsakliga aktivitet kommer vara att föra logg över den enskilda anställdes utveckling. Intervjuer visade också att spellagret måste främst fokusera på användarens förmåga att använda systemet, och i mindre utsträckning på användarens motivation att använda det eftersom graden av förhöjd motivation begränsas av användarnas limiterade tid i systemet. Resultatet inkluderar också en redogörelse för de underliggande psykologiska faktorerna av varför gamification anses fungera. Den föreslagna speldesignen är också presenterad som ett designförslag i slutet av detta examensarbete.

**Nyckelord:**

Gamification, Spelifiering, Game Layer, Spellager, Personalens engagemang, Betendeförändring, Personalutveckling.

## Glossary

Gamification	Applying game-design thinking to non-game applications to make them more fun and engaging.
Game layer	Putting a layer of game mechanics and elements in non-game contexts. In the proof of concept, referred to as the collection of game mechanics and game elements to be put on the competence model.
Proposed system	The proposed digitalisation, including game elements, of the competence model presented as the master thesis result in the proof of concept.
Competence model	Cybercom's internal model for consultant evaluation and professional development.
Gamified	A process or system where game-design thinking has been applied.
Employee development process	This is the process described in the competence model. See Appendix 3&4 for details.
Competence areas	The different areas in the competence model describing what skills and competences that are required in that area.
Game mechanic	Rule based sub-system which provides feedback for the user.
Motivator	Element of motivation that drives behaviour.
Proof of concept	The result of this thesis describing a proposed system for implementation.
Epi Server	The content management system (CMS) that Cybercom's intranet is built on.
The model	Refers to the competence model.
Intrinsic motivation	Refers to motivation that is driven by an interest or enjoyment in the task itself, and exists within the individual rather than relying on any external pressure.
Extrinsic motivation	Refers to the performance of an activity in order to attain an outcome, which then contradicts intrinsic motivation.

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# 1 Introduction

## 1.1 Background

Video games have been spreading widely the past years, mostly thanks to new game platforms such as smart phones, and we can see that gamers are not only teenage boys anymore, but includes people regardless of demographics. One example is the Zynga game Farmville which has grown incredibly popular and shows how simple games can change people's behaviour through engagement. There are currently 25 million active Farmville gamers spending 50 million hours per week growing virtual crops and expanding their farms (Appdata, 2012). Angry birds, the popular smart phone game, have 40 million monthly active users who together spend 5 million hours a day trying to kill green pigs (Hamburger, 2012). In fact, if you combine the yearly in-game time in World of Warcraft, Angry Birds and Farmville it approximately equals the accumulative time the entire Swedish population spend working annually. Gamers pour that time into games for free and it is hard not to think about the outcome of that effort if you design a game with a productive outcome. Games obviously have a great impact on people's behaviour, routines and day-to-day living. The realisation of games influence on behaviour through engagement and motivation, has led many people around the world to start thinking about using game elements in other contexts to raise productivity.

This realisation has led to a new trend stemming from Silicon Valley (Reeves & Leighton, 2009) which is Gamification. Gamification is basically about motivating, engaging and in the end changing people's behaviour by applying game mechanics to non-game contexts. One definition of gamification is:

*"Gamification is the concept of applying game-design thinking to non-game applications to make them more fun and engaging."*

(Gamification Wiki, 2012)

Systems that engage people to act are by no means a new concept. People have been applying game-design thinking into various applications for a long time. One of the oldest examples is the various loyalty programs that award the customer by sticking to certain behaviour over time. This system was invented in the 1890's by S&H and their now famous "Green stamps" (Zichermann & Cunningham, 2011), which was a type of virtual currency that customers received when buying goods from certain stores. This virtual currency could then be redeemed for several types of material rewards. These "Green stamps" was a huge success and some authors described the situation in North America as being afflicted with a "licking frenzy", referring to the activity where customers glued the stamps in certain collection books" (Zichermann & Cunningham, 2011). However, this frenzy was not driven by the extrinsic urge to receive these material rewards. The customers could rationally see that they were probably paying extra for these stamps and thereby never really got anything for free. This was about the intrinsic reward of having received something extra that was hard to value in real currency, and being part of a social movement. Everyone was engaged in collecting stamps and people generally need to be inside a social group than outside it (Zichermann & Cunningham, 2011).

Motivating people by intrinsic rewards lies close to the heart of what gamification is all about. Another extremely successful example of early gamification is the Weight Watchers' game. It is a game where all participants receive points for everything they devour. The goal is to minimize their overall points for a given period of time, which rewards the player with a slimmer waist and gives them continuous feedback on their progress.

The act of collecting, may it be stamps or points, is a basic human instinct (Zichermann & Cunningham, 2011) and is a frequently used concept in game design. Psychological studies have shown that there need to be at least three mechanics to keep people engaged and motivated by the task at hand; a reward-mechanic, a feedback-mechanic and a challenge-mechanic (Csikszentmihalyi, 1996). It is around these three basic principles that game developers design games today, and has done since the beginning of video games. But games have always been considered as an activity of leisure and spare time, and often looked down upon. It is not until quite recently that this expertise has been recognised in designing experiences that could be used to motivate and engage people in other, non-game, contexts as well.

This is where gamification originates from and today it is driven by both the academic - and corporate world. By combining knowledge from game designing, psychology and business, several of the Fortune 500-organisations have implemented gamification-systems into their daily businesses. Among those are Siemens, who introduced a game-module for better overview of emissions during transports into their SAP-system (Gamification Wiki, 2012), Spotify with the social environment Ryppl (Computer Sweden, 2012) and IBM that, with help from the Stanford professor Byron Reeves, introduced a leadership programme for experienced gamers (Reeves & Leighton Read, 2009). However, the main driving force in the field of gamification is entrepreneurs and small start-ups that have their own unique game-solution for everyday tasks.

Today, analysts believe that the gamification trend will explode over the next couple of years. Gartner predicts that more than 70 % of Global 2000 organisations will have at least one gamified platform by 2014 (Gartner, 2011). According to a new report done by Wanda Meloni of M2 Research (2012), the gamification market is expected to grow to \$242 million in 2012 (more than double the 2011 total), and reach \$2,8 billion in 2016, as seen in Figure 1-1. So where is this money spent? The past few years specialised gamification companies have started to pop up. In the area of enterprise gamification, which is the scope of this master thesis, organisations that offer gamification platforms for employee engagement are growing. Bunchball is currently one of the biggest. They offer Nitro as a plugin gamification application to Salesforce and Jive which is an enterprise gamification module that can be customised depending on the target context. The Swedish market is currently rather unexplored. The game design company Ozma has developed a product called WeProject which is a project based gamification system which helps organisations trying to promote a special behaviour on a time limit basis, e.g. organisational restructure (Personal communication with Ozma Spelldesign, 2012). There is also an open source platform under development called Userinfuser that can be used to customise an enterprise gamification system by making a selection of modules one wish to include (Google Code, 2012).

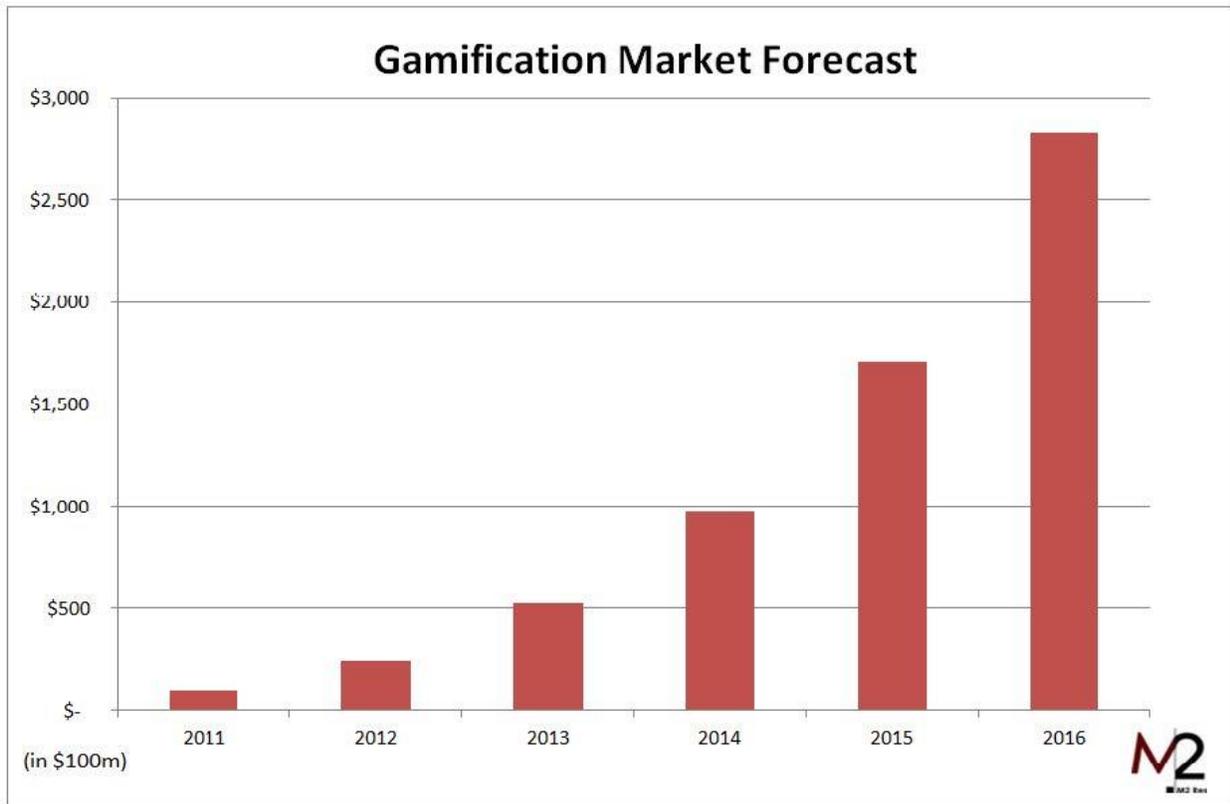


Figure 1-1 - Gamification Market Forecast (Peterson, 2012)

## 1.2 Cybercom

Founded in 1995 and quoted on the NASDAQ OMX Nordic exchange since 1999, Cybercom is now a leading Nordic supplier of advanced IT consultancy services, with global presence in selected market segments such as telecom and security solutions. By the end of 2010, Cybercom had 1727 employees in ten countries divided into five main areas: Internet services, Mobile Services, Security, Embedded systems and Telecom management. In 2011, Cybercom Sweden had a total turnover of 1.1 bn SEK (Cybercom, 2012).

Through Cybercom’s history, customers in the telecom business have been their most important sector. However, since the telecom market in the Nordic countries are shrinking with the decline of large actors as Nokia and Sony Mobile (earlier Sony Ericsson), Cybercom chose to diversify their client base into new areas. This has been a large change for Cybercom and has, along with decreasing margins on expert consulting, driven many internal structural and organisational changes during the recent years (Cybercom, 2012).

Today, Cybercom is striving towards being a supplier of complete projects instead of a mere resource supplier, which in turn puts higher demands on the employees. One effort from the management to visualise what they expect from their employees has been in a new competence model where all consultant roles at Cybercom is described as several competence areas, each with different criteria (a

full description of the competence model can be found in Appendix 3 & 4). However, this model has not been uniformly implemented through all business units in Sweden and, according to the HR-department at the Malmö office, has had a limited impact on the consultants.

Cybercom's Vision:

*"Cybercom will successfully dominate its chosen markets in a leading position for customers, employees, and owners."*

(Cybercom, 2012)

### 1.3 Problem Statement and Purpose

Being a new field in the world of IT and social media, gamification is currently being researched and implemented by progressive firms in the western world. However, most of this research is done by American scientists and is mainly focused on business culture in the U.S.A. Since gamification is an area closely connected with psychology and culture (Gamification Wiki, 2012), it may well be the case that it needs to be tailor made for each and every implementation. As of today there are few, if any, studies conducted on which game mechanics that could motivate and engage people in a Swedish company culture.

The field of gamification is highly up and coming and analysts from Gartner Inc. predict that up to 70 % of the Global 2000 organisations will gamify at least one internal system by 2014 (Gartner, 2011). And as a progressive IT & Strategy consultant company, Cybercom needs the competence and ability to meet the rising demand for gamification applications.

To substantialise the research it was agreed that the results should be used to develop a proof of concept on how gamification could be used on the new competence model, which is to be digitalized in a near future. The proof of concept should show how the concept can be applied on a real business situation and how it can create user engagement and business value.

This yields the following research questions:

- How does gamification work and what are the underlying psychological factors?
- How can Cybercom implement a game layer on their employee development process?

The goal of this thesis is to present the concept of gamification in the form of a theoretical framework and of a proof of concept of the competence model.

### 1.4 Delimitations

- The proof of concept development shall not include any programming and shall not result in a working implementation.
- Aspects and opinions (such as suggestions for modification) regarding the competence model itself will not be included.

- The proof of concept will serve as a proposal and guide line for an implementation. Suggestions of interface design will be included but a real-time testable system will not be developed. A thorough research regarding the technological solution, such as choice of platform, will not be included.
- Even though a general research of gamification will be included, focus will lie on organisational gamification in an enterprise context. Other contexts that are popular subjects to gamification, such as education, advertisement and e-commerce, may be mentioned as examples but are not the primary subject of interest.

## 1.5 Structure of the Thesis

This thesis follows a logical and structured line of argumentation. Each chapter is introduced with a brief summary of the chapter's content and intent. The outline is as follows:

Chapter 1, *Introduction*, is an introductory chapter which describes the problem definition and its background, the purpose and objectives of the thesis and the outlines of the report.

Chapter 2, *Method*, describes the methodology used throughout the thesis

Chapter 3, *Theory*, provides a foundation of the subject of Gamification, a description of why people appreciate games so much and establishes frameworks and models on how to create engagement and behavioural change with game mechanics and game design thinking.

Chapter 4, *Empirics*, presents the procedure, results, interpretation and reliability of the results of the qualitative and quantitative study.

Chapter 5, *Discussion and Analysis*, translates the findings from the empirics into the frameworks provided in the theory chapter to set the structure of the game layer and the proposed types of game mechanics.

Chapter 6, *Proof of Concept*, develops the findings of the Discussion and Analysis into a tangible concept proposition of what to include in the gamification of the consultancy picture. The strengths and weaknesses of the proof of concept are also discussed along with a section of the potential return on investment if this proposition is implemented.

References

Appendices

## 2 Method

*This chapter introduces the research methodology used throughout the thesis and the choice of methodology is justified. The different approaches of data collection are explained along with a general discussion of the credibility.*

### 2.1 The Research Approach

#### 2.1.1 Deductive, Inductive and Abductive Reasoning

The deductive thinking approach is mainly used by experimental scientists. This approach to scientific research explains specific phenomena or events by studying accepted, general principles and theory. This means that deductive thinking tries to verify consequences and events from that which have been generally accepted as truth (Depoy & Gitlin, 1999). Therefore it can be argued that deductive reasoning is most suitable for testing existing theories, not creating new science. The method is described graphically in Figure 2-1 below.

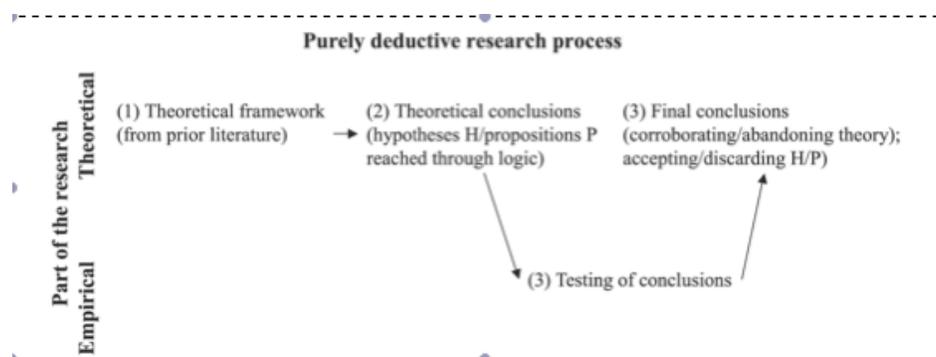


Figure 2-1 – The deductive reasoning process (Kovács & Spens, 2005)

As opposed to deductive thinking, there is the inductive thinking which is mainly used by scientists that takes a qualitative approach to their research. This form of cognitive activity studies specific events or phenomenon's and tries to formulate new and general rules and theory from these observations. Analogically to deductive reasoning, it can be argued that inductive reasoning is suitable for creating new science (Kovács & Spens, 2005). The inductive thinking is described graphically in Figure 2-2 below.

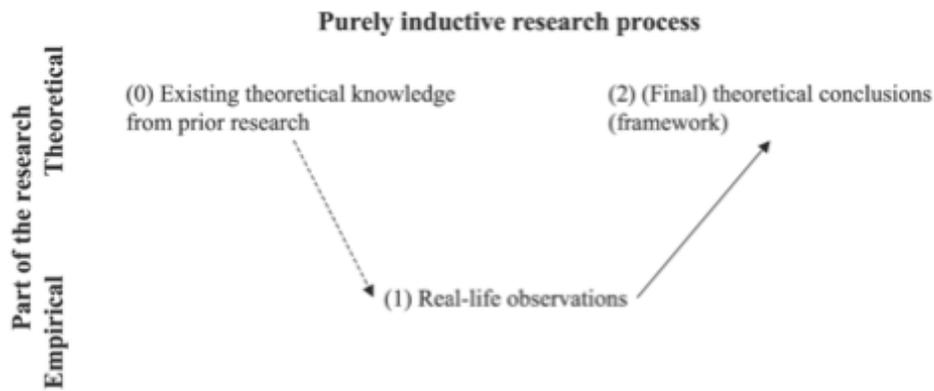


Figure 2-2 The inductive reasoning process (Kovács & Spens, 2005)

There are however, an alternative approach that combines the deductive and inductive reasoning; abductive reasoning. This approach stems from the insight that most great advances in science neither followed the pattern of pure deduction nor of pure induction (Kovács & Spens, 2005). Like induction, abduction starts by observing a specific phenomenon and tries to match these observations with prior theoretical knowledge in the studied field. If deviations are found, an attempt to find a new matching framework is made to extend the current theory of the phenomenon. The abductive process is depicted below in Figure 2-3.

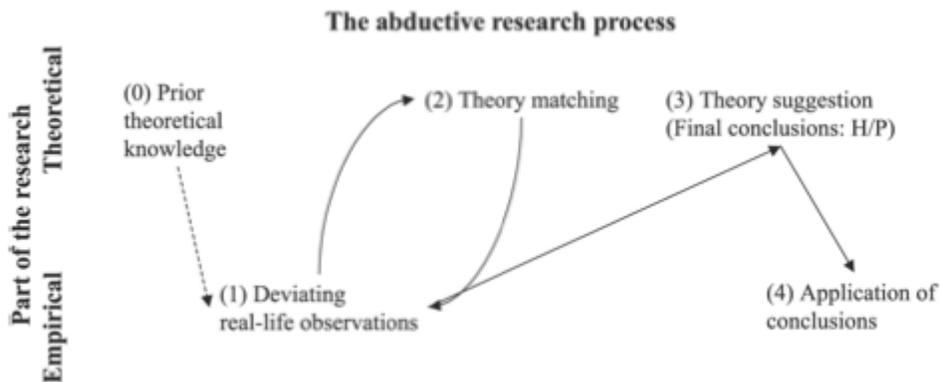


Figure 2-3 The abductive reasoning process (Kovács, Spens, 2005)

According to Kovác and Spens (2005), it is important do indicate which approach is used in the research, since these differs in terms of:

- their starting point
- their aim

- The point in which they draw their final conclusions.

Since this thesis is focused on exploring current theory and trends in the field of gamification to, in the end, apply this knowledge in a proof-of-concept solution with help from the observations it is a mixed research approach. However, if the final product, the proof-of-concept, can be described as theoretical conclusions our research approach is closely related to the inductive research approach. This means that this thesis tries to apply existing knowledge in a new application, based on real-life observations. This is quite accurate since there may be a research gap in this field, very few actors today are trying to build gamification systems upon theory and empirical research and there are no clear processes on how this may be done.

## 2.2 The Research Process

The inductive research approach dictates that the research process shall build upon existing knowledge and result in new knowledge by gathering data from real life observations. This is how the research process has been structured in this thesis. The research process starts with a thorough literature study, which is the base for all other activities in this research. The literature study has been developed continuously as deeper knowledge was required in different areas of interest, in parallel with the other research activities. The research process is presented below in Figure 2-4 below, and is a representation of the major activities, their relation to each other as well as their results. The figure also includes in which activities the research questions (RQ1 and RQ2) are answered.

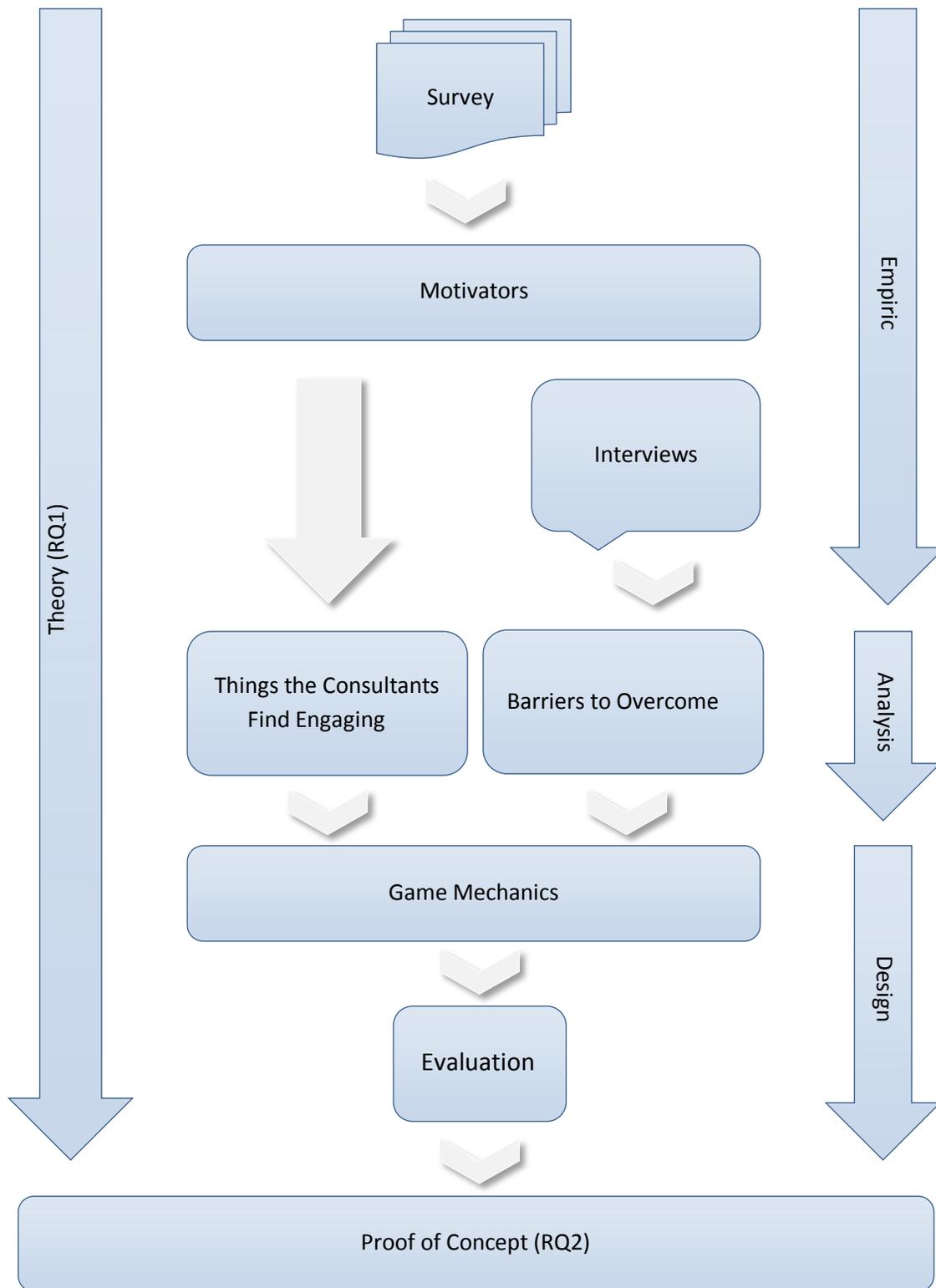


Figure 2-4 – The research process of this thesis (own creation)

## 2.3 Data Collection

### 2.3.1 Introduction

This section describes the different data collection methods used in this thesis and how to choose the appropriate method. A more detailed discussion of the actual procedures, the samples and the reliability of the studies can be found in Chapter 4 – Empirics.

### 2.3.2 Qualitative and Quantitative Research

Quantitative research is the collecting of data that can be counted or classified, e.g. quantity, weight, colour, etc. The quantified data can be analysed and processed with statistical analysis. Qualitative data, on the other hand, cannot be counted and is often described in detailed and nuanced descriptions and words and requires another type of analysis than quantitative research. Categorising and sorting are essential when analysing quantitative data. In many cases, especially when studying a complex system, only one of these approaches will not suffice and a combination is preferred. (Höst & Regnell, 2006)

The following table provides an overview of some concrete characterisations and differences between qualitative and quantitative research.

<b>Quantitative methods</b>	<b>Qualitative methods</b>
1. Precision: The scientist tries to obtain results that, as far as possible, authentically reflect the quantitative variation.	1. Compliance: The scientist tries to obtain the most authentic reproduction of the qualitative variation.
2. Measures several different units but provide modest information on each. Research scope is broad.	2. Few different units but extensive information on each. Research scope is narrow.
3. Systematic and structured observations; e.g. survey with fixed options.	3. Non-systematic and non-structured observations, e.g. depth interviews which can be structured, semi-structured or not structured.
4. Interest lies in the common, the average or the representative.	4. Interest lies in finding the unique, the peculiar or what diverge.
5. Information is derived from situations that differ from the authentic situation.	5. Information is derived from situations with close resemblance to the authentic situation.
6. Interest lies in non-correlated variables.	6. Interest lies in finding connections and structures.
7. Description and explanation.	7. Description and understanding.
8. The scientist observes a phenomenon from the outside without affecting the situation or environment. Variable variations can be created by manipulation.	8. The scientist observes the phenomena from the inside and is aware that he or she affects the result with his or her presence. He or she can also participate as an actor.

Table 2-1 Characteristics for qualitative and quantitative method. (Magne Holme & Krohn Solvang, 1997)

### *2.3.2.1 Choosing method*

Choosing the right method is a decision that should be based on the problem description. To make an accurate description it is important to know the strengths and weaknesses of the different methods in acquiring the important data.

The strength of the qualitative research method lies in its ability to explain different phenomenon. By using statistical techniques we can also make generalisations and in certain situations the derived information can be representative also for other variables we have measured.

As the quantitative research method is not as strictly tied to a developed structure it can evolve during the research process and be redirected to capture the needed information. It can provide an in-depth understanding of a system. Furthermore, using few variables facilitate the possibility to capture an overview of the situation by connecting the variables to the subject at hand.

A combination of both methods is a common approach and has some advantages. By combining different research method the validity can be increased since the results can verify each other. If ambiguous results are obtained that may trigger the researcher to rethink his or her interpretation. To study something with different methods also provide a way to see things from different angles, resulting in a more nuanced picture (Magne Holme & Krohn Solvang, 1997).

### *2.3.2.2 Interviews*

Interviews are a qualitative research technique that is good for gathering information about the present work in the domain and to identify present problems. It is also a way to elicit ideas about the future system. However, even if one can get valuable opinions and input it is important to confirm that information with other sources (Lauesen, 2002).

Early in the project it became clear that there were diverse opinions on certain aspects of the gamification of the consultant model. The most protruding example probably was how much transparency that is suitable; how much of your personal development can be presented to your co-workers? Another example was the issue connected to in-house and out-house working consultants. Most of the projects are done out-house and sometimes consultants are hired purely as reinforcement and can work at the customer's facility for several years. An assumption was made; how an employee work will affect the preferences they have on the gamification system. The selection of individuals that was interviewed was based on these realisations and the aim was to make a selection that was as diverse as possible. An interview with a manager was also made to provide views and opinions on which aspects that are important when using the consultant model to evaluate employees.

The interviews were semi structured. Even if each interview had an established purpose and goals on what to derive, the questions were left open for discussion. Since the authors are relatively unfamiliar with the domain the idea was to inspire a reasoning that could lead to conclusions about aspects that

the authors was unaware of. Details on how these interviews were carried out can be found in chapter 4.3.3 which describes this procedure in detail.

### **2.3.2.3 Questionnaire**

Questionnaires can primarily be used in two ways; to get statistical evidence for an assumption, or to gather opinions and suggestions. In the first case closed questions are used, giving the attendee options that can be summarised and statistically analysed. In the second case questions can be asked that are similar to the ones asked during an interview. One must, however, keep in mind that there is no way to follow up and clarify the answer. Closed questions might also be subject to misunderstandings. To avoid this, knowledge about the domain is essential so that the questions can be formulated in an adequate way (Lauesen, 2002).

The need for a quantitative research was recognised to establish the motivation profile. The selection of possible and suitable mechanics heavily depends on motivation and since the system is to be used by all employees there was a need to get valid indicators on where the focus should lie in the game. Details on how this questionnaire was carried out can be found in chapter 4.2.2, which describes this procedure in detail.

### **2.3.3 Literature Review**

Literature studies are an important part of this thesis. Thoroughly made literature studies supports the master thesis goal, which is to build upon existing knowledge of the students and also to reduce the risk of failing to utilize already existing knowledge in the studied field. What more is, by accounting for the sources of the thesis the authors make it easier for independent reviewers to understand the base of the work and to develop the results even further (Höst & Regnell, 2006).

There are also other advantages with the literature study; a well-made analysis of the knowledge base in a certain area is an important contribution in itself. Often, there are many different studies, made with different methods, under different conditions with varying results. To build a complete knowledge base of the area is of great importance in the master thesis (Höst & Regnell, 2006).

## **2.4 Quality**

The main difficulty with the literature review in this thesis is to evaluate the quality and trustworthiness of the sources. Since gamification is, in many aspects, a new area, not many scientific studies have been made. However, extensive research about the psychological theory behind gamification, and games in general, has been conducted by various scientists and psychologists from different universities which provide a solid foundation for many of the arguments that are presented in this thesis.

### **2.4.1 Reliability**

To establish high reliability in a research, it is important to be thorough in accounting of the method of the data collection and the analysis (Höst & Regnell, 2006). This can be achieved by letting a colleague analyse the data collection methods to find potential weaknesses. It is also of vital important to secure a

suitable sample and method of the quantitative parts of the thesis.

In this thesis, the reliability is deemed as quite high since the quantitative data collection is based upon the extensive research of Dr. Reiss (Reiss, 2011). The sample of the quantitative and the qualitative data collection was quite large, the survey was pre-tested by a test group and it was also tested with a group from another population inside Cybercom to secure its reliability.

### 2.4.2 Validity

Validity concerns the coupling between the studied object or phenomena and what is actually measured (Höst & Regnell, 2006). To increase the validity in a study one can apply the method of triangulation, which means that the same object or phenomena is studied with different methods.

Even though some aspects of the studied effects have been confirmed by the different data collections, the authors have not been free to do an unlimited numbers of surveys and interviews. This mainly since Cybercom is a consultancy firm and every minute spent on non-value-enhancing activities counts as a cost for the firm.

### 2.4.3 Representativity

The representativity of the result is highly dependent of the sample of the data gathering. Strictly speaking, a study can only be generalized to the specific population from which the sample has been taken (Höst & Regnell, 2006). One important factor that accounts for much of the representativity is how much of the sample that has dropped out or if there is a specific category of people in the sample that suffers from a large drop-out.

The representativity of the results has mainly been adjusted by the verifying test of the survey, which showed no deviations from the main sample at all. The representativity may be a bit lacking since all surveys were done completely anonymously, with no demographical information at all. This was a conscious choice since some of the issues were quite delicate, and it had to overrule the drawbacks of the representativity.

## 3 Theory

### 3.1 Introduction

The Theory chapter aims to form the theoretical foundation of this master thesis. The chapter consists of three major parts which in short answers the four following questions; why games bring intrinsic motivation and are so appealing, what parts that constitute a game, how games can be used to change behaviour and how to analyse what drives consultants at Cybercom to be able to customise a game layer to the specific context. A further description of the three parts follows.

In short, the first part describes what a game is and why game mechanics are such powerful tools to drive long-term engagement and influence behaviour. Results from the initial literature review are presented, containing both explanations of different psychological phenomena connected to games and references to existing examples to increase validity and clarity. A thorough review of what constitute the fundamental parts of a game is also included. There are three main purposes of this section. The first part is to provide a good overview of the subject itself and to introduce terms that will be used later in the discussion. The second purpose is to present theories that show the engaging and motivating effect of games and the third purpose is to establish the frame that constitutes a game that was used when designing the gamification system.

The second part of the theory chapter is directly connected to the implementation at Cybercom. The end purpose of gamification is to change people's behaviour and research on human behaviour made by Professor B.J. Fogg (Fogg, 2012), serves as the red thread, connecting to the other theories that are presented. Fogg asserts that there essentially are three elements that underlie change in behaviour; Motivation, Ability and Trigger. The first part of the chapter describes why games are good at facilitate all these three elements. The second part provides a more hands-on explanation on how to address these elements in the gamification system that will be suggested for Cybercom. All of Fogg's elements will be covered by different game mechanics (which essentially constitute the game). The aim for most of the suggested mechanics is to be motivating. However, some might be designed to be purely motivational, some to increase ability (by facilitation of clarity and overview) and some will serve as triggers to action. As the main difference between a gamified system, compared to a non gamified system, is the motivating and engaging components, focus will lie on the motivation element and game mechanics connected to it.

A successful gamification system has to be designed for the given audience. To choose game mechanics, one must have knowledge of what motivates people, and in the end, what activities that will be engaging and appealing to the consultants at Cybercom. Thus, a significant part of this chapter is a presentation of research that has been done on the subject of motivation and ways to derive a personal motivation profile that can be used to analyse the employees at Cybercom. A description on how these motivation profiles can be used is also included, explaining how they can be turned into things people enjoy, and in the end game mechanics.

The last part of the chapter consists of an overview of the most common game mechanics. Even if the designing mechanics is a creative task, research has been done to derive best practice examples and for inspirational purposes. There will also be a discussion about the potential weaknesses and risks with gamification.

## 3.2 What is it about Games that is so Engaging?

There are numerous examples of successfully gamified systems and one does not have to look for long to find proof of how gamification effectively can change people's behaviour. But what is it about this "game layer" that is so exciting and engaging?

Even if gamification is rather new as a concept, games have been played since the cave men wandered the earth (Bunchball, 2010). But it is not only humans who enjoy games. When watching nature shows one often sees cubs playing with each other as a way to learn skills for their adult life. More sophisticated animals, such as dolphins, are known for playing even when they are older. It seems, as Aaron Dignan concludes, like games are nature's own reward system and that we are hard wired to find them engaging, a conclusion that naturally includes humans as well (Dignan, 2011).

A lot of research has been conducted in the subject of games, especially in the digital era with the upcoming of video- and computer games. Scientists and psychologists have tried to explain the different feelings we experience while gaming. What is it that makes players never want to quit a really good game of Tetris or what is it that makes them so keen to explore one more cave in World of Warcraft? And why is it that players can get the same thrill from reaching the top of a high score list in Donkey Kong arcade game as when they achieve something in real life? Several new concepts have been defined to explain the new phenomena of games. The most commonly recognised and relevant concepts in gamification will be presented in this section to establish a common ground for analysis and discussion later in the thesis and to address the first research question.

Games are meant to be engaging. But the trigger for that engagement is different for different people. To properly customise a gamification to fit the employees at Cybercom it is vital to understand the theory behind motivation and how that theory can be used for analysing a group of individuals.

### 3.2.1 Alief

In the article, Alief and Belief (2008), Yale professor of philosophy Tamar Szabó Gendler, describes a term that explains how non-reality situations, such as in games, can have the same effect and trigger the same emotions as real-life situations. Gendler refers to the feeling players get when they find that epic sword in World of Warcraft, grow more crops in Farm Ville or win that last match of WordFeud. The reward for these things is purely fictive and has very little connection to your situation in real life. Still, they trigger the same emotions as if they would achieve something in your real life. Gendler uses horror movies as a reference that most people can relate to. When someone is watching a horror movie the logical part of their brain knows that they are completely safe sitting at home in their comfortable sofa. Then how come this small frame of moving pictures can make the viewer terrified, not just for the moment but shake them up for days? Another good example is the u-shaped glass walkway over the

Grand Canyon. Even if the visitors know that it is perfectly safe they are still hesitant and afraid of walking out on the transparent walkway (see Figure 3-1).



Figure 3-1 - The Glass walkway of Grand Canyon (Pixmule, 2012)

In these situations, the illogical and more primitive part of the brain takes over and overrides the common sense. The same thing happens when playing games, but in a positive way. This is *alief*, which Gendler defined as follows:

*“A paradigmatic alief is a mental state with associatively linked content that is representational, affective and behavioural, and that is activated—consciously or unconsciously—by features of the subject’s internal or ambient environment. Aliefs may be either occurrent or dispositional.”*

(Gendler, 2008)

Creators of all types of media have known and used alief for a long time. But it is only recently this mental state was named and defined. Emotions play a big role in human behaviour and alief has a great effect on human emotions. Thus are games, where alief plays a central role, a powerful tool when it comes to changing human behaviour.

### 3.2.2 The Opposite of Work is not Play, it is Depression

In the classic horror movie *The Shining*, Jack Nicholson says: "All work and no play make Jack a dull boy". According to McGonigal (2011), that's just plain wrong. Studies have actually shown that people are at their happiest when doing hard work at the borders of their skill level. People need to be challenged and receive continuous feedback on their work, otherwise they will be bored. Most of the relaxing activities that people like to do on their spare time, like watching TV, are actually mildly depressing. Persons are generally less happy, less motivated and less confident after a couple of hours in front of the TV.

So, hard work makes people happy. But what's the right work? McGonigal (2011) describes that depressing feeling at work when the employee wants nothing else than just get to the couch and leave work and stress behind. She argues that this is because companies often fail to continuously challenge their employees at the right level in a structured way, and without giving them frequent feedback.

McGonigal continues to describe a place where one can observe that level of commitment and motivation, and that is with gamers in front of the computer screen. Gamers are willing to put up with hard work to achieve the game goals, hours upon hours is often poured into a game. That is because games are structured challenges, designed to make use of the player's skills while giving frequent feedback on how they are progressing. Gamers are highly engaged and motivated and this is the heart of gamification.

### 3.2.3 Flow

Creative people might be different from one another in many ways but they always have one thing in common; they love what they do. They do not love what they do because of a potential outcome or a big reward. What drives them is solely the opportunity to do what they enjoy doing (Csíkszentmihályi, 1996). That psychological wellbeing is something one of the most recognised game psychologists, Professor Mihaly Csíkszentmihályi, took interest in. Csíkszentmihályi has interviewed people who are willing to devote many hours a week to their avocations without any real-life reward. After a series of interviews Csíkszentmihályi establishes that it is clear that these people are motivated by the quality of the experience. The experience often involves hard tasks, risks and stretches the person's capacity to his or her limit. He calls this experience *flow*. A good game-related of flow is the classic game Tetris. In Tetris you do not want to lose but neither do you want to win because both will end the game, and more importantly, the flow that the player is in. It is the thrill that comes by overcoming the challenges while playing (putting the next piece in the right place) that is the reward, rather than getting the highest score.

During his study Csíkszentmihályi has identified some key elements that are connected to flow.

- There are clear goals every step of the way.
- There is immediate feedback to one's actions.
- There is a balance between challenges and skills.
- Action and awareness are merged.
- Distractions are excluded from consciousness.
- There is no worry of failure.
- Self-consciousness disappears.
- The sense of time becomes distorted.
- The activity becomes an end in itself.

Game designers are very good at implementing mechanics that facilitate flow. That these mechanics are missing at most workplaces is, in many cases, obvious, and results in that many seriously bored at work (Dignan, 2011) and completely absent flow.

### 3.2.4 Fiero and Epic Wins

McGonigal (2011) describes the feeling players get in World of Warcraft when they find a new item that is so great that they didn't even think it existed. Or winning a game of football, passing that "impossible" exam or getting a job you never thought you could get. Most of us have experienced that "high" you feel after such an achievement (Plooma Research Institute, 2012). Games are excellent at creating that feeling. Lacking a proper English word, this feeling is known as *Fiero*. It means "pride" in Italian and describes the sensation of achieving, as usually described in the gaming world as, an Epic win.

McGonigal (2011) gives the following description; "An epic win is an outcome that is so extraordinarily positive that you had no idea it was even possible until you achieved it". Epic wins serve an evolutionary important role as the carrot for exploring. It makes us curious and eager to push limits because we know that something great can come out of doing something even if we aren't sure exactly what.

Then why are games so good at creating epic wins compared to real life? McGonigal argues that even when faced with bad odds, difficult and risky tasks and great uncertainty, gamers acknowledge the opportunity and as importantly; they are not afraid to fail. Failing can even be fun and empowering. Gamers are therefore willing to put themselves in situations where epic wins can happen, something which people are hesitant to do in real life.

### 3.2.5 Different Types of Players

People are different and experience things differently. What triggers certain emotions and behaviours for one person might have an entirely different effect on another. Thus, to successfully develop a game for a given audience you need to be aware of what type of gamers who are going to use it. Some people play games solely to compete, some to explore a new virtual world and others to meet and interact with other gamers. When games, as in this case, intend to change people's behaviours to fit a clear purpose (increase awareness of the consulting model, increase motivation, etc.) it is vital to get the right input from the future gamers themselves. Failing to design the game accordingly might be fatal. A highly competitive game, for example, might be demotivating for non-competitive employees and end up being contra-productive. The challenges that one has to overcome when designing a game is unique and the majority of experts are convinced that each game system has to be tailored to the specific audience and context. (Hermann, 2011)

One of the first researchers to analyse the ethnography of online game players was Richard Bartle (Bartle, 1997). Bartle is one of the co-developers of the first MUD (Multi-User Dungeon), MUD1 in 1978. MUD1 is the first digitally created virtual world and one of the first games that could be played more freely. Thus, the game experience was depending on the gamer. Bartle tried to categorise players after how they experienced and acted different part of the game. What he came up with was a chart where players could be placed after in-game behaviour and four main categories were identified; killers, achievers, socialisers and explorers.

Even if Bartle's theories are well-known and recognised, it is important to point out that they aren't based on any empirical research nor has been tested<sup>1</sup>. The theory describes the four types of players as isolated groups and ignores the fact that they most likely correlate (Yee, 2002).

### 3.3 What is a Game?

#### 3.3.1 Defining a Game

There are many definitions of a game, and experts seem to change the definition slightly for each implementation and have different apprehensions on the basic concepts like rules, goals, feedback and voluntary participation (Dignan, 2011). A blended definition is given by Salen and Zimmerman:

*"A game is a system in which players engage in artificial conflict, defined by rules, which result in a quantifiable outcome."*

(Zimmermann & Salen, 2003)

Although this definition is quite generic it covers all types of games, whether it is sports, chess or videogames. However, it does not cover all the important aspects of a game. As McGonigal points out in *Reality is Broken* (2011); it lacks the notion of a feedback system. McGonigal argues that for a player to reach the goal of the game, or the outcome as Salen and Zimmerman puts it, a feedback system must be in place that tells the player how close they are to achieve the goal. The feedback system can take the form of points, levels, score, progress bars or in its most basic form simply as the player's knowledge of the objective: "The game is over when....". The feedback systems is present in all games and serves as a promise that the goal is achievable, or at least that the progress is quantifiable, and provides motivation to keep on playing (McGonigal, 2011).

Furthermore, there is also the notion of voluntary participation that many game designers believe helps defining a game (McGonigal, 2011). The voluntary participation requires that everyone who plays the game willingly accepts the rules, the goals and the feedback along with the freedom to enter or leave the game at will. This ensures that intentionally stressful and challenging work can be experienced as playful, safe and engaging activity.

All these characteristics of the definition of a game are important and are modelled by Dignan below in Fig 3-1 (Dignan, 2011):

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<sup>1</sup> Since Bartle's research about the four player types is a central model in gamification theory, it is described in this literature study. But due to the model not being thoroughly tested nor based on empirical research, it will not be used as for further analysis in this thesis. It is included since it supports the purpose of this thesis – to increase the knowledge about gamification.

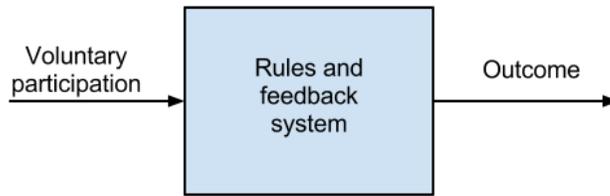


Fig 3-1 – A definition of a game (Dignan, 2011)

It is important to understand that games are not real and that they require imagination from the player, therefore it is crucial to understand the definitions and dynamics of a game to be able to bridge the gap from imagination to reality (Dignan, 2011).

### 3.3.1.1 Behavioural Games

As the definition of a game encompasses everything from sports to videogames, there is a need for a narrower definition for the more specific types of games used in gamification. Dignan (2011) introduced the term “behavioural games” to describe games that can make almost any activity more engaging and conducive to learning by applying game dynamics to everyday experiences. This is exactly what gamification is about and Dignan defines it as<sup>2</sup>:

*“A behavioural game is a real world activity modified by a system of skills-based play”*

(Dignan, 2011)

### 3.3.2 Dignan's Game Frame – How Behavioural Games are Designed

Dignan describes a behavioural game as made up by ten components which together design the framework “Game Frame” (Dignan, 2011). This framework describes all characteristics of a behavioural game as well as being a helpful tool in the design of such a game. It is a layered framework illustrated below in Fig 3-2. The Game Frame allows the designer to look at any behavioural game from the top down, understand its essential parts and see how they together make up a game. If no other source is cited, all information in this section, 3.3.2, is cited from Dignan (2011).

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<sup>2</sup> It is worth noting that Dignan’s definition of behavioural games has nothing to do with the mathematical game theoretical definition of behavioural games.



Fig 3-2 – Dignan’s Game Frame (Dignan, 2011)

### 3.3.2.1 The Outer Layer – the Structure of the Game

These four components of a game define what the game should be about, who should play the game and why they should be playing.

The Activity is the real-world action that the game is built around. This is the start of designing a game – what activity will it focus on? It is something that the designer wants players to do more, better or differently. This can be virtually any activity, like cooking, cleaning, relaxing, learning and so on.

The next step is defining who will play the game. Who are the targets? What are their motivations for playing? These motivational drivers are psychological traits that help us understand what motivates the player. These drivers need to be thoroughly evaluated before designing the game, otherwise the game might not engage the right players in the right way.

When having defined the activity on which the game shall be based upon and evaluated the potential player types, the designer needs to create Objectives. These are goals toward which the effort is directed. The objectives in behavioural games can be divided in two types: the short-term and the long-term objectives. The long-term objective is the ultimate objective, the objective that determines how the player wins. Without a long-term objective, it will be unclear what the player is trying to accomplish. Short-term objectives are goals that must be accomplished along the way, which gives the player motivation and builds confidence for the coming challenges. Dignan argues that in many behavioural

games, the objectives are not presently clear but needs to make up altogether. A good long-term goal should be something that is desired by the player and the system both.

Related to the short-term objectives are the outcomes. If a short-term goal is accomplished, an outcome is generated as feedback to the player. An outcome often takes the form of a reward (tangible or intangible), but they can also be positive or negative. If all outcomes in a behavioural game are positive, the uncertainty goes down and so does the learning. Outcomes can be triggered by a specific action by the player, or scheduled with timers within the game.

### *3.3.2.2 The Skill Cycle*

The skill cycle is the inner ring of the Game Frame and can be described as the process of one move by the player; what the player does how the game reacts and what feedback to the player that is generated. A skill cycle is one “period” during which actions are taken and feedback is delivered. One cycle could last a minute, a month, a year, etc., depending on the activity and the used skill.

The Actions are the available moves to a player in a behavioural game. A move includes what the player is allowed to do as well as when, where and how the move may be executed. An action is how the player interacts with the game and is what drives the game forward. An action is based on a decision by the player and influences the tone and style of a behavioural game, so the designer must choose them carefully. The amount of actions available to the player also decides how active play that is required, i.e. how much work that is required.

An action by the player needs to be handled by the game according to its rules. The black box is a rule engine within a behavioural game which comes in many forms. It could be a computer programme, a document or purely reside in the head of the designer. It contains all the information about the interplay between the performed actions by the player and the feedback from the game. These rules can either be partly unknown by the player and needs to be explored or completely known beforehand.

The feedback system is the game’s response to the player’s action, decided by the black box. This is how the game communicates with the player and comes in many different forms; it can be messages, audio, information, or purely visual modifications. Without feedback, it would be completely unclear to the player what effect their actions have in the game. Feedback is one of the most important methods for evaluating performance. If the players receive good feedback, they become more confident that they can achieve the given objectives and reach the desired outcomes. It is important that the feedback is frequent since this gives the player motivation to continue.

### *3.3.2.3 The Building Blocks*

There are certain traits required by the game and the player to secure a good and challenging experience. There are the skills required by the player, the resources available to the player and the obstacles set by the game.

The skills are specialized abilities that the player puts to use in a behavioural game. By definition, skills are abilities that we can learn, and learning new skills is one of the most satisfying things a player can

experience. Skills can be divided into three subgroups; physical (the things we do), mental (such as pattern recognition, memory, logic and organisation) and social (like presentation, conversation and meeting new people). Behavioural game design requires that we are conscious of all three and develop them through play.

For the skills to develop the player needs certain resistance in the game. Without resistance, there is no feeling of advancement and achievement and the game is guaranteed to be won. The player can just watch events unfold. Behavioural games need some element of resistance, or uncertainty, to be engaging. The resistance can be artificial or real, depending on the area of implementation. The two most common forms of resistance are competition and chance.

To overcome these resistances the player has certain resources at hand and has often the potential to acquire more. The options for action available to players increase in proportion to the resources available to them. For example, playing tennis with two balls instead of one would drastically alter the available actions for a player. In a classic game, resources could be things like cards, pieces or ammunition. However, in behavioural games the resources are often material things around the player. For instance, in a cooking game, the resources could be the kitchen, kitchen utensils and ingredients. To choose resources for a behavioural game the designer needs to think about the basic supplies needed for the chosen activity.

#### *3.3.2.4 Case - How Dignan's Game Frame can be Applied*

The music website TheSixtyOne is a behavioural game focused on a central activity: listening to music. The player profile shows hints of volition issues since many customers are unwilling to do the work required to find new independent artists. This tendency has forged the objective of the game, which are to become very knowledgeable about independent music (long-term) and to find new bands on the site (short-term). The outcomes are of course that the players find many new artists that they like.

The involved skills include critical listening and predicting what will be popular in the future. The service offers actions in the form of small quests like "Listen to six songs", or "Recommend a song to a friend". These actions offer rewards, or resources, in the form of "hearts" that can be used to vote for songs. If the songs the player votes for become popular, the site gives feedback in the form of email notifications alerting the player of the success. The resistance comes in the form of making the hearts quite scarce and limiting the playlist options for one song at a time. The black box in this system is the code of the website.

*"All these parts add up to a system of reinforcement that makes listening to music a much more focused and enjoyable activity where every song counts."*

(Dignan 2011)

### **3.4 Components of Behavioural Change**

Dr. BJ Fogg of Stanford University has developed a behavioural model which describes three elements that are necessary for behavioural change to occur. As a doctoral student at Stanford University he used

elements of experimental psychology to show that computers can change people’s thoughts and behaviour. He later started the Stanford Persuasive Technology Lab which received a grant from the National Science Association in 2005, after research on how mobile phones can persuade people to change their behaviour. He later developed the behavioural model which is now used by World Economic Forum (Fogg, 2011).

Fogg argues that the necessary elements for behavioural change are Motivation, Ability and Trigger. The model is intended to serve as a guide for designers to identify what stops people from performing the behaviour that the designer seeks. It is also an attempt to bring clarity and structure to the subject of behaviour which is fuzzy and overflowed with a fuzzy mass of theories. Firstly, a brief description is given on the three elements, followed by an explanation of Fogg’s research on how the model can be used to create new habits, and lastly, a description of how it all is related to gamification.

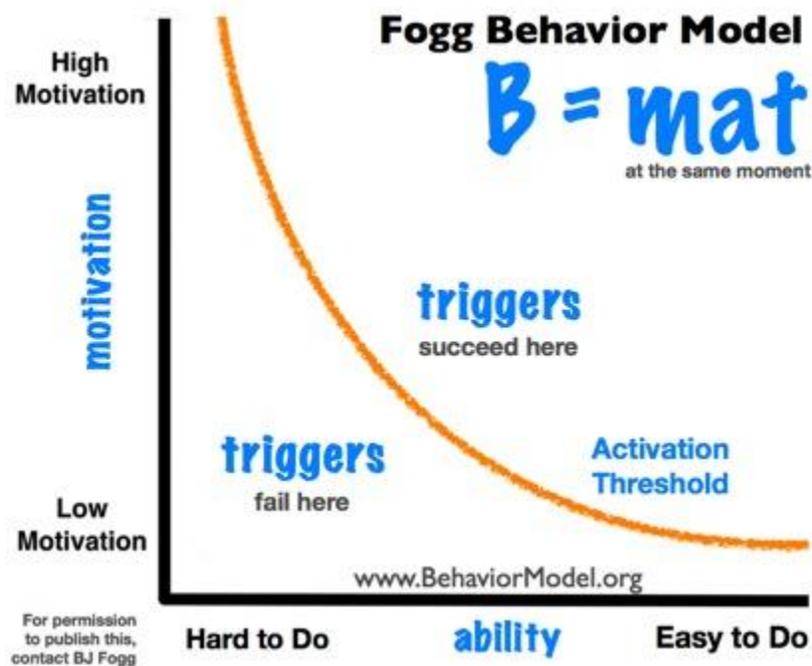


Figure 3-2 – Dr. Fogg’s Behavioural model (Fogg, 2011)

In addition one can see that the model illustrates that it is possible to make trade-offs between motivation and ability.

### 3.4.1 Motivation

Motivation is a dimension in Dr. Fogg’s model to appreciate how much a person is willing to do a specific task. The possibility to affect how a system motivates a user is the main strength of gamification. While many IT-systems only affect a user’s ability to use the system, a well-designed game layer can increase the user’s motivation as well. Game dynamics often motivate people by positive feedbacks, such as accumulation of points, badges, status, progress, customization, etc. A thorough theoretical foundation on motivation is included in 3.5 Motivators and will hence not be further described in this section.

### 3.4.2 Ability

It seems quite obvious that a person needs the ability to perform a desired behaviour, Fogg points out that this aspect is important to acknowledge since designers sometimes assume that people have more ability than they actually do. Furthermore, Fogg argues that there are two ways to increase ability; by training people or to make the behaviour easier to practice. Training people is hard work and does often encounter resistance. It is much easier to try to simplify the desired behaviour. Hence, Fogg also refers to ability as simplicity. It is important to point out that “ability” not only refers to a certain skills, it could also be resources such as money or time. It should also be made clear that ability is not something one either has or hasn’t. Ability can range from high to low and may be referred to as how much resistance the user is faced with when trying to perform the action.

### 3.4.3 Trigger

Even when ability and motivation is high enough for a new behaviour to take place, it does not magically happen. Fogg explains with an example from his own life (Fogg, 2011): He has set up a goal to practice the ukulele once a day. However, some days he does not. He enjoys playing and it is easy to do so both ability and motivation is sufficient. What's lacking is the trigger, something that says: “Now is a great time to practice ukulele!”. It is common that the lack of a trigger prevent certain behaviour. Fogg argues that a good trigger has three characteristics; it has to be noticed, it has to be associated with certain behaviour and it has to be timely. Fogg describes three types of triggers; sparks, facilitator and signal.

Fogg carefully points at that if a trigger occurs when the user does not have enough motivation or ability to perform the intended task, the trigger will only be perceived as annoying. This is an important characteristic of triggers, if they are not well-designed and well-timed, their effect will be counter-productive.

#### 3.4.3.1 Spark as Trigger

Sparks are used when the user lack sufficient motivation to perform an action. In these cases it is a good idea to include a spark, i.e. a motivation element. Spark triggers can range from text that highlights fear to a video that inspires hope. In which form the trigger comes in does not matter as long as it is recognised, associated to certain behaviour at the right time. A common example is ads which includes information about a current discount.

#### 3.4.3.2 Facilitator as Trigger

A facilitator trigger is appropriate when the user has sufficient motivation but lack ability. The facilitator triggers behaviour by notifying the user that it is easy to do, that it does not require a resource that the user does not have. A good example of a facilitator trigger is the automated friend finder that can be found at many social networking sites. They trigger people to use the site by offering a simple way to connect to a lot of friends by a simple click.

### 3.4.3.3 Signal as a Trigger

By a signal trigger, Fogg basically refers to a reminder. They do not intend to increase motivation nor ability and are used when both these elements already are in place. However, as for the other two types of triggers, a signal needs to be well timed since both ability and motivation for a certain activity varies over time. Fogg mentions a traffic light as an ordinary example of a signal trigger. The traffic light does not try to be motivational, only to show when behaviour is appropriate.

### 3.4.4 Using the Model with Gamification to Change Behaviour

When the three elements occur simultaneously, the target person's behaviour will change, i.e. when motivation and ability is high enough and the behaviour is triggered. The line in the model (Figure 3-2) illustrates the activation threshold which marks the crossing the person has to be above to be willing to change his or her behaviour. It clearly shows that, if motivation is low, ability must be high and vice versa.

PhD Michael Wu at Lithium Technologies (Wu, 20110214) uses Fogg's model to describe how game mechanics effectively can change a person's behaviour. He compares games with social media which has proven very effective when it comes to creating new routines in people's lives. They do so by playing on people's motivation to connect with others, making that really easy to do and by using triggers (Facebook uses notifications, emails, etc.). In his comparison, Wu concludes that games are far superior to social media when it comes to changing someone's behaviour since games offer various ways to increase all three elements, including motivation that cannot be done by social media alone.

*"Well designed games are able to solve complementary (and relatively much harder) problems than social networks do. If used properly, gamification is able to drive long term engagement and persistent actions reliably."*

(Wu,20110412)

The use of game mechanics is simply a great way to push a person over the activation threshold, and may therefore have a big impact on behaviour. The gamification system designed in this thesis serves as an example of how all three elements can be exerted. The game mechanics aim to; increase motivation by doing the competence model more fun, increase ability by illustrating the competence model in a clear way and by providing effective and timely triggers. Wu present this conclusion in an excellent way:

1. Game dynamics use positive feedbacks (e.g. points, badges, status, progression, customization, surprises, social factors, etc.) to build up the users' motivation.
2. They increase the perceived ability of users by making difficult jobs simpler and more manageable; either through training/practice or by lowering the activation threshold of the target behavior.
3. Game dynamics place triggers in the path of motivated users when they feel the greatest excess in their ability. That is, triggers that prompt the user for action are designed to bring about the convergence of motivation, ability, and trigger all at the same moment.

(Wu, 20110214)

As stated; a good game should address all three elements, combining them to create an intended change in people's behaviour. The big difference between a gamified context, compared to a non-gamified context, is the use of game mechanics, which are solely implemented to engage and motivate. Thus, even if the two other elements will be included in the final product of this thesis, the theoretical research has been focused on motivational game mechanics. The next sections will describe theories about motivation and how these, practically, can be turned into game mechanics.

## 3.5 Motivators

It is clear that motivation plays a big part when one tries to change people behaviour. This part of the chapter presents theories on what is motivating and understanding of how one, in the end, can increase a person's willingness to perform an intended activity. The result will be used later in the chapter where we present ways to turn motivators into game mechanics.

### 3.5.1 What Motivates People?

To successfully select a set of motivating mechanics for a new game you need to find out what intrigues and motivate your future gamers; what drive people? What make them tick? Those are questions that have been asked by philosophers and psychologists since the age of the ancients Greeks and probably even before that (Reiss, 2011). The theories differ widely. Sigmund Freud, the originator of psychoanalysis, claimed that there is only one driver for human behaviour; sex. Even though many psychologists acknowledged sex as a big motivator they wanted to expand the list. Freud's student Carl Jung, for example, thought that our biggest drive is a general will to live. Clark Hull and Kenneth Spence made their own model of human incentives to explain behaviour (Reiss, 2011). Instead of motivators they discussed different learned and unlearned drivers such as the drive eat and how these drivers add up differently for people forming different motivators. B.F Skinner (1904-1990) went against the stream and urged his fellow psychologists to see to the individual. He claimed that since there are no scientific ways to establish human motivators they couldn't be generalised for everyone. He concluded that you have to ask each individual to extract his or her motivators. Another famous contribution was made by Abraham Maslow (1943) when he presented the article "A Theory of Human Motivation". Maslow identifies five major needs; self-actualisation, esteem, love/belonging, safety and psychological needs. He also claimed that even if these need do co-exist, people prioritise between them in a certain order.

### 3.5.2 Reiss' Sixteen Motivators (2001)

Even if there are many interesting and fascinating theories from big philosophers and psychologists, few of them are based on actual scientific research. Steven Reiss, professor of psychology and psychiatry at The Ohio State University, wanted to fill the gap in scientifically based theories regarding the connection between human motivators and behaviours, and conducted a research of his own. But how do you make a survey to derive authentic human motivators? In his book "Who Am I?" (2001), Reiss describes how a local newspaper drew the conclusion that people's sex-life is more important than their job. 94 % of the participants had agreed on the statement "Enjoyable sexual relations add to a person's quality of life" and 82% thought that "sex is very important". Reiss criticises the report and stresses the fact that how you formulate the question have a deep impact on the answer. If you, for example, change the

statement “sex is important” to “sex is the most important goal of my life” or even “I would rather die than live without sex”, you would get an entirely different answer and different priorities.

The research done by Reiss was far more thought-through, scientific and thorough (Reiss, 2001). He started by listing over 400 important goals he could think of (with some help from people in his surroundings). After eliminating redundancies and basic, physical desires like “drinking water”, he ended up with 328 goals. He then had 401 adolescents and adults from different states in life to rate each goal after importance. The collected data was used in statistical calculations using factor analysis. The purpose was to boil down the input data into a number of categories based on root meaning. They had a computer try the many thousand different combinations possible for making the categories and did this for 10 to 20 categories. The goal was to optimise the number of categories in order to capture as many of the 328 goals as possible but at the same time have a complexity that was reasonable. The result was 16 categories. If less were used some important goals would be excluded and with more, the complexity would be too great. These 16 categories of root meaning, or motivators, form the base of his book “Who Am I” (2011) and are used as Reiss tries to explain human behaviour. The categories are presented below:

#### *3.5.2.1 Power – The Desire to Influence Others.*

With *power*, Reiss is referring to the ability to influence our surroundings. Power is connected to the need of experience mastery and excellence. It also motivates us to pursue challenges, ambitions and glory. The most common way to satisfy the need for power is through achievements. People who crave power usually try to become influential in an area, such as law, business or sports, by achievements. Another common way is to gain power through leadership and being in charge.

#### *3.5.2.2 Independence - the Desire for Self-reliance.*

Independence, the desire of self-reliance, creates a periodic need to feel free (Reiss, 2001). It is independence that urges young people to move from their family home. People with a strong need for independence are unwilling to accept help or guidance from others, especially on tasks they think they can do themselves. When given an assignment, an independent person often wants to form it after his or hers own ideas and thoughts. Regardless of the degree of need for independence, people seek balance so that they can reach a level of independence they feel comfortable with.

#### *3.5.2.3 Curiosity - the Desire for Knowledge.*

Curiosity is the need to explore and learn. Curiosity drives animals to find new territory and to learn habits and behaviour that, for example, making hunting more efficient. It is important not to confuse curiosity with achievement which is associated with the desire for power. Curiosity refers to learning for its own sake and not learning as a mean to an end.

#### *3.5.2.4 Acceptance - the Desire for Inclusion*

Acceptance is the need for inclusion and is closely associated with self-esteem and self-confidence. People with low acceptance do not like to be evaluated and hence avoid situations where they are evaluated. People with a strong desire for acceptance often over-react to criticism.

### *3.5.2.5 Order - the Desire for Organisation*

Order includes the sense for traditions and rituals and creates a feeling of stability and control. The need for order severely differs between people. Losing control and structure can be very stressful for an organised person whereas a flexible person feel strangled by too much order and too little freedom and flexibility.

### *3.5.2.6 Saving - the Desire to Collect Things*

The need for saving is the desire to collect but also the desire not to throw anything away. Reiss talks about frugal people who aim to save everything that can have even the slightest future value. Collecting and saving do not necessarily refer to objects. It can also be the collecting of favours and the urge to save time by not wasting time. It is also important to point out that saving is an intrinsic need where saving itself, without any particular use for the things saved, is satisfying.

### *3.5.2.7 Honour - the Desire to be Loyal to One's Parents and Heritage*

Reiss defines honour as the desire to be loyal to one's parents, and by extension, to one's heritage, ethnic group, culture, moral code, religion, city or nation. Honour gives us a desire to perform the duties that are in line with our moral and values. Reiss distinguish between loyalties as described above compared to loyalty to friends, spouse and children. The three latter are covered by other needs such as desire for romance and desire for social contact.

### *3.5.2.8 Idealism - the Desire for Social Justice*

Idealism is the desire for social justice and fairness. It is idealism that makes people volunteer to do humanitarian work, makes physicians help the health situation in developing countries rather than opening a profitable practice at home or that make people devote their life to be politicians and overcome injustices in society.

### *3.5.2.9 Social Contact - the Desire for Social Companionship*

Social contact is essentially the desire for spending time with friends. Reiss concludes that sociable people need social contact, not only to have fun, but to get a basic sense of happiness. There are also people who do not have a great need for social contact and prefer being alone most of the time. However, these people should not be confused with shy people. A shy person is (often) someone with low acceptance level thus insecure in seeking new social contact even if the desire is high.

### *3.5.2.10 Family - the Desire to Raise One's Own Children*

Family is the need (or instinct) for humans and animals to nurture and potentially make sacrifices for their children. These instincts are especially important for humans since the human child is vulnerable and in need of care for several years.

### *3.5.2.11 Status - the Desire for Social Standing*

Status is the basic desire for prestige. Sometimes employees agree to a lower pay check just to get a more status-like job title which serve as a good example that proves that status is a truly intrinsic motivator.

### *3.5.2.12 Vengeance - the Desire to Get Even*

Vengeance is the will to get even with people that, one way or another, has offended us. This desire has close connection to anger and hatred but does not necessarily need to be the same thing. Competition falls under the vengeance category. In sports, a non-violent competition, you get the chance to instantly retaliate when the opponent get one up. The desire to compete differs hugely between different people. It is common to seek revenge without any apparent reason but for the joy of getting even.

### *3.5.2.13 Romance - the Desire for Sex and Beauty*

Romance is the desire for sex and beauty and has its primal origin in mating instincts. Romance for humans is not only biological but also affected by social and culture aspects. Appreciation of beauty also belongs to the romance category and includes physical beauty, art and music.

### *3.5.2.14 Eating - the Desire to Consume Food*

The need to eat is obvious. What makes the desire for food different from other biological needs to survive is that it has psychological aspect. We get hungrier if we see an attractively prepared meal on TV or catch a delicious smell walking through town regardless of when we last ate. Hunger can also be emotional, for example, some people tend to eat when they are sad.

### *3.5.2.15 Physical Activity - the Desire to Exercise Muscles.*

Most people find joy in physical activity. It might be exercise by practicing and competing in some sport but it might also be taking a walk or a jog. Physical activity is a true intrinsic desire and hence enjoyable in itself.

### *3.5.2.16 Tranquillity - the Desire for Emotional Calm.*

Tranquillity is a psychological state defined as the absence of disturbances and turmoil. People are comfortable with different amount of stress. Some actively tries to steer their life to reduce stress as much as possible by turning down promotions, etc. Others do not mind stress even if they do not particularly enjoy it. Tranquillity has become more and more interesting from a psychological perspective the past decades. People spend more and more time doing anxiety management, most likely due to an increasingly hectic life style.

## **3.5.3 Motivators are not Black or White**

As Reiss describes the 16 motivators, for each of them he points out that a person have a certain degree of desire. To be happy, people try to balance activities to fit their desires for the different motivational areas. Reiss gives the example that when people have to learn a lot in a short time and the learning experience is too intense, they seek mindless activities to balance the desire for curiosity to a level that

make us happy. Students prove this behaviour. At the end of a semester, after the exams and hours of studying, students like to party, do sports or just lay in the park. Anything as long as it does not involve learning. This goes for all of the motivators. Someone who had too much tranquillity for a while often want to compensate by doing something active and it is not unusual that a person with a highly influential job experiences too much power and seek balance by being submissive in other contexts.

### 3.5.4 Our Desire Profile Describes Who We Are

According to Reiss, our individual prioritisation of the motivators is a big part of who we are. By finding out someone's prioritisation or *desire profile* as Reiss names it, one can learn a great deal about that individual's personality and predict his or her behaviour. It is important to point out that he does acknowledge, as for all psychological tests, the importance of studying how well the test results correspond to the individual's actual behaviour in the real world. He shows that the desire profile can be used to predict important behaviour such as a person's college major, membership in a club and scores on other psychological tests with valid measures of personality. It can also predict, with statistical significance, how religious contra atheistic a person is.

## 3.6 42 Things Players Think Are Fun

Jon Radoff has used the research behind Reese's 16 motivators to develop the framework "42 things that players think are fun" where all the motivators are translated into actual tasks and traits that a game might incorporate (Radoff, 2011). These 42 types of fun may serve as the base for the design of the game mechanics since they clearly signal what types of tasks the specific player profile might enjoy and which tasks the game designer should avoid. Note that if no other source is cited in this section, 3.6, the information is cited from Radoff (2011).

This is a link between the psychology of the player profile and the game mechanics that are to be implemented in the design. According to Radoff, the activities that players think are fun are the following:

1. Recognising Patterns
2. Collecting
3. Finding unexpected treasure
4. Achieving a sense of completion
5. Gaining recognition for achievements
6. Creating order out of chaos
7. Customizing virtual worlds
8. Gathering knowledge
9. Organising groups of people
10. Noting insider references
11. Being the centre of attention
12. Experiencing beauty and culture
13. Romance
14. Exchanging gifts
15. Being a hero
16. Being a villain
22. Telling stories
23. Predicting the future
24. Competition
25. Psychoanalysing
26. Mystery
27. Mastering a skill
28. Exacting justice and revenge
29. Nurturing
30. Excitement
31. Triumph over conflict
32. Relaxing
33. Experiencing the freakish and bizarre
34. Being silly
35. Laughing
36. Being scared
37. Strengthening a family relationship

- |   |  |
|---|--|
| 17. Being a wise old man                  | 38. Improving one's health               |
| 18. Being a rebel                         | 39. Imagining a connection with the past |
| 19. Being the ruler                       | 40. Exploring a world                    |
| 20. Pretending to live in a magical place | 41. Improving society                    |
| 21. Listening to a story                  | 42. Enlightenment                        |

A deeper explanation of the activities is presented in the following section. However, please note that several of the activities have been left out since they do not have any practical application for the gamification of the competence model. The ones that are presented below are those considered possible for implementation<sup>3</sup>.

### *3.6.1.1 Noting Insider References - Acceptance/social contact*

Players that are motivated by acceptance and social contact often find insider references enjoyable. These things could be certain names, metaphors, inside jokes or even the use of certain numbers that players stumble upon while playing. When a player finds them, it can provide a sense of acceptance and a feeling of belonging as well as satisfying a need for order.

#### **Typical game mechanics of “noting insider references”**

A typical game mechanic of insider references is Easter eggs, which is a hidden message or joke inside a game. Other game mechanics could be a story-telling figure whose stories include messages that only players that belong to a certain group can understand.

### *3.6.1.2 Laughing - Social contact/Physical activity/Tranquillity*

Elements of laughter provide a break of tension and readies people for events to come. People love to laugh, especially among friends which provide a sense of comradeship.

#### **Typical game mechanics of “laughter”**

There are numerous mechanics that can produce laughter, among those are good story-telling, inside jokes, creative designs - among others.

### *3.6.1.3 Achieving a Sense of Completion - Power/Independence/Order*

When a player completes a given task or assignment it contributes to their sense of order. Hence his or her feeling of power and independence increases. Good games are effective at giving player challenges that are designed for their current skill level and feeding them with a constant sense of that they have finished something with a well-designed feedback system. This is a core element in many games and since it is one of the main ways to give feedback, a key factor in Dignan's Game Frame, it is extremely important to get right (Dignan 2011).

#### **Typical game mechanics of “achieving a sense of completion”**

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<sup>3</sup> These 13 things of fun that are chosen, is chosen on recommendation from Radoff (2011) in his book “Game on”.

Many important game mechanics induces a feeling of completion, among those are progress bars, to-do lists or quests, achievement systems and levels.

#### *3.6.1.4 Customizing - Power/Independence/Social contact/Status*

Players often enjoy being seen and leaving their mark on their environment. In games this can be things like equipping their own avatar, changing the layout of their profile page or the naming of their character. Experimental evidence has shown that people place great value on things they have made, and the same concept seems to hold true in games as well. This behaviour makes the game more individual and may therefore appeal to those who are motivated by independence. It can also enhance the player's sense of control of their environment, which is engaging for players who are motivated by power and status.

#### **Typical game mechanics of "Customizing"**

This is very dependent on the type of game, but common mechanics include designing and naming things in the environment. It could also include the crafting of virtual equipment.

#### *3.6.1.5 Imagining Yourself as a Character*

People generally enjoy the idea of imagining themselves as someone else than they really are. This is a common concept in video games, especially in the Roll Playing Game genre. It is also a common mechanic in other contexts where attending costume parties or riding a rollercoaster at Disney land are two examples. Most types of fiction are also good at creating this sensation. When reading a book or watching a movie, people tend to identify themselves with one of the characters and that they are going through the same experience as that character. Depending on the character that is imagined by the player, all motivators could be applied.

#### **Typical game mechanics of "Imagining yourself as a character"**

An avatar of the player.

#### *3.6.1.6 Listening to a Story - Curiosity/Social contact*

Stories have the power to take abstract rules and mechanics of the game and ground them in plots, themes and curiosity to make them easy to understand and more engaging. Stories appeal to the player's curiosity about people, places and things. However, depending on the story, it can satisfy a player's need for other motivators as well, such as laughter, romance among others. A good story can also decrease the player's initial resistance for playing and make them committed to the story.

#### **Typical game mechanics of "Listening to a story"**

A common way to include a story is by having a certain figure telling it through different stages of the game. It could be triggered by certain events or discovered continuously.

### *3.6.1.7 Being silly - Acceptance/Independence/Tranquillity*

There are other ways, except laughter, that removes the serious edge and breaks tension from certain situation - and that is silliness. As Radoff points out, the world is far too serious as it is, games should strive to act as a counterweight to this. When people are comfortable with a certain situation, they may allow themselves to act silly. This is a sign of independence and group acceptance. A game can deal with serious subjects without being all too serious itself.

#### **Typical game mechanics of “Being silly”**

None in particular.

### *3.6.1.8 Recognizing Patterns - Curiosity/Order*

The human brain is naturally curious, pattern recognizing and order-seeking that sends out stimuli whenever a person figures something out. Many games are all about pattern recognition, such as Chess or Tic-Tac-Toe. These games are often very easy to learn but extremely different to master which motivates players to keep on playing the same game.

#### **Typical game mechanics of “Recognizing patterns”**

- Strategic patterns, such as learning optimal moves in chess.
- Mathematical patterns, such as learning optimal strategies based on figures.
- Visual patterns, as in putting together different shapes and colours into groups (as seen in the game Bejeweled)

### *3.6.1.9 Gathering Knowledge - Curiosity/Social contact/Status*

Even though studying may not always be fun, learning is fun. As discussed in the last paragraph about pattern recognition, the curiosity of the human brain is tightly coupled with learning. If a game manages to immerse players in an experience that helps them learn passively, rather than force an education on them, it has the potential to engage players greatly.

#### **Typical game mechanics of “Gathering knowledge”**

In many games, players are subject to finding things out for themselves while playing. The rules are not explained at the very beginning, but introduced gradually in a natural way as player’s progress. This can be achieved by good story-telling and design.

### *3.6.1.10 Enlightenment - Curiosity/Idealism/Tranquillity*

Games have the power to represent the environment as it actually is, or at least how it should be. This is very powerful and can provide structure and enlightenment to a player that a non-fictive environment could not. This can satisfy a player’s need for idealism and tranquillity.

#### **Typical game mechanics of “Enlightenment”**

None in particular, this is more of a concept to keep in mind while designing a game that should represent the reality in some way.

#### *3.6.1.11 Competition -Power/Status/Vengeance*

In a competitive game, players need to win and players need to lose. This could be in direct player vs. player competition or in an indirect, more subjective form of a leader board. Competition works with players that are naturally hungry for the power and status that comes with winning, and the vengeance that comes with losing.

#### **Typical game mechanics of “Competition”**

There are many types of game mechanics that focuses on competition. For example, there is the player vs. player competition settings or competition by comparing individual scores on a leader board.

#### *3.6.1.12 Gaining Recognition for Achievements - Acceptance/Social contact/Status*

While achievements can give the players a sense of accomplishment, they can also act as means of recognition. Players whose strong motivations include status and acceptance may be engaged by these things. It is important to distinguish between push-awareness of achievements, such as a public feed in the game that reports progress for successful players, and pull-awareness of achievements where other players needs to actively look for another’s achievements.

#### **Typical game mechanics of “Gaining recognition for achievements”**

Mechanics that incorporate sharing of achievements to other players or the general public, such as in-game activity feeds, badge or trophy galleries.

#### *3.6.1.13 Being the Centre of Attention - Power/Status*

This is a big part why people enjoy commenting online. A lot of people are motivated by attention. Game designers can create the feeling of being the centre of attention by putting the player in the centre of an epic story, or by designing the game for interaction between different players. This is often very important for players that are motivated by power and status.

#### **Typical game mechanics of “Being the centre of attention”**

Epic stories where the story revolves around the player.

### **3.7 Game Mechanics**

Any game is essentially built up by a set of game mechanics and designing a game is mostly about choosing, tweaking and customising this set of fitting mechanics. In this section further explanation of what a game mechanic actually is, how they can be used and a description of commonly used mechanics are given. The focus of this chapter lies on how one can change behaviour through increased motivation. Hence, the following section on game mechanics will describe game mechanics in a motivational perspective.

There are several scientifically established theories that offer different ways to explain and map human motivation. What makes games so good at motivating and engaging people is their ability to trigger these different intrinsic motivators. Games do this so well because of game mechanics that are designed solely to make you engaged in different ways (Wu, 2011-02-14). When designing a game, after deriving the motivators of the audience, it is important to choose and customise a set of fitting game mechanics. So what is a game mechanic? There are several quite consistent definitions. One that covers most aspects of them in a brief way is Daniel Cook (2006) that defines a game mechanic as:

*“Game mechanics are rule-based systems that facilitate and encourage a user to explore and learn the properties of their possibility space through the use of feedback mechanics (Cook, 2006).*

A central part of the definition is the feedback loop which is a simple but important concept. Cook describes this as a four step model:

1. Player performs an action.
2. The action causes an effect in the simulated game environment. The exact effect is often unknown to the user. This unknown portion of the rules is often referred to as “the black box”. Usually is discovering all these rules a part of the game experience.
3. The player receives feedback.
4. With the new tools and information gained, the player performs a new action.

As the definition states, game mechanics can be divided into different types. First you have the mechanic that is the possible action, say for example the rolling of a die. Next step is the game rules that also are one kind of game mechanics, which decides how the die rolls will affect the game and feedback. Lastly is the feedback mechanic which serves as the output from the game with the given action. This could be everything from a reward in the game currency, new knowledge or avatar growth.

As one purpose of this thesis is to research gamification as a subject some of the most common game mechanics are presented below. They also serve as direct, or inspirational, input to the proof of concept. Note that if no other source is cited, all information in this section (3.7) is cited from Zichermann and Cunningham (2011).

### 3.7.1 Points

Points are one of the most essential game mechanics and are part of every game (Zichermann & Cunningham, 2011). One might think of points as a way to communicate progress between the game and the user or to keep score in a competitive game. But as game designer, you always need to track every move the player makes, even if it is not communicated. Without that tracking the game does not register how the player is interacting with the system and thus not which response to give.

Different ways to measure progress and current status are seen in everyone’s day to day life. Money is an excellent example that everyone can relate to. Money has been used to measure wealth and status as long as they have existed. Yet, people are reluctant to discuss their own account balance in a casual conversation since that’s a social taboo. Instead one shows the “score” in different ways; by driving a nice car, wearing expensive clothes, buying a big house, etc.

Other examples of real life point systems are number of friends on different social media communities, job titles and points in sports. Sometimes points can be used to quantify composite metrics which are metrics that are based on several, different factors. Creditworthiness is one composite metric which takes many factors into account; from average credit card expenses to amassed debt over lifetime thus making a complex set of metrics into one that are easy to compare.

As with every component in game design, the point mechanic has to be customised to suit the target audience in order to affect behaviour in an intended way. In his book “Gamification by Design”, Gabe Zichermann (2011) describes five different types of point systems that can be used in games. Sometimes the different point systems can be combined to achieve the intended purpose, but in other cases points need to step down and work in the background to give room for mechanics better suited for the game.

#### 3.7.1.1.1 Experience points

Experience points are points that are rewarded for every task you complete in the game. They do not serve as a currency in the system but are used to watch, rank and guide the player. In the common sense of experience points they cannot be redeemed or removed, only increase. Using experience points is a good way to affect the player’s long-term behaviour and align player’s long-term goals with the intended goals of the game designer, in our case, Cybercom’s. An option is also to clear all experience points periodically; resetting the game to create goal loops.

Zichermann points out the importance of limitless experience points, making it a never ending incentive for improvement and growth and that they are a powerful tool to show the player what activities that are important.

#### 3.7.1.1.2 Redeemable points

Redeemable points are points that are earned and spent in exchange of things. They usually constitute the currency system of the game. As in real life economics, it is important to control the flow and quantities of the points to ensure their value and to balance the incentives of different tasks in the game. Redeemable is not supposed to, at least not in the same extent as with experience points, to affect the behaviour of the individual player, but rather of the whole player community. Again clear parallels can be drawn to real-world economy.

One option is to have two currencies. This is used in Farmville (Zichermann & Cunningham, 2011) where one can earn both points and cash. The two currencies may be traded for different things or the same thing but for a different price. There are several opportunities with two currencies; one of them is the possibility to vary the value of different parts of the game without having to inflate or deflate the whole economy.

#### 3.7.1.1.3 Skill points

Skill points are assigned to special tasks in the game and intend to create incentives for the player to complete sub goals and objectives outside the game core. This could be extra points for posting feedback on a forum or learning non-compulsory skills.

#### 3.7.1.1.4 Karma points

Karma points are seldom seen in classic games. They are points which are non-beneficial to keep but provide a reward when given away. Instead of using redeemable points to give feedback and encouragement (such as gifts) karma points can be used to promote such behaviour. It is an altruistic way of interact while minimising the game tendencies in the system. A common example is rating system where you have a certain amount of points to rate different options.

#### 3.7.1.1.5 Reputation points

Essentially a reputation point system is meant to facilitate trust between the participants in the game. Reputation points can be very difficult and complex to manage; they have to incorporate a wide range of activities and must reward “the right” behaviour. Furthermore, these systems tend to be “gamed”, meaning that people are trying to find shortcuts to gain undeserved reputation. A well-known example is the stars and feedback that an eBay-seller gets from selling items (Zichermann & Cunningham, 2011).

### 3.7.2 Levels

Most traditional games use the levels mechanic to effectively increase the challenge and keep the player engaged. In Tetris for example, the level is continuously increased and the dropping speed of the pieces becomes faster and faster with each level. Tetris has (at least in newer versions) an indicator showing the level as a number, in other games the level is indicated in different ways. In Pac-Man the colour of your enemies shows the level (Zichermann & Cunningham, 2011).

Levels are generally not linear, meaning that the increased challenge faced in a new level is not directly proportional to the number of cleared levels. Instead the difficulty curve is curvilinear. In Ms’ Pac-Man for example, the speed of the monsters is slowed after level three but a new restriction is added; increased safety time zone delineations (Zichermann & Cunningham, 2011).

In Angry Birds the difficulty is not noticeable increased in the beginning. But at level 21 there is a bump in challenge. Such game design might lose players who fail to pass that level but on the other hand hook player who succeeds by making them feel that they have achieved something great. This serves as an example of how you can balance fiero contra flow in your game (McGonigal, 2011).

### 3.7.3 Progress Bars

A progress bar is a common way of showing how close to the next level you are. Progress bars are traditionally seen in roll playing games where they indicate the progress of the avatar (often measuring experience points). Today progress bars are all over the internet. In a common practice, they show how much personal information one have added to create a deeper core experience (Zichermann & Cunningham, 2011). Progress bars work very well together with levelling systems by clearly visualising how much further you have to go to reach the next level.

LinkedIn is an online community which uses a progress bar to measure your profile completeness. However, Zichermann points out two major flaws: The bar can be maxed out and the fact that you need to complete the steps to fill the bar reflects a missing experience points system.

### 3.7.4 Social Engagement Loops

A social engagement loop is a mechanic that targets the fact that a good game designer not only have to focus on how the player engage while in the game but also how he or she leaves it and, perhaps more importantly, how he or she returns to it (Zichermann & Cunningham, 2011). The iPhone metric company Flurry says that after 30 days, a free iPhone app generally loses 95% of its player. That clearly shows the importance of a gamified way to re-engage the users.

The loop consists of four steps, as shown below in Figure 3-3.

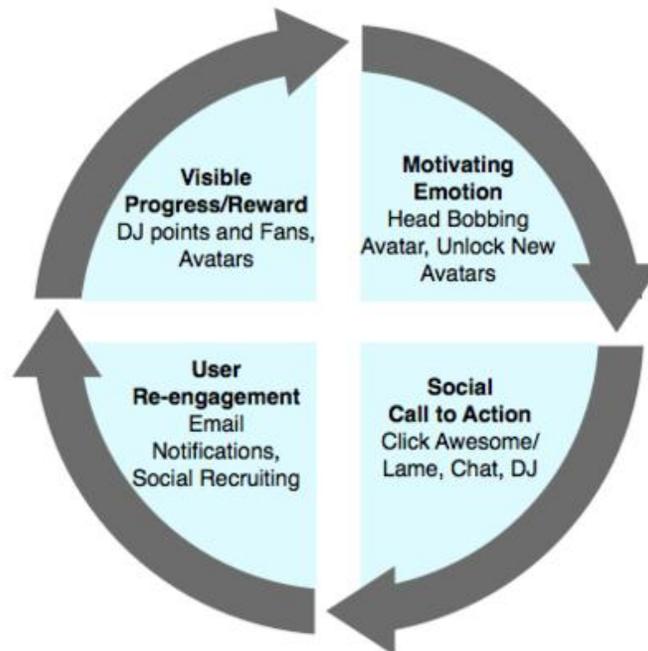


Figure 3-3 - Social engagement loops (Zichermann & Cunningham, 2011)

Zichermann uses Twitter as an example on how the social engagement loop can be used for game re-engagement:

#### 3.7.4.1 Motivating Emotion

For new users Twitter is mostly a way to connect and express. As one become more and more active that purpose is often shifted to be more about getting as many followers as possible.

#### 3.7.4.2 Social Call to Action

In Twitter the Social Call to Action is the tweets themselves. When making a tweet, making a re-tweet or mention someone in a tweet with a “@Mention” it serve as a social call to other users.

### *3.7.4.3 Player re-engagement*

A re-tweet or a mention notifies a user that your input has been received and that feedback makes the user log in again to continue the social contact.

### *3.7.4.4 Visible Progress/Reward*

The visible reward from twitter is how many followers you have. A “successful” user gets more followers, increasing his or her status and serve as feedback when you are posting interesting tweets.

### *3.7.4.5 Customisation*

The customisation mechanic allows the player to influence the game environment. A common example is the possibility to change the look of your avatar in roll playing games. However, most games have no need for a full scale 3d avatar. It can be small and simple things like changing the background colour or modifying the menus. This is also a good reward system or a way for the players to spend the in game currency.

Too many options, however, will only be de-motivational. In 2004, Barry Swartz wrote the paper “The Tyranny of Choice” where he explains how more option is satisfactory to a certain degree, but if you cross that line more choices will have the opposite effect (Swartz, 2004). Swartz divides people in to two general groups; maximisers and satisfiers. When buying something, maximisers always aim to get as much as possible for his or her money by comparing all options available and making a thorough cost/benefit analysis. Satisfiers, on the contrary, make a list of minimum requirements and decide an amount of money they are willing to spend. The satisfiers then simply buy the first option available that meets the requirements. Analysis of the two different behaviours shows that satisfiers are generally happier people. When it comes to game design, it is therefore not a good idea to reveal all options up front, making the game seem too complex and overwhelming.

With a balanced customisation system the game designer can create engagement with small effort. And by integrating customisation with the in game currency and points, one can increase the engagement and guide the player through the game (Zichermann & Cunningham, 2011).

## **3.7.5 Leader boards**

A common game mechanic in behavioural games is the leader board. It is a visual ranking system used to make simple comparisons. This mechanic is used in many applications today; a good example is the “Game Centre” in the operative system iOS which lists the leader boards of all the games that the user owns, see Figure 3-4.



Figure 3-4 Leader boards in the iOS application “Game centre” (Authors creation)

### 3.7.5.1 The No-Disincentive Leader Board

In Gamification by Design (2011), Zichermann and Cunningham define two kinds of leader boards; the no-disincentive leader board and the infinite leader board. The purpose of the no-disincentive leader board is to provide social incentive for competition, rather than disincentive. This is accomplished by putting new players in the middle of the leader board. This way, the player will see friends who are right behind and exactly how close the player are to friends ahead. The important part in this mechanic is that the player does not start at the end, with only resistance ahead.

### 3.7.5.2 The Infinite Leader Board

In a typical game, there are not too many ways a player can exist on a leader board. You are either in the top 20, or you are not shown at all. If the 20<sup>th</sup> best score is beaten at some point, that player will fall off the leader board. However, in today’s games there are ways to control that no player will ever fall off the leader board.

This can be accomplished with a dimension in the leader board. There can be many types of dimensions, popular ones are the social (where the scores of friends are shown), a local (geographical) and global (all scores) leader boards. The latter is used by the popular iPhone game Doodle Jump (see Figure 3-5). Other dimensions of a leader board could be that only players at the same level are shown or that only players at your particular department at work is shown. The purpose of this type of leader board is that no one ever falls off the leader board and that the player is compared to relevant competitors, not the best players in the world (presuming that you aren’t a doodle jump master).

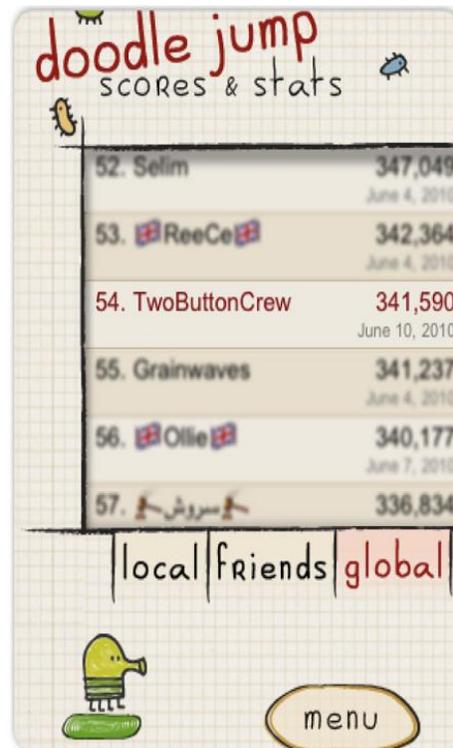


Figure 3-5 Doodle Jump's multidimensional leader board (Zichermann & Cunningham 2011)

### 3.7.5.3 Leader Boards and Privacy

When creating a performance-based leader board, as in a work-related implementation, the items being compared may be sensitive or difficult to value in a fair way. Since the objective of a leader board is to publicly compare results, the game designer needs to be careful when implementing games that compare information best kept in private (Zichermann & Cunningham 2011). These situations can be solved by abstract point systems where the game measures player's performance or commitment in a non-sensitive and non-discriminating way. For example, it may be more appropriate to measure the frequency of visits to the gym instead of how much weight the players have lost.

### 3.7.6 Badges

Badges are a way for game designers to encourage social promotion and desired behaviour. However, badges are not, by any means, a new concept. On the back of a car there are often a logo and a string of letters that displays a message to other people about what kind of engine there is under the hood, the wealth of the driver, the driver's sense of fashion or the driver's environmental awareness. Car manufacturers are completely aware of the power of these badges and display them prominently for potential buyers.

In addition to signalling status, people desire badges for many reasons. For some players it is the sudden exhilaration of surprise or pleasure when a badge shows up unexpectedly in a gamified system. For others it is just the collecting that is a powerful drive. Badges have the power to mark the completion of

goals and displays steady progress through the system. Nevertheless, it is often quite hard to use badges in an effective way. Many systems completely swamp the players with badges, which reduces their effect drastically. Other systems use them too sparingly so that only the most ardent players have any chance to earn them which increases the resistance for other players to an uncontrollable level and thereby decreasing engagement.

### 3.8 Weaknesses and Risks with Gamification

Even if the area of gamification mostly receives positive feedback and enthusiasm there are some skeptical opinions and qualms that are important to include in order to create a thorough, theoretical foundation of the subject. A common criticism of gamification is that it easily can be used to manipulate people's behaviour (Costa, 2012). The fear that it will have negative impact is especially regarding marketing, but also enterprise gamification. David Kirschner, research assistant at Nanyang Technological University in Singapore says:

*"Negative outcomes are mainly in advertising. It is insidious really, using game elements to get people to buy more [things] they do not need. It is especially bad when gamification-fueled consumer culture targets kids".*

(Andersson, 2012)

Richard Holeyton, author of *Cyberspace: Identity, Community, and Knowledge in the Electronic Age*, is also skeptic to the manipulative side to gamification. He says:

*"Manipulating people in the workplace (say, to make them more loyal or productive) or the political sphere, and 'monetizing' our every gamified interaction, would be the bad things."*

(Andersson, 2012)

Other common criticism to gamification is that it is only engaging in the short-term and does not focus on long-term objectives in an efficient way. As the company PrepaidEvolution states in their official blog:

*"Gamification focuses on short-term results. It rewards and encourages basic, measurable behaviors. It is not so great at rewarding or encouraging big-picture thinking and long-term goals."*

(PrepaidEvolution, 2012)

This is the same problem as with any game. Players get tired with games, especially if they do not continuously evolve. This is why any successful gamification implementation needs to be maintained and developed continuously as well; otherwise the users will get bored.

What more is, many games have ways to exploit the rules to benefit the single player beyond reason. This is the way with Foursquare, which is a game that rewards the user who checks in to the most places most frequently, mainly to promote the advertising at those particular places. However, users of

Foursquare are able to stop outside a connected store and check in, and then move on to the next one, and still reap the rewards. Even though they never actually behaved as was intended by the system. This means that the system is suddenly rewarding the best gamers, not the hardest workers. This is a common fallacy of gamification implementations, and one that everyone game designer needs to be aware of.

### 3.9 Conclusion

When talking to people about gamification, sceptical opinions often originate from the belief that without real reward, such as money, engagement will remain low. The fact that games are engaging even if they only bring perceived value is probably the most important conclusion to realise. This is because humans are hard-wired to enjoy games. Another part of the explanation is that a short feedback loop is a central part of any game and probably the biggest difference between games and reality where the feedback-loop tends to be long. Fiero and epic wins are also two phenomena that one seldom sees in real life but are common in gamified contexts. The last conclusion that can be derived is the fact that games should be a relaxing experience is a myth. To play an engaging game is hard work which also is why humans find them appealing. When realising these conclusions, it is not hard to understand why game thinking have great potential to raise engagement in an enterprise context. By creating an environment that promotes hard work by providing intrinsic “alievied” awards with a short feedback-loop and achievable epic wins, change in behaviour is feasible.

In order to implement these central elements of a game, Dignan’s Game Frame (2011) is used as an organised structure. The model clearly shows what components that are needed to create a game which has been important input as the empiric research was planned.

The purpose of gamification is to create a change in behaviour. Because of its clear connection to gamification, Dr. Fogg’s behavioural model (2011) will serve as the theoretical foundation for how that can be achieved. Once the outline of the game is set, details about the game mechanics need to be worked out. The model is used to analyse what the obstacles are for the intended behaviour and how these most effectively can be overcome. Since behavioural change is the very core of what gamification tries to achieve, Dr. Fogg’s research will permeate throughout the entire reasoning in this master thesis.

Once it is decided exactly what is to be achieved by the game layer it has to be shaped in a way that is appealing to the employees at Cybercom. Reiss’ (2001) research on human motivation is used to derive a player profile which will constitute that important input and is used as the selection of game mechanics, included in the final system, is made. Reiss’ research includes a survey which is used in the empiric study.

Finally Radoff’s (2011) 42 things of fun serves as the connection between motivators and what game mechanics that will be engaging for the consultants at Cybercom.

Together, these parts form a theoretical foundation to gamification; why it works, how to design a game and what input that is needed to customise the game layer to the specific audience in order to create an intended behaviour.

## 4 Empirics

### 4.1 Introduction

This part of the thesis accounts for the empirical studies conducted in this master thesis. It consists of two major parts, a quantitative study and a qualitative study.

The results of the quantitative questionnaire show that the employees of Cybercom (sometimes denoted as “players” of Cybercom) are motivated by curiosity and self-fulfilment but not status and acceptance. These results are extremely important when choosing what kinds of mechanics that are to be included in the proof of concept, and as important, which not to include.

The results of the qualitative semi-structured interviews show how the employees use the competence model today and reveals that it is not very well utilised, nor liked. Another objective of this study was to find out the obstacles for behavioural change, or more specifically, what hinder the employees from using the competence model. These results are important since they also help choosing which mechanics that needs to be included in the proof of concept. The nature of the obstacles will be used later in conjunction with Dr Fogg's (2011) behavioural model (see chapter 3.4) to establish whether the mechanics need to focus on ability or motivation.

### 4.2 Quantitative Study

This section concerns the questionnaire that was sent out to all employees of Cybercom South in the beginning of March. Its purpose is to examine what motivates the employees. All parts of the study will be presented, including procedure, research questions and results. The results will be further discussed in in the Discussion and Analysis.

#### 4.2.1 Research Question

According to Dignan’s game frame, an essential part in designing a gamification system is to define the player profile by investigating what motivates the target players (Dignan, 2011).

Much research has been done in the psychological area of motivation over the years, although psychological research is quite rare in the context of gamification. However, as described in chapter 3.5.2, Dr. Reiss has done extensive research on the different human motivational drivers and his research has been applied by Radoff in gamification. This is an important linkage for this project as it allows the use of existing psychological theory and the game design. Other frameworks for the player profile have been considered, as the “Bartle test of Gamer Psychology” (Radoff, 2011), but these have been rejected due the missing formal linkage between gaming psychology and gamification. What more is, Dr Reiss’ extensive research to derive these motivators makes them more credible than many other explanation models for human motivation (Reiss, 2011).

It should be mentioned that Reiss describes 16 motivators in his research, including “eating”. Since the motivator “eating” is not deemed to be of any particular importance for this master thesis it is

consequently left out. The framework will therefore be referred to as Dr Reiss' 15 motivators.

Given Dr Reiss 15 motivators, the following research question is used in this study:

*“Which of Reiss 15 motivators is of positive or negative importance to the employees of Cybercom?”*

Based on this, the following 15 hypotheses are tested:

<b>Null hypothesis (H<sub>0</sub>)</b>	<b>Hypothesis (H<sub>a</sub>)</b>
<b>Power</b> is not a motivator of the employees of Cybercom	<b>Power</b> is a positive or negative motivator of the employees of Cybercom
<b>Curiosity</b> is not a motivator of the employees of Cybercom	<b>Curiosity</b> is a positive or negative motivator of the employees of Cybercom
<b>Independence</b> is not a motivator of the employees of Cybercom	<b>Independence</b> is a positive or negative motivator of the employees of Cybercom
<b>Acceptance</b> is not a motivator of the employees of Cybercom	<b>Acceptance</b> is a positive or negative motivator of the employees of Cybercom
<b>Order</b> is not a motivator of the employees of Cybercom	<b>Order</b> is a positive or negative motivator of the employees of Cybercom
<b>Saving</b> is not a motivator of the employees of Cybercom	<b>Saving</b> is a positive or negative motivator of the employees of Cybercom
<b>Honour</b> is not a motivator of the employees of Cybercom	<b>Honour</b> is a positive or negative motivator of the employees of Cybercom
<b>Idealism</b> is not a motivator of the employees of Cybercom	<b>Idealism</b> is a positive or negative motivator of the employees of Cybercom
<b>Social contact</b> is not a motivator of the employees of Cybercom	<b>Social contact</b> is a positive or negative motivator of the employees of Cybercom
<b>Family</b> is not a motivator of the employees of Cybercom	<b>Family</b> is a positive or negative motivator of the employees of Cybercom
<b>Status</b> is not a motivator of the employees of Cybercom	<b>Status</b> is a positive or negative motivator of the employees of Cybercom
<b>Vengeance</b> is not a motivator of the employees of Cybercom	<b>Vengeance</b> is a positive or negative motivator of the employees of Cybercom
<b>Romance</b> is not a motivator of the employees of Cybercom	<b>Romance</b> is a positive or negative motivator of the employees of Cybercom
<b>Physical activity</b> is not a motivator of the employees of Cybercom	<b>Physical activity</b> is a positive or negative motivator of the employees of Cybercom
<b>Tranquillity</b> is not a motivator of the employees of Cybercom	<b>Tranquillity</b> is a positive or negative motivator of the employees of Cybercom

Table 4-1 – The tested hypotheses

#### 4.2.2 Procedure

The employees at Cybercom were asked if they could identify themselves with a number of statements from each of Reiss' motivators, or if they considered themselves neutral or totally against the statement. The design of the questionnaire itself has been made by Reiss', and has not been modified in any significant way to keep the validity from his research. No demographical information was included in

the survey on the grounds that personal answers could easily be discerned in some cases based on that particular information. It was neither deemed vital to include demographical information in the survey since these were not factors that needed be controlled for. The exact sequence and formulation of the questions is shown in Appendix 1.

The instrument used for the data collection was an eQuestionnaire. This instrument was preferable since standardized, comparable and measurable answers were required for a quantitative analysis. This instrument also suited the purpose and hypotheses of the study very well. Other instruments such as interviews or paper-based questionnaires were rejected since the required sample was rather large and since the respondents were geographically diversified, even though Internet surveys tend to be more biased than other surveys. It should also be pointed out that the proof of concept is designed for Cybercom South rather than the entire organisation.

#### *4.2.2.1 Sample*

The chosen population on which to conduct this survey was Cybercom South, which included a total of 270 potential respondents. An alternative population that could have been used was the whole Cybercom Sweden, which consists of about 980 respondents. This alternative population was abandoned since it could mean a large cost for Cybercom to allow a too large number of consultants to use fifteen minutes on this questionnaire. However, a verifying test of 15 respondents was used from the population of Cybercom East to add validity to the survey.

The questionnaire was also pre-tested by six employees of Cybercom, unrelated to the project, and was found understandable and clear after a few minor language and layout modifications.

#### *4.2.2.2 Data Analysis*

The data was collected with an Internet survey-tool and analysed with Microsoft Excel.

#### *4.2.2.3 Variables:*

All questions were multiple choice questions with the alternatives “Very important”, “Of Average Importance” and “Less Important”. These variables were represented with the numbers 1 (“Very important”), 0 (“Of Average Importance”) and -1 (“Less Important”) to allow for statistical processability.

#### *4.2.2.4 Statistical Method*

The data was analysed with a two-tailed *Students t-test*<sup>4</sup> to see if the null-hypotheses could be discarded or not. The t-test was performed on each motivator in isolation to discern its significance. After establishing the motivators’ significance, a normal distribution was calculated to determine the negative or positive importance of the motivators. The significance level used in the tests were  $\alpha = 0.05$ .

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<sup>4</sup> A Student’s t-test is any statistical hypothesis test in which the test statistic follows a Student’s t distribution if the null hypothesis is supported. Please refer to any book on statistical analysis for details.

### 4.2.3 Results

The main results of the survey are presented in Table 4-2 below:

Motivator	df	Mean	$\sigma$	t	P(X=0), $\alpha=0.05$	H <sub>0</sub> :
Power	81	0,370	0,641	5,199	1,50E-6	Reject
Independence	81	0,296	0,679	3,927	0,001813	Reject
Curiosity	81	0,778	0,447	15,65	0	Reject
Acceptance	81	-0,346	0,692	4,495	2,32E-5	Reject
Order	81	0,160	0,661	2,186	0,032	Reject
Saving	81	0,234	0,657	3,213	0,002	Reject
Honour	81	0,642	0,555	10,12	0	Reject
Idealism	81	-0,210	0,607	3,114	0,003	Reject
Social Contact	81	0,185	0,709	2,350	0,021	Reject
Family	81	0,284	0,597	4,284	5,07E-5	Reject
Status	81	-0,481	0,654	6,625	3,69E-9	Reject
Vengeance	81	-0,160	0,641	2,252	0,027	Reject
Romance	81	0,160	0,460	3,141	0,002	Reject
Physical activity	81	0,222	0,570	3,121	0,001	Reject
Tranquillity	81	-0,383	0,538	6,405	9,61E-9	Reject

Table 4-2 – Results of the survey

Table 4-2 summarizes the statistical findings on impact of the motivators of the employees at Cybercom. The most important figures are the df (degrees of freedom), the t-value and the corresponding p-value. The degrees of freedom describe the sample and together with the t-value they determine the p-value. The p-value can be seen as the probability that the motivator might have zero impact on the average employee. The average employee motivation profile is depicted below in Figure 4-1.

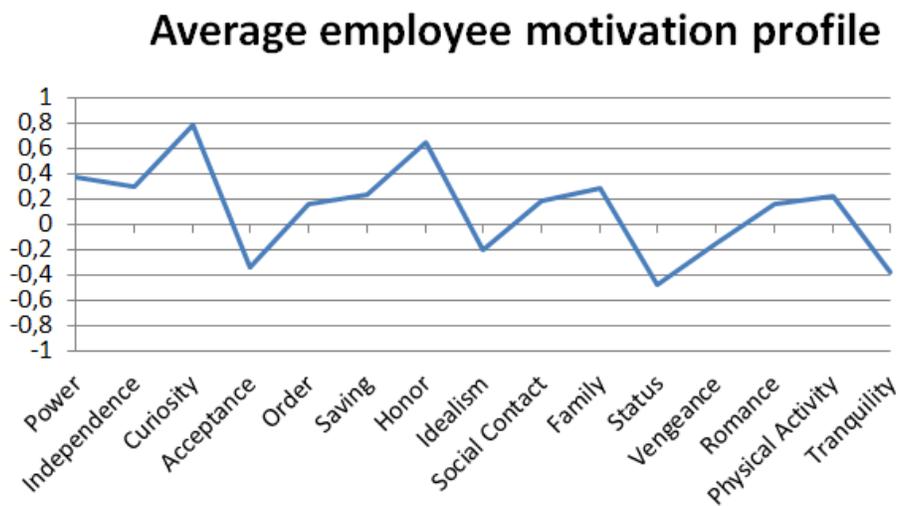


Figure 4-1 – Results of the survey

The normally distributed importance of each motivator is presented in Table 4-3 below. The importance is calculated over the cumulative normal distribution N (0, 1).

<b>Motivator</b>	<b>Per cent</b>
Power	0,756
Independence	0,688
Curiosity	0,964
Acceptance	0,103
Order	0,547
Saving	0,626
Honour	0,924
Idealism	0,186
Social Contact	0,574
Family	0,675
Status	0,051
Vengeance	0,224
Romance	0,547
Physical activity	0,613
Tranquillity	0,086

**Table 4-3 – the cummulative normal distributed results.**

Table 4-3 above summarizes the individual average importance of each motivator between 0 and 1. A high value can be interpreted as being of high importance, and a low importance can be interpreted as low importance or a demotivator. A value close to 0.5 can be interpreted as being neither a motivator nor a demotivator.

Results from the verifying tests made in Cybercom East showed that the null hypothesis: “There is no difference between Cybercom South and Cybercom East” could not be rejected.

#### 4.2.4 Interpretation of Results

The first important insight is that no motivator is without impact in the average player profile. This means that the information of this study is valuable. Furthermore, the verifying test made at Cybercom East implied that the survey is valid for all of Cybercom. But what does the survey say? Which motivators are strong and which are weak? Judging the answers from a cumulative normal distribution based on their collective mean paints a clearer picture. These results are shown below in Figure 4-2.

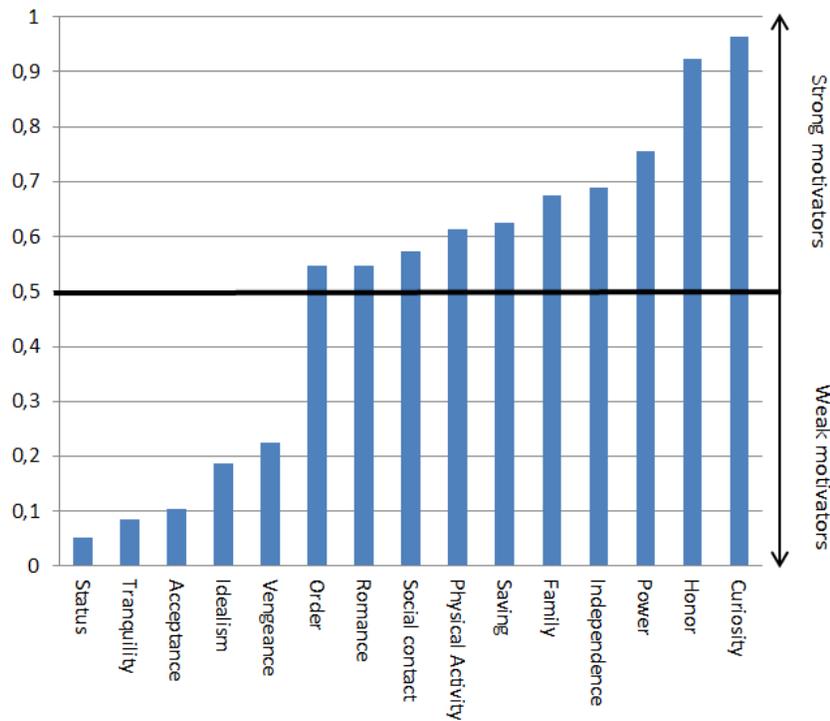


Figure 4-2 – Cumulative normal distribution of the motivators

These results imply that the motivators Status, Tranquillity, Acceptance, Idealism and Vengeance may actually be demotivators and that Honour and Curiosity are the strongest motivators at Cybercom. However, all these must be valued in isolation. For example, what does it mean that Status is very low? Or that Acceptance is very low? It does not necessarily mean that these are demotivators, but that including these in game mechanics may not lead to increased engagement. It means that the gamification design cannot, for example, revolve around solely status-oriented game mechanics. The design can probably include status-oriented mechanics, but in a low-key manner. Establishing the motivators individual strength is an important part of the design and these results will be used in conjunction with Radoff’s theory “what players think are fun”.

#### 4.2.4.1 A Comment on the Variance

In this survey, no demographics have been controlled for, which means that any potential subgroups of the population cannot be identified. However, the variance of the answers suggest that there may indeed be subgroups in the motivators, as seen below in Figure 4-3, which shows the mean value of each motivator with +/- 1 variance.

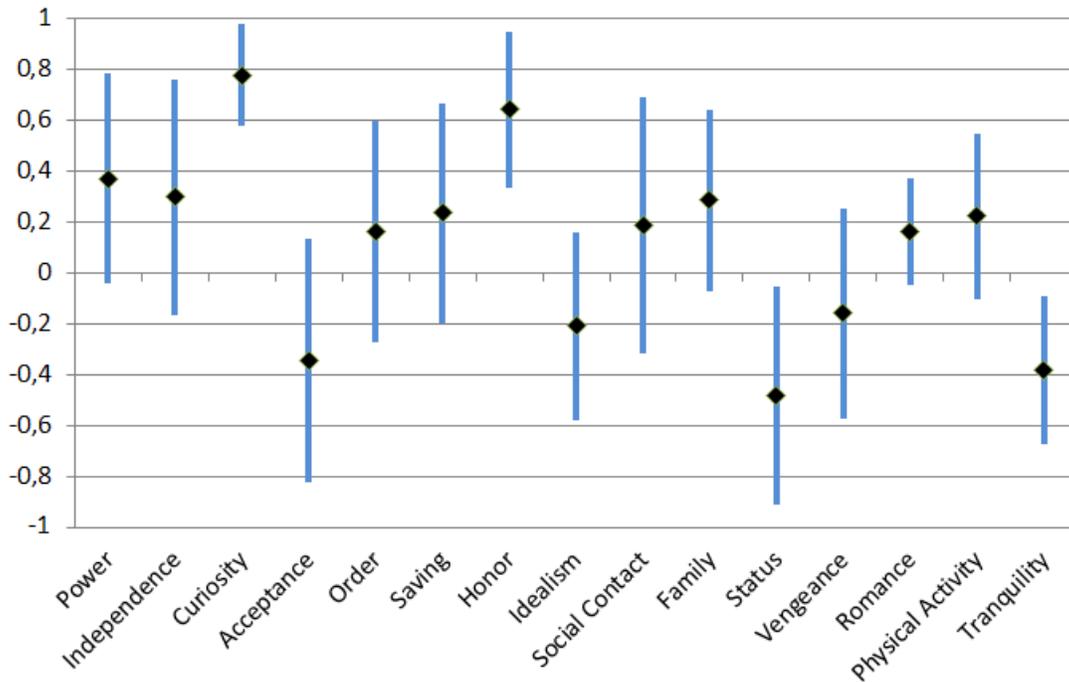


Figure 4-3 - The variance of motivators

Those motivators with highest variance includes Power, Independence, Acceptance, Order, Saving, Social Contact and Status. This means that these motivators have participants with variable preferences for the level of the motivator. It may be the case that these factors vary with some demographical factor such as age, sex, office or rank, but no conclusions could be drawn if that is the case. Nevertheless, the reasons for not including demographics in the survey still stands; demographics could have compromised the anonymity of the participants since many subgroups are not well represented at Cybercom, as well as the fact that the proof of concept should appeal to every type of employee, which means that the system will be generic and sub-groups will not be taken into account in the final design. If the design was to be tailor-made for each demographic group, this would be of interest for the system designer.

#### 4.2.5 Reliability of Results

The size of the sample, 81 respondents out of a population of 270, is a very good foundation for a statistical analysis<sup>5</sup> and probably in itself not a source of biasness. However, the sample size of the

<sup>5</sup> Since the central limit theorem holds for this sample size.

verifying test at Cybercom East, which included only 15 respondents, is quite small and may not be representative for that particular population. This is a potential source of bias, but due to lack of resources one that cannot be solved within the scope of this thesis.

Another potential source of bias is the chosen method of data gathering, the eQuestionnaire. Gathering answers on an optional basis through a particular single medium may cause the sample to be skewed. It may be the case that only a particular type of employees has answered the survey. Some types of people may be more inclined to answer Internet surveys in general; others may be more inclined to answer this particular survey since it is a subject that interests them. All these factors may be sources of biasness. However, due to the large sample size, this effect is probably largely mitigated.

The formulation of the questions is always a big issue when doing surveys. A small change in the wording may yield a completely different result. Since the author of this survey, Dr Reiss, states that these particular formulations is a result of a long research (Reiss, 2002) it was deemed suitable by the project group that these were not to be changed. It is important to mention that this survey has been designed for an American population. Due to cultural factors this could mean that some of the answers may be a bit skewed compared to answers from a survey designed for a Swedish audience. Despite this fact the project group chose to keep Dr Reiss' formulations in its original state on the grounds that we do not have the time nor competence to design a completely new one.

In summary it can be concluded that most of the biasness has been mitigated by having a large sample size, but that the answers may have been a little skewed due to cultural differences between America and Sweden. All in all the results are deemed to be reliable.

### 4.3 Qualitative Study

While the qualitative studies attempts to study the motivational profile of the employees, a qualitative study was deemed necessary to investigate how the employees currently uses the competence model and which obstacles need to be overcome by a gamification solution. This was achieved by doing semi-structured interviews to elicit specific issues that the system proposed in the proof of concept needs to address. Described in this section are the research question, the procedure and the results. The results will be discussed further in section 5.3.3.1.

#### 4.3.1 Hypothesis

During this master thesis, many potential issues have arisen that affects the employee's relationship to the competence model. A common challenge that has been voiced by several employees is that they do not understand the model fully, that they generally do not log their activities in any structured way and that some do not see the benefit of the model. From these potential issues, the following hypotheses were formed:

##### **Usage of the competence model:**

1. Employees do not log their activities in any structured or frequent way, as proposed by the competence model.
2. Employees believe that they do not benefit much from using the competence model, it is more of a management tool.
3. Employees think they can benefit from writing smaller logs more regularly than once a year.
4. Employees suspect that their co-workers fail to see the benefits of the competence model and that it, in some cases, is perceived as an obstacle.

#### **Understanding:**

1. Employees have only a basic understanding of the competence model.
2. Employees feel that the competence model is too extensive to easily comprehend.

#### **Design and features:**

1. Employees believe that some form of transparency between colleagues should exist.

#### **4.3.2 Sample**

The chosen population was Cybercom South, which consists of about 270 employees. Out of this population, seven persons were chosen randomly from different positions and departments for interviews. This population was chosen since the competence model is recently introduced to Cybercom South, which is the situation for all offices except Cybercom East. As a controlling factor, one interviewee was chosen from Cybercom East, that person was chosen on recommendation from the staff at Cybercom South.

#### **4.3.3 Procedure**

The interviews were of a semi-structured nature, with several open ended questions (see Appendix 2 for the exact formulations and sequence). The interviewees were contacted a couple of days before the interview and they were supplied with a list of subjects that the interview would include, but not a complete list of questions. The reason for this was to not give the interviewees a chance to prepare too much, natural responses and emotions were preferable. All interviewees were asked the same questions in the same order to keep the validity as high as possible.

#### **4.3.4 Results**

All hypotheses except Design and features, 1 - "Employees believe that some form of transparency between colleagues should exist." has been confirmed by these interviews. The majority of the subjects have expressed the opinion that transparency should be handled with care, and that there are no immediate benefits of knowing how the colleagues are performing. This is consistent with the quantitative findings that status is not a strong motivator at Cybercom.

In summary, this means that the results reveal that the employees do not understand the potential utility of using the model and they do not, in general, understand the model itself. Other results include:

- Employees have limited time to use the model, especially if they are working at a client's site.
- Employees believe it takes too much time to prepare for the activities in the competence model.

These results will be used in the discussion to establish if the obstacles are best handled with increased ability or motivation.

#### **4.3.5 Reliability of Results**

Even though the sample is quite small, all interviewees have expressed similar opinions, which in turn are consistent with findings from unmonitored interviews and discussions that have been held throughout the master thesis with many employees in different settings. To increase the validity of the result, employees from different positions, offices and departments have been chosen for these interviews.

## 5 Discussion and Analysis

### 5.1 Introduction

This chapter consist of an analysis and discussion based on the results derived from the literature review and empiric research. The aim is to explain how the research, in conjunction with relevant frameworks, was used to develop the final proof of concept. Essentially, gamification is about applying game mechanics to non-game contexts. Design of a gamified system is therefore all about selecting, designing and customising game mechanics. This chapter contains the analysis and discussion leading to the final selection of game mechanics that constitute the game layer proposed in the proof of concept.

First off, there will be a discussion regarding the frameworks and models that are used to design the game and its mechanics.

The second section of this chapter will serve as an explanation, and motivation, of how the game layer is designed. The foundation of the game design is Aaron Dignan's game frame (Dignan, 2011). There is a discussion on how the conclusions, drawn from the theoretical and empiric research, can be mapped in to the model's outer layers, i.e. objects, outcomes, obstacles, which activity that is to be central in the game and player motivation analysis. The discussion will also link Fogg's (2011) model to game design to analyse how to, in an effective manner, overcome the behavioural obstacles that are identified.

Lastly, the discussion will end by suggesting a number of possible and preferable game mechanics based upon the general game design, the obstacles and the empirical studies. These suggested mechanics will be further defined and described in the Proof of Concept (Chapter 6).

## 5.2 Discussion Approach

Gamification is a rather new term and even though there are plenty of theories and ideas of how it is done and why it works, few of these conclusions spawn from actual scientific research. The subject itself is mostly driven by visionaries and entrepreneurs. That has made it hard to come by reliable information on the subject.

There are however some scientific gamification-related research to be found. Psychology studies regarding motivation and behaviour constitute most of them. Also some new studies on the subject of behaviour, directly connected to gamification, have been conducted. In this thesis some of these theories are used to bridge the gap between the science of psychology and the game mechanics that will make up the proposed game layer. Each of the major theories has been chosen due to its relevance to the subject, compatibility to other theories and trustworthiness and validity. They will be further discussed in the following sub-sections.

### 5.2.1 How to Design a Gamified System

There are three major frameworks and models included in this thesis. There are Dignan's "Game Frame" which describes all the necessary components of a behavioural game (Dignan, 2011), Dr. Reiss "Sixteen motivators" which describes what motivates the player (Reiss, 2001) and lastly Dr. Fogg's "Behaviour model" which examines how a new behaviour is realised (Fogg, 2011).

These frameworks are chosen with respect to academic validity and base in empirical research. The area of gamification is still quite new and there is no general process for designing a gamified system, which means that this thesis needs to develop its own.

In this thesis, Dignan's "Game Frame" is used as a structure to describe the situation. Who will play the game (the player profile), what will the game be about (the activity), why is the game played (the objectives), how the game is played (the skill cycle), and which tools that are available to the player (the resistance, the resources and the skills involved). This structure needs to be filled with information, which basically is what this chapter will be about. Through Dr. Reiss "sixteen motivators" the player profile can be defined, the activity can be elicited through process analysis of the competence model and the objectives for the game was given as an initial project purpose.

However, to design how the game is played and the available tools for the players, one needs to know what kind of behaviour that is intended. Because a gamification is ultimately about behavioural change of the players. So before designing how it is played, what currently inhibits the intended behaviour (the obstacles) needs to be investigated. To elicit the obstacles, the results from the semi-structured interviews are used. The characteristics of these obstacles are then categorised in terms of lack of ability or motivation with Dr. Fogg's "behavioural model" to investigate what kinds of mechanics that will be most efficient to promote the new behaviour.

Only with understanding of the general structure of a game and of existing obstacles, the rules of the game and its game mechanics can be designed. This means that this discussion will boil down to the choosing of game mechanics.

## 5.3 Designing the Game

To design a behavioural game according to Dignan (2011), you need to define which central activity it is about, which objectives that it needs to address, who the players are and which outcomes that are generated along the way. This represents the outer layer of Dignan’s game frame, as depicted below in Figure 5-1.

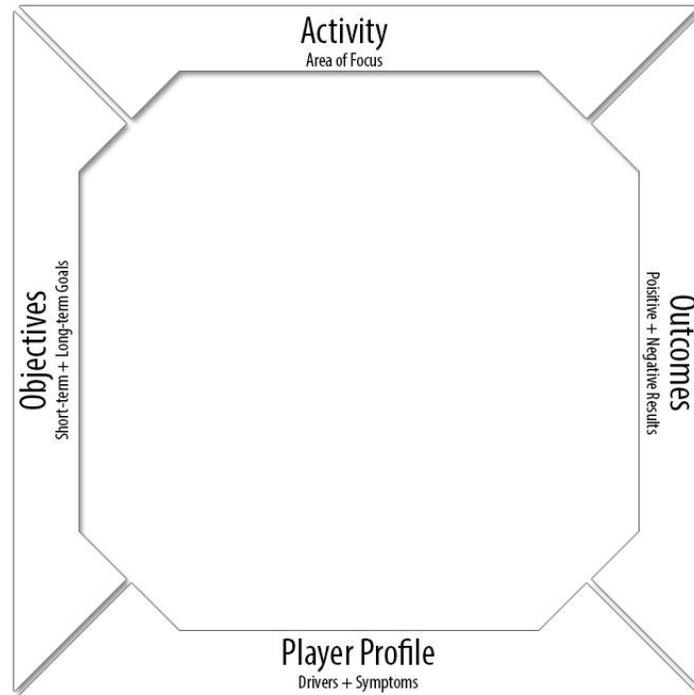


Figure 5-1 – Dignan’s Game Frame (Dignan, 2011)

### 5.3.1 The Objective and Activity

The objective for this game was given in the initial project description and was formulated as “to increase the usage and the understanding of the competence model”. However straightforward this may seem, it is still unclear what “usage” is defined as.

To increase the usage of the competence model, one need to examine how the model is supposed to be used and what its purposes are, and then use the gamification design mechanics to change the player’s behaviour towards the proper use. The following figure describes the process of the competence model:

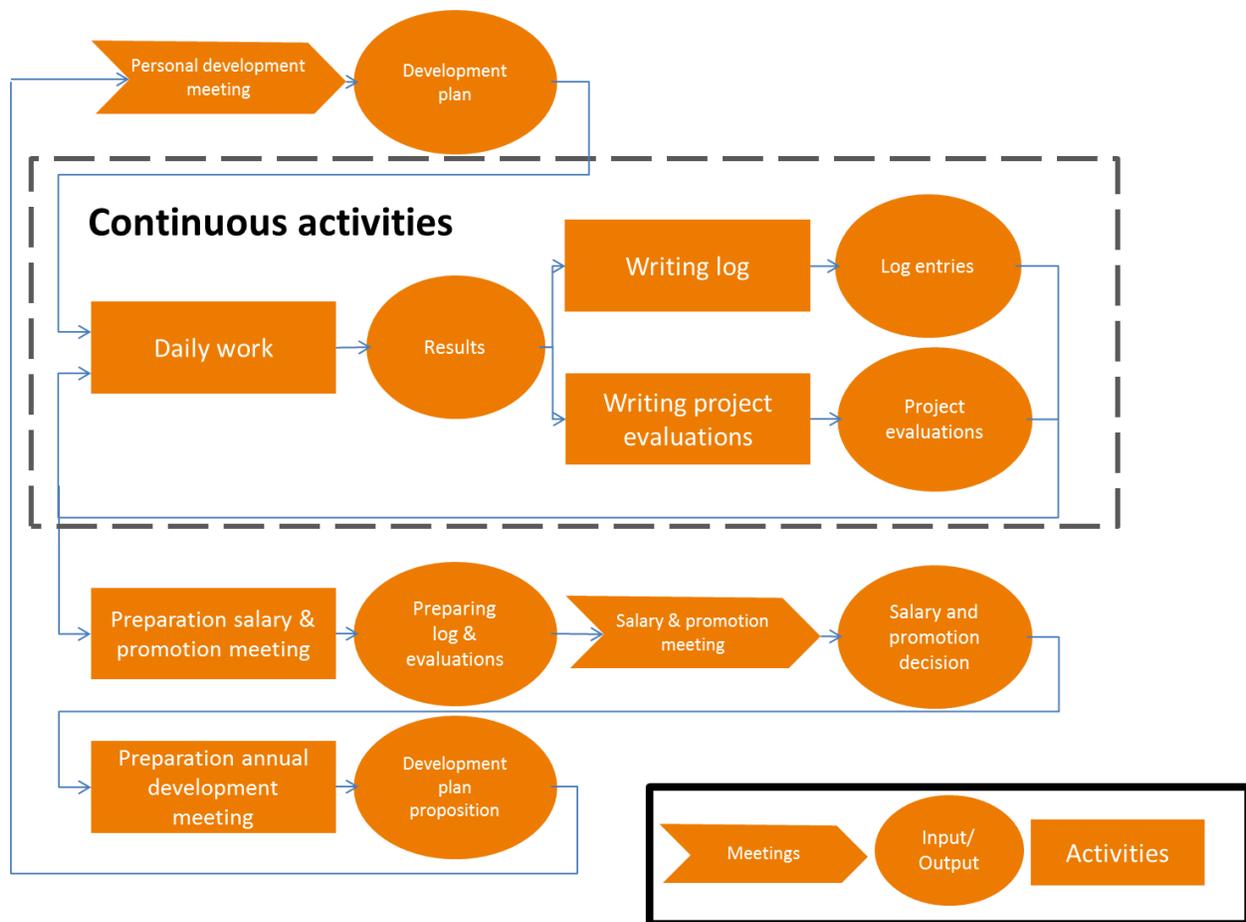


Figure 5-2 – The Competence model Process (Produced by the authors, guided by internal documentation)

The activities in this process are:

- The daily work of the consultant
- Preparations before meetings
- The production of logs and project evaluations

These are the main activities that constitute the competence model. This is how it is supposed to be used and the activity the behavioural game revolves around needs to be one of these. Out of these activities, there are two of utmost importance in this model, since all other activities and meetings rely on them; namely the Writing log and the Writing project evaluations-activities. These activities specify what the consultants have done in their daily work and serves as input to the Salary and Promotion meetings, which in turn are important for the Personal development meeting. Therefore, these activities can be seen as the main way of interacting with the competence model. However, the empirical studies have shown that the writing of the log is not something that the consultants do continuously, nor is writings the project evaluations. In fact, most of the employees answered that they almost never write any project evaluations. The main difference between project evaluations and a regular log is that the project evaluations are only written at certain points of time (when a project is finished) while the log could be written continuously. This implies that building a behavioural game around the project

evaluations means that the feedback loop often will be very long and hard to control which make a gamification implementation quite useless. Therefore the main activity in this behavioural game will be the writing of the log. The log writing could be done quite often and serves as a base for personal development, salary and promotions. If the behavioural game could help the quality and frequency of the log writing it could lead to reduced time spent in preparation and meetings of the consultancy process, which means money saved for the company. What more is, it also opens up for the possibility that the system could provide a clearer picture of the progress of the employees.

So, the main activity in this behavioural game is the writing of the log. This leads on to the next part of the outer layer, namely the player profile.

### 5.3.2 The Player Profile

The player profile defines the player type(s) of the game, what motivates them and what they supposedly do not like at all. This is crucial to the game design, since if it is overseen, it may make the game to arbitrary or totally unengaging for the target player type.

As the base for the player type(s) of Cybercom lies the empirical motivational study, which showed that the lowest motivators is Status, Acceptance and Tranquillity, while the highest is Honour, Power and Curiosity. The rest of Reiss’ 16 motivators were deemed as “medium to high”, see Figure 4-1 for more information. To be able to discern what implications this has, the framework “42 types of fun” (Radoff, 2011) will be used. However, these 42 types of fun include activities or mechanics that are of no real value for this project, for example “Experiencing Beauty and Culture”. Therefore the framework is stripped down to the 13 most important types of fun for this project, which are displayed in Figure 5-1. No further discussion will be held on the discarding of the other types of fun.

Type of fun	Motivators
Noting Insider references	Acceptance, Social contact
Laughing	Social contact, Physical Activity, Tranquillity
Achieving a sense of completion	Power, Independence, Order
Customising	Power, Independence, Social contact, Status
Imagining yourself as a character	[Depending on which type of character, all motivators may apply in different cases]
Listening to a story	Curiosity, Social contact
Being silly	Independence, Acceptance, Tranquillity
Recognizing patterns	Curiosity, Order,
Gathering knowledge	Curiosity, Social contact, Status
Enlightenment	Curiosity, Idealism, Tranquillity
Competition	Power, Status, Vengeance
Gaining recognition	Acceptance, Social contact, Status
Being centre of attention	Power, Status

Table 5-1 - 13 Types of fun (Radoff, 2011)

Accounting for the results of the survey, the following “types of fun” could create engagement for the users and may therefore be used for designing game mechanics in this project:

- Achieving a sense of completion
- Customising
- Listening to a story
- Recognizing patterns

The following “types of fun” should be avoided on account of the survey:

- Competition
- Gaining recognition
- Being the centre of attention

The other six “types of fun” could be used as guidance for game mechanics, but should be designed with care to make sure that they do not demotivate the player type. In general, it can be said that the employees are motivated by self-actualization but not by showing off their progress to others. It is neither motivating to search for acceptance or tranquillity. The implications of this is that the focus of the game mechanics should be on the progress of the individual and not by comparing or benchmarking employees, which in many cases is a central theme in gamification implementations (in the form of leader boards).

### 5.3.3 Outcomes

The last frame in Dignan’s “game frame” is the outcomes that are generated along the way of the game.

To know the outcomes, one has to know the game itself. We know that the purpose of the game is to increase the usage and understanding of the competence model. What is also know is that the central activity that the game will be about is logging and the players are motivated by self-actualization but not by comparing progress to others. This means that the short-term outcomes should primarily be to get individual feedback on the day-to-day activities of the work, as well as being better prepared for important career meetings included in the competence model. The long-term outcomes are to get a clearer picture of the career progress.

There will be other short-term outcomes as well that are generated by the side-activities in the game, however since these are not in the core product they will not be presented here. They will be presented along with each game mechanic in terms of feedback.

#### 5.3.3.1 Which are the Obstacles to Overcome?

When having defined the exterior of Dignan’s game frame, the structure of the game is set. But when designing a gamification system you are essentially looking to change the behaviour of your given audience. To effectively achieve this, you need knowledge about the players and what it is that is currently prohibiting the intended behaviour. In other words; one need to clearly identify what obstacles one are trying to overcome. Once that is done, the identified obstacle can be addressed by enhancing the proper and most efficient element (ability or motivation according to BJ. Fogg’s behavioural model). Maybe Dr. Fogg’s motivation and ability is already present and all that is needed is a trigger in the form of a simple reminder. Maybe all you need is to make a task a little bit simpler. The

important thing is to be aware of the elements so that the most effective method could be chosen in order to push the user over the activation threshold. As an example, there is no need to spend a lot of resources on trying to simplify a task when all that is required is to increase motivation.

The obstacles were identified during the semi-structured interviews with the employees (see section 4.3.4) and can be summarised as two major groups:

- The employees do not understand how to use the competence model.
- The employees do not understand the utility of the competence model.

This means that for the system to change the employees behaviour, the employees needs to understand how to use the model and to see the utility of using the model.

### *5.3.3.2 Obstacle 1 – The employees do not understand how to use the competence model*

The lack of understanding means that the employees believe that the material is too complex; there are simply too many employment levels and criteria for the material to be absorbed in an easy way. What more is, the criteria are quite vaguely formulated which makes them hard to translate to specific actions. Also, the format for the competence model is currently a heap of quite technical documents on a server, which, according to the empirical study, no one cares to read. There is currently no structured way available to interact with the model. It is up to the consultant to keep track of the log, notes from meetings, project evaluations, etc.

In the terms of Dr. Fogg's behavioural model, this obstacle is mainly about low ability to use the competence model (see Figure 5-3 below):

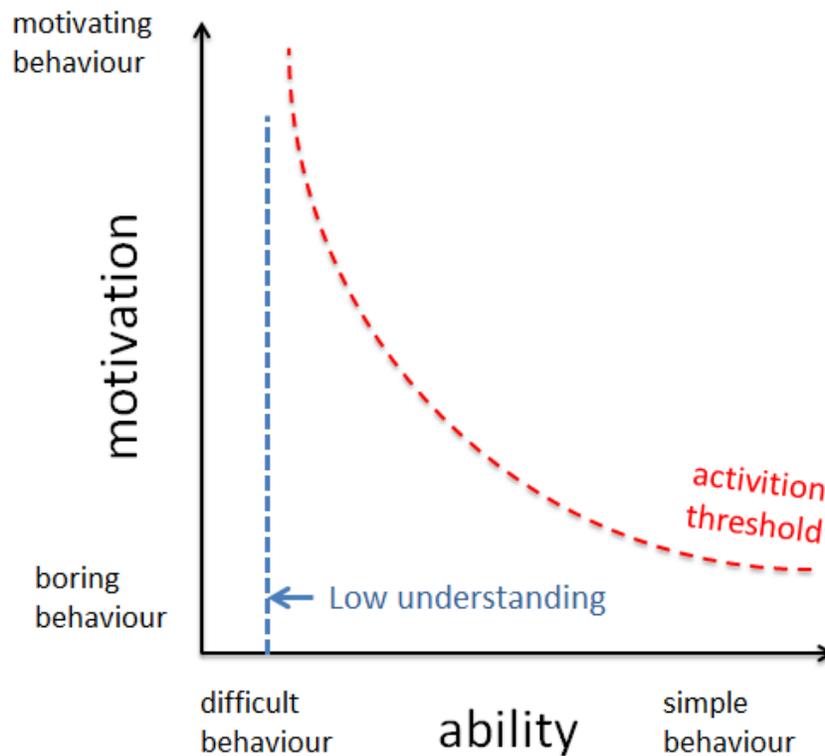


Figure 5-3 – Diagram of low ability

The implications of the low ability to understand the model is that, in order to overcome this obstacle and facilitate change in the user's behaviour, efforts must be made towards heightening the ability to use the model. This means to make the material easily accessible and understandable and to translate the criteria's into more specific actions. However trivial as this conclusion may be, it is important to make since if the focus is to heighten the ability to use the competence model, the importance of engaging game elements is lessened to change the behaviour.

### 5.3.3.3 Obstacle 2 - The employees do not understand the utility of the competence model

Since the introduction of the competence model, many employees have expressed a feeling of being forced into a model that does not fit them, their goals or their working situation. This is shown by the empirical study and many employees simply do not see the utility of using the competence model at all for their own purposes. However, since the competence model is the ground for their salary and career there are some motivation for using the model.

In terms of Dr Fogg's behavioural model, this obstacle is mainly an issue of low motivation. The motivation is low because the employees generally do not see the utility for their own goals and progress, but it is somewhat saved by the fact that it is the basis for their salary. This is modelled in Figure 5-4 below.

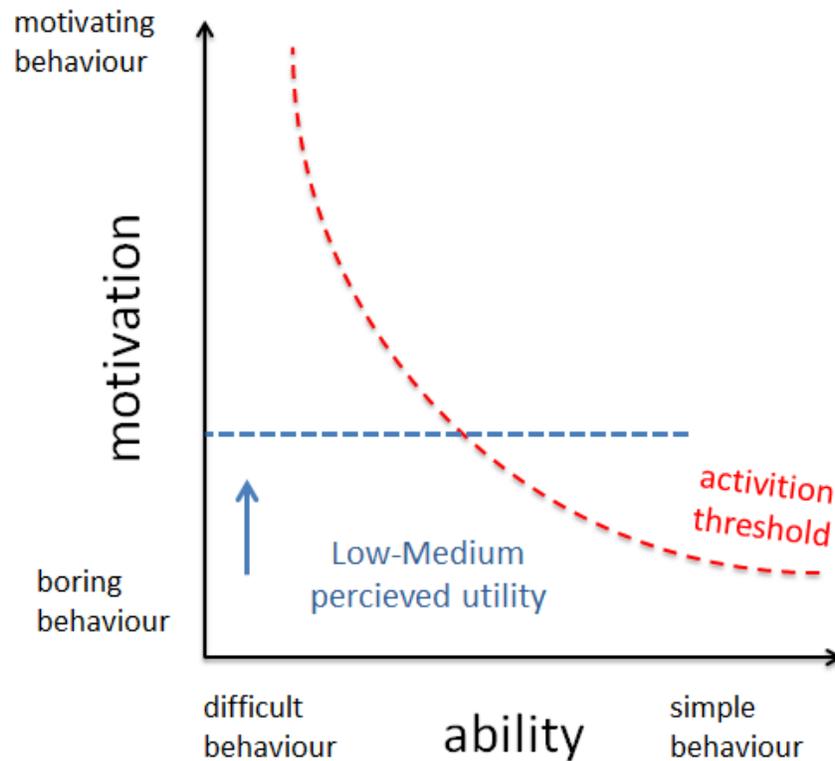


Figure 5-4 –Diagram of low to medium motivation

This means that the motivation must be increased to reach the activation threshold and thereby changing the behaviour.

Now that the game structure is defined and the obstacles identified and analysed, the mechanics of the game layer can be designed. This leads on to the next section, how is the game actually played?

## 5.4 How is the Game Played?

The only difference between a gamified system and a regular IT-system is the presence of game mechanics. Thus, the designing of a game layer all boils down to the development, choice and customisation of game mechanics that will constitute the game. The discussion in the previous sections derives the different parameters that need to be accounted for when designing a customised game layer at Cybercom. The question is how these parameters will affect the choice of game mechanics and the final design of the game layer.

### 5.4.1 Choosing the Game Mechanics

The goal with putting a game layer on the competence model is to make as many activities as possible more motivating and engaging. Some activities have a practical purpose and will be included in a digital version of the competence model regardless if it is gamified or not, some are side-activities which serve a practical purpose but are not vital functions for the model and some activities will be purely motivational game mechanics.

With an established structure, the big question is how to fill the four components with mechanics that are engaging and create an intended behaviour. The full selection and description about each mechanic can be found in the proof of concept (Chapter 6). Thus, the following section will not be an in-depth discussion regarding each separate mechanic, but rather a general discussion on important aspects that need to be kept in mind when making this selection. These mechanics' purpose is to increase either ability or motivation to accomplish the desired behaviour for the employees.

To structure this part, the rest of Dignan's game frame will be used. This is the inner part of the framework, called the skill cycle (as seen in Figure 5-5).

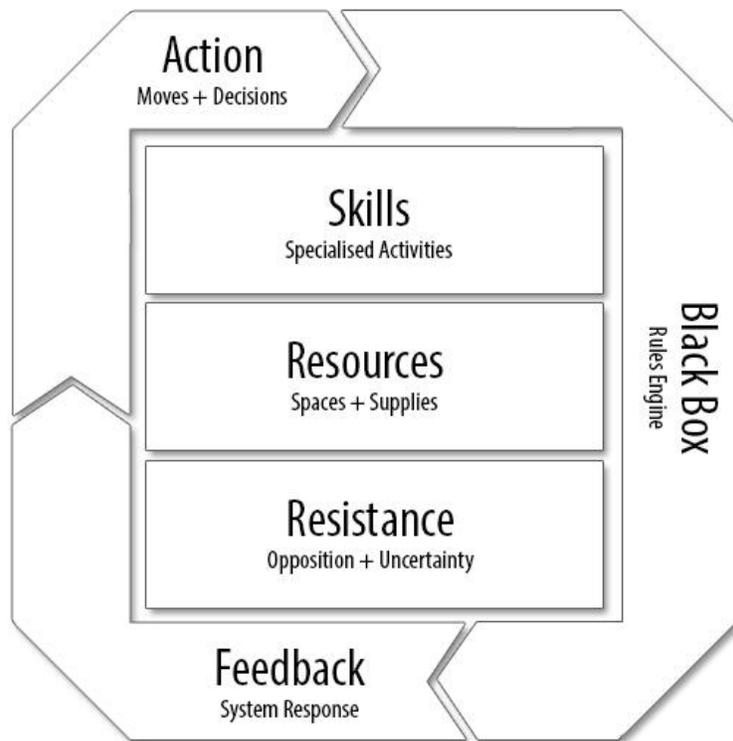


Figure 5-5 – Dignan's skill cycle (Dignan, 2011)

#### 5.4.2 Defining the Feedback Cycle

As concluded time and again, having a well-designed feedback loop is at the core of a game and one of the greatest challenges in the gamification of the competence model. In the discussion about the main activity, the writing of the log was chosen on account that it is of high importance and that it is the only activity that could be used in a short feedback cycle. Therefore, the main action of the game is writing log entries.

But the next two parts, the black box and the feedback, are quite hard to design. The natural feedback from the log is a meeting with the employee's closest manager. But naturally, a personal feedback from the manager for every log entry is not feasible. This raises an important question; can, or should, the

system handle automatically generated feedback based on the log entries? The answer to this question is no. The system cannot generically judge an employee's performance based on log entries, nor is it desirable (Torsbrandt, 2012). According to the HR-department, one important part of the competence model is that the employees estimate their own performance. In terms of the feedback, this means that the employees need to estimate the value of their own performances in this system as well. Hence, when logging an activity, the employee needs to estimate how valuable that particular action is.

However, a feedback based on the employees own estimation will probably not suffice. It needs to be complemented with some sort of visualisation of the progress as well, which stimulates the Radoff type of fun - "Achieving a sense of completion" and thereby raise motivation. The feedback could also be increased by other game mechanics, as intangible or tangible rewards, or even feedback from others. On these grounds, it is also important to include a community-like feature where the employees can give feedback on each other's log entries and also some purely motivational mechanics.

To sum up the feedback cycle, one can conclude that the action is writing a log entry, the feedback is a combination of the employees own performance estimation, rewards and a community where consultants give each other feedback. The black box is represented by how the progress is visualised to achieve a sense of completion. In terms of Dr. Fogg's behavioural model, this can increase the ability of the user since it will be easier to log entries in a devoted system instead of a word document and that the employee can follow the estimated progress in a graphic representation of his or her skills. The motivational factor will be increased by community-driven feedback and intangible rewards. These rewards should be in terms of in-game currency, and/or badges.

### 5.4.3 Defining the Resistance, Resources and Skills

The last part of Dignan's model of behavioural games is to define the game's resistance, available resources and skills. These are parts that are purely to increase the game's "fun-factor", or in terms of Dr. Fogg's behavioural model, the motivation.

The resources are mainly the in-game currency of the feedback cycle described above. These resources are earned by performing activities, such as logging, but how to redeem this currency to gain perceived value is more problematic. One alternative that is used by the gamification company Ozma Speldesign AB in their product "WeProject" (Ryding, 2012) is to allow the users to invest their currency into different projects, suggestions for improvements or activities that they feel are important. This way they get to make their opinions and ideas heard by the management, and the management gets another source of information on what the employees want. Other uses for the in-game currency could include investing in user-interface customisation such as equipping or modifying an avatar or changing the general theme of the system. This could be quite powerful since customising is a strong "type of fun", according to the empirical study.

The skills used in this game layer are not that obvious. Many games uses challenges to stimulate and improve the skills of the player, but since the ability to use the competence model is already very low, it would be unwise to introduce more challenges in the system. However, before taking an action (i.e., writing a log entry), the user needs to use their professional skills in a work-related situation, which

means that there is a natural element of skills that are used in this game. By keeping it this way, the skills used to utilize the system are completely based on their personal capabilities which are preferably in a game.

The resistance in this game is mainly about scarcity of resources, other resistance will probably also lower the ability of the user. This means that the user only get a limited amount of in-game currency to use.

#### 5.4.4 Other Mechanics to Increase Ability and Motivation

Outside Dignan's game frame, which could be considered the "core" of the game, there are other potential mechanics that other gamification implementations have used successfully. Some of these should be considered as well to further increase the ability and motivation in order to drive employee engagement and change behaviour.

One important part of the competence model which has not yet been considered is the personal goals. The personal goals, or the development plan, is defined at the "Personal development meeting" in the competence model process (Figure 5-2). These goals serve as a guideline for the employees work-related activities throughout the year. In other words, these goals are the desired behaviour from both the management and the consultant. Many games uses some sort of quest log, or to-do lists, to let the player know what is expected of them and to give them a more specific and actionable direction. This is also an important mechanic to include in the system, preferably along with some motivational mechanics as increased rewards when logging an activity that relates to the personal goals.

#### 5.4.5 Triggers

As Dr. Fogg points out; triggers are one essential part of creating a new behaviour. However, triggers are tricky. Most of us have experienced annoying reminders and popups that try to convince us to do something we have no interest in. Who does not remember the deeply disturbing "Clippy" in the old versions of Microsoft Word? However, as Dr. Fogg also points out; properly designed, triggers can include elements which increase ability and motivation, providing an effective last push over the behaviour threshold.

Another aspect that Fogg carefully points out regarding triggers is that they have to be well timed so that they arrive exactly when an activity can be pushed over the behaviour threshold. The central activity in the gamification of the competence model (see section 5.3.1) will be the filling in the personal log. To trigger this behaviour in a timely manner however, will be hard considering that log entries are made when one have something to actually note and thus aren't made regularly. This means that it will be hard to anticipate when the trigger should occur.

There are some activities that are very well suited for triggers. One example is having a trigger that tells the employee that there are several log posts connected to a certain competence area and that it may be a good idea to make an appointment with your manager to discuss if a formal "level-up" in that area is possible. Such triggers will come very timely since the consultant is motivated by "achieving a sense of completion", and if the trigger provides an easy way to make that appointment it also increases ability.

### 5.4.6 Transparency

An important subject that has been studied during the interviews is the transparency between users. This is one of the most controversial subjects in the digitalisation of the competence model. Issues like how much of the employee's progress should be shown to other employees are common. This is a complex matter since the empirical studies have shown that the employees of Cybercom do not like to be compared and measured with others, but on the other hand it is an important feature in the feedback loop to be able to comment and receive comments on each other's progress. The implementation of the community will therefore need to be a compromise between professional integrity and feedback, but this will be a decision that needs to be taken at a higher management level when a system implementation is imminent.

## 5.5 Summary of the Discussion and Analysis

*To end the discussion and analysis, a summary of the findings and conclusions will be presented in a compact manner along with Dignan's game frame.*

### 5.5.1 Listed Findings

- The main activity of the game will be the writing of the log
- The objectives of the game are to increase the understanding and the usage of the competence model.
- The players (the employees of Cybercom) are motivated by self-actualisation but not by competition or status.
- The outcomes of the game are to receive individual feedback and to visualise the career progress.
- The obstacles can be summarised as:
  - The employees do not understand the model, which in terms of Dr Fogg's behavioural model is lack of ability.
  - The employees do not understand the utility of the model, which in terms of Dr Fogg's behavioural model is lack of motivation.
- The need for higher ability exceeds the need for motivation, which result in that an investment in usability of the system will yield the highest impact.
- The resources available to the player are in-game currency, which is earned by playing the game and used to buy customisation or voting for ideas.
- The resistance in the game is the scarcity of the resources.
- The skills used are the professional skills in the day-to-day work.
- Other game mechanics that are considered include:
  - To-do lists or quest log to track the employee's personal goals, both to increase ability and motivation.
  - In-game currency.
  - Community features.
  - Customisation components.
  - Badges.

- The transparency between the users in the system is a compromise between professional integrity and feedback. A decision about the amount of transparency needs to be taken at a higher management level.

### 5.5.2 Dignan's Game Frame Summarised

According to the discussion and analysis above, the framework will look like as follows:



Figure 5-6 – The Game Frame of this game layer (Authors creation)

These are the important building blocks and describe the general structure of the game. These findings will be used in the Proof of Concept to elicit the specifics about the chosen mechanics.

## 6 Proof of Concept

### 6.1 Introduction

This part of the thesis is a suggestion of how the game layer may be designed. The game layer is described as a set of game mechanics that are chosen and customised based on the findings made in the literature review, empiric and analysis. The game mechanics are divided in to five main components in order to create a clear structure and overview of the system. First off, a description of the purpose and function of each component will be discussed, including relations between the components. The second part will consist of an overview, followed by a detailed description about each mechanic. Most of the mechanics are illustrated with a screenshot of how it may be implemented to make it easier for the reader to comprehend.

For each game mechanic there is a summary briefly describing how to interact with the mechanic, purpose of the mechanic, how the mechanic intends to affects behaviour (in terms of ability and motivation according to Dr. Fogg's behavioural model), which one of Radoff's 42 things of fun it appeal to and finally dependencies to other mechanics and prioritisation (Radoff, 2011). The summaries aim to give the reader a good overview of the system, point out which mechanic that addresses specific obstacles and that the system will use elements that correlate to the player profile. A more thorough description is also available.

As mentioned, this design is a suggestion. Other aspects, such as platform selection, resources, politics, etc., may put limitations on the final system, making some mechanics not feasible. Hence, it must be possible to use a selection of the presented game mechanics. However, some mechanics are dependent on others and some are central because not implementing them will render the system rather pointless. Thus, dependencies, along with prioritisation, are presented for each game mechanic as a guide to simplify future implementation.

As with all designs, trade-offs have been made in order to customise the system to the given context at Cybercom. It is impossible to make a game layer that fits perfectly for all future users. Hence, after the description of the system itself there will be a discussion concerning weaknesses, risks and which trade-offs that have been made.

There will also be a discussion regarding the return on investment one can expect from implementing the proposed system. The authors have failed to acquire appropriate data to do an estimate but there will be a more general discussion on which parameters that can be measured and what parallels that can be made to other internal organisation system which can be used at reference cases.

Lastly, system potential and ideas for future development will be discussed.

It should be noted that all pictures in this chapter have been designed by the authors and that all examples are for demonstrational purposes and purely fictive.

## 6.2 Structure of the Game

In order to create a clear overview of the system, the mechanics are grouped into 5 different components as illustrated in Figure 6-1. The Competence model, Road Map and The Log form the foundation of the system. The mechanics in these components are strongly related to the competence model and these components would be a part of a digitalised competence model, gamified or not. Hence, the level of modification that can be applied is limited and focus will lie on increased ability. The Community and The Game are not part of the original competence model and are introduced as motivational components to provide feedback, reward system, open communication within the organisation, ways to spend the in-game currency, etc. In short, these are the parts of the system which constitute the game layer and can be tweaked and modified to best serve its purpose.



Figure 6-1 – The structure of the game

### 6.2.1 The Competence Model

The competence model is part of the game aims to facilitate the user's understanding of the model itself. It will include mechanic which clearly visualise the different components of the model in an interactive manner and thus provide a good overlook and promote easy learning. In terms of Dr. Fogg's behaviour model, the aim is primarily to increase ability. Exploratory elements, combined with rewards as support, will serve as motivators.

### 6.2.2 The Log

The competence model itself is the very core of the system and its activities and rules will form a natural foundation component. The log is one of those activities and will, as argued in section 5.3.1, play a central role in the final system and will therefore constitute one of two main components. Since there are limitations to how the log activity itself can be modified, focus will lie on increasing ability. Other game mechanics will however be connected to increase motivation, such as rewarding coins for log posts.

### 6.2.3 The Road Map

The rules of the game ultimately decide the consultant's current position and direction in the competence model. The core of the second component will therefore be a clear, accessible and visualised road map of the user's professional development. Included in this component is also the experience point mechanic which are set by the user to rate his or her own performance. The last part of the component is the personal goal mechanic which keeps track and facilitate feedback on the user's personal goals.

### 6.2.4 The Community

The third part will be an integrated community. A community is not, by any means, necessary but form a natural part of a social gaming system. It presents several opportunities. The possibility to allude to the social contact motivator is an obvious example, but it also enables shortening of the feedback loop by letting the consultants give each other feedback in a direct manner. A community also offers advantages not directly connected to the competence model. If implemented correctly it could facilitate awareness of internal competences and spreading of internal knowledge.

### 6.2.5 The Game

The last component is a grouping of the purely motivational mechanics which purpose is to motivate and promote general usage of the system. These mechanics may include avatars, customisable elements, etc. The purely motivational mechanics will be connected to mechanics in the other components do promote these activities. This component contains more traditional gamification elements such as coins, rewards, customisable design, etc.

## 6.3 Mechanics

Please note that all illustrations are suggestions for future layout of the system. The mechanics are graded after importance where 1 is most important and 3 least important.

## 6.3.1 The Competence model

### 6.3.1.1 Interactive Visualisation of the Model



Figure 6-2 – The interactive visualization of the model

<b>Summary</b>	Interactive visualisation of the model where every development objective can be explored and a proper description provided.
<b>Purpose</b>	To create a fast and efficient introduction to increase understanding of the competence model and how to use the system.
<b>Ability</b>	Greatly increased ability compared to reading the manual.
<b>Motivation</b>	Increases motivation through an exploratory way of learning.
<b>Radoff's type(s) of fun</b>	Recognising patterns and Enlightenment.
<b>Dependencies</b>	No dependencies
<b>Importance</b>	1

#### 6.3.1.1.1 Description

This part of the system is a clear, user friendly and interactive visualisation of the competence model. Interaction with the model will facilitate an exploratory learning which is very much aligned with game

design thinking. Clear, real-life examples (provided from the community) will be given for the different development areas since the empiric have shown that consultants sometime find it hard to fully understand what is expected to reach the next level. Figure 6-2 illustrates an example design where users easily can navigate through the different levels and competence areas in the model and, by simply clicking on development goals, can browse through relevant examples.

#### 6.3.1.1.2 Why is this Important at Cybercom?

The description of the competence model is today a 42 pages long document which, according to the empirical research, many feel hard to comprehend. Even if the system promotes intuitive learning as the user uses the system, there is a need for a thorough description of the entire model (which ultimately constitute the rules of the game).

#### 6.3.1.2 Initial Learning Guide

<b>Summary</b>	Step by step learning guide to the competence model and the system in an inspirational and engaging manner.
<b>Purpose</b>	To create a fast and efficient introduction to increase understanding of the competence model and how to use the system.
<b>Intended Behaviour</b>	To take time to learn and understand the competence model.
<b>Ability</b>	Greatly increased ability related usage of the system and the competence model itself.
<b>Motivation</b>	Increases motivation through a fun way of learning.
<b>Radoff's type(s) of fun</b>	Listening to a story, Enlightenment, Recognising patterns and Achieving a sense of completion.
<b>Dependencies</b>	Points, Badges
<b>Importance</b>	2

#### 6.3.1.2.1 Description

To introduce the user to the system an introduction session will be offered to first time users. It will be an exploratory walk through where every part of the system is introduced and described. If “Clippy” (6.3.5.8 “Clippy”) is to be implemented it is suggested that it will have the role of guide to promote a personal relation to the game.

#### 6.3.1.2.2 Why is this Important at Cybercom?

The empirics have shown a generally low understanding of the competence model which is heavily dependent on the, currently used, thick document which is difficult to comprehend. What the consultants find most difficult to acknowledge is the point of having a competence model at all, primarily because they fail to see how it is related to their personal career. Focus in the introduction will therefor lie on pointing out the advantages of the model by providing examples and interactive a

learning process. An interesting introduction to the system will raise engagement, motivation and ability.

### 6.3.1.3 Competence model Time-Line

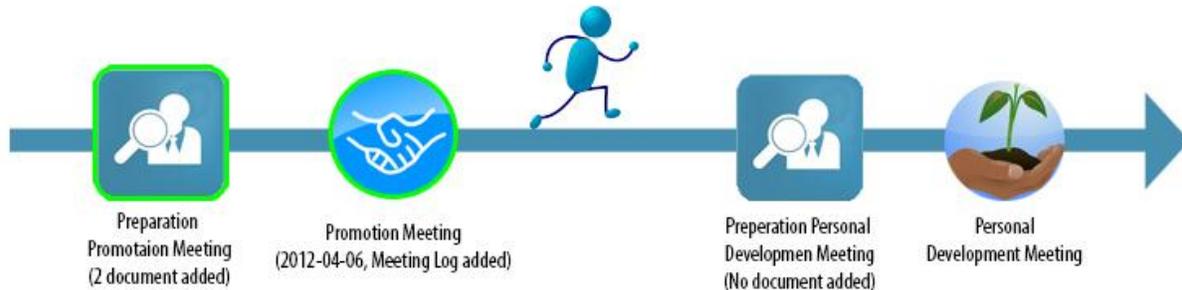


Figure 6-3 - The Competence model Time-Line

<b>Summary</b>	A time line to keep track of in which phase of the model the consultant currently is. Also links notes to meetings.
<b>Purpose</b>	To clearly visualise the different phases of the competence model, facilitate note taking after meetings and increase awareness of up-coming events.
<b>Intended behaviour</b>	Better preparation before and better follow-ups after meetings.
<b>Ability</b>	Facilitates tracking of notes from meetings and makes it easier for the user to grasp the different events included in the competence model.
<b>Motivation</b>	N/A
<b>Radoff's type(s) of fun</b>	Enlightenment.
<b>Dependencies</b>	Points, Badges
<b>Importance</b>	2

#### 6.3.1.3.1 Description

The time line will visualise the main events (meetings) that are included in the competence model. The user can interact with the time line to decide in which phase he or she currently is. The time line will also support storage of notes from meetings by allowing the user to simply click on the event and add information. The time line, as illustrated in (Figure 6-3), will include the two main meetings, and preparation activities prior these meetings. By clicking on the icons the user can easily upload documents and notes related to these events. The “running man” visualises where on the time line the user currently is.

#### 6.3.1.3.2 Why is this Important at Cybercom?

During our research a desire for more frequent meetings between consultant and manager was recognised. These are done annually at best. One of the problems is that the consultants are not aware

of the different events that are included in the competence model, and even if they are, they tend to forget or are not triggered to initiate the meeting. The inclusion of a time-line will raise awareness of the events and also make it easier to organise notes related to the different events, such as meeting notes.

## 6.3.2 The Log

### 6.3.2.1 Log Visualisation



Figure 6-4 – Log visualisation

<b>Summary</b>	A tool for the user to, in an easy manner, explore one's log and see how each post correlates to personal goals and the road map.
<b>Purpose</b>	Create an overview of the log and to increase understanding of how tasks are affecting one's position according to the model and personal goals.
<b>Intended behaviour</b>	Facilitate conscious decisions regarding one's future tasks.
<b>Ability</b>	Increases the ability to get an overview of achieved tasks.
<b>Motivation</b>	Motivates through a clear connection between log entries and personal

development.

**Radoff's type(s) of fun** Enlightenment.

**Dependencies** Road map and personal goals.

**Importance** 1

### 6.3.2.1.1 Description

The log visualisation is essentially where the user can get a good overlook of, manage and share log entries. Focus lies on usability to create an appropriate interface to the log. For each log entry, information about linked competence areas (visualised by the competence areas icons), experience points rewarded and eventual linkage to personal goals (visualised by the target icon), will be displayed. The log relation to the career progress will be visualised by highlighting the competence areas affected by a certain log entry in the road map. The community will be incorporated into this part so that the user easily can see comments made to the log entry from fellow consultants by clicking on the speech bubble icon.

### 6.3.2.1.2 Why is this Important at Cybercom?

Please see the Analysis and Discussion section 5.3.1 for an elaborate discussion on why the log should be the central activity in the system.

### 6.3.2.2 Manage Entries

Ämne 2012-02-21

Beskrivning

Personligt mål

- Kommunikation
- Hantera strukturkapital
- Hantera Kund 210
- Leverans
- Kontoansvar
- Uppdragshantering 25
- Analytisk och Teknisk Färdighet
- Konsultrollen
- Uppdragshantering

Figure 6-5 – Manage entries

**Summary** An easy way to do new, weighted, entries into one's log and see how these impact the road map and personal goals.

**Purpose** Increase ability to add new entries that reflects the personal development.

<b>Intended behaviour</b>	More conscious and frequent logging.
<b>Ability</b>	Highly increases the ability to manage log entries.
<b>Motivation</b>	The direct impact of the road map from each entry will provide a motivating and direct feedback loop. Rewarded with points and badges are also added as reward.
<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement and Achieving a sense of completion.
<b>Dependencies</b>	Log visualisation, Road map, Coins and Badges
<b>Importance</b>	1

#### 6.3.2.2.1 Description

Adding log entries is generally thought of as a dull activity which is currently poorly practiced. The primary objective for this mechanic is therefore to increase ability (motivation is increased by the use of coins and badges). The system will support a way for users to add entries in a time efficient and easy fashion. For each entry a subject, description, experience for affected competence areas and relation to personal goals will be filled in. The different input fields are filled in, connection to a personal goal is selected through a scroll down list and relevant competence areas are selected by simply clicking them.

#### 6.3.2.2.2 Why is this Important at Cybercom?

Please see the Discussion and Analysis section (5.3.1) for an elaborate discussion on why the log should be the central activity in the system.

## 6.3.3 The Roadmap

### 6.3.3.1 Roadmap Visualisation

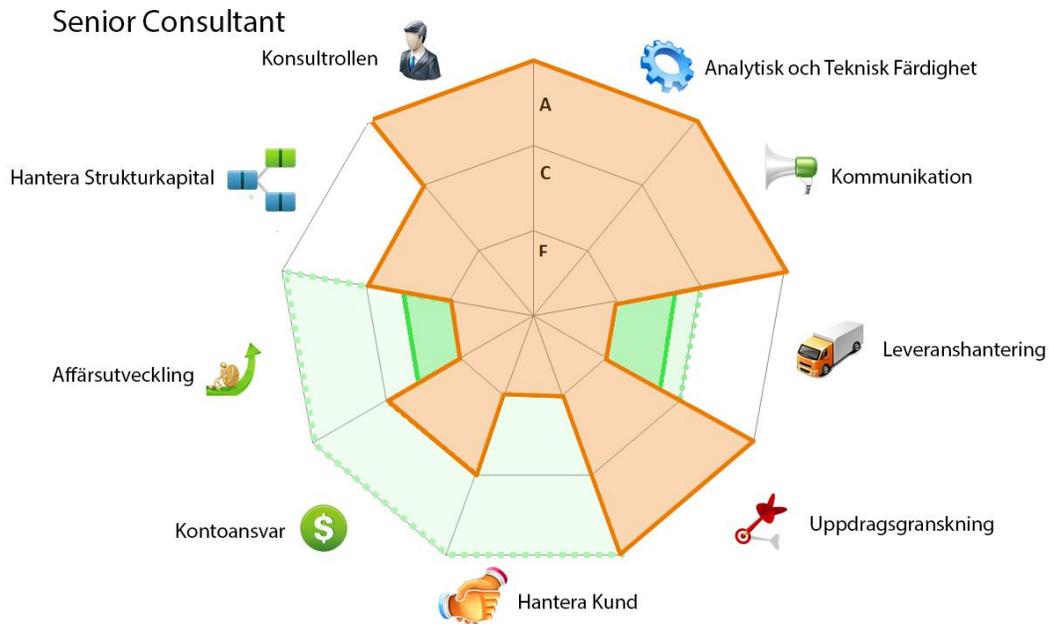


Figure 6-6 – Roadmap visualisation

<b>Summary</b>	The road map poses as a detailed progress bar where the user can see his or her current and perceived position according to the competence model.
<b>Purpose</b>	To provide a clear visualisation of the consultants current status and progress. Also works as a tool to provide direct feedback for the other mechanics.
<b>Intended behaviour</b>	Insightful decisions on which areas of competences the consultant should focus on. The inclusion of the consultant's perceived status will also trigger additional meetings with management.
<b>Ability</b>	Increased ability for the consultant to see his or her own development.
<b>Motivation</b>	Motivation through increased awareness of one's own development.
<b>Radoff's type(s) of fun</b>	Achieving a sense of completion.
<b>Dependencies</b>	Log Visualisation and Manage Entries
<b>Importance</b>	1

### 6.3.3.1.1 Description

The road map is the system progress bar and will be in the shape of a spider diagram that clearly visualise consultants current position in the different competence areas according to the competence model (visualised by orange), the consultants perceived progress (visualised by darker green) as well as personal goals within each area (visualised by light green). Each area of the road map will be clickable to let the user easily zoom in and navigate through the competence areas and find related log entries, description of the specific competence area and examples of activities other consultants have chosen to link to it.

### 6.3.3.1.2 Why is this Important at Cybercom?

In order for the competence model to feel meaningful to the consultants, there has to be a clear connection between what they do and how that affects their progress according to the model. As concluded in the Analysis and Discussion section, the system itself cannot generate feedback. By making a road map where the consultant can insert his or her perceived progress the feedback loop can be shortened which is essential for any game.

### 6.3.3.2 Experience Points

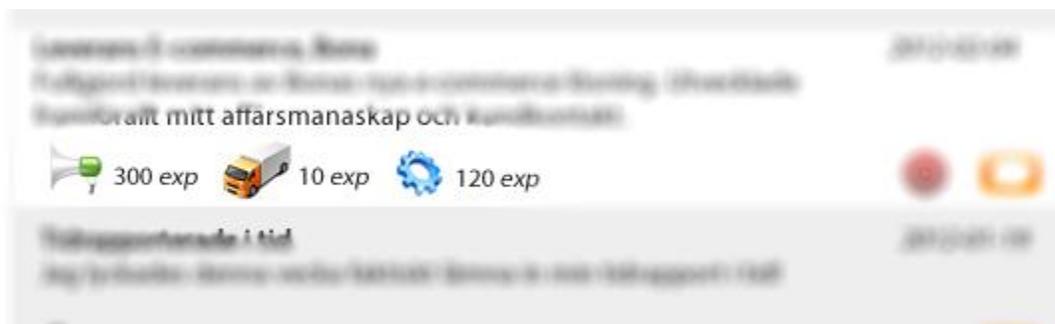


Figure 6-7 - Experience points

<b>Summary</b>	Experience points are used to keep track of the user's personal development related to the road map.
<b>Purpose</b>	The fundamental point of the competence model is to have a structured way to track the consultant's development. To visualise progress in the road map it has to be quantified and will be so in experience points.
<b>Intended behaviour</b>	Increased engagement with the competence model through visualisation of progress by the use of experience points.
<b>Ability</b>	Simplifies evaluation by an easy and standardised way of measuring progress.
<b>Motivation</b>	Raises motivation by rewarding activities and tasks with experience points in a direct manner.
<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement and Achieving a sense of completion.
<b>Dependencies</b>	The Road Map, Log Visualisation and Manage Entries.

## Importance

1

### 6.3.3.2.1 Description

The experience points will be assigned to each log entry and the amount is decided by the user. The points will be saved for each entry and visualised in the road map. Optionally, the points may be made visible to other users at the community to let other consultants see how his or her colleagues have weighted tasks and activities.

### 6.3.3.2.2 Why is this Important at Cybercom?

In a system that keeps track of consultant's personal progress, there has to be a way to measure and quantify that progress. The experience points fill that purpose. As already concluded in the discussion; the system cannot automatically generate experience points for activities and achievements, which assessment always has to be done in dialog with a manager. By making the user assign his or her own experience points for each activity, one is forced to make continuous self-evaluation, which will serve as helpful input to evaluation meetings. Furthermore, during the empiric study, opinions were encountered, which pointed out that lack of accurate awareness of one's own performance do cause problems.

### 6.3.3.3 Personal Goals



Figure 6-8 - Personal goals

#### Summary

Support for the personal goals agreed upon at the annual meeting. The personal goals are linked to the log.

#### Purpose

To keep track of personal goals and help the consultant work aligned to those.

<b>Intended behaviour</b>	Become more aware of one's personal goals and encourage more active work to achieve those.
<b>Ability</b>	Increases the ability to get an overview of the personal goals and to map activities (log entries) to each goal.
<b>Motivation</b>	Seeing that one's activities can be traced to personal goals will institute a short feedback loop.
<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement and Achieving a sense of completion.
<b>Dependencies</b>	Log Visualisation and Manage Entries.
<b>Importance</b>	1

#### 6.3.3.3.1 Description

The system will support the personal goals that are set in the evaluation meeting between the consultant and manager. They will be clearly visualised on the main page of the system as a reminder of in which professional direction the user is aiming for. Log entries are connected to personal goals and the system will support browsing of these entries. To visualise progress on each goal, the number of log entries connected to the specific goals will be presented (as one can see in figure).

#### 6.3.3.3.2 Why is this Important at Cybercom?

One of the obstacles with the current implementation of the competence model is that consultants fail to recognise the models relevance to their own career and development. To clearly display personal goals and how one's activities and performance are linked to those aim to increase the feeling that the model is individual and relevant to each consultant.

## 6.3.4 The Community

### 6.3.4.1 User-to-user Feedback

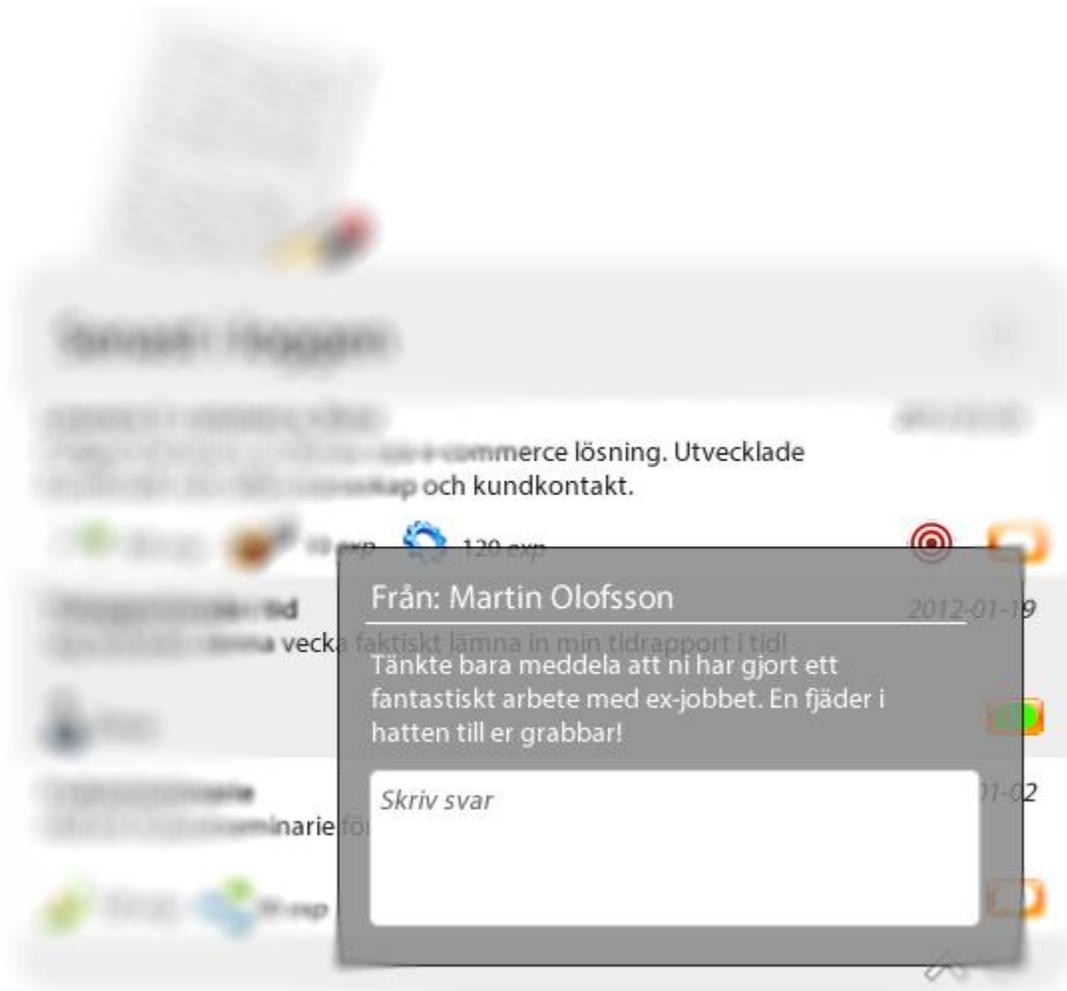


Figure 6-9 – User-to-user feedback

<b>Summary</b>	Implemented support for user-to-user feedback throughout the system through comments.
<b>Purpose</b>	To institute an additional feedback system which will provide meaningful and feedback in a direct manner.
<b>Intended behaviour</b>	Sharing experience and knowledge by giving and receiving comments from colleagues.
<b>Ability</b>	Facilitates communication related to the competence model and the system between the consultants.
<b>Motivation</b>	Getting feedback from others.

<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement.
<b>Dependencies</b>	Badges, Log Visualisation
<b>Importance</b>	2

#### 6.3.4.1.1 Description

Connecting a community to the system allows the consultants to see what other consultants have done, how they graded their performance, what knowledge they have obtained, etc. When browsing through other profiles and log, the users can create comments to give feedback. This, consultant-to-consultant feedback system through comments will permeate the entire system.

#### 6.3.4.1.2 Why is this Important at Cybercom?

As concluded in the theoretical study for this master thesis, a main difference between games and reality is the short feedback loop found in games. Letting consultants give feedback to each other will make up an additional way to receive, and give, feedback on one's performance and achievements in a direct manner. It will also raise discussions about the system itself and increase overall communication within the organisation, which promotes knowledge spreading. Having an interactive community will also increase engagement and promote usage of the community itself (browse through others people's profiles, logs, etc.).

### 6.3.4.2 Profile Page

**Martin Olofsson**  
Ivl 3 - Senior Consultant

3023 coins

**Kontaktuppgifter**  
Senior consultant, Cybercom Group  
+46 (0)702 29 44 33  
Dockplatsen 12 SE-211 19 Malmö  
Phone +46 (0)40 691 96 00  
martin.olofsson@cybercom.com  
www.cybercom.com

Hej!  
Martin Olofsson heter jag. Efter mina 72 år på Cybercom är jag en erfaren Cybercomare, och konsult såklart. Mitt huvudområde är digitala strategier och digital marketing. Under mina år på Cybercom har jag testat på ett flertal roller, däribland affärsenhetschef för Internet Service. På fritiden spelar jag gärna kanasta med mina vänner och tar hand om min fru och dotter. Favoritmaten är såklart bridgeblandning.

**Projekt**  
**Projektledare**  
Var ansvarig för 4 konsulter i ett mindre projekt för Media-web där vi gjorde en förundersökning till en ny mediaplattform för deras mobila oper...  
**Bid manager**  
Var ansvarig för estimering i budgivningen för ett webstrategi-projekt till En-koncernen.  
**Teambuilding**  
Spelade gitarr på teambuildingaktiviteten om våra nya värdeord.

**Kompetensområden**  
jQuery, Bid management, Projektledning, Handledning, .NET

**Senast i loggen**  
Leverans E-commerce 2012-02-04  
Fullgjord leverans av nya e-commerce lösning. Utvecklade framförallt mitt affärsmanuskript och kundkontakt.  
300 exp 10 exp 120 exp  
Tidrapporterade i tid 2012-01-19  
Jag lyckades denna vecka faktiskt lämna in min tidrapport i tid!  
20exp  
Frukostseminarie 2012-01-02  
Höll ett frukostseminarie för IS Malmö inom gamification.  
120 exp 80 exp

**Förslagslåda**  
After work på sista torsdagen i varje månad!  
Poäng: 785 Satsa coins!  
Utbildning i estimering  
Poäng: 380 Satsa coins!

Figure 6-10 - Profile page

<b>Summary</b>	A profile page for each consultant incorporated in the community. The profile page includes professional experience, role, etc.
<b>Purpose</b>	Increase awareness of internal competences at Cybercom.
<b>Intended behaviour</b>	Consultants add their personal details to be presented at the profile page. Consultants use the profile pages when looking for certain profiles within the organisation.
<b>Ability</b>	Easy to update your own profile page and find information on other's profile pages.
<b>Motivation</b>	Adding information on one's profile is rewarded with coins and badges.
<b>Radoff's type(s) of fun</b>	Being the centre of attention and Gathering knowledge.
<b>Dependencies</b>	Coins and Badges.

### 6.3.4.2.1 Description

Each user will have his or her own profile page as part of the community. The profile page will include personal as well as professional information such as skills, experience and current and previous projects. A user's profile page will include the user's log. Through the profile page one can also get information about earned coins, badges and what ideas the user wants to promote (see 6.3.5.3 Suggestion Box). Figure 6-10 illustrates the different components included in the profile page.

### 6.3.4.2.2 Why is this Important at Cybercom?

On Inside (the intranet currently used at Cybercom), there already are profile pages for each consultant. These are however poorly used and commonly lack proper information. By including support for profile pages in the game layer, awarding coins and badges for filling in details, additional incentives will be provided to actually use and fill in the profile pages. Detailed profile pages will increase awareness of competences within the organisation and serve as gateway to other game mechanics, such as seeing each other's amount of coins, badges etc.

### 6.3.4.3 Knowledge Sharing

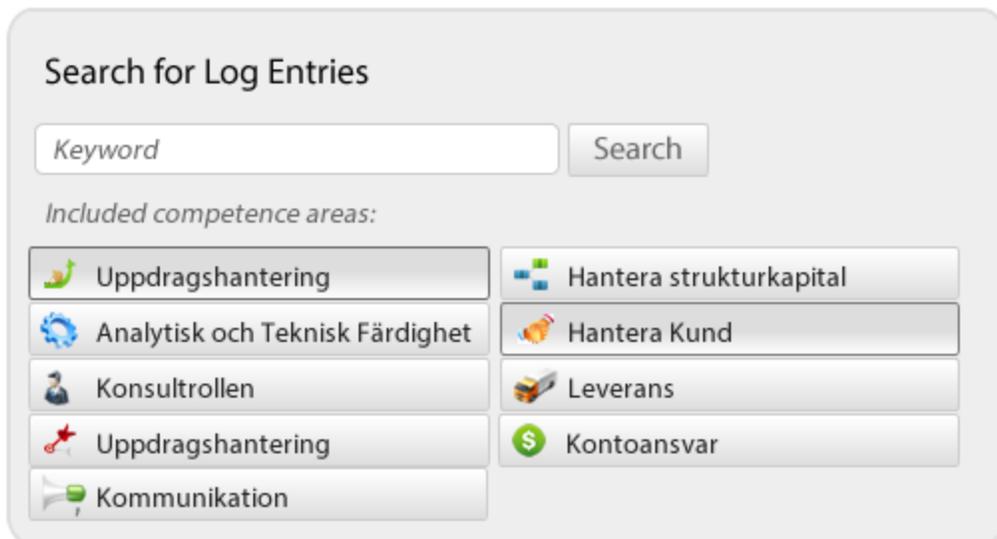


Figure 6-11 -Knowledge sharing

<b>Summary</b>	Possibility to browse through other consultant's log to see how they have interpreted goals in the competence model and weighted their efforts.
<b>Purpose</b>	To keep track of personal goals and help the consultant work aligned with those.
<b>Intended behaviour</b>	More aware and informed decisions on how to link one's activities to the competence model. Increased understanding will encourage general usage of the system and the model.

<b>Ability</b>	Makes it easy to see how others have interpreted the competence model.
<b>Motivation</b>	An easy and relevant way to seek information.
<b>Radoff's type(s) of fun</b>	Gathering knowledge.
<b>Dependencies</b>	Community
<b>Importance</b>	2

#### 6.3.4.3.1 Description

Users will be able to access other user's public logs. The user can either browse logs through the profile pages or search for relevant log entries with an interface that may look like the proposed layout above (Figure 6-11)

#### 6.3.4.3.2 Why is this Important at Cybercom?

As concluded in the discussion (section 5.3.3.1) one of the obstacles is low understanding of the vaguely formulated criteria in the competence model. Furthermore, managers often experience a gap in consultant's actual and perceived progress. By including the possibility to see how other users have interpreted and weighted similar tasks, the system aim to provide an input to a more well-informed decision when relating and weighting log entries according to the competence model.

### 6.3.5 The Game

#### 6.3.5.1 Coins



Figure 6-12 - Coins

<b>Summary</b>	Coins are rewarded for a range of activities within the system. The coins can then be spent on other game mechanics.
<b>Purpose</b>	To create motivating incentives to change behaviour.
<b>Intended behaviour</b>	Behaviour according to the activities rewarded with coins.
<b>Ability</b>	Do not directly increase ability.
<b>Motivation</b>	Coins rewarded to increase motivation.
<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement and Achieving a sense of completion.
<b>Dependencies</b>	N/A

6.3.5.1.1 Description

The coins form a redeemable point system (see theory, section 3.7.1.1.2) and will serve as the in game currency. Coins are rewarded for activities that are aligned with the intended behaviour the system aim to create. Several activities in the system will be rewarded in the system, including:

- Adding log entries.
- Commenting (give feedback) on other’s log entries.
- Adding personal and professional information.
- Completing the initial guide.
- Adding meeting journals.
- Frequently logging into the system.

Coins can be spent to vote for ideas (see Suggestion Box, section 5.4.4) and to customise the system environment.

6.3.5.1.2 Why is this Important at Cybercom?

The coin system serves purely motivational purposes as an intrinsic motivator. The idea is to boost engagement for the activities within the system for which coins are awarded and by that impact behaviour. It will also serve as an important way to facilitate direct feedback. Changing which tasks that are awarded with coins and the amount of coins gained provides a good way for management to tweak the system and influence behaviour in new ways.

6.3.5.2 Badges

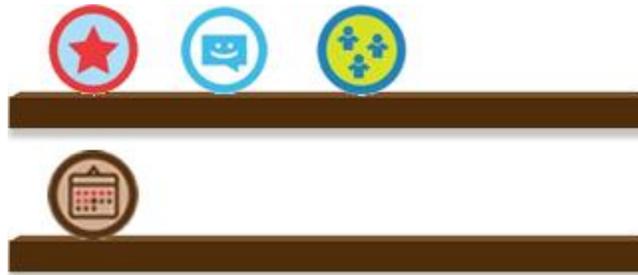


Figure 6-13 - Badges

<b>Summary</b>	Badges are rewarded for special achievements. What badges that are available are initially unknown to the consultants. Consultants can see each other’s badges which will provide a way to “show off” and also increase willingness to perform badge-awarding tasks.
<b>Purpose</b>	Promote certain behaviour.
<b>Intended behaviour</b>	Perform activities rewarded with badges. Incentive to look at other player profiles to see which badges other consultants have collected.

<b>Ability</b>	Do not directly affect ability.
<b>Motivation</b>	Badges as direct feedback.
<b>Radoff's type(s) of fun</b>	Gaining recognition for achievement, Noting Inside References and Achieving a sense of completion.
<b>Dependencies</b>	N/A
<b>Importance</b>	2

#### 6.3.5.2.1 Description

Badges will serve as an intrinsic motivator to boost engagement connected to certain activities that the game layer aims to promote. Which badges that are available will initially be unknown for the user. Following badges will be included:

- Logger - Awarded for 20 log entries.
- Top Logger - Awarded for 60 log entries.
- Master Logger - Awarded for 200 log entries.
- Good Co-worker - Awarded for commenting on 20 different log entries.
- Top Co-worker - Awarded for commenting on 60 different log entries.
- Master Co-worker - Awarded for commenting on 200 different log entries.

The suggested badges are a subject of discussion, change and extension. Badges provide a good way to tweak the motivational element of the system as well as drive long term-engagement through adding new badges (please see 6.4.3 System Weaknesses and Risks for discussion concerning long-term engagement and the need for system maintenance).

#### 6.3.5.2.2 Why is this Important at Cybercom?

As for coins, badges provide an efficient way to give feedback which encourages an intended behaviour in the system. By using “hidden” badges, unknown to the user, the system will drive long term engagement and add an exploratory element to the game layer which is well suited for Cybercom where exploring is a great motivator for the consultants. It will also serve as a way to gaining recognition by making the badges public in the community and encourage browsing through profile pages to discover new badges. On the contrary to coins, users aren’t rewarded with badges for a single activity. They are to be given after consistent usage of the system, promoting long-term engagement.

### 6.3.5.3 Suggestion Box



Figure 6-14 – Suggestion box

<b>Summary</b>	Users can spend his or her coins on own or others ideas.
<b>Purpose</b>	Increase motivation for collecting coins. Also gives management a grip of existing opinions within the organisation.
<b>Intended behaviour</b>	Users create ideas and spend coins on those or other's ideas.
<b>Ability</b>	Does not directly affect ability.
<b>Motivation</b>	Users can spend their coins on something meaningful.
<b>Radoff's type(s) of fun</b>	Competition, Being the centre of attention and Gaining recognition for achievement.
<b>Dependencies</b>	Coins
<b>Importance</b>	2

#### 6.3.5.3.1 Description

This part of the game layer lets the user create new ideas that he or she wants to promote. Ideas can basically be anything, such as a weekly coffee break or suggestions for interesting breakfast seminars. By spending coins at the idea, users can show interest. The user can access other's suggestions through an implemented suggestion section of the system or by browsing through profile pages where the suggestion boxes will be presented. The user's own suggestion box is presented on his or her start page

and can easily be managed. The community will also be connected to this mechanic by letting users share comments by clicking on the comment icon.

#### 6.3.5.3.2 Why is this Important at Cybercom?

This game mechanic primarily aims to make the coins get a higher perceived value and by that increase the incentives to collect them. If implemented correctly, it may also serve as important source of input for management to recognise opinions within the organisation. It will also appeal to the power motivator for the users.

#### 6.3.5.4 Triggers

<b>Summary</b>	Triggers within the system to trigger certain behaviour related to the implemented tasks. For further details of the different triggers please see description below.
<b>Purpose</b>	Trigger a certain behaviour related to a task within the system.
<b>Intended behaviour</b>	User performs the triggered task.
<b>Ability</b>	A trigger may include elements which increase ability.
<b>Motivation</b>	A trigger may include elements which increase motivation.
<b>Radoff's type(s) of fun</b>	N/A
<b>Dependencies</b>	Triggered tasks.
<b>Importance</b>	1

##### 6.3.5.4.1 Description

There will be several triggers in the system, each intended to spark certain behaviour. The following triggers will be included:

- Email
  - Frequent emails encouraging users to fill in their log. Emails will contain a direct link to the log to increase ability and the amount coins earned on the action will be presented to increase motivation.
  - Un-frequent emails that will be sent to inactive users. Emails will serve as a simple reminder.
  - Email to remind the user when it is time to add notes from a meeting included in the competence model. Emails will contain a direct link to upload notes to increase ability and the amount of coins earned on the action will be presented to increase motivation.
  - Email as a reminder of upcoming events according to the time line. The trigger will serve as a simple reminder with the intention to make the user to set up an appointment and start to prepare.
- Notification bar

- The notification bar will make the user aware of newly added comments in the community to trigger him or her to read the comment and answer. The trigger will include a direct link to the specific log entry to increase ability.
- The notification bar will make the user aware of upcoming events according to the time line. The trigger will serve as a simple reminder with the intention to make the user set an appointment and start to prepare.
- The notification bar will make the user aware of when he or she has enough experience to advance one level in one of the competence areas in the competence model. The trigger aim to make the user set up a meeting with a manager to get the progress confirmed.
- Clippy
  - Trigger inactive users to do new log entries when he or she has been inactive for a certain period. The trigger will include a direct link to increase ability.
  - Trigger inactive users to comment on other consultants log entries when he or she has been inactive for a certain period. The trigger will include a direct link to increase ability.
  - Trigger inactive users to fill out profile details if this has not been done. The trigger will include a direct link to increase ability and show awarded points to increase motivation.

Please note that these are triggers that potentially could be used, but since triggers is a sensitive issue, they need to be initially evaluated thoroughly before deciding on the final triggers structure.

#### 6.3.5.4.2 Why is this Important at Cybercom?

As B.J Fogg concludes (see section 3.4.3), a trigger is always needed to create a new behaviour. Triggers are used to create long term engagement, remind users of important task and have the possibility to increase both ability and motivation.

#### 6.3.5.5 Events

<b>Summary</b>	No games are fun forever and therefor need sparks to reignite engagement. Special events will facilitate these sparks. For further details of the events see description below.
<b>Purpose</b>	Re-engage users.
<b>Intended behaviour</b>	Promote behaviour related to the event.
<b>Ability</b>	According to the specific event.
<b>Motivation</b>	According to the specific event.
<b>Radoff's type(s) of fun</b>	According to the specific event.
<b>Dependencies</b>	According to the specific event.
<b>Importance</b>	3

### 6.3.5.5.1 Description

An event is a new system feature which is made available for a limited time. Examples may include rewarding extra coins for a limited time, competitions such as top logger of the months, etc. Exactly what events that will be included in the system are not proposed in this proof of concept. Events serve as a good adjustment tool to promote certain behaviour that the system fails to create after implementation.

### 6.3.5.5.2 Why is this Important at Cybercom?

It is a difficult task to create a game that is engaging over time. Even if users initially use the system extensively, there is a risk that the exiting first-time experience fades over time. Events serve as a good way to reignite the spark and re-engage users. Events can also be used when management are looking for to create a behaviour that is not supported by the system. E.g. events where users come up with new ideas for new project processes and are rewarded with coins.

### 6.3.5.6 Design Customisation

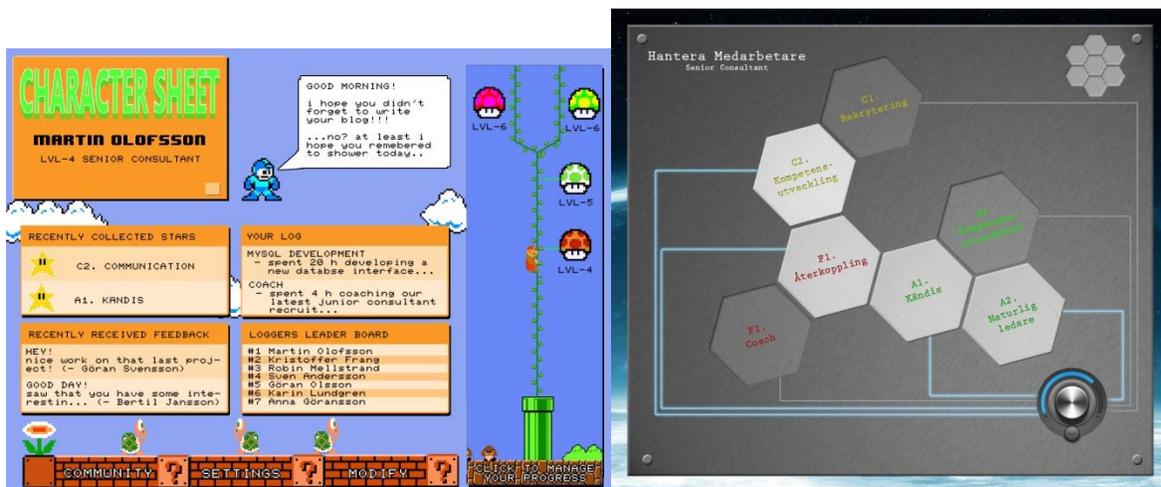


Figure 6-15 – Design customisation

<b>Summary</b>	Different themes for the systems graphical interface will be available for which users can spend coins to unlock.
<b>Purpose</b>	Increase motivation to use the system in general and to collect coins.
<b>Intended behaviour</b>	Collect coins by performing different activities in the game and use these to modify the graphical interface.
<b>Ability</b>	Do not directly affect ability.
<b>Motivation</b>	Increases motivation to perform the intended tasks in the system.
<b>Radoff's type(s) of fun</b>	Customising.
<b>Dependencies</b>	Coins.

### 6.3.5.6.1 Description

Different themes for the systems graphical interface will be available for which users can spend money to unlock. Please note that Figure 6-15 only serves as inspirational examples of how the different design might look like.

### 6.3.5.6.2 Why is this Important at Cybercom?

To increase the perceived value of the coins, users need to be able to spend them on something they find meaningful. Customisation is a strong motivator (see section 4.2.3) and a mechanic to customise the system itself should be appealing. During the empiric research, the question “how much game can the system be?” was raised with a wide range of responses. Some would like to see something similar to popular games like World of Warcraft, while others would prefer a stricter, business-like layout. By including a mechanic which lets the user decide for him- or herself is a way to make a system well-suited for all preferences.

### 6.3.5.7 Avatar



Figure 6-16 - Avatar

<b>Summary</b>	Each consultant will have an avatar presented on his or her profile page. The avatar can be modified by spending coins.
<b>Purpose</b>	Provide incentive to collect coins and make the system itself more engaging.
<b>Intended behaviour</b>	Collect coins by performing different activities in the game and use these to modify the avatar.
<b>Ability</b>	Do not directly affect ability.

<b>Motivation</b>	Increases motivation to perform the intended tasks in the system.
<b>Radoff's type(s) of fun</b>	Imagining yourself as a character, Gaining recognition and Customising.
<b>Dependencies</b>	N/A
<b>Importance</b>	3

#### 6.3.5.7.1 Description

The avatar is customisable part of the system. The user can spend coins to buy equipment in order to change the looks of the avatar. Some of the consultants have expressed a concern that the system will be too game-like. Thus, the avatar will be optional.

#### 6.3.5.7.2 Why is this Important at Cybercom?

The avatar mechanic serves a solely motivational purpose and constitutes a way for users to spend earned coins and hence provide incentive to collect coins. It also promotes use of the community since users can see and compare each other's avatar on the community. The avatar aim to bring humour to the system, removing the serious and dull edge currently associated with the competence model.

#### 6.3.5.8 "Clippy"



Figure 6-17 - Clippy

<b>Summary</b>	Personal guide in the system. The guide "Clippy" will both trigger and gives hints in a humorous manner.
<b>Purpose</b>	Trigger different behaviour, give useful hints and increase engagement by humour.
<b>Intended behaviour</b>	The user follows the hints and is triggered to do an intended task.
<b>Ability</b>	Triggers from Clippy may have elements which increases ability.
<b>Motivation</b>	Triggers from Clippy may have elements which increases motivation.

<b>Radoff's type(s) of fun</b>	Noting inside references, Laughing and Being silly.
<b>Dependencies</b>	N/A
<b>Importance</b>	3

#### 6.3.5.8.1 Description

This is a mechanic that will simulate the help-function in old versions of MS Word. This is a mechanic that many people know of, and probably did not like at all. This implementation of Clippy is mainly supposed to make dry remarks of the users actions in the systems, to invoke laughter and to reduce the feeling of seriousness of the system. Clippy may also be used to initially give pointers about the functionality of the system.

#### 6.3.5.8.2 Why is this Important at Cybercom?

As the interviews showed, the competence model is a tender subject for many employees. Many do not like it at all. To reduce the feeling of seriousness in the system in a familiar way intends to make the user feel more secure and comfortable in using the system.

## 6.4 System Implementation

This part concerns the end product, its potential for changing behaviour and a discussion of the positive effects of that. It will also include a short discussion about the possible return of investment, and potential weaknesses of the system. This discussion is important since it discerns the feasibility of a future implementation.

### 6.4.1 Technical solution

The main question that needs to be answered in terms of the technical solution is which platform it should be implemented upon. To be able to answer this, one must know what the platform needs to be capable of. Therefore, a list of technical high-level requirements has been set up below in Table 6-1.

#	Description	Priority
1	The system needs to be easy to access and in a familiar environment, preferably as a part of the existing intranet.	1
2	The content of the system needs to be manageable by different parts of the management.	1
3	The platform should support graphical design and graphical customisation.	2
4	The system must support specialised user rights with customised access to user profiles, logs and other, possibly sensitive information, for each account.	1
5	The system must be able to interact with the employees through emails, or similar channels	2
6	The top priority game mechanics need to be able to implement.	1

Table 6-1 – System high level requirements

There are also other requirements related to costs and feasibility. One that has been communicated by the management is that it needs to be a platform that Cybercom already uses; otherwise the project may be too expensive. What more is, the technical solution must be manageable by internal resources, which means that it must be a familiar environment.

Opinions have been encountered during the interviews that points out the advantages with incorporating the game layer into the already existing intranet. The main argument is that it is convenient to have as many organisational functions as possible gathered on one site. Today consultants use the intranet for news feed, another system for time reporting, etc. Adding one additional system might be excessive. However, since the system itself is virtually platform independent one have to weigh the advantages and disadvantages of having a stand-alone digitalisation of the competence model when deciding on platform. The down sides of including the system in the intranet is that the intranet is based on Epi Server which is mainly a content management system and even if one can develop the needed features, there is no advantage in form of built-in support for the functions proposed in the proof of concept (Clair, 2012). In order for the proposed system to be engaging there are also some requirements regarding layout, user experience and design. Making such aspects dependant on the intranet may render the final system insufficient in being motivating and fulfilling its goals.

Instead of integrating the proposed system into the intranet, a stand-alone system can be developed with an interface to the intranet in order to share information. An example of this may be the profile page; if the game layer succeeds in pursuing users to add details, these can be shared to the intranet through the interface. Other information from the game layer, such as coins, badges, log, etc., may also be presented on the intranet even though they are generated from the stand-alone system. A stand-alone system also has the advantage of a free choice of layout, graphics and user experience aspects. Furthermore, if a stand-alone system is developed, that can be used as show case material to show existing and potential customers.

These arguments are based on inside information from experienced Epi Server consultants at Cybercom and lead us to the conclusion that a future implementation should be done as a stand-alone system with

an interface to the existing intranet. The proposed system is, as already mentioned, possible to implement on several different platforms. As a stand-alone system, the platform which most thoroughly supports development of the proposed features should be used. There are, for example, an open source gamification platform, Userinfuser (Google Code, 2012) and a gamification platform developed by Ozma (Ryding, 2012) which may be used. However, a more in-depth speculation on the matter will not be included since further research and analysis need to be made to form the foundation to a well-informed decision, which is not within the scope of this thesis.

## 6.4.2 System Potential

Introducing a game layer will, if properly designed, make an activity more fun and engaging. However, the reason enterprises has taken such great interest in gamification is the realisation of the potentially gained business value through changing people's behaviour. One of the tasks of this thesis is to analyse that business value to serve as input to an investment analysis. Calculating return of investment (ROI) of gamification is one of the biggest challenges that actors in the area are facing. Further discussion on the difficulties with ROI analysis for gamification in general is included in *The Future of Gamification* (chapter 7.3). In this section focus lie on how to evaluate ROI for the specific solution proposed for Cybercom.

Development of an accurate ROI analysis, for the proposed implementation at Cybercom, is not an easy task since many of the advantages with putting a game layer on the competence model are soft values, such as happier employees, which are hard to quantify. The following section will separately list soft and hard ROIs to consider when an investment analysis is being made.

### 6.4.2.1 Direct ROIs

#### 6.4.2.1.1 Measuring time

In a competence model time is a central parameter and every hour for every consultant is valued. Introducing new processes and procedures which reduce consultant's time spent on non-debited activities may be considered as money saved (Christiansen, 2012).

Management has pointed out that many of the activities included in the competence model are unnecessarily time consuming due to lack of preparation before the meeting (Christiansen, 2012). Without a structured way to keep track of one's activities during the year, one can also assume that proper preparation may take long time. A small survey was made to get input on how much time that was actually spent on preparation and activities connected to the competence model. As time can be converted to money with the cost per hour and consultant, a quantified ROI may be feasible.

There are, however, some difficulties connected to such an estimate. The competence model is rather new to the employees at Cybercom in Malmö and routines are not yet properly established. Furthermore, since one of the objectives of the game layer is to increase usage of the competence model, it is a risk that the time spent on an implemented, and fully utilised competence model, is compared to the current implementation where the competence model is not used as intended. The

results could therefore be misleading. Hence, the conducted survey did not provide sufficient data to draw trustworthy conclusion regarding time spent. Furthermore, answers from employees in management position were not acquired. Such answers are considered most valued and informative since managers spend most time working with the competence model. Due to this situation, the conclusion was made that a quantified analysis could not be conducted.

#### 6.4.2.1.2 Investment Analysis for the Competence model

As the proposed game layer intends to increase overall usage of the competence model, a good option is to look at the investment analysis that was conducted when the model was first implemented. Since the model is currently poorly used the ROI for this implementation, assuming that it brings the expected result, could be directly correlated with the ROI found in that investment analysis for the competence model. However, that data could not be acquired but the recommendation is to use that as input for further evaluation.

#### 6.4.2.1.3 Research at IBM

As quantified data could be estimated for the ROI analysis, other reference cases were looked for to gain information on gamification's business value. An interesting article was discovered where research was conducted to see how the removal of point-based incentive system affected the patterns of user activities in an enterprise social network. The conclusions drawn in the study clearly showed how the removal of the point-system had a significant negative impact on the user activity on the site, as well as reduced in-system content (Thom, Millen, DiMicco, 2012).

### 6.4.2.2 Indirect ROIs

#### 6.4.2.2.1 Increased Usage and Understanding of the Competence model

The empiric research has shown resistance, or at least indifference, towards the competence model among the consultants at Cybercom, making them reluctant to use it in a proper manner. The usage is strongly limited by the lack of understanding of the advantages of using the competence model. The proposed system aim to increase understanding and usage of the model. Changing this behaviour will make the competence model into the tool it was intended to be, including some major advantages:

- Consultants will progress in a direction intended by Cybercom.
- Cybercom would have a better tool for mapping competences within the organisation.
- Consultants will be better prepared to meetings with management.
- Consultants and management will have a common ground for discussion.
- Consultants will have tool to follow up his or her performance in a structured way.
- Consultants can easier align his or her personal goals to the competence model.

#### 6.4.2.2.2 Internal Knowledge Sharing

When hiring a consultant, the customer is not solely hiring the competence of the single consultants but rather the competence within the entire consultancy company. To provide that competence there must

be effective channels for sharing of knowledge and experiences within the organisation. By including a community in the proposed system the aim is to facilitate these channels. Sharing of logged activities will raise awareness of colleague's experiences and by providing incentives for filling in details on the profile pages, it will be easy to get information regarding someone's skills and expertise. Lack of that behaviour can easily be recognised by looking at the currently used profile pages which often are more or less empty.

### 6.4.3 System Weaknesses and Risks

This gamification implementation has risks and weaknesses like most gamification implementations. One of the most obvious ones are the fact that games need to be maintained and continuously developed to drive long-term engagement. Otherwise the users will eventually get bored. It is not reasonable to believe that a gamification implementation will be perfectly maintained and developed internally, this will cost too much for the company (Olofsson, 2012-05-23). In terms of Dr. Fogg's "behavioural model", this means that the motivation for using the system will deteriorate with time. To counteract this effect, the focus must lie on increasing the ability as much as possible. That way there is still a possibility to keep the users above the activation threshold and thereby keeping the intended behaviour. In addition to raised ability, effort must be made to maintain the motivational elements of the game layer. That includes updates on game mechanics, bringing in new engaging elements and tweaking existing mechanics, such as in game currency.

Another risk with this system is that it can be exploited or misunderstood if not managed carefully. Since it is up to the users to evaluate their own performance up to the salary and development meetings with their closest managers, they may have completely different expectations on their own development than their managers have. Or maybe logging too many activities just to receive an experience-award and thereby getting a skewed progress. However, according to the supervisor of this project, these are concerns that the management will have to address if the situation arrives (Olofsson, 2012-05-21). Furthermore, even if this is a possible source of discontent, self-evaluation is something Cybercom requires from their consultants today as well even if it is not conducted properly.

There is also the risk of participation in the system. As McGonigal (2011) argues, one trait that all games share is that they have voluntary participation. In this case with the competence model, it can be argued whether the participation is voluntary or not. No one is of course forced to use the system, but they will be encouraged by the managers. This may damage the engagement potential of the game. An effect of low participation is that the community-mechanic of the game may suffer. A social game where players need to interact with each other needs participation, otherwise the system loses much of its potential, and especially in this case since the feedback system is heavily dependent on community feedback. These are issues that need to be addressed with internal marketing at the time of implementation.

### 6.4.4 Ideas of System Future Potential and Further Development

Even if the suggested game layer attempts to promote each activity by adding motivational elements, a big focus on increased ability has permeated the selection and design of the game mechanics. That is mainly because the empiric research clearly has shown that the time to spend on the activities in the

competence model is a limiting factor. The system that is proposed in this master thesis is therefore deliberately designed to be a light-weight since the less time one spends in a game system the harder it is to drive engagement and motivation. Hence, simplicity is very important in order to push someone over the activation threshold.

However, gamification, as concluded time and time again, has great potential in changing behaviour and could be used at Cybercom to potentially create new routines regarding the competence model as well as other day-to-day related activities. To achieve a greater impact, organisational elements at Cybercom need to be included in the system so that in-game rewards have a clear connection to the consultant's career. One step in that direction would be to incorporate projects as part of the game layer. That would allow log entries to be linked to specific project entities and the connection between the system and what the consultant actually do will be clearer (instituting a more relevant feedback loop). It would also create a good way for project leaders and management to give feedback. The down side, and the main reason that it is not proposed, is that it would bring an additional dimension, raising the commitment and time needed to use the system. There is also great potential in adding team based mechanics into the system. These could be project based teams or made up teams. There are many examples showing that the social component in team-based activities is a powerful way of affecting behaviour.

The conclusion is that there are many elements that could drive engagement and motivation to a greater extent than the system we propose. It all boils down to a trade-off between commitment (primarily the time Cybercom are willing to spend) and motivation. Dedication takes time but enables more ways to create relevant feedback loops, awards more strongly connected to the consultant's professional situation, in-game currency that can be spent in various ways, team-based structure and challenges etc. It is all a question how deep the gamification system is allowed to permeate through the organisation.

## 7 Epilogue

### 7.1 How the Research Questions were addressed

The research questions that this thesis sought to answer was:

- How does gamification work and what are the underlying psychological factors?
- How can Cybercom implement a game layer of their employee development process?

The first question is covered in the theoretical section of the thesis and is not discussed further, mainly since the competence of the authors is not that of psychology, nor is it the purpose of this thesis to extend the knowledge about the psychological factors. The purpose is to convey the knowledge of gamification and why it works to the readers, and that is deemed sufficient by the literature study.

The second question is mainly covered by Chapter 6 – The Proof of Concept. This is the author's proposal for a game layer of the employee development process. This Proof of Concept is motivated by empirical data and a thorough discussion and analysis, which in turn, is built upon the theoretical foundations established earlier in the thesis.

### 7.2 Reflections on Research Method

Overall, the research method that was used in the master thesis was successful in deriving sufficient data needed to develop a good proof of concept. The number of answers on the motivator survey provided a good result with high resolution. Demographical data would be desirable to get a clearer picture of different sub-groups with a diverged player profile. However, it was deliberately left out as adding personal information might render the participants more hesitant to answer.

The qualitative research was very rewarding. Consultants at Cybercom have shown great interest in the subject itself which has led to thoughtful input on how to design the proposed system. During the interviews, it was also made clear that there are many opinions regarding the competence model at Cybercom. Conducting interviews on a subject closely related to the participants' careers and every-day work made it rather easy to derive valuable information. Preferably, more interviews could be held with consultants in a management position to extract a more comprehensive collection of opinions from a management point of view. There was however troublesome to get appointments with individuals in such position. Valuable information was also given spontaneously by consultants who went to the two presentations that were held during the writing of the thesis which provided thoughts and inspiration that was not directly included in the empiric study.

The initially planned method included a verification phase where work-shop was to be held in order to test the proposed system. However, the mechanics that were finally suggested are not a feasible subject for testing in such manner that was planned. As the system intends to drive long-term engagement, most of the mechanics are designed to have impact over time which prohibits proper assessment with the limited time available.

### 7.3 The Academic Contribution of this Master Thesis

The scientific and academic area of gamification is relatively new. As stated in the thesis, it is mostly driven by entrepreneurs and enthusiastic game designers wanting to “change the world” (McGonigal, 2011) through engaging game design thinking. Few actual academic studies have been made on the subject. Research has been conducted on the subject of games (such as Bartle’s four types of players), but the area gamification, where games are integrated into non-game contexts, does not yet stand on solid academic grounds.

The first contribution, that the authors believe adds value to the academic foundation of gamification, is the literature review that was conducted. Gamification is very much a living subject and, as far as the authors are aware, a collocation of theories, definitions, trends, etc. has not yet been made. Furthermore, this thesis aims to connect all aspects of gamification including game design, enterprise aspects and psychology to analyse how these parts are connected. Such analysis was not encountered as the subject where researched and the authors consider it rather unique. It should however be noted that gamification is under constant development and that the concept itself is, to a great extent, defined by a few individuals through their blogs, presentations and other similar activities. Therefore, the literature review included in this thesis might rapidly grow out of date.

The second major contribution is the development process for gamification system design that has been produced in this thesis. Most of the case examples describing successful gamification implementations did not have a clear process of how exactly to design the specific game layer. It seems, for most of these reference cases, as the game mechanics were thrown in and it just happened to work. The assumption that a gamification design process seldom has been used, is strengthened by the fact that such process was not found during the literature study. In this thesis a bottom-up approach was used to design the game layer at Cybercom. Theories and models were gathered as tools, a thorough empiric study was conducted as input and the literature on game design was lastly used as input when the system was designed. By covering the whole design process of a gamification system, the authors believe that this thesis is of value to the academic foundations of the subject.

### 7.4 The Future of Gamification

Gamification is still a rather new discipline and almost every forecast points at a great market growth in the next few years. As mentioned in the introduction, M2 expect the market for gamification platforms to reach \$2.8 billion in 2012 (Meloni, 2012) and Gartner predict that 70% of the global 2000 companies will have a gamified platform in 2016 (Gartner, 2011). Furthermore, enterprise gamification to drive employee engagement is expected to leap forward and represents 38% of the total market (or \$91 million). Several examples of successful companies provide additional proof that gamification will continue to grow. Badgeville is a bright example. It was founded in 2010 and has, with its Behavioural Platform and customers like Deloitte, Samsung and EMC, grown to be one of the up-coming market leaders, in merely two years. The upcoming and success of such companies as well as new, open-source gamification platforms indicates that gamification is transforming from a buzz to an important enterprise component that are here to stay.

The industry is, however, facing some challenges. Identification of accurate ROIs stands out as the most difficult problem to tackle (Section 6.4.1). Some companies have reported positive ROI directly connected to gamification. Examples of such companies are LiveOps (increased sales), Not Your Average Joe's (increased sales and gratitude) and Playboy (increased revenue from one month to the next) (Herger, 2012). But the deeper within the organisation gamification is applied, the harder it gets to make clear connections to revenue. The root problem is often that the intended outcomes of gamification are "soft" values such as employee satisfaction, engagement and fun. There are attempts to make them quantifiable by measuring clicks, comments, ratings, etc. but to make the connection back to the soft values are based on assumption. Until trustworthy metrics can show that gamification actually generate profit, a wide spread adoption of the discipline will most likely be prohibited.

But as Seth Priebatsch argues in his TED Talks presentation (Priebatsch, 2010); gamification (or the game layer) is the new decade's social media. Regarding ROI and metrics, the same problem was also discussed when social media revolutionised the world. Nonetheless, businesses all over the world recognised the potential and the massive impact it was about to have. Gamification is currently evolving in a very similar way and, measured or not, it is most likely to be as big part of our lives as social media in a near future.

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# Appendix 1 – The Questionnaire About Dr. Reiss Motivators

## Introduction

The purpose of this survey is to support the gamification of the competence model, which is a part of our master thesis.

The whole survey takes about 10-15 minutes and it is important for us that we get your answers on these questions. It is entirely anonymous and we will not use any answer individually, but use the answers collectively to look for general trends of motivation factors.

Thanks for your participation! It means a lot to us.

/Robin and Kristoffer

Ps. It is worth mentioning that we have not designed this survey ourselves, it is designed by a Stanford professor as a part of a research of what motivates people. We have chosen not to adjust the survey to be more "Swedish" to keep its validity. Therefore some of the answer alternatives may sound a bit odd.

---

## 1. Demographical information

Where are you located?

1. Please choose your office below:

(Question 1/16)

- Göteborg
  - Huskvarna
  - Karlskrona
  - Linköping
  - Lund
  - Malmö
  - Östersund
  - Stockholm
  - Sundsvall
- 

## 2. Power

Rate your desire for power as:

A. Very important to you if any of the following statements is generally true:

- \* You are highly ambitious compared with other people your age.

\* You usually seek leadership roles.

\* You usually dominate in social situations with people your own age.

**B.** Less important to you if either of the following statements is generally true:

\* You are noticeably less ambitious than other people your own age.

\* Generally, you prefer being submissive in social situations.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that power is both very and less important to you.

2. Select your answer below:

(Question 2/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

### **3. Independence**

Rate your desire for independence as:

**A.** Very important to you if either of the following statements is generally true:

\*You usually resist advice and guidance from others.

\*Self-reliance is essential to your happiness.

**B.** Less important to you if either of the following statements is generally true:

\*Compared to other people your own age, you are noticeably more devoted to your spouse or partner.

\*You dislike being on your own.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that independence is both very and less important to you.

3. Select your answer below:

(Question 3/16)

**A.** Very important

**B. Less important**

**C. Average importance**

---

#### **4. Curiosity**

Rate curiosity as:

**A. Very important in guiding your behaviour if any of the following statements is generally true:**

\*You have a thirst for knowledge.

\*Compared to your peers, you ask a lot of questions.

\*You think a lot about what is true.

**B. Less important in guiding your behaviour if either of the following statements is true:**

\*You dislike intellectual activities.

\*You rarely ask questions.

**C. Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that curiosity is both very and less important to you.**

4. Select your answer below:

(Question 4/16)

**A. Very important**

**B. Less important**

**C. Average importance**

---

#### **5. Acceptance**

Rate acceptance as:

**A. Very important to you if any of the following statements is generally true:**

\*You usually set easy goals for yourself.

\*You have great difficulty coping with criticism.

**B. Less important to you if either of the following statements is true:**

\*You have a lot of self-confidence.

\*You handle criticism noticeably better than most people - that is, you do not become unduly upset.

C. Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that acceptance is both very and less important to you.

5. Select your answer below:

(Question 5/16)

A. Very important

B. Less important

C. Average importance

---

## 6. Order

Rate your desire for order as:

A. Very important in your life if any of the following statements is generally true:

\*You are noticeably more organized than most people.

\*You have many rules and try to follow them religiously.

\*You enjoy cleaning up.

B. Less important in your life if either of the following statements is generally true:

\*Your office/workplace is usually a mess.

\*You hate planning.

C. Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that order is both very and less important to you.

6. Select your answer below:

(Question 6/16)

A. Very important

B. Less important

C. Average importance

---

## 7. Saving

Rate your desire for saving as:

**A.** Very important to you if any of the following statements is generally true:

\*You are a collector.

\*You are noticeably more tight with your money than other people are with their money.

**B.** Less important to you if you if any of the following statements are generally true:

\*You are a free spender.

\*You rarely save anything at all.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that the desire to save is both very and less important to you.

7. Select your answer below:

(Question 7/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## **8. Honour**

Rate your desire for honour as

**A.** Very important to you if either of the following statements is generally true:

\*You are known as a highly principled person.

\*You are known as a very loyal person.

**B.** Less important to you if either of the following statements is generally true:

\*You believe that everyone is out for him- or herself.

\*You do not care much about morality.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating honour is both very and less important to you.

8. Select your answer below:

(Question 8/16)

**A.** Very important

**B. Less important**

**C. Average importance**

---

## **9. Idealism**

Rate your desire for idealism as:

**A. Very important to you if any of the following statements is true:**

- \*You make personal sacrifices for a social or humanitarian cause.
- \*You have repeatedly volunteered time to community-service organizations.
- \*You have repeatedly made generous contributions to the needy.

**B. Less important to you if either of the following statements is generally true:**

- \*You pay little attention to what is going on in society at large.
- \*You do not believe in charity.

**C. Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that idealism is both very and less important to you.**

9. Select your answer below:

(Question 9/16)

**A. Very important**

**B. Less important**

**C. Average importance**

---

## **10. Social contact**

Rate your desire for social contact as:

**A. Very important to you if either of the following statements is generally true:**

- \*You feel that you need to be around other people a lot to be happy.
- \*You are known as a fun-loving person.

**B. Less important to you if any of the following statements is generally true:**

\*You are a private person.

\*You do not like parties.

\*You do not care much about other people except for family and a few close friends.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that social contact is both very and less important to you.

10. Select your answer below:

(Question 10/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## **11. Family**

Rate your desire for family as:

**A.** Very important to you if either of the following statements is generally true:

\*Raising children is essential to your happiness.

\*Compared with other parents you know, you spend much more time with your children.

**B.** Less important to you if either of the following statements is generally true:

\*You find being a parent mostly burdensome.

\*You feel that family in general is mostly burdensome.

**C.** Of average importance if you have not rated it as very important or less important, or if you endorsed statements indicating that family is both very and less important to you.

11. Select your answer below:

(Question 11/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## 12. Status

Rate your desire for status as:

**A.** Very important to you if any of the following statements is generally true:

\*You almost always want to buy only the best or most expensive things.

\*You often buy things just to impress other people.

\*You spend a great deal of time trying to join or maintain membership in prestigious clubs or organizations.

**B.** Less important to you if any of the following statements is generally true:

\*You usually do not care what most people think of you.

\*You are significantly less impressed by wealth than most people you know.

\*You are not at all impressed by upper-class status or royalty.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that status is both very and less important to you.

12. Select your answer below:

(Question 12/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## 13. Vengeance

Rate your desire for vengeance as:

**A.** Very important to you if any of the following statements is generally true:

\*You have trouble controlling your anger.

\*You are aggressive.

\*You love to compete.

**B.** Less important to you if any of the following statements is generally true:

\*You are slow to feel anger compared to most people.

\*You often “look the other way” when insulted or offended.

\*You dislike competitive situations.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that vengeance is both very and less important to you

13. Select your answer below:

(Question 13/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## **14. Romance**

Rate your desire for romance as:

**A.** Very important to you if any of the following statements is generally true:

\*You spend an unusual amount of time, compared to other people you know who are about the same age as you, in the pursuit of romance.

\*You have a long history of sex with many partners.

\*You have trouble controlling your sexual urges.

\*Compared to most people you know, you spend much more time appreciating beauty.

**B.** Less important to you if any of the following statements is generally true:

\*You spend little time pursuing or thinking about sex.

\*You think that sex is disgusting.

**C.** Of average importance if you have not rated it as very important or less important to you, or if you have endorsed statements indicating that romance is both very and less important to you.

14. Select your answer below:

(Question 14/16)

**A.** Very important

**B.** Less important

C. Average importance

---

## 15. Physical activity

Rate your desire for physical activity as:

**A.** Very important to you if either of the following statements is generally true:

\*You have exercised regularly all your life.

\*Playing a sport is an important part of your life.

**B.** Less important to you if either of the following statements is generally true:

\*You have a history of being physically lazy.

\*You have a sedentary lifestyle.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that physical activity is both very and less important to you.

15. Select your answer below:

(Question 15/16)

**A.** Very important

**B.** Less important

**C.** Average importance

---

## 16. Tranquillity

Rate your desire for tranquillity as:

**A.** Very important to you if any of the following statements is generally true:

\*You strongly agree with at least two of the four ASI statements:

-It scares me when I feel "shaky" (trembling).

-It scares me when my heart beats rapidly.

-When I notice that my heart is beating, I worry that I might have a heart attack.

-It embarrasses me when my stomach growls.

\*You have a history of recurring panic attacks.

\*You are generally fearful and timid.

**B.** Less important if either of the following statements is generally true:

\*You are a brave person.

\*You have noticeably fewer fears than your peers.

**C.** Of average importance if you have not rated it as very important or less important, or if you have endorsed statements indicating that tranquility is both very and less important to you.

16. Select your answer below:

(Question 16/16)

**A.** Very important

**B.** Less important

**C.** Average importance

## Appendix 2 – The Interview Guide (In Swedish)

### Barriärer

- Hur använder du konsultmodellen idag?
  - Hur gör du ditt loggförande?
  - Hur frekvent skriver du logg?
- Hur väl förstår du konsultmodellen?
- Vad har du för uppfattning om konsultmodellen?
- Vad är barriärerna/problematiken för som eventuellt hindrar användning?
- Hur tror du andras uppfattning är om konsultmodellen?

### Mål med konsultrollen

- Vad är din personliga målsättning?
- Hur mycket hänsyn upplever du att konsultmodellen tar till dina personliga mål, som den praktiseras idag?
- Är ökat stöd för hantering av konsulternas personliga mål önskvärt?

### Transparens

- Vilken transparens anser du lämplig/önskvärd mellan konsulterna?
- Tror du att konflikter kan uppstå om transparensen ökar? Och i så fall, vilken typ av konflikter?
- Tror du att det finns ett motstånd mot transparens bland konsulterna?

### Utformning

- Hur mycket "spel" tycker du att användargränssnittet skall vara? (Seriöst/lekfullt)
- Har du andra tankar eller idéer du tycker vi bör tänka på?

## Appendix 3 – The Competence Model Summarised

*This summary of the competence model is written by the HR department of Cybercom and is a document that is designed for external presentation.*

---

Cybercom Sweden's consultant's competencies are yearly reviewed and we use our consultant model for this purpose. The competencies are mapped towards our offerings and business areas to ensure that there are a match of competences towards the market.

The purpose of our competence model is to be a tool for structural competence- and personal development for both managers and consultants.

As a consultant at Cybercom you should have a clear view of your professional level and how you can improve yourself in your role. For us it's important that our consultants grow as professionals.

The consultant categories in this model is; Junior Consultant, Consultant, Senior Consultant, Manager Consultant, Principal Consultant and Senior Manager Consultant.

All consultants within Cybercom Sweden should hold one of these categories, and as a new employee you will be placed in one as a start.

Each consultant is measured within the areas; Service Delivery, Staff Management, Client Management, Knowledge Management and Professional Attributes,

- Service Delivery is divided in four sub areas:
  - Analysis & Technical Proficiency. The consultant should demonstrate high performance and deep knowledge regarding new and innovative techniques, processes, products and commercial concepts.
  - Communication. The consultant should be effective and demonstrate high quality in his/her communication in meetings, reports and presentation etc.
  - Deliverable Creation. Deliver with high quality that increase the impact of the delivery and gives our customers more business value.
  - Assignment Management. Contribution to the projects/assignments success both operative and socially by working independent, be clear in reporting and finish the project in time and within budget.
- Staff Management describes the consultant's competence in demonstrating an effective leadership of coworkers with less experience, optimize resources and secure quality in the assignments.

- Account Management describes the consultant’s ability to strengthen client relationships and our brand.
- Knowledge Management means contribution to our knowledge capital and structure in order to expand our offerings and internal processes and competence base.
- Professional Attributes. Our consultants should act as ambassadors externally and internally. It’s about being a proactive and social colleague that shows respect and loyalty towards colleagues, customers and the company.

In each area the consultant can achieve three different levels; Fundamental, Contributory and Advanced. To advance in the model the consultant needs to improve in the different areas. Evaluations towards the criteria’s in the model are an ongoing process during the year.

The yearly plan for the model is:

Q1-2: Personal Development Plan for the Consultants. Personal objectives is set for the year

Continuous Evaluation of the consultant’s performance in the assignments

Q1 Yearly review of salary and benefits

The model is yearly reviewed and the HR department is responsible.

## Appendix 4 – Excerpts from the Competence Model (Swedish)

Figure 0-1 is an excerpt from the documentation of the competence model. This is an example of which criteria a consultant needs to have to be promoted from Consultant to Senior Consultant. These documents are only available in Swedish.

### 3 Consultant → Senior Consultant

Minimikrav för att en **Consultant** skall kunna uppgraderas till **Senior Consultant**:

Leverans av tjänst	F (Grundläggande)	C (Bidragande)	A (Avancerad)
Analytisk och teknisk färdighet			√
Kommunikation		√	√
Leveranshantering		√	√
Uppdragshantering		√	√
<b>Hantera Medarbetare</b>			√
<b>Hantera Kund</b>			
Kontoansvar		√	√
Affärsutveckling		√	√
<b>Hantera Strukturkapital</b>		√	√
<b>Konsultrollen</b>		√	

Gradering "A" måste vara uppfylld för minst 1 område

Gradering "A" måste vara uppfylld för minst 1 områden

Figure 0-1 – Promotion criteria of the competence model (Internal Cybercom document)

Figure 0-2 is an excerpt from the documentation of the competence model. This figure shows an example of the descriptions of the criteria the consultants need to develop to advance according to the model. These documents are only available in Swedish.

## 7 Leverans av tjänst – Analytisk & teknisk färdighet

	Grundläggande	Bidragande	Avancerad
<b>Leverans av tjänst – Analytisk &amp; teknisk färdighet</b>			
<b>Junior Consultant</b>	<p>F1. Utföra arbetsuppgifter genom att använda stödverktyg.</p> <p>F2. Förstå ett kompetensområde så att man kan utföra uppgifter definierade av en uppdragsledare.</p>	<p>C1. Leverera resultat av hög kvalitet inom ett kompetensområde med stöd av mer erfarna kollegor.</p> <p>C2. Identifiera viktiga frågor för ditt uppdrag.</p>	<p>A1. Använda och förstå stödverktyg för att utföra analytiska uppgifter.</p> <p>A2. Självständigt leverera resultat av hög kvalitet inom ett kompetensområde.</p> <p>A3. Identifiera, behandla och lösa viktiga frågor med stöd av mer erfarna kollegor.</p>
<b>Consultant</b>	<p>F1. Använda och förstå stödverktyg för att utföra analytiska uppgifter</p> <p>F2. Självständigt leverera resultat av hög kvalitet inom ett kompetensområde</p> <p>F3. Identifiera, behandla och lösa viktiga frågor.</p>	<p>C1. Använda och förstå flera stödverktyg för att utföra analytiska uppgifter.</p> <p>C2. Självständigt leverera resultat av hög kvalitet inom flera kompetensområden.</p> <p>C3. Strukturera och sammanfatta viktiga frågor samt identifiera och rekommendera alternativa lösningar.</p>	<p>A1. Utveckla/använda stödverktyg för att utföra analytiska uppgifter.</p> <p>A2. Självständigt leverera resultat av hög kvalitet inom flera kompetensområden i olika miljöer/uppdrag.</p> <p>A3. Strukturera och sammanfatta viktiga frågor samt identifiera och rekommendera alternativa lösningar i olika miljöer/uppdrag.</p> <p>A4. Klarat tillämplig certifiering/ vidareutbildning inom aktuellt kompetensområde.</p>

Figure 0-2 - Criteria descriptions of the competence model (internal Cybercom document)