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1 Introduction

As far back as the ancient civilizations of Mesopotamia and Egypt can we trace the creation and management of knowledge, which has been able to propel humans into a modern technological civilization, with marvellous innovations that make our life easier and safer. It is crucial these days for organizations to manage their knowledge in order to remain competitive (Teece, 1998; Vorakulpipat & Rezgui, 2008; Ruggles, 1998; Nonaka 1991; Hansen, Nohria & Tierney, 1999; Krogh, Nonaka & Aben, 2001; Huber, 1999). Companies need to be innovative and organizations need to improve their efficiency to gain the most out of the resources available to them. Additionally the service sector's importance on the economy has increased tremendously over time (Soubbotina, 2000), which marks a shift away to companies, which rely on knowledge as their main resource. According to many researchers managing knowledge is now the key to keeping organizations and companies innovative and viable in the future (Dyer & Nobeoka, 2000; Brown & Duguid, 1998; Krogh, Nonaka & Aben, 2001; Nonaka, 1991; Ruggles, 1998; Teece, 1998). Nonaka (1991) suggests that we augment our old assumptions of a resource based view of a company (Wernerfelt, 1984 & 1995) towards the knowledge-creating company instead. As the need for innovation and self-renewal increases for an organization so does the value of knowledge as a resource. Now knowledge can create a hard to imitate competitive advantage (Teece, 1998; Grover & Davenport, 2001). As a result many researchers as well as managers have turned their focus to creating ways to optimize how knowledge is managed in organizations (Alavi & Leidner, 2001; Ruggles, 1998; Grover & Davenport, 2001).

1.1 Background

Knowledge Management became particularly prominent with Nonaka's (1991) definition of the 'knowledge-creating company'. He states that knowledge is the main source of a company's competitive advantage, and the management of this resource is the key for a company's success. Since then other researchers have joined the research into Knowledge Management and investigate how companies manage their knowledge and how successful different strategies are (Hall, 2006; Gammelgaard & Ritter, 2005; Edge, 2005; Assudani, 2009; Ambos, 2009; Greiner, Böhmann & Krcmar, 2007; Hahn & Wang, 2009). Nonaka (1991) furthermore divided knowledge into two different types: tacit and explicit. Tacit knowledge is comparable to know-how and explicit knowledge is the equivalent to know-what (Nonaka, 1991; Brown & Duguid, 1998). Both types have different characteristics, whereas tacit knowledge is very context-specific and consequently hard to disseminate, explicit knowledge is codifiable and therefore easier to communicate (Nonaka, 1991). Hansen et al. (1999) describe two knowledge management strategies, which correspond to the two types of knowledge: *codification* and *personalization*.

Codification describes a strategy of collecting knowledge, codifying it and then storing it in some form of a repository, to allow others easy access to knowledge. It is a people-to-document approach, which relies on the transcription of knowledge/information (Hansen, Nohria & Tierney, 1999). This approach is most effectively used with explicit knowledge, for example through the use of searchable databases, reports, value propositions, and case studies.

Personalization tries to encourage knowledge dissemination by enabling direct communication between people, consequently creating and supporting social networks. It is therefore a person-to-person approach, which heavily depends on social interactions to transfer knowledge. This approach is best for managing tacit knowledge, which cannot simply be written down. Presentations, monthly meetings, communities of practice (Gammelgaard & Ritter, 2005; Bosua & Scheepers, 2007; Zboralski, 2009), and communications with knowledge experts are personalization tools used for managing knowledge.

What makes knowledge difficult to manage is its bond to the individual or collective from which it was generated (Nonaka, 1991; Fahey & Prusak, 1998; Alavi & Leidner, 2001), as a consequence knowledge is highly personal and hard to formalize (Nonaka, 1991). This makes it necessary to create a shared context and understanding to share knowledge among parties (Alavi & Leidner 2001; Fahey & Prusak, 1998). These obstacles are what knowledge management systems (KMS) are used to overcome, to enable knowledge to flow freely. Knowledge management systems are a particular type of Information System (IS), 'developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application.' (Alavi & Leidner, 2001, p.114) This is done with the help of tools such as online directories, databases, and many forms of information rich communication channels (Alavi & Leidner, 2001). Knowledge systems can be used to find knowledge, which has been input by other members with access to the system, and it can help to connect people. This is especially important when there is a need to find a person, who generated a certain piece of knowledge, as they have background knowledge. KMS are ultimately there to support users in making decisions and finding solutions to problems (Halawi, McCarthy & Aronson, 2007/2008).

For this study we decided to look at a consulting company, since their purpose is to effectively manage their own and their clients' knowledge. The company is one of the largest professional services firms in the world. The importance of a successful Knowledge Management System is essential for it, as it provides services to other organizations dealing with knowledge management. The company was founded in 1998 through a merger between two large consulting agencies, which created one of the largest consulting firms in the world. Today it has more than 160,000 employees in 151 countries. It serves 26 industries and is focused on assurance, tax, human resources, transactions, performance improvement and crisis management. Since 1933, it has also been active in Sweden and today it claims the market leadership, employing 3,600 employees in 125 locations around Sweden. The focus for this study was on two offices, since they were able to help with the process of distributing and collecting the survey. The Jönköping and Gothenburg office combined have around 330 employees, who aim to help businesses in becoming more secure, efficient and profitable. The main tasks involve auditing, risk assessment, corporate finance, and tax advisory.

There are two main factors that make knowledge management and the knowledge management system extra important at the investigated consulting agency, the first factor is the size of the company. There needs to be a well functioning system for knowledge sharing, to be able to coordinate 160,000 employees, all of which generating knowledge. The fact that many of these employees serve the same types of industry, and thus face similar issues, but in different locations highlights this issue. The second factor is the client and employee turnover, since an employee can work with several clients and needs to quickly access knowledge about a multitude of companies, industries, and regions.

The consulting agency identifies the following five competences as their factors of success:

1. Broad competence accessible locally
2. Understanding of the clients culture and business
3. Proactive and professional activities
4. Personal commitment and trust
5. Focus on quality and professionalism

All of these factors involve the communication of knowledge, again highlighting the importance of knowledge management. The company has always had knowledge management integrated in their business, but has only recently started to focus on knowledge management as a business function. There is no dedicated KM manager at the Jönköping office. The company's knowledge management is instead addressed on a national level by the knowledge management section at the Stockholm office. The section was set up in the beginning of 2010 as the KM initiative effort in Sweden and comprises 30 employees .

1.2 Problem Discussion

Companies have realized that they cannot afford to let knowledge go to waste, therefore knowledge management has become focus area for management in many organizations. As a result organizations have started creating knowledge management systems (KMS), which help them manage knowledge activities. Many knowledge management system tools like the telephone, archives, and email have been used for a long time in companies, but the emergence of information technology (IT) has created new opportunities to optimize knowledge management (Gammelgaard & Ritter, 2007; Kim & Trimi, 2007; McDermott, 1999). Groupware, intranets, and company-wide databases are just a few examples of ways to reap the benefits of IT. But implementing a new or improved KMS can be challenging for any organization. It has to be adopted by the intended users, it should improve upon past processes and procedures, and in the end give a return higher than its cost. However, just like knowledge itself, it is hard to measure the actual benefits of implementing a KMS (Wu & Wang, 2006; Petter, DeLone & Mclean, 2008; Fahey & Prusak, 1998). There is no way to measure a direct effect on the bottom line of a company (Fahey & Prusak, 1998). The effect a KMS has on innovativeness and competitiveness of a company is a hard-to-measure concept, but it is these benefits received from a KMS that determine its success for a company. How then can a company measure the success from its KMS and which factors determine it? One model by Wu & Wang (2006) derived from DeLone & Mclean's (1992; 2003) IS success model offers companies a way to measure the success of a KMS by looking at its impact on the work of employees and identifying the areas which are important to consider when trying to create/implement a good KMS. It also offers a quantitative way to measure the success, resulting in an overview of different areas an organization can focus on when looking at their KMS in detail. Measuring general acceptance, usage and perceived benefits of a KMS can then be used to suggest further improvements of the KMS or reveal problems in particular functions or processes of the KMS, and since the model is using the employees' perspective it helps management to see what employees need in order to make maximize the KMS usefulness for employees.

1.3 Purpose

The purpose of this paper is to investigate the success of the consulting agency's KMS, examine the relationships between the factors constituting its success and explore possible effects of the knowledge management strategies codification and personalization on these correlations.

1.4 Research limitations

This study 's main limitiation is the sample size of only 25 valid responses, which is lower than the 75 recommended by Stevens (1996) (cited in Pallant, 2001). In order to increase the statistical power of the study's results it helped to use measures which adjust the results for a smaller sample size, like the adjusted R^2 value (Pallant, 2001).

Generalizability is further decreased as this research is following a case study approach (Marczyk, DeMatteo & Festinger, 2005, p.149). On the other hand, the case study approach helped to focus the study on a typical consulting company, and further case studies in other industries could help to compare the relationships of the KMS success dimensions for different industries. This could result in adjusted models for each industry and improve the KMS success models' value to companies. Furthermore, it would improve the review of models based on DeLone & McLean's (1992, 2003) IS success model.

This is another limitation of this study. It is based on the model developed by Wu & Wang (2006) which has not been extensively peer reviewed, generally it can be said that no KMS success model was reviewed much by the research community, it seems every researcher always goes back to the model of DeLone & McLean (1992, 2003). Thus it is necessary to find and agree on a KMS success model derived from the IS success model. This model could then be improved, instead of creating new KMS success models.

Further improvements to this and other studies related to KMS success could come from a thoroughly researched and peer reviewed measurement scale for the KMS success dimensions. This study employed the same scales as Wu & Wang (2006) did, but currently different studies use different measurement items for the same KMS success dimensions (Wu & Wang, 2006; Halawi, McCarthy & Aronson, 2007/2008; Kulkarni, Ravindran & Freeze, 2006). This is a big issue as the results are not comparable when they measure different things, and since surveys are the basis for KMS success models, a unified approach would boost the value and comparability of models tremendously.

2 Conceptual Framework

2.1 Knowledge Management

Knowledge management deals with controlling the processes of knowledge transfer and creation, which in turn assists companies in attaining a higher efficiency and innovativeness (Grover & Davenport, 2001). It should be a part of the different business processes and over time completely mesh together with the organization according to Grover & Davenport (2001), so that it cannot be noticed as a specific business process separate from others. The activities of knowledge management can be classified by the following three processes:

> Knowledge generation
>
> Knowledge codification
>
> Knowledge transfer/realization
>
> (Grover & Davenport, 2001)

Knowledge generation comprises processes involving the 'acquisition and development of knowledge' (Grover & Davenport, 2001, p.7). Knowledge codification is the 'conversion of knowledge into accessible and applicable formats' (Grover & Davenport, 2001, p.7), and knowledge transfer/realization represents the movement of knowledge to its point of use (Grover & Davenport, 2001). Depending on how a company manages these processes it can leverage its knowledge more effectively (Greiner et al, 2007). Companies realized that value can be extracted from managing knowledge and trying to build and implement a KMS, which aids the activities of knowledge management in an organization.

2.2 Knowledge Management Systems

Knowledge management systems (KMS) are the means by which to put the knowledge management strategy into effect. There always have been personal knowledge management systems for the individual, as they would just reach out for help from somebody they know, who has the knowledge to help solve a problem (McLure-Wasko, 1999). More than ever companies need to locate and map knowledge residing in the company, and extract it to remain competitive and innovative. The advances in information technology (IT) and the creation of information systems (IS) have helped a great deal with these knowledge management processes. ISs consist of three parts: application programs, information resources and/or knowledge bases, and user interfaces, which are used support business processes (Guarino, 1998), essentially any information technology used to help people get specific tasks done. Knowledge management systems are a particular type of IS, which are 'developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer, and application.' (Alavi & Leidner, 2001, p.114) This is done with the help of tools like, online directories, databases, and many forms of information rich communication channels (Alavi & Leidner, 2001). Unlike an IS, a knowledge management system does not only deal with information though, but it focuses on knowledge and how users across an organization can gain access to knowledge, or the person from who the knowledge originated (Alavi and Leidner, 2001; Gray, 2000; Wu & Wang, 2006; and McLure-Wasko, 1999). Another important difference pointed out by McLure-Wasko (1999) is the ownership of knowledge in a KMS.

A traditional IS's information belong to the organization, a KMS however manages knowledge owned by individuals or communities of an organization. This distinction is very important, as not all knowledge by members of an organization can be codified, and consequently might be lost to the organization. If the organization can gain access to an individual's knowledge and encourage people to share their knowledge, then value can be extracted from an otherwise hard to access source (McLure-Wasko, 1999).

Three common functions of a KMS are:

1) Coding and sharing of best practices
2) Creation of corporate knowledge directories
3) Creation of knowledge networks

(Alavi & Leidner, 2001)

The first point might be the most common and widely used application of KMS (Alavi & Leidner, 2001), which entails the use of repositories to 'provide information or knowledge to support operations, management, analysis and decision-making.' (Wu & Wang, 2006, p.729) The second and third functions of a KMS are also very important. The second function basically refers to the creation of *knowledge maps* (Wu & Wang, 2006; & Alavi & Leidner, 2001) to depict who knows what in the company, and how they can be contacted. The creation of knowledge networks refers to the development of communities, which cooperate and bring together different specialists, some of these communities can also be referred to as *communities of practice* (CoP) (Vorakulpipat & Rozgui, 2008; Ruggles, 1998; & McDermott 1999).

KMS are an important part to an organization's knowledge management strategy, because members with access to the KMS can acquire a large amount of information, which can help them solve problems, or get in touch with the right *knower*. But KMS need to be 'appropriate, accurate and accessible' (Karlsen & Gottschalk, 2004, p.4) in order to be valued by and successful among its targeted users. Organizations need to create 'systems, methods and procedures' (Karlsen & Gottschalk, 2004, p.4), which foster the use of KMS and make it user-friendly. The overreliance on IT can be detrimental to the success of a KMS as well (McDermott, 1999; Davenport & Prusak, 2000), as it misses the management of knowledge, and just becomes another IS. It is therefore crucial to consider the type of knowledge a KMS will manage in a given situation and adapt it accordingly to achieve the best possible user experience (Alavi & Leidner, 2001). It also needs to be aligned with other KM activities and strategies of an organization to be successful. Otherwise, the lack of support might lead to a low acceptance among organization members and ultimately to a useful but empty KMS without users (Alavi & Leidner, 2001)

The main knowledge management tools in use at the consulting agency were extracted from an interview with Mattias Eklund, the manager responsible for the company's KMS in Sweden and listed in table 2-1.

Codification	Personalization
Searchable Database	Network
Case Study	Presentations
Offers/Value Propositions	Knowledge Experts
Reports	Monthly Meetings

Table 2-1 Codification & Personalization Tools

The KMS tools are explained in detail below, with additional information from KM research on each one:

Searchable Database

Searchable databases are used to store many different kinds of documents. Their main function is to simplify the sharing and locating of knowledge. The tool creates an index for other Knowledge Management functions, both personalized and codified. You can through the database find documents about regions, industries and companies, but it also enables you to locate tacit knowledge such as networks and knowledge experts.

Case Study

You can as an employee at the consulting company find reference Case Studies through the searchable databases. This can provide you with a framework for projects and tasks. You will find knowledge about general challenges, solutions and positions with regards to a scenario similar to the Case study.

Offers/Value Propositions

You are able to find already established packets of value propositions for services through the searchable database. These value propositions includes estimations of prices, payment conditions, delivery terms and timeframes. This provides knowledge to employees and clients at an early stage.

Reports

The most common use of the searchable databases is to find and upload reports. Everything from internal industry reports, client history and financial assessments can be found through the databases. The consulting company has no formal incentive system for encouraging sharing and retrieving reports. The usage of the system will however contribute to your personal development and advancement in the company

Network

A lot of the tacit knowledge available in a company is hard to transfer. The consulting company works actively to enable the transfer of tacit knowledge by incorporating sharing and searching knowledge into the business culture. Networks are an important tool in order to successfully do this. At the consulting company they have established Communities of Practice and what they call Centers of Excellence. These networks are a center to share knowledge and are not limited to departments or countries.

Presentations

Presentations are another way to share the tacit knowledge. The benefit of presentations is that you can more easily communicate tacit knowledge, thus sharing it among individuals. Presentations are also used to inspire feedback and ensure an ongoing discussion.

Knowledge Experts

One method that the consulting company uses to incorporate knowledge sharing in to the business culture is by identifying and using what they call Knowledge Experts. These are individuals within the company that possess unique knowledge within an area. The Knowledge Experts can then be sent to educate and create networks among targeted divisions that are seen to benefit from the expertise.

Monthly Meetings

Monthly Meetings is a way to share tacit knowledge within divisions, networks and offices. The meetings are set up in order for everyone to be routinely share new knowledge that is generated throughout the company. This provides a basis for discovering and applying new methods and solutions through knowledge sharing.

2.3 An Approach to KMS Success

2.3.1 DeLone & McLean's IS Success Model

It is not easy to measure the success of KMS directly (Fahey & Prusak, 1998), as some benefits from a KMS, such as improved knowledge flow and innovativeness are hard to measure. Despite this issue research has been rather limited on models measuring the success of a KMS (Wu & Wang, 2006; Halawi et al, 2007/2008; Kulkarni, Ravindrani & Freeze, 2006). Since KMS is a kind of IS (Alavi & Leidner, 2001) a model that can measure the success of an IS might also be appropriate for measuring a KMS's success (Wu & Wang, 2006; Petter, DeLone & McLean, 2008). A model that can and has been used extensively to measure IS success, is the D&M IS success model (Seddon, 1997), which has been used and adapted in different studies to measure KMS's success (DeLone & McLean, 2003), therefore it is important to understand its conception.

After reviewing conceptual and empirical studies regarding IS's success DeLone & McLean (1992, 2003) came up with six dimensions that reflect IS success:

- System Quality
- Information Quality
- Use
- User Satisfaction
- Individual Impact
- Organizational Impact

DeLone & McLean (1992) combined a temporal process model with a causal model, to describe the process of an IS and understand how each dimension was connected and how they impacted the IS's success.

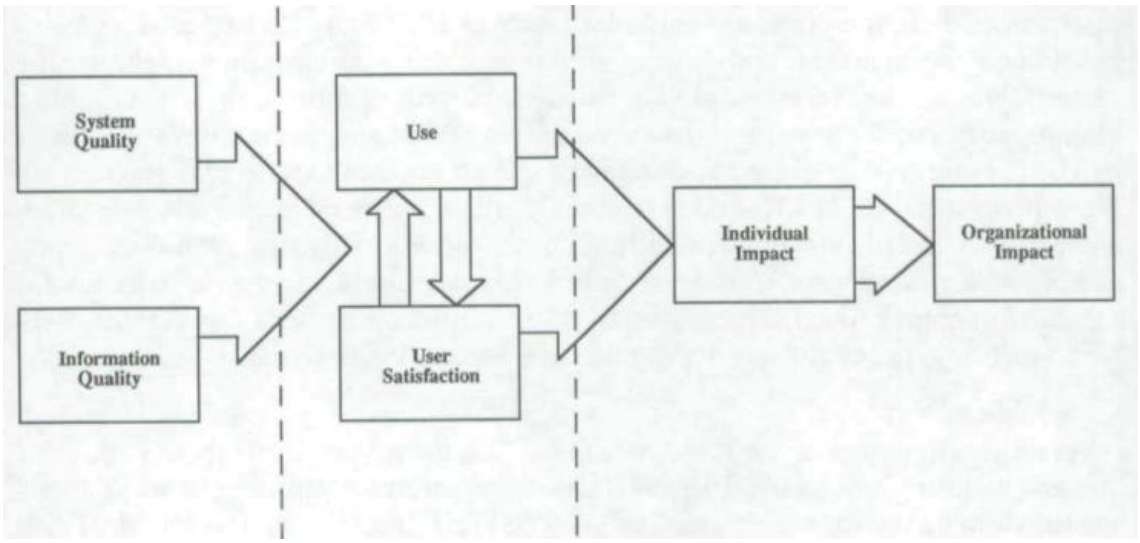


Figure 2-1 (DeLone & McLean, 1992)

Their model (figure 2-1) was based on communications research by Shannon and Weaver (1949) and the *information influence theory* of Mason (1978). Shannon and Weaver (1949) identified three levels in communications: a technical level, a semantic level and an effectiveness level.

The technical level represented the accuracy and efficiency of a communication system, which produces information, the semantic level describes how efficient the communication system is at conveying the meaning of a message, and the effectiveness level illustrated the effect of the message on the recipient (Shannon & Weaver, 1949).

Each of these levels is represented in the D&M (DeLone & McLean, 2003), and measuring how an IS succeeds at each of these levels is the basis for its overall success. Semantic success was measured through *information quality*, and *use*, *user satisfaction*, *individual impacts* and *organizational impacts* are used to measure the success of the effectiveness level.

As can be seen in their model the dimensions were interrelated and therefore close attention was necessary, when defining the dependent variable and trying to measure an IS's success (DeLone & McLean, 1992). DeLone and McLean (1992, p.88) suggested the model 'needs further development and validation before it could serve as a basis for the selection of appropriate IS measures.' After 10 years they re-evaluated their model (DeLone & McLean, 2003) in order to adopt it to the findings regarding this model and address critics.

In the research following the proposal of the model in 1992 the links between system use and individual impacts, system quality and individual impacts, information quality and individual impacts had the strongest empirical support. (DeLone & McLean, 2003) Significant and important determinants for measuring each dimension extracted from the studies are as follows:

System Use:	frequency of use, time of use, number of accesses, usage pattern, dependency
System Quality:	ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, importance
Information Quality:	accuracy, timeliness, completeness, relevance, consistency
Individual Impacts:	job performance, decision-making performance, quality of work environment, quality of work

(DeLone & McLean, 2003)

All other links between the IS success dimensions were validated by the studies as well, and thus give the model a significant empirical support (DeLone & McLean, 2003).

There was also criticism of the model, DeLone & McLean (2003) addressed the most important ones and adapted their model accordingly or defended it against the critic. One critique was the use of causal as well as process model in one descriptive model (Seddon, 1997). He argued that this can cause confusion as to what arrows in the model mean, since they can refer to a process or influence (Seddon, 1997). DeLone & McLean (2003) admit that it could lead to confusion, but in order to understand IS success as a construct of the different dimension the use of both models is helpful. The process model only consists of three parts: the creation, the use, and the consequences of a system. Every one of these parts 'is a necessary, but not sufficient, condition for the resultant outcome.' (DeLone & McLean, 2003, p.16) As an example you can look at system quality and information quality, without the two nobody would use the system, and nobody would know if or not they are satisfied, since the system does not exist. Moreover, as a logical conclusion without any system that can be used, there is no individual impact, and consequently no organizational impact, therefore it makes sense to include a process model.

DeLone & McLean (1992) also wanted to show the relevance each of their dimensions had for IS success, that is why a causal model was useful as well, since it can show how the dimensions impact IS success.

Another critique that was brought against the model, was the usage of system use as a success variable (Seddon, 1997), since it describes a behaviour and does not affect benefits. As DeLone & McLean (2003) point out, it is important to consider the nature, quality, and extent of use. When you look at use with in-depth criteria you can extract information about how it is used, and compare it to its intended use, as well as investigate the influence of the how on the other dimensions.

Two advices by DeLone & McLean (2003) were very important for addressing critics. First it is important to consider the research context one is using the model in, the dimensions and measurements have to be adjusted depending on the setting. And here DeLone & McLean (2003) propose the use of established measures, since that adds validity to research and makes it more comparable to other researches using the D&M IS success model. Other researchers need to make sure they know what their dependent variable is, the dimensions DeLone & McLean (1992 & 1993) have suggested are all a part of success and thus dependent, but variables that cause success rather than reflecting success are independent. This can possibly lead to confusion and faulty decisions on IS efforts.

DeLone & McLean (2003)enhanced their model and made these three major changes to improve their model's reflection of IS's success (Wu & Wang, 2006):

- *Service Quality* was added as a dimension, to reflect the importance of service and support in successful e-commerce systems
- *Intention to Use* was added as a measure of attitude towards an IS, which is influenced by the quality of the IS as well as user satisfaction
- *Individual Impact* and *Organizational Impact* were combined in the new dimension *Net Benefits*

The updated model can be seen in figure 2-2.

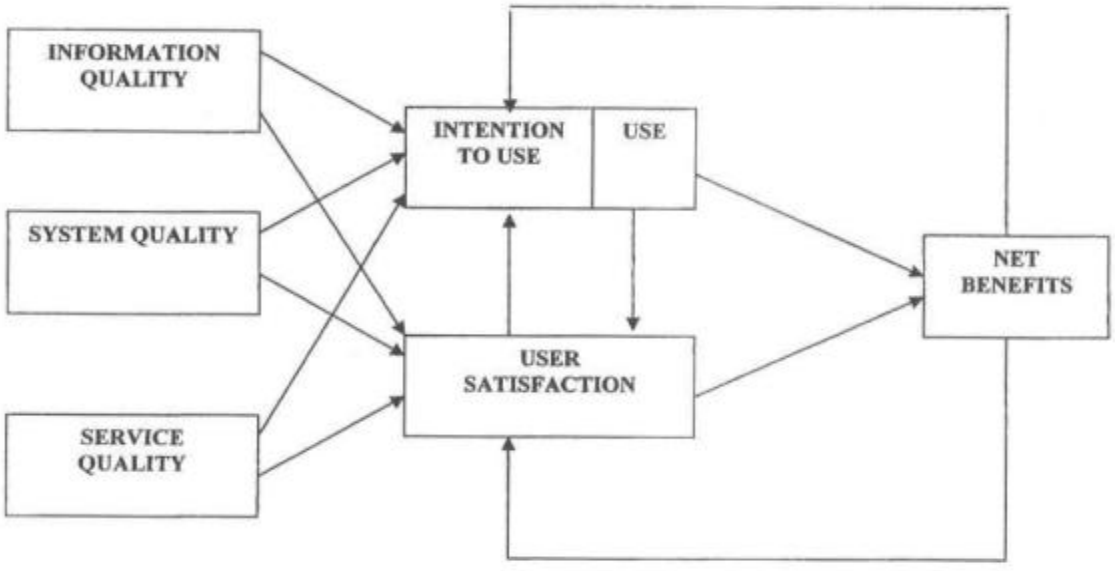


Figure 2-2 (DeLone & McLean, 2003)

2.3.2 A KMS Success Model

The resulting model of DeLone & McLean (2003) is a good start to analyze and measure the success of an IS, but needs to be slightly adjusted in order to apply it for a KMS. This chapter takes a closer look at a KMS success model by Wu & Wang (2006), with slightly adjusted dimensions accounting for the differences between IS and KMS. (see Figure 2-3)

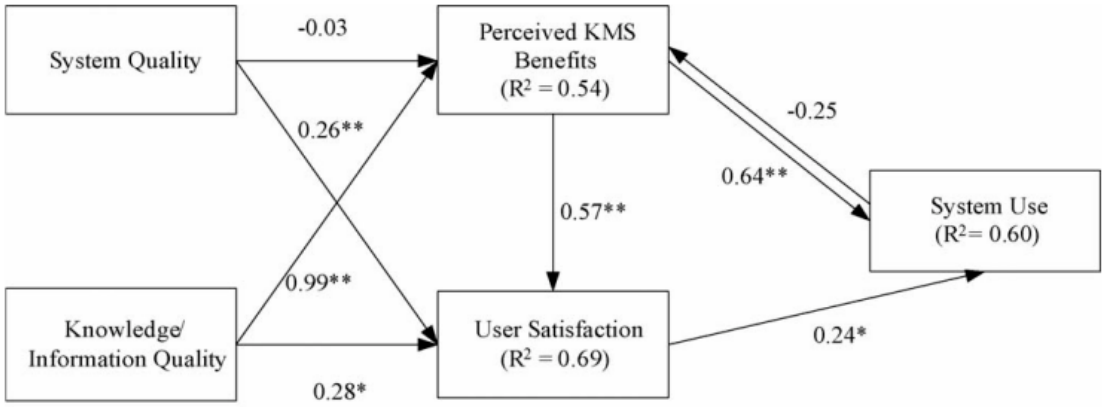


Figure 2-3 (Wu & Wang, 2006)

One difference from DeLone & McLean's model is the changed dependent variable used to judging success, Wu & Wang (2006) use *Perceived KMS Benefits* for this. They additionally exclude the influence of a direct connection between *System Use* and the two quality dimensions of the system. Wu & Wang (2006) argue that user satisfaction is not caused by using a system, but rather by the quality of the system and its perceived benefits. This distances their model from the process model, where use is a requirement for satisfaction to occur (DeLone & McLean, 2003). Another change is the removal of the service quality dimension, which Wu & Wang (2006) deemed necessary, seeing how Service Quality is not a part of a KMS, but rather an external factor. In short, service quality is a necessity for a good KMS to succeed, but it will not be able to improve a bad KMS. Wu &Wang (2006) decided to drop the *Intention to Use* dimension as well, since it is only relevant in a setting where the access to the KMS is non-permissible. Under normal circumstances its impact on other factors should be linear with the one of *System Use*, it is therefore implicitly included in the dimension *System Use*. A further change was the revision of *Net Benefits* into *Perceived KMS Benefits,* which stems from the fact that *Net Benefits* can be hard to define (Wu & Wang, 2006) and as mentioned by DeLone & McLean (2003) dimensions need to be adjusted for specific research contexts. In this case the context is a KMS and most benefits from it, cannot easily be measured with numerical values, but the 'soft' benefits described by *Perceived KMS Benefits* are a way to assess the success of a KMS (Fahey & Prusak, 1998).

The model with its adjustments for KMS success can be used to measure the success of the technological dimensions of a KMS from the users' perspective. In the model *System Quality* and *Information Quality* represent the technological dimension, which is the direct overall quality of the KMS. A human dimension is represented through *User Satisfaction*, *Perceived KMS Benefits*, and *System Use,* which represent the effect of the KMS on the users (Wu & Wang, 2006). This approach makes the model very suitable for this paper's purpose and was used to measure the KMS success at the consulting company. In order to make propositions about the correlations between the different dimensions of KMS success, it is important to look at the dimensions of Wu & Wang's (2006) KMS success model and propose possible correlations based on a theoretical approach, which can then be tested for through a survey.

System Quality

'System quality depends on the intended operational characteristics. It is concerned with whether there are errors in the system, its ease of use, response time, flexibility, and stability. System quality measures the reliability and predictability of the system independent of the knowledge it contains.' (Wu & Wang, 2006, p.731) This measure is very important for a KMS's success, as studies have proven that a KMS, which is not user-friendly and optimized for its purpose will most likely result in low adaptation and lower benefits (Ajmal, Helo & Kekäle, 2010; Alavi & Leidner, 2001; Hahn & Wang, 2009; McDermott, 1999; DeLone & McLean, 2003; Rhodes, Hung, Lok, Lien & Wu, 2008; Peel & Rowley, 2010; Xu & Quaddus, 2005; Staples, Wong & Seddon, 2002). As a result it is a dimension crucial to the efficacy of a KMS and therefore a necessary part of any framework aiming to measure a KMS's overall success. Additionally, the manager responsible for the KMS at the consulting company pointed out the importance of a system, which lets users find information fast, and encourages them to share knowledge. Therefore we hypothesize that *System Quality* has a considerable influence on the *Perceived KMS Benefits* and *User Satisfaction* of the KMS at the consulting company.

H1: System Quality has a positive impact on Perceived KMS Benefits.

H2 System Quality has a positive impact on User Satisfaction.

Knowledge or Information Quality

'Information quality has been used as a success measure for traditional IS. In the KMS context, the distinction between knowledge and information depends on context and the user.' (Wu & Wang, 2006, p.731) The information that a KMS supplies to its user needs to be of quality in order to be useful (Rao & Osei-Bryson, 2006; DeLone & McLean, 2003; Staples, Wong & Seddon, 2002). If the users of a KMS find the information useful and of quality they obviously find the KMS more useful, therefore we think that it is an important dimension in a KMS success model. Particularly in for supporting employees in the consulting company it is important to receive useful information, which can aid in problem solving and decision-making processes, thus improving *Perceived KMS Benefits* and *User Satisfaction*.

H3: Knowledge or Information Quality has a positive impact on Perceived KMS Benefits.

H4: Knowledge or Information Quality has a positive impact on User Satisfaction.

User Satisfaction

'User satisfaction is one of the most frequently measured aspects of IS success. In addition, it is hard to deny the success of a system which users say they like; thus, user satisfaction is also a good measurement for KMS success.' (Wu & Wang, 2006, p.731) As KMS is a system, which intends to improve the management of knowledge in an organization, it relies on its users. If users do not like the system and are very dissatisfied they will stop using the system or only reluctantly engage it for knowledge related processes (Ajmal, Helo & Kekäle, 2010; DeLone & McLean, 2003; Peel & Rowley, 2010; Xu & Quaddus, 2005; Staples, Wong & Seddon, 2002). This makes *User Satisfaction* an important factor for a KMS's success, because only when users of the KMS are satisfied with it, will they be willing to use the KMS and engage in knowledge sharing.

H5: User Satisfaction has a positive impact on System Use.

System Use

System use is a necessity for getting net benefits from a KMS (DeLone & McLean, 2003). The right part of Wu & Wang's (2006) model would become obsolete without *System Use*. Just like *Perceived KMS Benefits* and *User Satisfaction* it is a requirement for a KMS to be used, if one of these components ceases to exist then users would stop utilizing the KMS. Making the use of the KMS mandatory could however lead to a diminished usefulness of measuring 'System Use' as part of KMS success (Seddon, 1997). That is why 'System Use' needs to be employed correctly, and in Wu & Wang's (2006) model focuses on 'the nature, extent, quality, and appropriateness of the system use' (DeLone & McLean, 2003, p.16) rather than only the time spent with it. This qualitative definition of System Use makes it an appropriate dimension for measuring KMS success. Wu & Wang (2006) argued that as the quality of system use increases, so should Perceived KMS Benefits, since only when a system is used to its full potential can a user realize the system's full benefits However, this cannot be tested during this paper, as it requires structural equation modeling to investigate non-recursive models.

Perceived KMS Benefits

'Perceived system benefit is the degree to which a user believes that use of the system results in benefits to the user or the organization, often assuming that this results in an increase in job performance and productivity.' (Wu & Wang, 2006, p.731) System benefits are the result of other factors influencing the success of a KMS, such as effectiveness (Wu & Wang, 2006). They can therefore be considered a dependent variable, and are consequently used as the main measure for KMS success in Wu & Wang's (2006) model. Their model represents the gains users perceive to achieve through the KMS. There should also be a correlation to *System Use* and *User Satisfaction*. It is only logical that users will try to use a system more, which is beneficial, and that they are more satisfied with a KMS, which helps them a great deal.

H6: Perceived KMS Benefits have a strong correlation with User Satisfaction.

H7: Perceived KMS Benefits has a positive impact on System Use.

2.4 Knowledge Management Strategies

This study also investigates how the two knowledge management strategies *codification* and *personalization* influence the correlations between the dimensions of Wu & Wang's (2006) framework for KMS success. As a part of this these two strategies need to be defined first. Attention was brought to codification and personalization by Hansen et al (1999), with subsequent research focusing on using them to explain knowledge management in organizations (Hall, 2006; Gammelgaard, 2005; Greiner et al, 2007; Merono-Cerdan, Lopez-Nicolas & Sabater, 2007; Saito, Umemoto & Ikeda, 2007).

Codification describes a strategy of collecting knowledge, codifying it and then storing it in some form of repository, to allow individuals or collectives access to it without having been part of its creation (Hansen et al, 1999; Greiner et al, 2007; Hall, 2006; Grover & Davenport, 2001). It is a *people-to-document approach* (Merono-Cerdan et al, 2007), which tries to separate knowledge and knower, thus allowing an easier transfer of knowledge. An advantage of this approach is the development of economies of scale regarding to knowledge, since knowledge can be reused multiple times after it has been created once, and it could theoretically keep on returning value to the company infinitely (Hansen et al, 1999). On the other hand, this approach can be problematic as it can miss certain nuances of knowledge, which cannot be captured in a codified form. Knowledge has barriers to sharing even when already codified. The one trying to retrieve knowledge will still need to be able to codify the knowledge and have an understanding of the context the knowledge was/is embedded in for it to be useful (Gammelgaard, 2005; Hall, 2006).

Personalization focuses on a social approach to knowledge management (Hansen et al 1999). Under this strategy an organization tries to encourage knowledge dissemination by enabling direct communication between people, consequently creating and supporting social networks (Hansen et al, 1999; Merono-Cerdan et al, 2007; Grover & Davenport, 2001). The communication between people can be face-to-face as well as electronic, especially today the event of online social networks, intranets and other electronic communication methods made it easier to initiate personal exchanges. The downside to this strategy is the high cost and the amount of time required to facilitate such communication between individuals (Hansen et al 1999).

Each strategy has their respective areas at which it excels, codification can be utilized in settings where knowledge can be reused and still gives high returns, whereas personalization is efficient for fostering innovativeness and the creation of very specific problem solutions (Greiner et al 2007). Even though a company can favor on strategy over the other, they will always have both parallel (Saito et al, 2007; Hansen et al, 1999; Grover & Davenport, 2001). In this case study the consulting company has a focus on a pluralistic approach with codification as the primary knowledge management strategy and personification in a supportive role (M. Eklund, 2010-04-01). This is in line with Hansen (1999), Saito et al (2007), Grover and Davenport (2001), and Gammelgaard et al's (2005) suggestion that both strategies are interrelated and should be supported by a company in order to maximize the positive effects of knowledge management. However the choice of which strategy to follow depends on what kind of services a company is offering, a more custom-tailored solution approach, or a fast, proven, and reliable solution one (Hansen et al 1999; Kim & Trimi, 2007). Since both strategies are different and encompass different sets of tools, and different approaches to knowledge management, Kulkarni et al (2006) suggested that there might be differences between the correlations of the dimensions of KMS success for codification and personalization. This is important considering that a company might have to initiate different measures to improve the overall success of their KMS.

Consequently this paper looks at the KMS success dimensions for each knowledge management strategy respectively and compares the correlations under both.

H8: The correlations between System Quality, Knowledge or Information Quality, Perceived KMS Benefits, User Satisfaction, and System Use are not the same for personalization and codification respectively.

3 Method

3.1 Research Approach & Study Design

The two research approaches involved when gathering data, are the inductive approach and the deductive approach. The fundamental difference between an inductive and a deductive approach is that the inductive approach aims to create a theory of its own once the data has been analyzed, whereas the deductive approach develops a theory from a hypothesis which then is tested (Saunders, Lewis, & Thornhill, 2007). This research paper uses a deductive approach at first proposing nine hypotheses, which were created following a thorough KM literature review, with particular focus on Wu and Wang´s (2006) respecification of the Delone and McLean´s (1992) IS success model. These hypotheses are tested using Wu & Wang's (2006) model's dimensions on data gathered with a survey at a Swedish consulting company. As a result the first part of the paper follows a quantitative research design in form of a case study. The quantitative approach was the most applicable for testing the hypothesis, by collecting data and using statistical modelling (Marczyk, DeMatteo & Festinger, 2005). However there are disadvantages to a quantitative approach. The researcher might not gain enough knowledge and understanding of the context in order to draw valid conclusions (Punch, 2005), but where quantitative research focuses on collecting and evaluating numbers, qualitative studies analyzes data collected in words, helping to reach an in-depth understanding about an issue (Saunders et al., 2007; Marczyk, DeMatteo & Festinger, 2005). Therefore the second part of this paper follows a qualitative and inductive approach. This dualistic design helps to exploit the strengths of quantitative and qualitative research approaches and helps to minimize the downsides of both (Neuman, 2006). The most common way to conduct a qualitative study is through unstructured or structured interviews (Sekaran, 2003). For this study it was important to conduct two semi structured interviews with the manager responsible for KM at the consulting company. The first interview helped to formulate the introduction of the questionnaire and understand the KMS and KM efforts undertaken at the company. A more structured second interview was conducted after the survey data was analyzed, in order to make sense of the statistical analysis' results.

In summary the individual properties connected to the different methods, made us come to the conclusion that our research would benefit the most from a combination of two different research approaches. The quantitative method using a questionnaire allowed us to use formal measurements and have many observations. The major advantage of using formal measurements is a stricter mathematical interpretation, which initially helps to see patterns over a larger scale (Firestone, 1987). The quantitative method additionally helps to stay objective, and the data is easier to communicate. Additionally the numbers create the opportunity to conduct statistical estimations (Davidsson, 1997). The Qualitative research approach in the form of two expert interviews provided us with knowledge about the context our study was conducted in and helped to understand how the statistical results can be interpreted, to make sense when applied to the KM context at the consulting company.

3.2 The case study approach

There are many different ways to conduct a case study and even more definitions to be found in existing literature. However, a common definition of a case study has been proposed by Stake (1995). He defines a case study as 'the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances.' (Stake, 1995, p. xi) For the purpose of this paper it was important to find a company that has KM as a key component of their business, otherwise it would have been impractical to investigate the success of a KMS without one present. The companies within the consulting industry rely heavily on knowledge, and in order to deal with the massive flows of knowledge they have developed extensive Knowledge Management Systems (Hansen et al, 1999). Therefore we considered most of the leading consulting firms with activities in Sweden for our case study, and purposely chose one based in Jönköping, because they were willing to support our research effort. The company is in the service sector with a heavy focus on managing knowledge, it furthermore is one of the most respected consulting firms in Sweden. Through an acquaintance in the Jönköping office, we established contact with Daniel Janson, who was responsible for students cooperating with the company at that time, and who aided us in the initial design of the questionnaire and its distribution. The well established use of KM in the consulting company allowed us to investigate its KMS's success as a *typical case study* for a KMS in a company very reliant on KM. Seawright and Gerring (2008) describe a *typical case study* as a case that is a typical example of some cross-case relations. Observing how the model works within the consulting company for our case allows us to make limited generalizations for other companies with similar KMS and KM approach, mainly other consulting agencies.

Yin (2003) compares the design of the case research to a blueprint that needs to be carefully constructed in order to be able to achieve the goal of your research. It is necessary to have an unambiguous and transparent case study design before collecting data, in order to achieve high validity for a case study. Yin (2003) identified five components that are especially important to consider when conducting a case study. Yin's (2003) components creating the foundation of this case study are the following:

- *The study questions & propositions*
  Our study questions and propositions are closely related, the main question is the purpose, but at the same time the presented hypotheses act as questions and propositions simultaneously. The case study was the direct result of the need to fulfil the purpose and test the hypotheses in a meaningful manner, furthermore the purpose and hypotheses guided the design of the survey and data analysis.

- *The unit(s) of analysis*
  In order to be able to fill out the questionnaire and contribute to this research the unit of analysis needed to be in contact with a KMS. Consequently in this case study the employees of the consulting company, who worked with the company's KMS were found the most useful unit of analysis.

- *The logic links between the data and propositions*
  This logic link is fulfilled by the employees contact with the company's KMS, and in order to make sure the data really measured KMS success. The literature review delivered the theoretical foundation of the survey and aided in the processes of analyzing the data and drawing conclusions from the results.

- *The criteria for interpreting the findings*
  The criteria for interpreting the findings are based on scientific articles in the knowledge management field, with an emphasis on DeLone & McLean's (1992, 2003) IS success model and Wu & Wang's (2006) model for KMS success.

3.3 Data collection

With the framework for the case study established, the next step was to collect data. In order to find out about the success of the consulting company's KMS we needed to collect primary data by asking the employees questions regarding their perception of the KMS. The most suitable and common way to do this when pursuing a quantitative approach is to conduct a survey (Davidsson, 1997; Sekaran, 2003). Since there we decided to use the same dimensions as Wu & Wang's (2006) model it was deemed necessary to replicate their method of data collection, to investigate the correlations between the dimensions. The logical conclusion was the adoption of Wu & Wang's (2006) survey's questions, in order to achieve a certain comparability and improve this study's validity with tested measures. The survey was distributed among the employees at the consulting company's Jönköping office by the student coordinator David. During the process of conducting this survey we adhered to the 14 stages mentioned by Thomas (2004) (see Figure 3-1) to improve the quality of our data.

1) Define population
2) Obtain/construct sampling frame
3) Decide sample size
4) Choose sampling method
5) Define survey content
6) Decide method(s) of delivery
7) Design survey instruments
8) Design incentives
9) Conduct pilot study
10) Amend survey methods
11) Deliver survey
12) Edit responses
13) Analyse and interpret results
14) Prepare presentation and feedback

3.3.1 Sampling

The sample and population was directly derived from the circumstances and purpose of this study, resulting in the use of a purposive sampling method (Sekaran, 2003). This means that the case study approach limited the population to the employees at the consulting company, who were using the KMS, because only they can answer questions related to the KMS utilized at the consulting company. Therefore the elements, single member of the population (Sekaran, 2003), in our study are all the employees, who are using the company's KMS. Three employees, two at the Jönköping office and another one at an office in Gothenburg were responsible for the distribution and collection of the survey at the consulting company. The creation of the population frame, was left up to them, since they could make educated guesses, which employees had relevant contact with the KMS, and the time to answer the survey.

Out of the 30 responses forwarded to us, five had to be dropped because of missing values, which left a final sample size of 25 responses out of a total workforce of more than 330 employees (specific number was not obtainable), which results in a response rate lower than 10%, this is below the recommended value of 30% (Neuman, 2006, p. 162), however he also mentions that it depends on the accuracy required and the degree of heterogeneity in the population, and all subjects use the same KMS in a similar environment, facing similar problems the small sample can still be used to investigate trends. Additionally the model used for the analysis is based on established research findings, which diminishes the need for a large sample to do a factor analysis to create a model, but rather allows to explore the correlations between the different KMS success dimensions of Wu & Wang's (2006) model in a smaller sample.

3.3.2 Survey Design & Distribution

A questionnaire is a very effective method to collect data, when the variables and the area of interest are already known and defined by the researcher (Sekaran, 2003). Hence a questionnaire was the best way to collect data for this case study, Wu & Wang (2006) used a questionnaire in their research, which made a survey the imperative in order to create a comparable study. The design of this survey is trying to explore the correlations between the dimensions of Wu & Wang's (2006) model at a consulting company in Sweden, therefore it is an inferential survey (Easterby-Smith, Thorpe & Jackson, 2008). When designing the survey it was important to make sure it could measure the right dimensions separately and allow a subsequent analysis of the correlation between the measured dimensions. In order to ensure proper measurement we relied on the approach of Wu & Wang (2006) and used the same questions as their survey, thus the following description of the measurement items used in Wu & Wang's (2006) survey is also true for the survey employed for this study, with the difference that the items were used twice to measure KMS success for personalization as well as codification tools.

1. **Independent variables**

The independent variables describe the left/technological side of Wu & Wang's (2006) model. Their measurement builds on research assessing the validity of IS success models by Rai, Lang, & Welker (2002) (cited in Wu & Wang, 2006, p. 732) and an 11-item instrument for measuring the context and linkage quality of a KMS developed by Wu & Wang (2006). In summary the instrument looks at the technical qualities of the KMS by investigating *System Quality* and *Knowledge or Information Quality*. All the items of these measures are shown in Appendix 1.

2. **Dependent variables**

The right/human side of Wu & Wang's (2006) model consists of the three dimensions *Perceived KMS Benefits, User Satisfaction*, & *System Use,* which were adopted for the use in this research's survey. *User Satisfaction* is based on a four-item instrument conceived by Seddon & Kiew (1994). *Perceived KMS Benefits* is based on five items developed by Wu & Wang (2006) measuring soft and non-financial indicators of KMS benefits for the system's users. The last dimension to measure is *System Use*, which measures passive use, which corresponds to knowledge retrieval, as well as active use of a KMS, which corresponds to knowledge sharing (Wu & Wang, 2006). During a confirmatory factor analysis Wu & Wang (2006) found these two measures to collapse into one, which consists of five items based on Doll & Torkzadeh's (1988) research. The specific measurement items can be seen in Appendix 1.

Other measures included in the survey were gender, age, and tenure of the respondents, this was done for descriptive statistics purposes. Additionally almost a full page was used to explain the survey's purpose, structure, and clarify the two different knowledge management strategies. It proved to be a crucial addition to the survey, as an initial pilot test of the interview and communications with Daniel showed that codification and personalization were not widely known or used terms. The survey was first drafted in English and tested for its perspicuity by a contact at Earnest & Young, Stockholm. After slight adjustments to the questions the survey was forwarded to Daniel at the consulting company's office in Jönköping. He helped to refine the survey and improve its comprehensibility, furthermore he recommended to translate the description of the survey into Swedish to avoid any confusion. In accordance with his criticism the survey's introduction was translated and the final survey drafted.

The final survey used a self-completion approach (Thomas, 2004), relied on the design of our questionnaire for a high understandibility and the on-location availability of Daniel, Jessica Hermansson, and Malin Lyckert to maximize the response rate. All three are representatives for students, responsible for the communication with students to improve the cooperation between the consulting company and students. It is however not their sole job function, but rather a 2nd responsibility assigned to relatively new employees besides their main job, for example accountant. This 'insider administration' of the survey helped to introduce the survey and purpose as well as relevance and meaning of it to the employees, and increases its relevance for the respondents. It also allowed respondents to ask for clarifications on items of the questionnaire in case of problems in understanding, lastly the timely collection of the questionnaires was another advantage (Sekaran, 2003). The three student coordinators were contacted in person and informed of our thesis and the survey's purpose, it was clarified that only employees, who deal with the company's KMS are of interest to our survey. Consequently the questionnaire was distributed to staff which uses the company's KMS. This more focused distribution improved the validity of our data and ensured the reliability of the responses.

3.4 Reliability and Validity

3.4.1 Reliability

Reliability indicates the occurrence of random errors in a scale (Pallant, 2001). There are two indicators used for measuring reliability of a scale, the test-retest reliability and internal consistency (Pallant, 2001). The test-retest reliability checks the results of a scale after testing it on the same person on two different occasions (Pallant, 2001). This is impractical for our test though, as there will not be another occasion to distribute our questionnaire at the consulting company.

The second reliability indicator is internal consistency, which examines how well 'the items that make up the scale are all measuring the same underlying attribute.' (Pallant, 2001, p. 6) The most prevalent statistic used for this indicator is Cronbach's coefficient alpha, which calculates the average correlation between all items that make up a scale. It ranges from 0 to 1, with values closer to 1 signifying higher reliability. According to Nunnally (1978) a Cronbach alpha value above .7 indicates a reliable scale, with higher values being even better (cited in Pallant, 2001). Since the data is split into two sets, one for personalization and another for codification, the Cronbach's alpha for each dimension was examined separately.

Every dimension's Cronbach's alpha except for System Use's exceeded 0.7, thus exhibiting internal reliability, but for User Satisfaction we had to check the Cronbach's alpha without the item 'US2' since it was dropped by Wu & Wang (2006). Despite Cronbach's alpha being sufficient for User Satisfaction in this study, the item was dropped for comparability during the analysis of the data. This did not let User Satisfaction's Cronbach's alpha value drop below 0.7 though, and confirmed a remaining internal reliability of the scale (see table.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
US2	**12,2000**	**3,417**	**,821**	**,738**	**,836**

Table 3-1 Cronbach's Alpha US2 deleted (Personalization)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
US2	**11,4000**	**2,500**	**,849**	**,771**	**,806**

Table 3-2 Cronbach's Alpha US2 deleted (Codification)

System Use's Cronbach's alpha value however neither under codification nor personalization exceeds 0.7. Pallant (2001, p.98) mentions the mean inter-item correlation value as another measure, which can be used to judge a scale's reliability for scales with less than 10 items, which fail to pass the 0.7 mark in Cronbach's alpha. Since System Use consists of only five items we looked at the mean inter-item correlation for System Use under codification and personalization. The mean inter-item correlation should lie between .2 and .4 for a good scale (Briggs & Cheek, 1986), under personalization the value is 0.34 (see table 3-3) and thus acceptable, but under codification it only reached 0.285 (see table 3-4).

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	**,340**	**-,005**	**,898**	**,903**	**-175,473**	**,067**	**5**

Table 3-3 Inter-Item Correlation for System Use (Personalization)

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	**,250**	**-,041**	**,735**	**,776**	**-18,123**	**,067**	**5**

Table 3-4 Inter-Item Correlation for System Use (Codification)

For this case one can use the item-total correlation to check, which items correlate only weakly with the overall dimension, value less than 0.3 are considered low and 'indicate that the item is measuring something different from the scale as a whole.' (Pallant, 2001, p.98) It becomes clear that SU1 as well as SU2, which are the first and second question in the questionnaire under the heading System Use, do not correlate well with the other items of System Use (see table 3-5). However because the Cronbach's alpha value was more than 0.6 George & Mallery (2003, p.231) would consider it 'questionable', which means it should be investigated but could possibly still be used, in this case since the survey was based on Wu & Wang's (2006) items and for the purpose of comparability we decided to keep the item. Based on the item-total correlation values SU1 and SU2's fit with the System Use dimension should be investigated further in future studies.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SU1	**14,2800**	**5,293**	**,129**	**,059**	**,701**
SU2	**14,0800**	**5,577**	**,110**	**,093**	**,693**
SU3	**14,4000**	**3,917**	**,512**	**,425**	**,511**
SU4	**14,4800**	**3,677**	**,671**	**,638**	**,423**
SU5	**14,2800**	**4,043**	**,591**	**,544**	**,478**

Table 3-5 Item-Total Statistics (Codification)

3.4.2 Validity

Validity is a very important aspect of a scientific paper. If the research does not have a sufficient validity its scientific value is diminished (Thomas, 2004; Marczyk, DeMatteo, & Festinger, 2005). Furthermore a higher validity increases the accuracy of a study by minimizing the effects of outside factors (Marczyk, DeMatteo, & Festinger, 2005). The four kinds of validity are internal, external, construct and statistical validity, which have to be considered for a scientifically sound study (Marczyk, DeMatteo, & Festinger, 2005). The following section is looking at the threats to validity of this paper and how they were minimized.

Internal Validity

Internal validity deals with the exclusion of alternative explanations for the study's results, thereby showing that 'the independent variable was directly responsible for the effect on the dependent variable and, ultimately, for the results found in the study.' (Marczyk, DeMatteo, & Festinger, 2005, p. 159) A high internal validity strengthens a study's findings, because it supports the causation found by the researchers, and a low internal validity consequently threatens the research's findings validity. Factors which were not controlled in the research but could have influenced the end results are thus called threats to internal validity. The most common threats to internal validity are 'history, maturation, instrumentation, testing, statistical regression, selection biases, attrition, diffusion or imitation of treatment, and special treatment or reactions of controls.' (Marczyk, DeMatteo, & Festinger, 2005, p. 160) Researchers need to be aware of these, because at least some of them influence every methodological design (Marczyk, DeMatteo, & Festinger, 2005). Only instrumentation and selection biases were important for this study though, since it was carried out in a short time frame and was distributed to the consulting company's employees only once.

Instrumentation

Changes in how scales are used to measure certain items can lead to problems with instrumentation (Marczyk, DeMatteo, & Festinger, 2005). Over time scales can be challenged and changed, it is therefore important to consider standardization, reliability and validity of the instruments used for measurement. The effect of instrumentation can be limited, if a measure follows established guidelines for 'administration and scoring of an instrument or other assessment method' (Marczyk, DeMatteo, & Festinger, 2005, p. 164), assesses the item of interest consistently, and measures what it was intended to. The best way to do this is by using thoroughly tested and established measures. This study relied on Wu & Wang's (2006) model, which itself is an adaptation of the heavily peer reviewed IS success model from DeLone and McLean (2003). On the other hand it is a new model for measuring KMS success, and therefore not tested much, and there are no established models it can be compared to. As a result this study can be affected by instrumentation, but it tries to test Wu & Wang's (2006) KMS success model in a new context. Thus it tries to minimize the effects of instrumentation for the KMS success model (Wu & Wang, 2006).

Selection Biases

Selection biases can threaten internal validity, because samples lack randomization, which 'evenly distributes and equates groups on any potential confounding variables.' (Marczyk, DeMatteo, & Festinger, 2005, p.169) This study looks at the employees of a consulting company, who are using their KMS, which is a purposive sampling method. This was necessary, as only those employees, who use the KMS can give meaningful answers to the questionnaire. The real threat to internal validity is the selection of one consulting company as a case, when comparing the study results to Wu & Wang's (2006) or trying to generalize them. The problem of generalizations is generally associated with case studies (Easterby-Smith et al, 2008). Additionally the consulting company of this case study might have uncontrollable factors influencing the employees, which cannot be accounted for, but influence the research results. For our purpose it is however important to note, that the model is used mainly to investigate how the different dimensions of Wu & Wang's (2006) model are correlated in a specific context. As a result in order for the model to be useful to test KMS success in companies, it needs to applicable in different contexts, without a selection bias influencing the actual construct too much.

External Validity

'External validity is concerned with the generalizability of the results of a research study,' (Marczyk, DeMatteo, & Festinger, 2005, p. 174) 'it refers to conclusions that can be drawn about the strength of the inferred causal relationship between the independent and dependent variables to circumstances beyond those experimentally studied.' (Marczyk, DeMatteo, & Festinger, 2005, p. 176) Hence the higher the external validity is the better the results can be generalized to other or broader contexts. Just like with internal validity there are multiple threats to external validity, these are investigated with regard to this study in the following section. The four threats to external validity for this study are: sample characteristics, stimulus characteristics and settings, reactivity of the experimental arrangements, and timing of assessment and measurement.

Sample Characteristics

The threat of 'sample characteristics' becomes an issue when it is unclear if conclusions about one sample can or cannot be applied to another (Marczyk, DeMatteo, & Festinger, 2005). In this test this is definitely an issue, as the research is based on a case study, however the purpose is specifically aimed at only testing the model in one specific context. For that purpose the paper has no issues with *sample characteristics,* as the employees at the consulting company have a rather low level of heterogeneity and the KMS is the same for all of them, and because the purpose is not to generalize the results for other companies in different industries. The results could however be an indicator for correlations between Wu & Wang's (2006) dimensions among consulting companies.

Stimulus Characteristics and Settings

The researchers and setting of research is unique for every such effort, it can therefore lead to specific factors that are unique to the context of a research and influence it, and as a result make it harder to replicate the study in a meaningful way (Marczyk, DeMatteo, & Festinger, 2005). This is a threat to external validity which can hardly be avoided, but should rather be paid close attention to, as it can help explain specific phenomena as well. In this study's case there are specific factors associated with the KMS at our case study's consulting company, the way the KMS is implemented there and how employees interact with it are most certainly rather unique, when compared to other companies. If Wu & Wang's (2006) KMS success model is useful for analyzing the success of a KMS in a company it will be either adaptable to unique factors in different organizations or simply be unfazed by these unique characteristics, as it would automatically adjust for them. It also helps if the person using the model has experience with it, and knows how to deal with and compensate for factors, which could possibly skew the results.

Reactivity of the Experimental Arrangements

The issue of *reactivity of the experimental arrangements* is a big threat to validity for many studies, as respondents often have to be informed that they are taking part in a study and what the study tried to achieve (Marczyk, DeMatteo, & Festinger, 2005). This information can however influence the behaviour of participants, thus changing the results of a study, which would have looked differently had the participants not known about their participation in it or its hypothesis (Marczyk, DeMatteo, & Festinger, 2005). The respondents to this study also had to be informed about the purpose and goals of the research, especially since they needed specific information beforehand in order to be able to give educated answers and understand the meanings of specific terms like *codification* and *personalization*.

A way to avoid this issue would be to refrain from using specific terms and create a survey, which focuses on specific KMS tools, and distribute it to more employees of the company on an international scale. That way no explanations would be necessary, but the workload and time frame of the study would be increased tremendously making it only feasible with sufficient time and funding allotted. On the other hand it seems unlikely that the knowledge about this study's purpose can have any influencing effect on the participants, as it does not encourage different answers other than honest ones about people's usage patterns concerning the KMS in this case study.

Timing of Assessment and Measurement

This form of threat to external validity is relatively prevalent in longitudinal studies (Marczyk, DeMatteo, & Festinger, 2005). It 'refers to the question of whether the same results would have been obtained if measurement had occurred at a different point in time.' (Marczyk, DeMatteo, & Festinger, 2005, p.188) For this study it is important to notice that this is not necessarily a threat to external validity, because the success of a KMS model may very well change over time. As long as the model itself does not change over time it is however no problem. Since our study is only conducted once, there is no way of checking whether or not time would change the way the dimensions of the model are related. It would be necessary in future research efforts, or the company's continuous efforts to check on their KMS's success to validate the model regularly.

Construct Validity

'[C]onstruct validity asks the question of whether the theory supported by the findings provides the best available explanation of the results.' (Marczyk, DeMatteo, & Festinger, 2005, p.188) This is important particularly for this paper's purpose, as it tries to validate the correlation between dimensions influencing KMS success to Wu & Wang's (2006) model. Clearly defining and investigating the variables in a study and using theories with 'a strong conceptual basis … based on well-validated constructs' (Marczyk, DeMatteo, & Festinger, 2005, p.190) helps to ensure construct validity. In this case the model of DeLone & McLean (1992) is the relatively new but well-validated construct used for Wu & Wang's (2006) model. Their research also helped Wu & Wang (2006) to accurately describe the variables influencing their model. This paper aims to further solidify Wu & Wang's (2006) effort to use the IS success model (DeLone & McLean, 1992, 2003) for measuring the benefits achieved with a KMS through a quantitative approach.

Statistical Validity

Statistical validity basically deals with the accuracy of quantitative methods used to analyse the data and the resulting conclusions about relationships between variables (Marczyk, DeMatteo, & Festinger, 2005). Statistical analysis is a notable part of this thesis and Wu & Wang's (2006) paper, that is why statistical validity is of particular interest and we paid close attention to avoid the six common threats to statistical validity.

Low Statistical Power

This most common threat to statistical validity comes from small sample sizes (Marczyk, DeMatteo, & Festinger, 2005). This can lead to a researcher missing significant relations between variables or other effects, which do exist but are not shown in the small sample (Marczyk, DeMatteo, & Festinger, 2005). The sample size of 25 respondents of this study definitely means that this is a big threat. According to Stevens (1996) there should be at least 15 subjects for each predictor used in the multiple regression analysis of data (cited in Pallant, 2001). In the case of this study this would entail a minimum of 30 valid responses to reach a good generalizability of the multiple regression analysis's results. Due to low response rate and the decision to drop 5 responses, because of missing values this could however not be achieved. The implications of this are further discussed under section 1.4 Research Limitations.

Unreliability of Measures

Unreliability of measures 'refers to whether the measures used in the study assess the characteristics of interest in a consistent–or reliable–fashion.' (Marczyk, DeMatteo, & Festinger, 2005). This issue of using unreliable and not thoroughly tested measures is related to *instrumentation*. The peer reviewed IS success model from DeLone and McLean (2003), which Wu & Wang (2006) used as the basis for their model, adds validity to the measures used in our questionnaire, particularly since the measures used in DeLone and McLean's (1992) model came from established communications research (Shannon and Weaver, 1949; Mason, 1978).

4 Results & Data Analysis

4.1 Pre-Survey Interview

Matthias the manager responsible for KM at the consulting company in Sweden, agreed to an interview outlining the overall approach the company has for KM. This interview was also used to identify the specific tools present at the consulting company, which later on where used in the survey to clarify the difference between personalization and codification. He describes their KM as something that is integrated with the overall strategy of the company. When asked about the two different KM strategies of personalization and codification he described the consulting company's approach as pluralistic, without a printed explicit KM strategy, but rather a versatile KM approach that is spread throughout the firm and present in their business plan. In summary this KM approach can be divided in to three important steps.

- Simplifying the search for information, individuals, experience and knowledge. Looking at how you can make it easier to find and be found throughout the structure and support systems. This is something the consulting company has worked with in order to have it as an ongoing strategy.
- Creating corporate knowledge culture where people participate actively in the knowledge flow. This is being done cross divisions and nations at the consulting company, through communities of practice and what is called centres of excellence. These are forums where employees are inclined to knowledge exchange and personal communication.
- Identify and put extra emphasis to the kind of knowledge that they see as their unique selling point. This means working with high quality distinctive knowledge that can help them provide new insights to their clients.

He went on to explain that the company had no direct incentives in place to encourage the use of their KMS, but believes that networking, the chance to participate in interesting projects, and a more positive outlook for promotions act as driving factors. Additionally training programs are conducted to help employees in properly utilizing the KMS. There are also barriers, which need to be overcome:

- Geographical distance
- Employees are working in teams that focus on one thing in particular
- People don't move and integrate cross divisions as much as desired

The company tries to overcome these barriers through job rotations, and closer cooperation across different divisions. Another important barrier mentioned was the ability to codify contextual knowledge, and really extract valuable knowledge from employees where possible, this separation of knowledge from its origin and sharing it across the company and different generations is currently the biggest obstacle, for knowledge sharing at the company.

4.2 Descriptive statistics

25 valid questionnaires were returned, with 17 coming from the Jönköping office and 8 from the Gothenburg office. The answers were split relatively evenly among men and women, with 13 women and 12 men having answered the questionnaire. The average age of the respondents was 29, the youngest being 24 and the oldest 45 years old. The shortest tenure observed among the respondents was 2 months and the longest one was 243 months, the average tenure was 45.4 months, since all respondents are users of the company's KMS, everyone except for one had at least 1 year of experience with it. A complete summary of the demographics can be found under Appendix 3. There was no significant difference found between the answers between males and females, or when dividing the sample by a tenure of 1-24 and 25+ months. The decision to divide tenure that way comes from the influence of tenure on employee productivity. Lichtenberg (1981) discovered that workers with a tenure of 0-6 months were only 24% as productive as workers with a tenure of more than two years, and between 7-24 months productivity increased to 65% (cited in Auer, Berg & Coulibaly, 2004). And since only one employee had less than 6 months tenure, but no significant difference between his results and the other respondents, we collapsed the 0-6 months and 7-24 months of tenure range together. When separating the respondents into three age groups from 18-24 years, 25-34 years, and 35-49 years, it was not possible to find any difference between the means for each dimension larger or equal to 1, furthermore the respondents age is concentrated between 25-34, with only two respondents in the other age groups respectively. In summary neither gender, nor age or tenure seem to have a significant impact on the dimensions of KMS success, the following sections look at the specific results for each dimension under personalization and codification.

4.2.1 System Quality

Question one to four of the survey (SQ1-SQ4) deal with System Quality, which is as earlier, mentioned a very important measure for a KMS success. The questions concern ease of use, user-friendliness, stability and response time of the KMS, thus representing overall System Quality. A system that is not user-friendly and/or adapted to its purpose will lead to low adaptation and suboptimal usefulness. This makes the System Quality dimension important for measuring KMS success.

The mean individual responses for question one to four are summarized in figure 4-1 and 4-2. The overall mean for the dimension is 3.88 for personalization, and 3.82 for codification, as indicated in the graphs by the black line. The figures report a perception of good System Quality, slightly higher for personalization than codification. All questions received answers higher or equal to three, with only two respondents rating the response time of the system as low as 2.

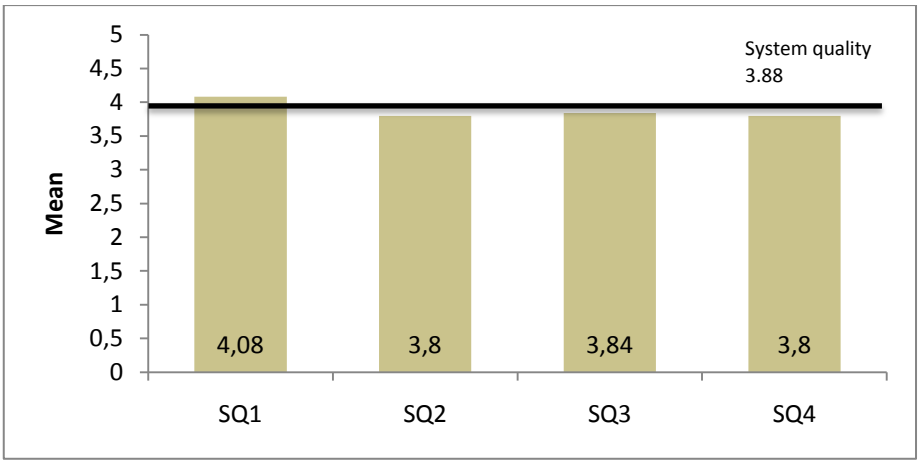


Figure 4-1 System Quality (Personalization)

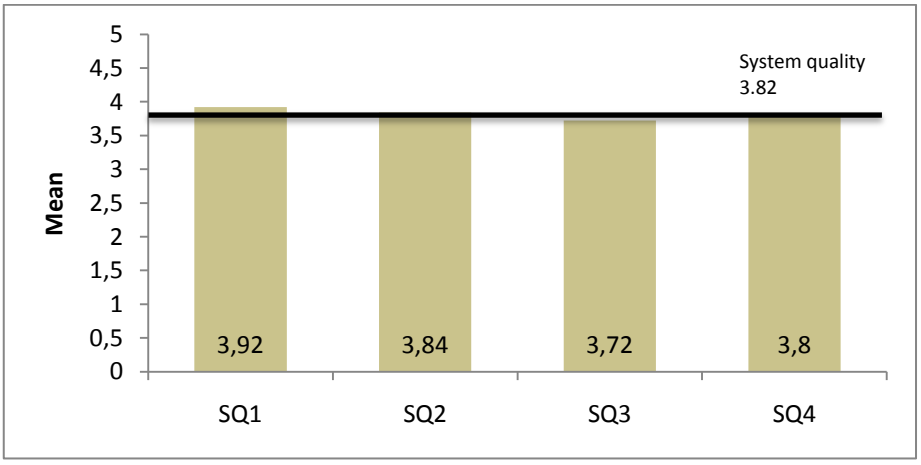


Figure 4-2 System Quality (Codification)

4.2.2 Knowledge or Information Quality

Question 5 to 15 of the survey deal with Knowledge or Information Quality. These questions do not only look at the quality of the available material in the KMS, but also at the context and linkage quality. Both issues are very important, since a higher quality and more useful information/knowledge improve the usefulness of the KMS. This dimension is therefore a cornerstone of the KMS success model.

The overall mean value for the responses to the questions in the dimension was very similar for personalization and codification, as can be seen in figure 4-3 and 4-4. The mean value was 3.73 for personalization, and 3.86 for codification. The results suggest a reasonably high employee satisfaction of the knowledge quality and linkage ability of the KMS.

In particular KIQ5 and KIQ6 are rated very positively, with both values being well above the mean, this means employees find the information provided helpful as well as understandable, which is a crucial purpose of any KMS.

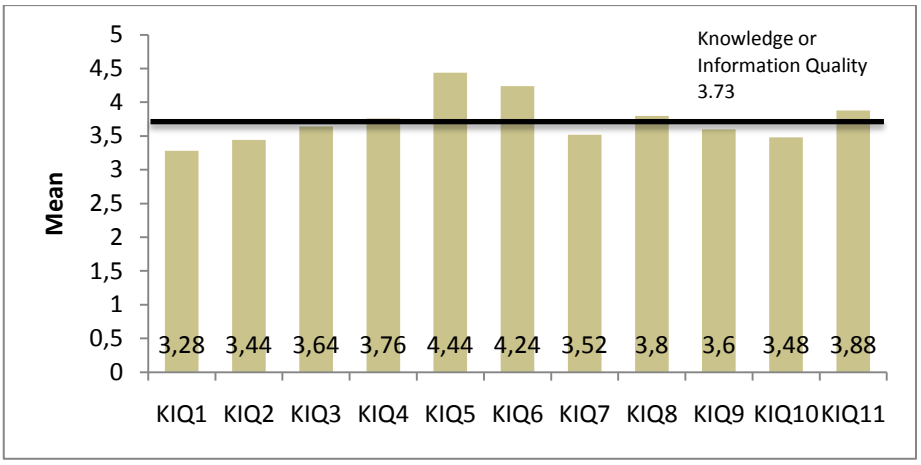


Figure 4-3 Knowledge or Information Quality (Personalization)

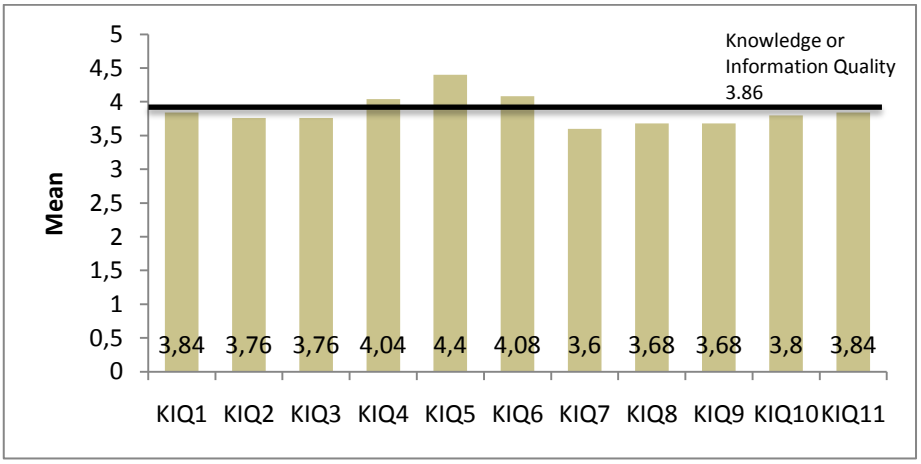


Figure 4-4 Knowledge or Information Quality (Codification)

4.2.3 User Satisfaction

User Satisfaction of a KMS has a significant influence on the overall success of a KMS. User Satisfaction has been previously used as a measure for KMS success, and shows how well a KMS is received by its users. Question 16 to 19 in the survey measure this dimension, and ask about how well the KMS is fulfilling its purpose, satisfaction with the KMS's efficiency and effectiveness, as well as overall satisfaction with the KMS.

The respondents expressed a strong user satisfaction of the KMS personalization tools. The mean value was 3.98, a little bit higher than the 3.86 mean value of the codification tools (see figure 4-5 & 4-6). Additionally only one respondent rated items in User Satisfaction with two, all other answers were equal to or above three, leading us to believe that the overall satisfaction with the consulting company's KMS is good.

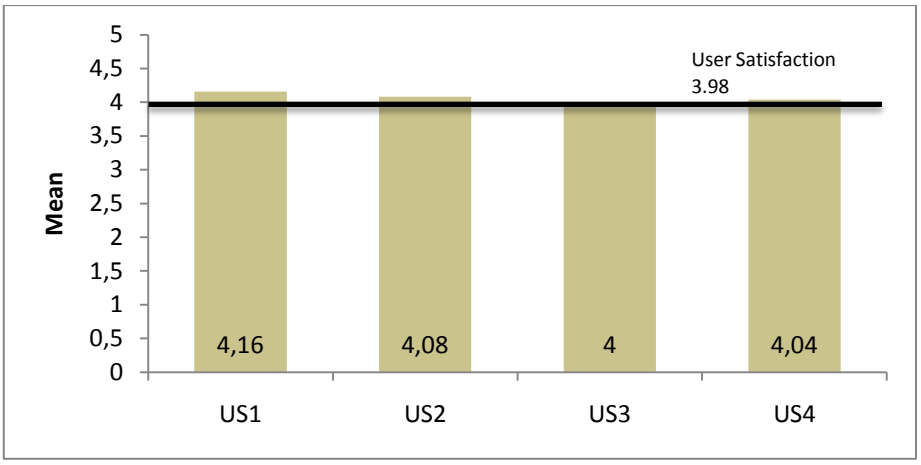


Figure 4-5 User Satisfaction (Personalization)

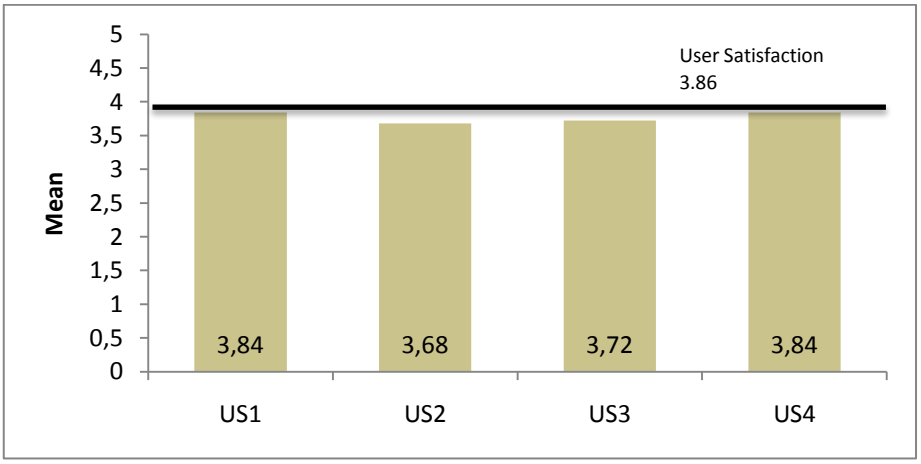


Figure 4-6 User Satisfaction (Codification)

4.2.4 Perceived KMS Benefits

Question 20 to 24 look at benefits of the KMS, which users think they receive from it. The dimension is important since it covers both individual benefits, but also the improved job satisfaction and productivity assumed to be caused by it. The respondents continue to show a positive perception of the benefits received from personalization tools with a mean of 4.07 and a slightly lower positive perception of codification tools at 3.8 (figure 4-7 & 4-8). This time however four respondents gave values lower than two, with two respondents rating more than one item with '2' or less, rating the KMS benefits as not good, the distribution looks as follows:

This can indicate problems these people have with using the KMS, or a mismatch between their needs of the KMS and its offerings. Since question 1 under perceived KMS Benefits in the questionnaire received more negative ratings, this could reveal that the system does not support the creation of knowledge.

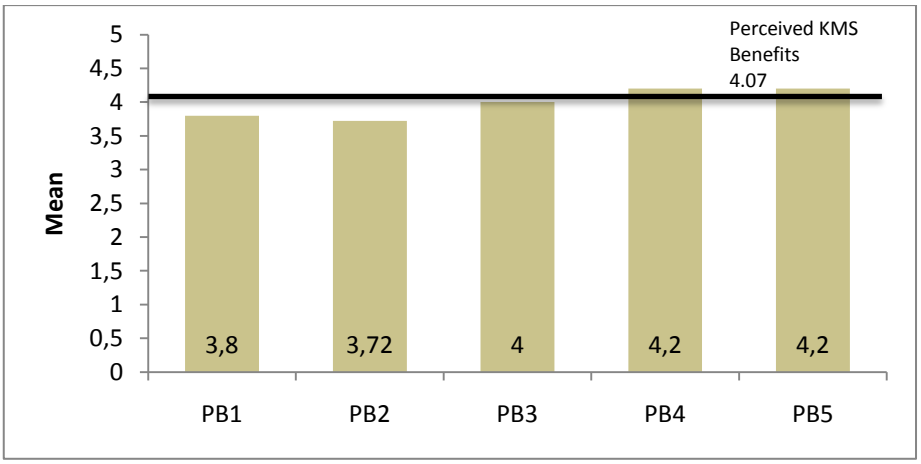


Figure 4-7 Perceived KMS Benefits (Personalization)

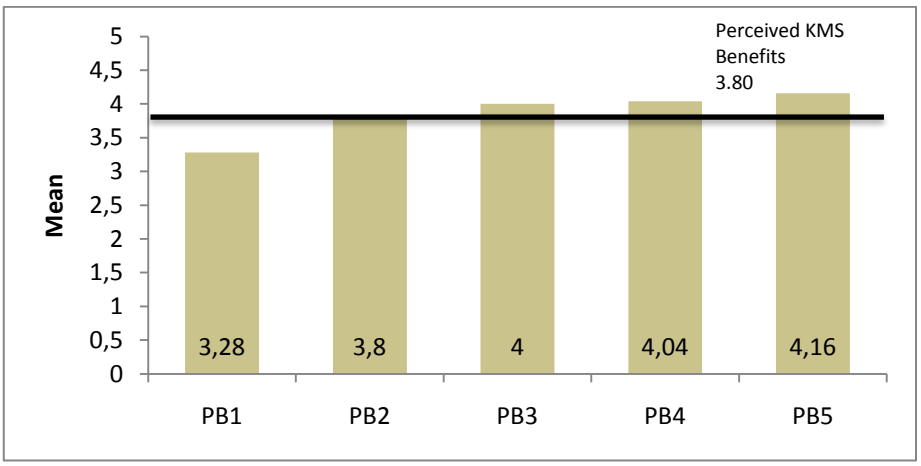


Figure 4-8 Perceived KMS Benefits (Codification)

4.2.5 System Use

The System Use dimension includes measurements that are needed in order to see how the KMS is being used qualitatively. The questions concern the purpose of the usage in order to get an accurate measure of the system use, as discussed in the theoretical framework. The mean value for the responses to the questions concerning system use of the KMS personalization tools was high for this dimension as well. The results show a high purposeful usage of the personalization tools, with 4.03 as a mean value (figure 4-9). The mean value of 3.58 for the responses relating to the codification tools suggests a somewhat lower qualitative use of these tools to achieve goals or solve problems at work (figure 4-10).

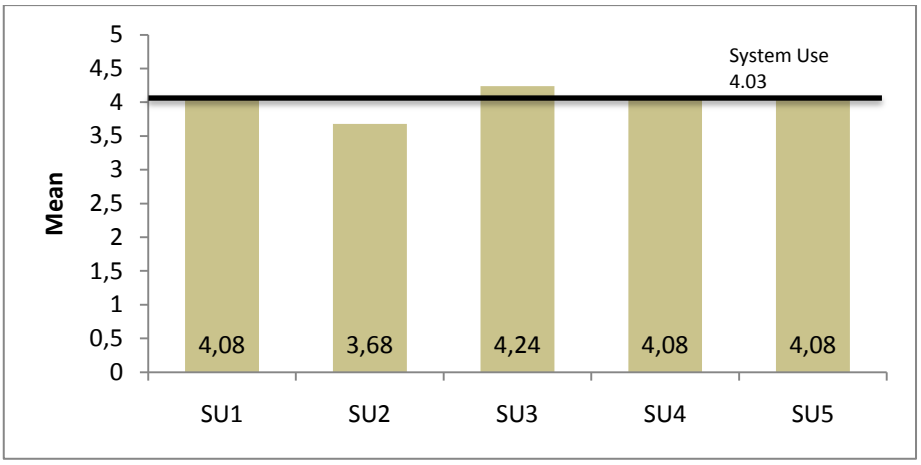


Figure 4-9 System Use (Personalization)

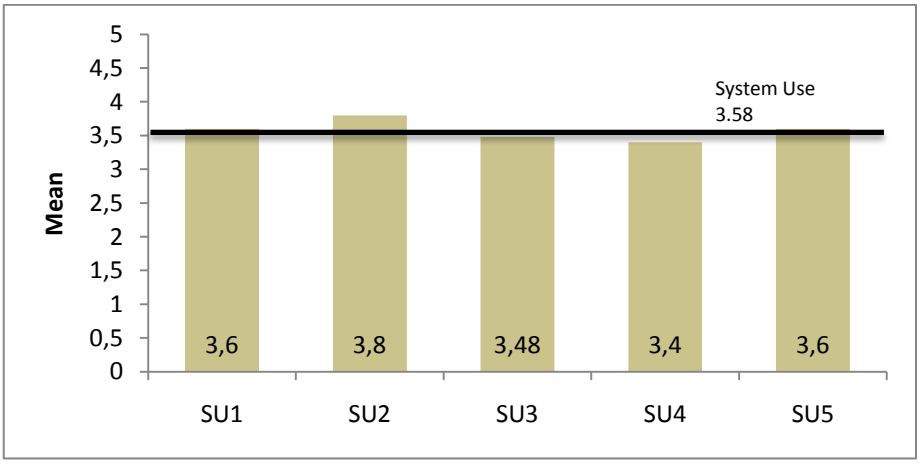


Figure 4-10 System Use (Codification)

4.2.6 Discussion

All the dimensions measured exhibit values higher than 3, illustrating a good KMS system for personalization as well as codification strategies, despite this positive result there is much room for improvement. Only for Perceived KMS Benefits as well as System Use does the mean exceed 4, and only for personalization. This focus shows how effective the networking offers and cooperation initiatives between departments are for the personalization strategy, it also means codification tools should not be underestimated. Once the knowledge is available and easily accessible in the KMS, it can be reused and adapted for new challenges, with less time needed to invest compared to having to completely compile/generate the knowledge from scratch. The general positive rating for the KMS success dimensions means the consulting company is benefiting from the use of its KMS, but continuous future efforts and the success of the recent focus on knowledge management in the company are needed to improve the KMS success. In Wu & wang's (2006) model Perceived KMS Benefits is used for judging overall KMS success, and with a value of 4.07 for personalization and 3.8 for codification, it becomes apparent that the consulting company's KMS is successful, more for the personalization strategy than codification.

Despite this positive result it can be seen that the KMS needs improvements particularly to help 'acquire new knowledge and innovative ideas' (Survey 'Perceived KMS Benefits' question 1) and 'effectively manage and store knowledge that I need.' (Survey 'Perceived KMS Benefits' question 2), because those two questions received the lowest ratings for Perceived KMS Benefits.

4.3 Standard Multiple Regression

The investigation of the correlations between the five dimensions of the KMS success model was conducted using three standard multiple regressions with the PASW17 (former SPSS). This revealed the standardized coefficients (β) between the dimensions, which can be compared to Wu & Wang's (2006) results. However some β values cannot be investigated for the sake of keeping the model recursive, which is necessary to conduct the multiple regression analyses. This means that all causal relations between the variables are flowing only one direction, without reciprocal effects or feedback loops (Lleras, 2005). These β values are the ones between Perceived KMS Benefits and User Satisfaction and the one going from System Use to Perceived KMS Benefits, the other correlations were tested using three multiple regressions. The results can be seen in figure 4-11 & 4-12 showing Wu & Wang's (2006) model, but with the β values obtained through the dataset from our case, and the full output generated by PASW17 can be found in Appendix 4. Furthermore using the results from the analyses it was possible to add other correlation measures, for examining the correlations between the dimensions. The three multiple regressions conducted are the following:

	Dependent Variable	Independent Variable(s)
1	Perceived KMS Benefits	System Quality & Information or Knowledge Quality
2	User Satisfaction	System Quality & Information or Knowledge Quality
3	System Use	Perceived KMS Benefits & User Satisfaction

4.3.1 Results

For each multiple regression we first checked the results for multicollinearity and the correlations present between the variables. Multicollinearity exists when the independent variables are highly interrelated, which can indicate problems with the model being used and should lead to a discussion about how the variables are defined (Pallant, 2001). Multicollinearity was investigated by looking at the correlations between the independent variables, if the value exceeded 0.7 they are highly interrelated (Pallant, 2001), then tolerance values were investigated to check for problems with multicollinearity. 'Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model' (Pallant, 2001, 156). If the value of tolerance is less than 0.10 it can indicate multicollinearity.

Both measures together can reveal problems with the correlations between the independent variables, however in this case they were not used to drop independent variables from the model, or change the model, but exclusively to look for problems with the model. Those problems are further discussed in section 4.3.2. Additionally the correlation matrix is used to check for the correlation between an independent and dependent variable, if the value of a correlation is below 0.3, then there is no or only a weak correlation present. Therefore correlations lower than 0.3 are considered not significant.

The next step in the analysis of the multiple regression's result is to evaluate the model, since the calculations of the model were done through three multiple regressions, the full model is divided into three parts. This means the evaluation will actually show how well parts of the model are describing the data, this is particularly interesting since Wu & Wang (2006, p.731) argued for their model containing a technological (left part of the model) as well as human side (right part of the model). The first measure is Adjusted R Square, which shows how much of the variance in the dependent variable is explained by the model and it corrects R square, for small sample sizes, to 'provide a better estimate of the true population value' (Pallant, 2001, p.158), a higher value approaching 1 indicates a better model. That means adjusted R square can be used as an indicator for the variance caused by the independent variables uniquely and shared (Pallant, 2001). As a result the shared contribution of the independent variables can be particularly high if the correlation between them is high. Furthermore the statistical significance of the results has to be tested by checking 'Sig.' in the ANOVA table provided as part of PASW17's output, this value has to be lower than 0.05 to reach statistical significance.

The third step in the multiple regression analysis concerns the β values for the independent variables. These are found under 'Standardised Coefficients' in the PASW17 output. Only when using the standardised coefficients can the β values for the different independent variables compared, since they are then converted to the same scale (Pallant, 2001). The β value basically shows how much each independent variable contributes to the change in the dependent variable (Pallant, 2001). It is important to check the Sig. value for each β value as well, to see if 'the variable is making a statistically significant unique contribution to the equation.' (Pallant, 2001, p. 159) A value of less than 0.05 indicates it did not make a unique contribution, which could be caused by an overlap with other independent variables (Pallant, 2001), this is useful especially when the correlation between the independent variables was found to be high. Another important measure to look at the influence of the independent variables on the dependent variable is the 'Part correlation coefficient' (Pallant, 2001). When the part correlation coefficient is squared it shows how much of dependent variable's variance is caused by an independent one (Pallant, 2001).

4.3.1.1 Perceived KMS Benefits

Personalization

The correlations between System Quality & Knowledge or Information Quality and Perceived KMS Benefits are both higher than 0.3 indicating a relation between the independent variables and the dependent variable. However, System Quality and Knowledge or Information Quality are also highly interrelated, with a correlation exceeding 0.7, but the tolerance is above 0.1. With an adjusted R^2 of 0.43 a large part of the variance in Perceived KMS Benefits is explained by the independent variables, and with a β value of 0.58 and sig. of 0.02 Knowledge or Information Quality is the main unique contributor to Perceived KMS Benefits.

The part correlation coefficient squared shows, that it explains 17% in the variance of the dependent variable. System Quality however fails to reach a statistically significant contribution to Perceived KMS Benefits, as can be seen by a sig of 0.53, which is higher than 0.5 and a part correlation squared of only 0.01.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
System Quality	0.56	0.72	0.49
Knowledge or Information Quality	0.69		

Table 4-1 Correlations (Personalization)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
System Quality	0.43	0.001	0.14	0.53	0.01
Knowledge or Information Quality			0.58	0.02	0.17

Table 4-2 Model Evaluation (Personalization)

Codification

Under Codification the only relevant correlation is between Knowledge or Information Quality and Perceived KMS Benefits. System Quality does not exceed a correlation with Perceived KMS Benefits of 0.3 and is consequently not significant. The correlation between the two independent variables does not exceed 0.7 under codification and is thus acceptable, the tolerance value does not drop below 0.1 either. The adjusted R^2 is relatively high at 0.43, and Knowledge or Information Quality's influence on it is really high, with a β value of 0.78 and a square part correlation coefficient of 0.44.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
System Quality	0.19	0.53	0.72
Knowledge or Information Quality	0.66		

Table 4-3 Correlations (Codification)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
System Quality	0.43	0.001	-0.22	0.24	0.04
Knowledge or Information Quality			0.78	0	0.44

Table 4-4 Model Evaluation (Codification)

H1: System Quality has a positive impact on Perceived KMS Benefits.

Hypothesis 1 has to be rejected for personalization as well as codification.

H3: Knowledge or Information Quality has a positive impact on Perceived KMS Benefits.

Hypothesis 3 is accepted, as Knowledge or Information Quality has a unique statistically significant influence on Perceived KMS Benefits under personalization and codification.

4.3.1.2 User Satisfaction

Personalization

For User Satisfaction both independent variables have a high correlation of 0.67 and 0.66 respectively, but they are highly interrelated as well, with a correlation of 0.72, which exceeds 0.7, and raises concerns of multicollinearity. Despite this high bivariate correlation the tolerance stays above 0.1. The problem of this high interrelation between the independent variables becomes apparent when looking at a relatively high adjusted R^2, followed by no statistically unique contribution to the variance in User Satisfaction by either independent variable. The Part correlation values below 0.1 support this point even further. In this case the β values are high at 0.4 for System Quality and 0.38 for Knowledge or Information Quality, and the direct influence of both independent variables on User Satisfaction is certainly there, but they are too interrelated to really make sense of the correlations between them and User Satisfaction.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
System Quality	0.67	0.72	0.49
Knowledge or Information Quality	0.66		

Table 4-5 Correlations (Personalization)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
System Quality	0.48	0	0.4	0.07	0.08
Knowledge or Information Quality			0.38	0.09	0.07

Table 4-6 Model Evaluation (Personalization)

Codification

The correlation between the independent variables and User Satisfaction is high at 0.6 each, and they are not as highly interrelated as under personalization, with a tolerance level well above 0.1. The adjusted R^2 shows a large influence of the independent variables on User Satisfaction, with 0.42. Additionally, both values have almost the same influence on User Satisfaction, with Knowledge or Information Quality taking a marginally higher influence as indicated by the slightly larger β and the square part correlation coefficient.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
System Quality	0.6	0.53	0.72
Knowledge or Information Quality	0.6		

Table 4-7 Correlations (Codification)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
System Quality	0.42	0.001	0.39	0.05	0.11
Knowledge or Information Quality			0.4	0.04	0.12

Table 4-8 Model Evaluation (Codification)

H2 System Quality has a positive impact on User Satisfaction.

H4: Knowledge or Information Quality has a positive impact on User Satisfaction.

Both hypotheses are accepted for personalization as well as codification, even though under personalization the clear distinction between the unique influence of System Quality and Knowledge or Information Quality on User Satisfaction cannot be made it is obvious, that they both have a major influence on User Satisfaction.

4.3.1.3 System Use

Personalization

The correlations between User Satisfaction & Perceived KMS Benefits are both relevant at 0.31 and 0.57 respectively, and both independent variables are not too interrelated at 0.63. The tolerance of 0.6 is an acceptable value as well, showing no obvious problems with multicollinearity. The adjusted R^2 is not that high with only 0.26, but the biggest influence on System Use is clearly caused by Perceived KMS Benefits, with a β of 0.62 and a squared part correlation of 0.23. User Satisfaction fails to reach a statistically significant unique contribution to the variance in System Use, shown by a Sig. of 0.72 for its β and a really low squared part correlation of 0.004.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
User Satisfaction	0.31	0.63	0.6
Perceived KMS Benefits	0.57		

Table 4-9 Correlations (Personalization)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
User Satisfaction	0.26	0.013	-0.08	0.72	0.004
Perceived KMS Benefits			0.62	0.01	0.23

Table 4-10 Model Evaluation (Personalization)

Codification

For codification the correlations are in principle the same as for personalization, albeit a bit weaker. The correlation between Perceived KMS Benefits and System Use is slightly lower than for personalization, and it is not as interrelated with User Satisfaction. The tolerance value is higher at 0.83. The adjusted R^2 is lower than for personalization and the β for Perceived KMS Benefits comes out at 0.45. The squared part correlation coefficient is lower for Perceived KMS Benefits as well, with only 0.17. Overall this indicates an influence of Perceived KMS Benefits on System Use, although it is lower than under personalization., and User Satisfaction does not make a statistically unique significant influence on System Use under codification.

Independent Variables	Correlation (Ind.+Dep.)	Correlation (Ind.+Ind.)	Tolerance
User Satisfaction	0.31	0.41	0.83
Perceived KMS Benefits	0.51		

Table 4-11 Correlations (Codification)

Independent Variables	Adjusted R^2	Sig.	β Value	Sig.	Part Correlation^2
User Satisfaction	0.2	0.03	0.13	0.53	0.01
Perceived KMS Benefits			0.45	0.03	0.17

Table 4-12 Model Evaluation (Codification)

H5: User Satisfaction has a positive impact on System Use.

This hypothesis has to be rejected for personalization as well as for codification There is no significant direct contribution of User Satisfaction on System Use.

H6: Perceived KMS Benefits has a strong correlation with User Satisfaction.

Even though we are not able to calculate a β value for this relation, as shown by the correlation between the two independent variables have a correlation higher than 0.3, under personalization it almost reaches 0.7, indicating a definite relationship between the two dimensions, therefore H6 is accepted for both knowledge management strategies.

H7: Perceived KMS Benefits has a positive impact on System Use.

We did find a correlation between these two dimensions, although it was not as strong as we had hoped for, but the hypothesis is still accepted for personalization and codification.

The following table summarizes the results for the hypotheses for codification and personalization respectively.

Hypothesis	Personalization	Codification
1	Reject	Reject
2	Accept	Accept
3	Accept	Accept
4	Accept	Accept
5	Reject	Reject
6	Accept	Accept
7	Accept	Accept

Table 4-13 Hypotheses Results

H8: The correlations between System Quality, Knowledge or Information Quality, Perceived KMS Benefits, User Satisfaction, and System Use are not the same for personalization and codification respectively.

The correlations for the codification strategy do exist for the personalization strategy as well (table 4-13), however, when looking at the specific relationships between the variables it becomes obvious that the quality of the relationships is not the same for codification and personalization. The overall model remains the same for both knowledge management strategies, but the strength of the correlations differs under each management strategy, as a result H8 has to be accepted.

5 Discussion

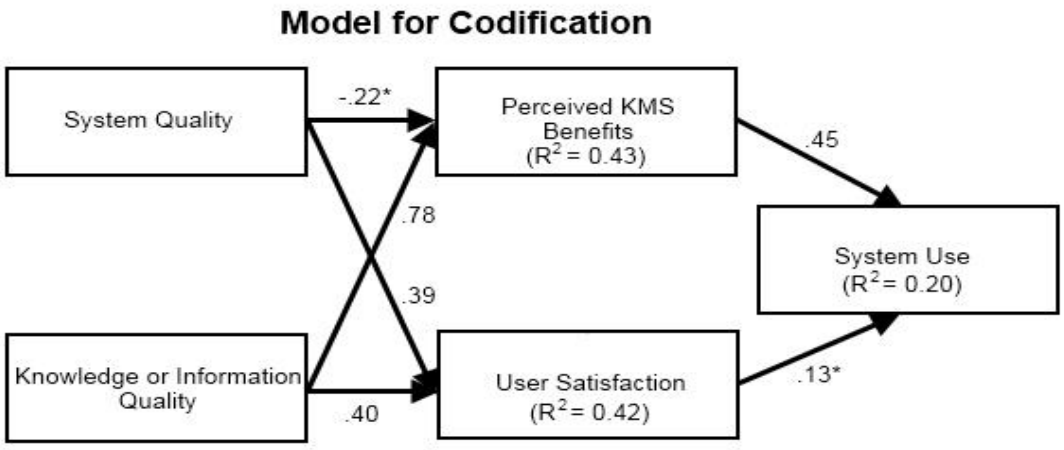


Figure 5-1 KMS Success Model (Codification)

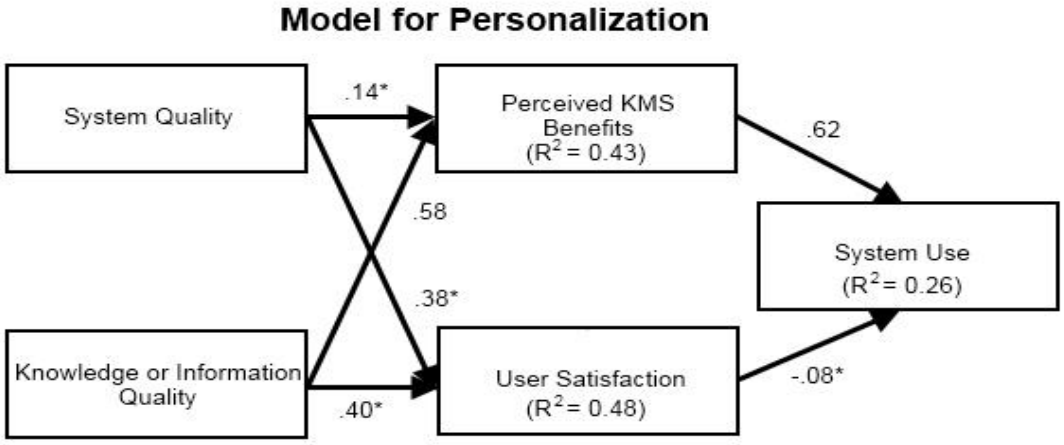


Figure 5-2 KMS Success Model (Personalization)

The focus of this thesis is to examine the correlations between the five dimensions of Wu & Wang's (2006) model in the context of a consulting company for two different knowledge management strategies. The result can be seen in the two models in figure 4-11 and 4-12. These models make it easier to compare the overall results with the results of Wu & Wang (2006). Leaving out the path from System Use to Perceived KMS Benefits and from Perceived KMS Benefits to User Satisfaction, the results from this study are similar to Wu and Wang's. We were however not able to reproduce the positive correlation between User Satisfaction and System Use. Despite the β values being different between the paths in the model for codification/personalization and Wu & Wang's (2006) the trends for the correlations are the same with exception of User Satisfaction and System Use. The adjusted R^2 values are high for Perceived KMS Benefits and User Satisfaction as well, again the big difference between Wu & Wang's (2006) results and ours are related to System Use.

Here the adjusted R^2 stayed below 0.3, whereas for Wu & Wang (2006) it is 0.6, this could indicate that in this case there might be other external factors influencing System Use, like training or incentives from management (Kulkarni et al, 2006). Another possibility is that the direct contribution of System Quality and Knowledge or Information Quality on System Use is rather significant. In the current model only a direct influence of the two is visualized, through Perceived KMS Benefits and User Satisfaction, but theoretically it makes sense to have this indirect relationship, because in order to improve the use of a system one needs a motivation(Krogh et al, 2001). System Quality and Knowledge or Information Quality by themselves are not motivational factors though, they need to result in benefits and/or satisfaction with the system for the user, only then will the user be interested in a quantitative as well as qualitative increase in the use of the system.

An interesting observation is the lack of correlation between System Quality and Perceived KMS Benefits, this was the case in Wu & Wang's (2006) and Kulkarni et al's (2006) study too. This dilemma does not exist in the original IS success model by DeLone & McLean (1992, 2003) or Halawi et al's (2007/2008) KMS success model. There the dimension System Use is in the position of Perceived KMS Benefits, but with that constellation there is no direct correlation between Knowledge or Information Quality and Perceived KMS Benefits possible, which seems to be rather strong though. System Quality still has an influence on System Use however, namely indirectly through User Satisfaction. This conclusion was supported by (M. Eklund, 2010-05-21) in the follow up interview, when asked about the small influence of System Quality on Perceived KMS Benefits. He also mentioned the correlation between System Quality and Knowledge or Information Quality, a good system can only get you so far, in order to benefit from it the contents is vital. This importance of the information contained within a KMS overshadows the importance of the System Quality, this does not mean it becomes unimportant however, as good knowledge is useless, if a bad System prevents users from finding and extracting knowledge. This explains the high correlation found between System Quality and Knowledge or Information Quality, and identifies System Quality to have more of a supporting and enhancing function for the relationships between Knowledge or Information Quality and Perceived KMS Benefits & User Satisfaction. This also explains why the correlation is higher for personalization than codification, because as (M. Eklund, 2010-05-21) pointed out: The complexity of tacit knowledge makes it harder to share, and thus the influence of a good system facilitating this exchange increases. (M. Eklund, 2010-05-21) furthermore emphasizes the importance of continuous efforts to uphold and improve System and Knowledge or Information Quality. Overall it seems no matter the knowledge management strategy the dimensions and their correlations remain, but the higher difficulty of dealing with tacit knowledge changes the influence of System Quality on the model.

Another observation which was supported by (M. Eklund, 2010-05-21) is the correlation between Perceived KMS Benefits and User Satisfaction, this relation has been observed in the consulting company as well, and demonstrates that users need to feel like the system is returning value to them. This makes perfect sense, since the users of a KMS have to invest time and effort in order to retrieve or input information, and if they do not see a return on their 'investment' it is unlikely they will continue with it, and rather focus their efforts in a way, which seems like a better 'return on investment'.

One more oddity of the model is the fact that User Satisfaction does not lead to System Use. This might seem puzzling at first, but on closer inspection it makes perfect sense. System Use for this model was not measure quantitatively but qualitatively, thus just because a user is satisfied will not result in a more extensive use of the KMS, without receiving benefits. A good system with useful information, might not lead to any benefits to solving the issues facing the user. Even though the user is satisfied with the system, there is no more that can be extracted from the system as the benefits do not increase. Once the user can gain more from the system, the system will be used more intensely, and the added benefits additionally result in an increase of User Satisfaction.

Besides looking at the correlations between the dimensions of KMS success our purpose was to look at the influence of personalization and codification on these correlations. The results indicate an insignificant difference between the correlations under personalization and codification. One reason for this could be the interrelatedness of the KMS tools in use at the consulting company. Since employees use both personalization as well as codification tools and both are integrated into the company's KMS both areas receive similar levels of attention, and thus the model shows that the KMS success model generally works for tools no matter the knowledge management strategy they are based on. Companies which do not focus on both knowledge management strategies and have a bias towards personalization or codification might change the correlations between the dimensions, since other factors like organizational support influence KMS success as well, as pointed out by Kulkarni et al (2006). It is also important to notice that there are differences in how high the tools were rated, with codification only being higher for Knowledge or Information Quality on average. This means it might still be important to look at the different KMS tools for each strategy separately, this division could however also be drawn based on other criteria, but it is clear that different tools, might have different areas where they are more successful, with our results we just found the model to still be applicable even if the type of knowledge strategy supported by the tool changes.

6 Conclusions

The purpose of this paper was to investigate the success of a consulting agency's KMS, examine the relationships between the factors constituting its KMS's success and explore possible effects of the knowledge management strategies codification and personalization on these correlations. Therefore a case study approach was chosen, and a survey distributed at a Swedish consulting company. A theoretical framework was shaped to explore the current field revolving around KMS success. During this process the KMS success model of Wu & Wang (2006) was adopted as the theoretical basis for this paper. The two different knowledge management strategies; personalization and codification were identified and in an interview connected with specific tools in use at the consulting company. After the model was determined, the survey was created using the same approach as Wu & Wang (2006), and distributed at two of the consulting company's offices in Sweden. The results of the survey were analyzed using standard multiple regression analysis, which lead to the discovery of the correlations between the KMS success model's dimensions.

The five dimensions were: *System Quality*, *Knowledge or Information Quality*, *Perceived KMS Benefits*, *User Satisfaction* and *System Use*. Positive correlations were found between *Knowledge or Information Quality* and *Perceived KMS Benefits & User Satisfaction*, *System Quality* and *User Satisfaction*, as well as between *Perceived KMS Benefits* and *System Use*. There was however no positive significant correlation between *System Quality* and *Perceived KMS Benefits*, and *User Satisfaction* and *System Use*. These correlations were found under personalization and codification respectively, but their strength varied for each knowledge management strategy. Therefore this study confirms the validity of Wu & Wang's (2006) KMS success model in a consulting company's context, in terms of the number of dimensions remaining constant, and its structure holding true with only a question raised as to the weak correlation between *User Satisfaction* and *System Use*. Furthermore we did not find any significant difference for the correlations of the KMS success dimensions under personalization and codification. Another result from the research is that the KMS at the consulting company is received positively by the employees, but can be improved by increasing the information of contents and adding to the perceived benefits. This is the concern of the company too, which recently started to focus on knowledge management and strives to improve the usefulness of their KMS for their employees.

The purpose of this paper to investigate the success of a consulting agency's KMS and examine the relationships between the factors constituting to its success, and explore possible effects of the knowledge management strategies codification and personalization on these correlations was fulfilled, since the results showed a clear relationship between the dimensions of KMS success. Except for *System Quality* and *Perceived KMS Benefits*, and *User Satisfaction* and *System Use* the found relations between the dimensions are in accordance with Wu & Wang's (2006) KMS success model. The consulting company's KMS was found to be rather successful and helping employees to carry out their jobs. We did not find a difference in the KMS success dimensions' correlations between codification and personalization tools however.

7 Implications & Future Research

Our research has shown that there is no big difference between KMS success under a personalization or codification strategy, but the correlations between the dimensions change slightly. Since many companies use a mix of both knowledge management strategies (Hansen et al, 1999), it might be interesting to see if in different companies with a different mix of the two knowledge management strategies the changes become more pronounced, and one should investigate KMS success for both strategies respectively. It could also help to employ such a specialized approach for companies, which have just implemented a new KMS that is specifically targeted at one knowledge management strategy, and its success should therefore be only measure with that knowledge management strategy in mind. In their study on KMS success Kulkarni at al (2006) too call attention to the possible influence a different knowledge management strategy can have on the overall correlations of the KMS success model. In order to improve the usefulness of a KMS success model, the addition of organizational factors, which explain some of the variance in System Use for example, could be a worthy research endeavor. Kulkarni et al (2006) have suggested this approach and empirically proven the significance of these factors on the dimensions of KMS success.

Another interesting topic to investigate might be if companies with a heavy focus on one knowledge strategy still see no difference between the KMS success dimensions' correlations for tools related to codification and personalization respectively. There is always a mix of both tools, but the company can choose to favor one strategy. Thus organizational factors could influence KMS success and change the model for the knowledge strategy which is not supported by the company. When including organizational factors into a KMS success model like Kulkarni et al (2006) did, this difference between correlations under personalization and codification might be included already as these factors would change for each tool. However, this means in general when there is a bias towards one or the other knowledge strategy and there is a change in the correlations for the codification and personalization a KMS success model found, then a KMS success model would have to be applied to the group of tools which is supported by the company, and the a group of unsupported KMS tools.

The most important result which becomes obvious through all research is the importance of the user for KMS success. This aspect has however not been researched enough, the way employees interact with the KMS can be a crucial factor in its success, this needs to be reflected better in a KMS success model. During our review of articles the psychological aspect of a KMS in regard to social interactions, and other indirect benefits from human relationships through a KMS have been neglected. The main focus is still mainly on technological aspects (Kulkarni et al, 2006; McDermott, 1999), this is in part the result of the success of DeLone & McLean's (1992, 2003) success model, which is the basis for other KMS success models (Seddon, 1997; Wu & Wang, 2006, Halawi et al, 2007/2008; Kulkarni et al, 2006). This is what future research should focus on, in order to truly improve a KMS for the user, which ultimately is the judge of its success or failure.

List of references

Ajmal, M., Helo, P., & Kekäle, T. (2009). Critical factors for knowledge management in project business. *Journal of Knowledge Management, 14*(1), 156-168.

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly, 25*(1), 107-136.

Ambos, T. C., & Schlegelmilch, B. B. (2009). Managing knowledge in international consulting firms. *Journal of Knowledge Management*, *13*(6), 491-508.

Assudani, R. H. (2009). Dispersed knowledge work - implications for knowledge intensive firms. *Journal of Knowledge Management*, *13*(6), 521-532.

Bartlett, M. S. (1954). A Note on Multiplying Factors for Various χ^2 Approximations. *Journal of the Royal Statistical Society, Series B, 16*(2), 296-298.

Bosua, R., & Scheepers, R. (2007). Towards a model to explain knowledge sharing in complex organizational environments. *Knowledge Management Research & Practice*, *5*, 93-109.

Briggs, S.R., & Cheek, J.M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54,* 106-148.

Brown J. S., & Duguid, P. (1998). Organizing Knowledge. *California Management Review, 40*(3), 90-111.

Campell, D. T., & Fiske, D. W. (1959). Convergent and Discriminant Validation by the Multitrait-multimethod Matrix. *Psychological Bulletin*, *56*, 81-105.

Catell, R. B. (1966). The Scree Test for Number of Factors. *Multivariate Behavioral Research, 1*(2), 245-276.

Davenport, T. H., & Prusak, L. (2000). *Working Knowledge: How Organizations Manage What They Know*, Boston, MA: Harvard Business School Press.

Davidsson P. (1997). *On the quantitative approach to research*. JIBS. 2nd revision.

DeLone, W. H., & McLean, E.R. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research, 3*(1), 60–95.

DeLone, W.H., & McLean, E.R. (2003). The DeLone and McLean model of information system success: a ten-year update. *Journal of Management Information Systems, 19*(4), 9–30.

Doll, W. J., & Torkzadeh, G. (1988). The Measurement of End-User Computing Satisfaction. *MIS Quarterly, 12*(2), 259-274.

Dyer, J. H., & Nobeoka, K. (2000). Creating and Managing a high- performance knowledge- sharing network: The Toyota Case. *Strategic Management Journal, 21*, 345-367.

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2008). *Management Research* (3rd ed.). London: SAGE Publications Ltd.

Edge, K. (2005). Powerful public sector knowledge management: a school district example. *Journal of Knowledge Management*, *9*(6), 42.

Fahey, L., & Prusak, L. (1998). The Eleven Deadliest Sins of Knowledge Management. *California Management Review, 40*(3), 265-276.

Firestone, W.A. (1987). Meaning in Method: The Rhetoric of Quantitative and Qualitative Research. *Educational Researcher, 16*(7), 16-21.

Gammelgaard, J., & Ritter, T. (2005). The knowledge retrieval matrix: codification and personification as separate strategies. *Journal of Knowledge Management*, *9*(4), 133-143.

Garson, G. D. (2009). *Data Imputation for Missing Values*. Retrieved April 10, 2010, from http://faculty.chass.ncsu.edu/garson/PA765/missing.htm

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.), Boston: Allyn & Bacon.

Gray, P. H. (2000). The effects of knowledge management systems on emergent teams: towards a research model. *Journal of Strategic Information Systems, 9*, 175-191.

Greiner, M. E., Böhmann, T., & Krcmar, H. (2007). A strategy for knowledge management. *Journal of Knowledge Management*, *11*(6), 3-15.

Grover, V., & Davenport, T. H. (2001). General Perspectives on Knowledge Management: Fostering a Research Agenda. *Journal of Management Information Systems, 18*(1), 5-21.

Guarino, N. (1998). In Proceedings of FOIS'98, Trento, Italy, 6-8 June 1998, *Formal Ontology in Information Systems* (p. 3-15).

Hahn, J., & Wang, T. (2009). Knowledge management systems and organizational knowledge processing challenges: A field experiment. *Decision Support Systems, 47*, 332-342.

Halawi, L. A., McCarthy, R. V., & Aronson, J. E. (2007/2008). An Empirical Investigation of Knowledge Management Systems' Success. *The Journal of Computer Information Systems, 48*(2), 121-135.

Hall, M. (2006). Knowledge management and the limits of knowledge codification. *Journal of Knowledge Management, 10*(3), 117-126.

Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's Your Strategy for Managing Knowledge? *Harvard Business Review, 77*(2), 106-116.

Huber, G. P. (1999). Facilitating Project Team Learning and Contributions to Organizational Knowledge. *Creativity and Innovation Management, 8*(2), 70-76.

Kaiser, H.F. (1970). A Second Generation Little Jiffy. *Psychometrika, 35*(4), 401-413.

Karlsen, J. T. & Gottschalk, P. (2004). Factors affecting knowledge transfer in IT projects. *Engineering Management Journal, 16*(1),3-10.

Kim, S., & Trimi, S. (2007). IT for KM in the management consulting industry. *Journal of Knowledge Management*, *11*(3), 145-155.

Krogh, G. v., Nonaka, I., & Aben, M. (2001). Making the Most of Your Company´s Knowledge: A Strategig Framework. *Long Range Planning, 34*, 421-439.

Kulkarni, U. R., Ravindran, S., & Freeze, R. (2006). A Knowledge Management Success Model: Theoretical Development and Empirical Validation. *Journal of Management Information Systems, 23*(3), 309-347.

Loehlin, J.C. (1998). *Latent Variable Models: An Introduction to Factor, Path, and Structural Equation Analysis*. Mahwah, NJ: Lawrence Erlbaum Associates.

Marczyk, G., DeMatteo, D., & Festinger, D. (2005). *Essentials of Research Design and Methodology*. Hoboken, NJ: John Wiley & Sons.

Mason, R. O. (1978). Measuring Information Output: A Communication Systems Approach. *Information & Management, 1*(5), 219-234.

McDermott, R. (1999). Why Information Technology Inspired But Cannot Deliver Knowledge Managennent. *California Management Review , 41(4),* 103-117.

McElroy, M. W. (2001). *Second-Generation Knowledge Management*. Retrieved March 16, 2010, from http://www.macroinnovation.com/images/McElroy_On_2ndGenKM.pdf

McLure-Wasko, M. (1999). In Proceedings of the Americas Conference on Information Systems, *How are Knowledge Management Systems Different from Information Systems, and Who Cares?* (p. 486-488), Retrieved March 16, 2010, from http://aisel.aisnet.org/amcis1999/168

Merono-Cerdan, A. L., Lopez-Nicolas, C., & Sabater-Sanchez, R. (2007). Knowledge management strategy diagnosis from KM instruments use. *Journal of Knowledge Management*, *11*(2), 60-72.

Neuman, W. L. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Pearson Education International.

Nonaka, I. (1991). The Knowledge-Creating Company. *Harvard Business Review, 69*(6), 96-104.

Nunnally, J. O. (1978). *Psychometric Theory*. New York: McGraw-Hill.

Pallant, J. (2001). *SPSS Survival Manual*. Buckingham, PA: Open University Press.

Peel, M., & Rowley, J. (2009). Information sharing practice in multi-agency working. *Aslib Proceedings: New Information Perspectives*, *62*(10), 11-28.

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems, 17*, 236-263.

Punch, K. F. (2005). *Introduction to Social Research: Quantitative and Qualitative Approaches* (2nd ed.). SAGE Publications Ltd.

Rao, L., & Osei-Bryson, K.-M. (2006). Towards defining dimensions of knowledge systems quality. *Expert Systems with Applications: An International Journal, 33*(2), 1-11.

Rencher, A. C. (2001). *Methods of Multivariate Analysis* (2nd ed.). USA: Wiley-Interscience.

Rhodes, J., Hung, R., Lok, P., Lien, B. Y., & Wu, C. (2008). Factors influencing organizational knowledge transfer: implication for corporate performance. *Journal of Knowledge Management*, *12*(3), 84-100.

Roscoe, J. T. (1975). *Fundamental research statistics for the behavioral sciences* (2nd ed.). New York: Holt, Rinehart and Winston.

Ruggles, R. (1998). The State of the Notion: Knowledge Management in Practice. *Califronia Management Review, 40*(3), 80-89.

Saito, A., Umemoto, K., & Ikeda, M. (2007). A strategy-based ontology of knowledge management technologies. *Journal of Knowledge Management*, *11*(1), 97-114.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students* (4th ed.). Harlow: Pearson Education

Schubert, P., Lincke, D., & Schmid, B. (1998). In Proceedings of the Fourth Americas Conference on Information Systems, E. Hoadley & I. Benbasat (Eds.), *A Global Knowledge Medium as a Virtual Community: The NetAcademy Concept* (p. 618-620), Retrieved March 16, 2010, from http://aisel.aisnet.org/amcis1998/207/

Seawright, J., Gerring, J. (2008). Case Selection Techniques in Case Study Research. *Journal of Knowledge Management , 61* (2)*,* 294-308

Seddon, P. B. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. *Information Systems Research, 8*(3), 240-253.

Seddon, P. B., & Kiew, M. Y. (1994). In Proceedings of the International Conference on Information Systems, *A partial test and development of the DeLone and McLean model of IS success,* (p. 99-110).

Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach* (4th ed.). New York: Wiley.

Shannon, C. E., & Weaver, W. (1949). *The Mathematical Theory of Communication.* Urbana, IL: University of Illinois Press.

Soubbotina, T. P. (2000). *Beyond Economic Growth Student Book* (2nd ed.). Washington: The International Bank for Reconstruction and Development/THE WORLD BANK. Retrieved April 14, 2010, from http://www.worldbank.org/depweb/english/beyond/beyondco/beg_all.pdf

Staples, D.S., Wong, I., & Seddon, P.B. (2002). Having expectations of information systems benefits that match received benefits: does it really matter? *Information & Management, 40*(2), 115–131.

Straub, D., Gefen, D., & Boudreau, M.-C. (2004). *The ISWorld Quantitative, Positivist Research Methods Website*. Retrieved April 17, 2010, from http://dstraub.cis.gsu.edu:88/quant/6issues.asp

Tabachnik, B.G., & Fidell, L.S. (1996). *Using Multivariate Statistics* (3rd ed.). New York: HarperCollins.

Teece, D. J. (1998). Capturing Value from Knowledge Assets: The New Economy, Markets for Know-how, and Intangible Assets. *California Management Review, 40*(3), 55-79.

Thomas, A. B. (2004). *Research Skills for Management Studies* (1st ed.). London: Routledge.

Trochim, W. M. K. (2006). *Convergent & Discriminant Validity*. Retrieved April 10, 2010, from http://www.socialresearchmethods.net/kb/convdisc.php

Vorakulpipat, C., & Rezgui, Y. (2008). An evolutionary and interpretive perspective to knowledge management. *Journal of Knowledge Management, 12*(3), 17-34.

Wernerfelt, B. (1984). The Resource-Based View of the Firm. *Strategic Management Journal, 5*(2), 171–180.

Wernerfelt, B. (1995). The Resource-Based View of the Firm: Ten Years After. *Strategic Management Journal, 16*(3), 171–174.

Wu, J.-H., & Wang, Y.-M. (2006). Measuring KMS success: A respecification of the DeLone and McLean's model. *Information & Management, 43,* 728-739.

Xu, J., & Quaddus, M. (2005). Adoption and diffusion of knowledge management systems: an Australian survey. *The Journal of Management Development, 24*(4), 335-361.

Yin, R. (2003). *Case Study Research Design and Methods*. SAGE publication.

Zboralski, K. (2009). Antecedents of knowledge sharing in communities of practice. *Journalof Knowledge Management*, *13*(3), 90-101.

Appendix 1 - Questionnaire – Measuring Knowledge Management System success

English Version

Dear Respondent,

We are a group of three students from Jönköping International Business School that would like to investigate the success of a consulting company's Knowledge Management System (KMS). A KMS describes an information system used to handle the knowledge processes in a company. This means controlling how knowledge flows, how it is created and transferred within the company. We are particularly interested in the impact of codification and personalization strategies on KMS success.

Codification describes a strategy of collecting knowledge, codifying it and then storing it in some form of a repository, to allow others easy access to knowledge. It is a people-to-document approach, which relies on the transcription of knowledge/information. It is thus connected with explicit knowledge. Searchable Databases, Reports, Value propositions (offert på svenska), and Case Studies are examples of codification tools used at the consulting company.

Personalization tries to encourage knowledge dissemination by enabling direct communication between people, consequently creating and supporting social networks. It is therefore a person-to-person approach, which heavily depends on social interactions to transfer knowledge. As a result it is connected with tacit knowledge, which cannot simply be written down. Presentations, Monthly Meetings, Communities of Practice(kontinuerlig kommunikation mellan anställda inom samma område), and Communications with Knowledge Experts are personalization measures actively used at the consulting company.

In the first part of the questionnaire we would like you to give us some general demographic information. In the second part of the questionnaire we have comments in different areas ,we want you to consider these comments for the codification tools and personalization tools you are using at the consulting company respectively. Not all tools will fit each comment the same, therefore it is necessary to look at the tools as a group for codification as well as personalization and take the comments as general statements for each group. Please mark how much you agree or disagree with a comment on the scale from 1 to 5 (**1** – *Strongly disagree*, **2** – *Disagree,* **3** – *Neither agree nor disagree,* **4** – *Agree,* **5** – *Strongly agree*) with an X.

All answers will be treated anonymously and only used to enhance our understanding of the success of the company's KMS. Completing this questionnaire will take approximately 5-10 minutes. We hope that you are willing to contribute to our study by answering this questionnaire. We thank you in advance for your participation.

Let's start with the demographic information:

Age: _____ years

Gender: ☐ Male

☐ Female

Tenure: _____ months

System Quality

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
KMS is easy to use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS is user friendly	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS is stable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The response time of KMS is acceptable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Knowledge or information quality

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
Content Quality										
KMS makes it easy for me to create knowledge documents	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The words and phrases in contents provided by KMS are consistent	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The content representation provided by KMS is logical and fit for its purpose	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The knowledge or information provided by KMS is available at a time suitable for its use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The knowledge or information provided by KMS is important and helpful for my work	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The knowledge or information provided by KMS meaningful, understandable, and practicable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
The knowledge classification or index in KMS is clear and unambiguous	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Context and linkage quality										
KMS provide contextual knowledge or information so that I can truly understand what is being accessed and easily apply it to work	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS provide complete knowledge portal so that I can link to knowledge or information sources for more detail inquire	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS provide accurate expert directory (function as yellow pages)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS provides a helpful expert directory (function as yellow pages) for my work	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

User satisfaction

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
I am satisfied that KMS meet my knowledge or information processing needs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I am satisfied with KMS efficiency	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I am satisfied with KMS effectiveness	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Overall, I am satisfied with KMS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Perceived KMS Benefits

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
KMS helps me acquire new knowledge and innovative ideas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS helps me effectively manage and store knowledge that I need	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS enable me to accomplish tasks more efficiently	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
My performance on the job is enhanced by KMS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS improves the quality of my work life	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

System Use

I use KMS to help me make decisions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to help me record my knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to communicate knowledge and information with colleagues	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to share my general knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to share my specific knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Swedish Version

Till den svarande,

Vi är en grupp på tre studenter från Internationella Handelshögskolan I Jönköping, som med hjälp av det här formuläret vill undersöka kunskapshanterings systemet (KMS) hos ett konsultföretag. Ett KMS beskriver de processer som medvetet används för att hantera kunskap inom ett företag. Det här innefattar hur kunskap eller information sparas, skapas och överförs mellan anställda. Vi är speciellt intresserade i hur en personlig kunskapshantering strategi respektive kodifierad kunskaps strategi påverkar framgången av systemet.

Kodifiering (*Codification*)är en strategi då man dokumenterar kunskap och sparar den på ett sätt som gör den lätt tillgänglig för andra. Det är ett människa till dokument tillvägagångs sätt som förlitar sig på dokumentation av information och tidigare kunskaper. Strategin är därav kopplad till mätbar kunskap. Databaser, rapporter, offerter och Case Studies är exempel på kodifierings verktyg som används i er organisation.

Personlig kunskapshantering *(Personalization)* handlar om att uppmuntra spridning av kunskap genom direkt kommunikation mellan människor, och därigenom skapa ett stödjande socialt nätvärk. Det är ett människa till människa tillvägagångs sätt som förlitar sig på personlig kommunikation och sociala relationer för att förmedla kunskap. Strategin är ofta kopplad till kunskap som inte går att mäta eller förmedla genom dokumentation. Presentationer, månadsmöten, Communities of Practice(organiserat och kontinuerligt utbyte av information mellan anställda inom samma område) och Knowledge Experts är exempel på verktyg som används i er organisation.

I första delen av formuläret så vill vi ha reda på lite allmän demografisk information om de svarande. I andra delen så har vi listat antaganden som vi vill att du ska överväga, för både de personliga och kodifierade verktyg du använder till att hantera kunskap. Antagandena är inte anpassade för alla verktyg individuellt, utan vi vill istället att du ser dem som grupperade mellan personlig eller kodifierad kunskapshantering.

Alla svar kommer vara anonyma och endast användas för att utvärdera kunskapshanterings systemet (KMS) vid er enskilda organisation. Formuläret tar cirka 5-10 minuter att fylla i, och vi hoppas att du är villig att bidra till vår studie genom att svara på frågorna. Vi vill i förväg tacka dig för ditt deltagande.

Age: _____ years

Gender: ☐ Male

☐ Female

Tenure: _____ months

System Quality

	Personalization tools 1 2 3 4 5	Codification tools 1 2 3 4 5
KMS is easy to use	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
KMS is user friendly	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
KMS is stable	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The response time of KMS is acceptable	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐

Knowledge or information quality

	Personalization tools 1 2 3 4 5	Codification tools 1 2 3 4 5
Content Quality		
KMS makes it easy for me to create knowledge documents	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The words and phrases in contents provided by KMS are consistent	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The content representation provided by KMS is logical and fit for its purpose	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The knowledge or information provided by KMS is available at a time suitable for its use	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The knowledge or information provided by KMS is important and helpful for my work	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The knowledge or information provided by KMS meaningful, understandable, and practicable	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
The knowledge classification or index in KMS is clear and unambiguous	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
Context and linkage quality		
KMS provide contextual knowledge or information so that I can truly understand what is being accessed and easily apply it to work	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
KMS provide complete knowledge portal so that I can link to knowledge or information sources for more detail inquire	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
KMS provide accurate expert directory (function as yellow pages)	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
KMS provides a helpful expert directory (function as yellow pages) for my work	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐

User satisfaction

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
I am satisfied that KMS meet my knowledge or information processing needs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I am satisfied with KMS efficiency	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I am satisfied with KMS effectiveness	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Overall, I am satisfied with KMS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Perceived KMS Benefits

	Personalization tools					Codification tools				
	1	2	3	4	5	1	2	3	4	5
KMS helps me acquire new knowledge and innovative ideas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS helps me effectively manage and store knowledge that I need	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS enable me to accomplish tasks more efficiently	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
My performance on the job is enhanced by KMS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
KMS improves the quality of my work life	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

System Use

I use KMS to help me make decisions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to help me record my knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to communicate knowledge and information with colleagues	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to share my general knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
I use KMS to share my specific knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Appendix 2 - Reliability Analysis

System Quality

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,850	**,857**	**4**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,741	**,742**	**4**

Knowledge or Information Quality

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,884	**,884**	**11**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,795	**,791**	**11**

User Satisfaction

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,890	**,894**	**4**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,882	**,884**	**4**

Perceived KMS Benefits

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,880	**,880**	**5**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,796	**,793**	**5**

System Use

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,689	**,721**	**5**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,634	**,625**	**5**

Appendix 3 – Demographics

N=25

	Frequency	Percentage
Gender		
Male	12	48%
Female	13	52%
Age (years)		
18-24	2	8%
25-34	21	84%
35-49	2	8%
Tenure (months)		
1-24	6	24%
25-1440	19	76%

Appendix 4 – Multiple Regression

Perceived KMS Benefits

Personalization

Descriptive Statistics

	Mean	Std. Deviation	N
Perceived KMS Benefits	**3,9840**	**,73919**	**25**
Knowledge/Information Quality	**3,7345**	**,55727**	**25**
System Quality	**3,8800**	**,58238**	**25**

Correlations

		Perceived KMS Benefits	Knowledge/Information Quality	System Quality
Pearson Correlation	Perceived KMS Benefits	**1,000**	**,686**	**,562**
	Knowledge/Information Quality	**,686**	**1,000**	**,718**
	System Quality	**,562**	**,718**	**1,000**
Sig. (1-tailed)	Perceived KMS Benefits	**.**	**,000**	**,002**
	Knowledge/Information Quality	**,000**	**.**	**,000**
	System Quality	**,002**	**,000**	**.**
N	Perceived KMS Benefits	**25**	**25**	**25**
	Knowledge/Information Quality	**25**	**25**	**25**
	System Quality	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**System Quality, Know-ledge/Information Quality[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: Perceived KMS Benefits

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Es-timate
1	**,693[a]**	**,481**	**,434**	**,55631**

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: Perceived KMS Benefits

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**6,305**	**2**	**3,153**	**10,187**	**,001[a]**
	Residual	**6,808**	**22**	**,309**		
	Total	**13,114**	**24**			

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: Perceived KMS Benefits

Coefficients[a]

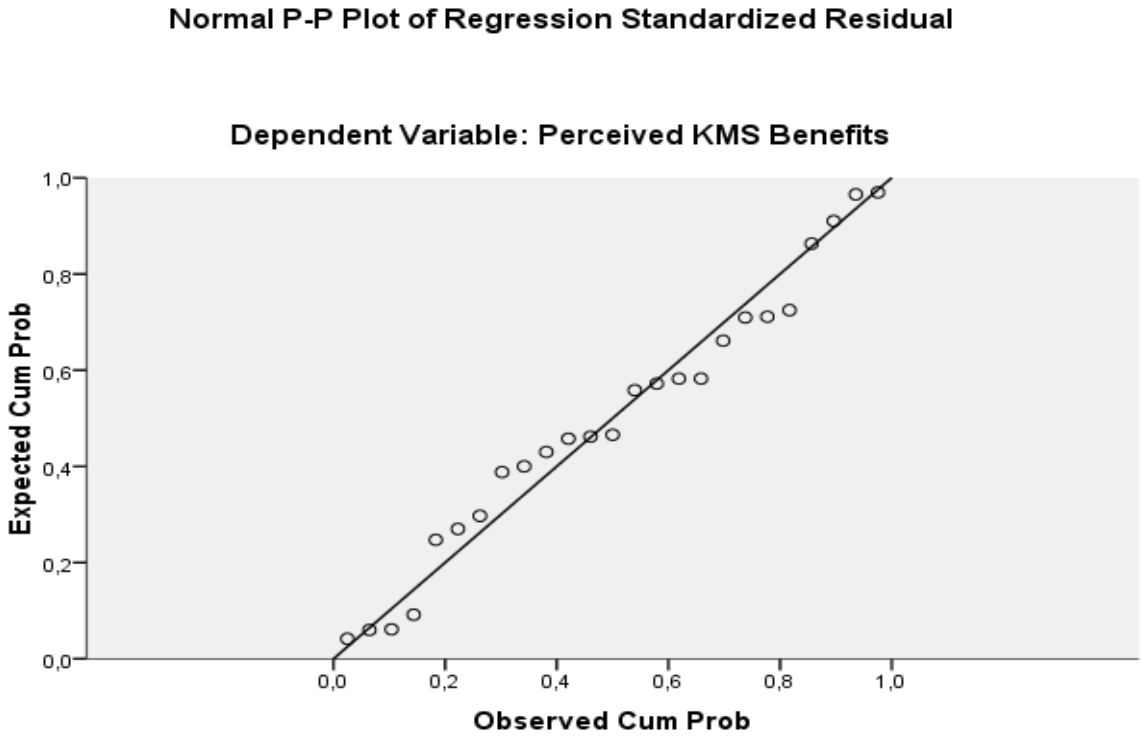
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**,389**	**,826**		**,471**	**,642**
	Knowledge/Information Quality	**,775**	**,293**	**,584**	**2,648**	**,015**
	System Quality	**,181**	**,280**	**,142**	**,645**	**,525**

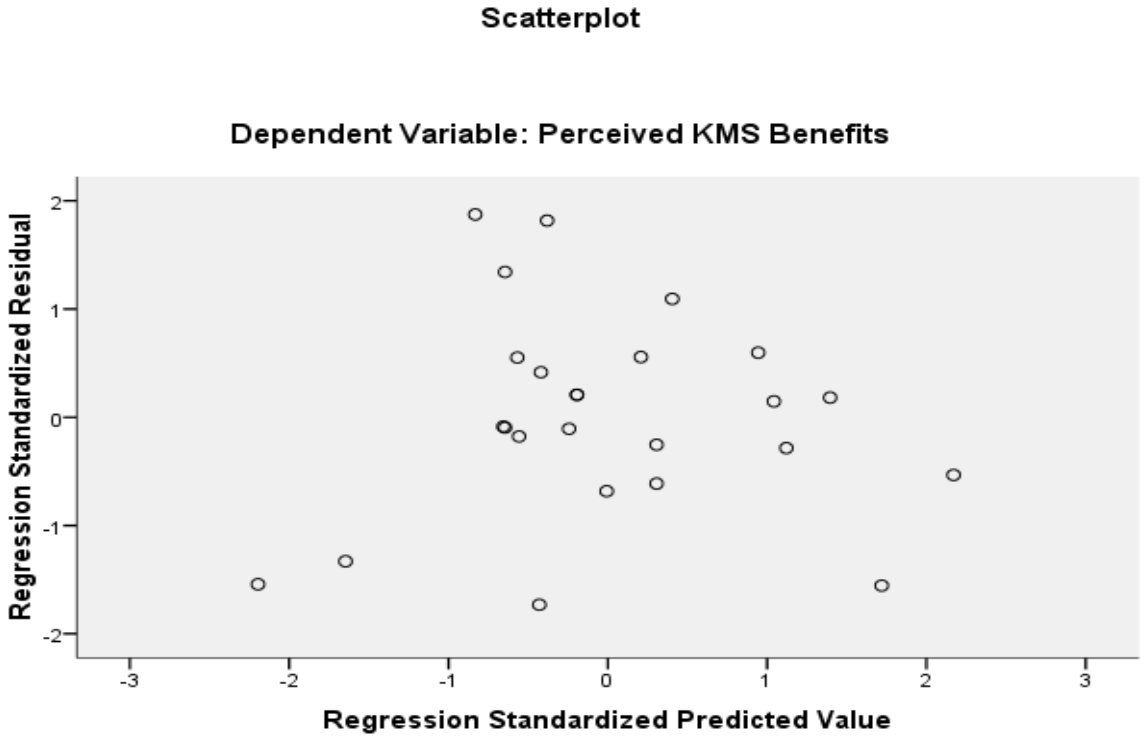
a. Dependent Variable: Perceived KMS Benefits

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**-1,324**	**2,103**					
	Knowledge/Information Quality	**,168**	**1,382**	**,686**	**,492**	**,407**	**,485**	**2,062**
	System Quality	**-,400**	**,761**	**,562**	**,136**	**,099**	**,485**	**2,062**

a. Dependent Variable: Perceived KMS Benefits


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Perceived KMS Benefits
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: Perceived KMS Benefits
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2
3

Codification

Descriptive Statistics

	Mean	Std. Deviation	N
Perceived KMS Benefits	**3,8560**	**,59587**	**25**
Knowledge/Information Quality	**3,8618**	**,43370**	**25**
System Quality	**3,8200**	**,54256**	**25**

Correlations

		Perceived KMS Benefits	Knowledge/Information Quality	System Quality
Pearson Correlation	Perceived KMS Benefits	**1,000**	**,664**	**,194**
	Knowledge/Information Quality	**,664**	**1,000**	**,530**
	System Quality	**,194**	**,530**	**1,000**
Sig. (1-tailed)	Perceived KMS Benefits	.	**,000**	**,177**
	Knowledge/Information Quality	**,000**	.	**,003**
	System Quality	**,177**	**,003**	.
N	Perceived KMS Benefits	**25**	**25**	**25**
	Knowledge/Information Quality	**25**	**25**	**25**
	System Quality	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**System Quality, Know-ledge/Information Quality[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: Perceived KMS Benefits

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Es-timate
1	**,690[a]**	**,476**	**,429**	**,45041**

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: Perceived KMS Benefits

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**4,059**	**2**	**2,029**	**10,003**	**,001[a]**
	Residual	**4,463**	**22**	**,203**		
	Total	**8,522**	**24**			

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: Perceived KMS Benefits

Coefficients[a]

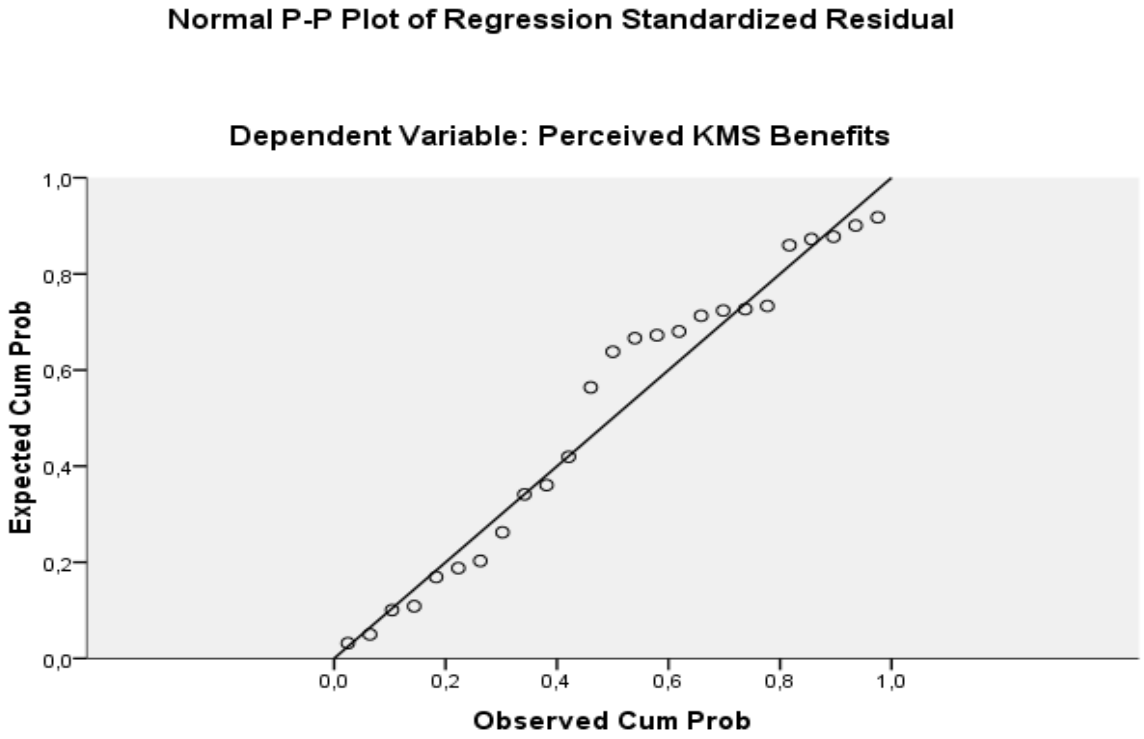
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**,636**	**,861**		**,738**	**,468**
	Knowledge/Information Quality	**1,073**	**,250**	**,781**	**4,293**	**,000**
	System Quality	**-,242**	**,200**	**-,220**	**-1,210**	**,239**

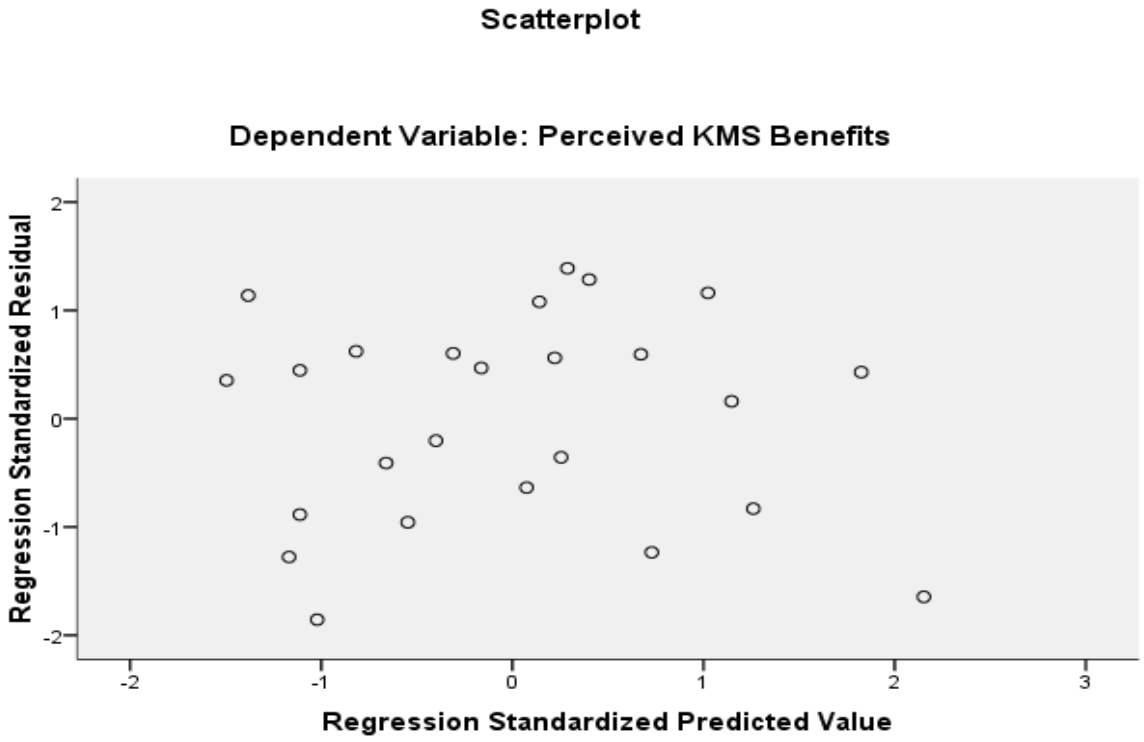
a. Dependent Variable: Perceived KMS Benefits

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**-1,150**	**2,422**					
	Knowledge/Information Quality	**,555**	**1,591**	**,664**	**,675**	**,662**	**,719**	**1,390**
	System Quality	**-,656**	**,173**	**,194**	**-,250**	**-,187**	**,719**	**1,390**

a. Dependent Variable: Perceived KMS Benefits


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Perceived KMS Benefits
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: Perceived KMS Benefits
Regression Standardized Residual
Regression Standardized Predicted Value
-2
-1
0
1
2
3

User Satisfaction

Personalization

Descriptive Statistics

	Mean	Std. Deviation	N
User Satisfaction	**4,0667**	**,61614**	**25**
Knowledge/Information Quality	**3,7345**	**,55727**	**25**
System Quality	**3,8800**	**,58238**	**25**

Correlations

		User Satisfaction	Knowledge/Information Quality	System Quality
Pearson Correlation	User Satisfaction	**1,000**	**,664**	**,672**
	Knowledge/Information Quality	**,664**	**1,000**	**,718**
	System Quality	**,672**	**,718**	**1,000**
Sig. (1-tailed)	User Satisfaction	**.**	**,000**	**,000**
	Knowledge/Information Quality	**,000**	**.**	**,000**
	System Quality	**,000**	**,000**	**.**
N	User Satisfaction	**25**	**25**	**25**
	Knowledge/Information Quality	**25**	**25**	**25**
	System Quality	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**System Quality, Know-ledge/Information Quality[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: User Satisfaction

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Es-timate
1	**,721[a]**	**,519**	**,476**	**,44613**

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: User Satisfaction

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**4,732**	**2**	**2,366**	**11,889**	**,000[a]**
	Residual	**4,379**	**22**	**,199**		
	Total	**9,111**	**24**			

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: User Satisfaction

Coefficients[a]

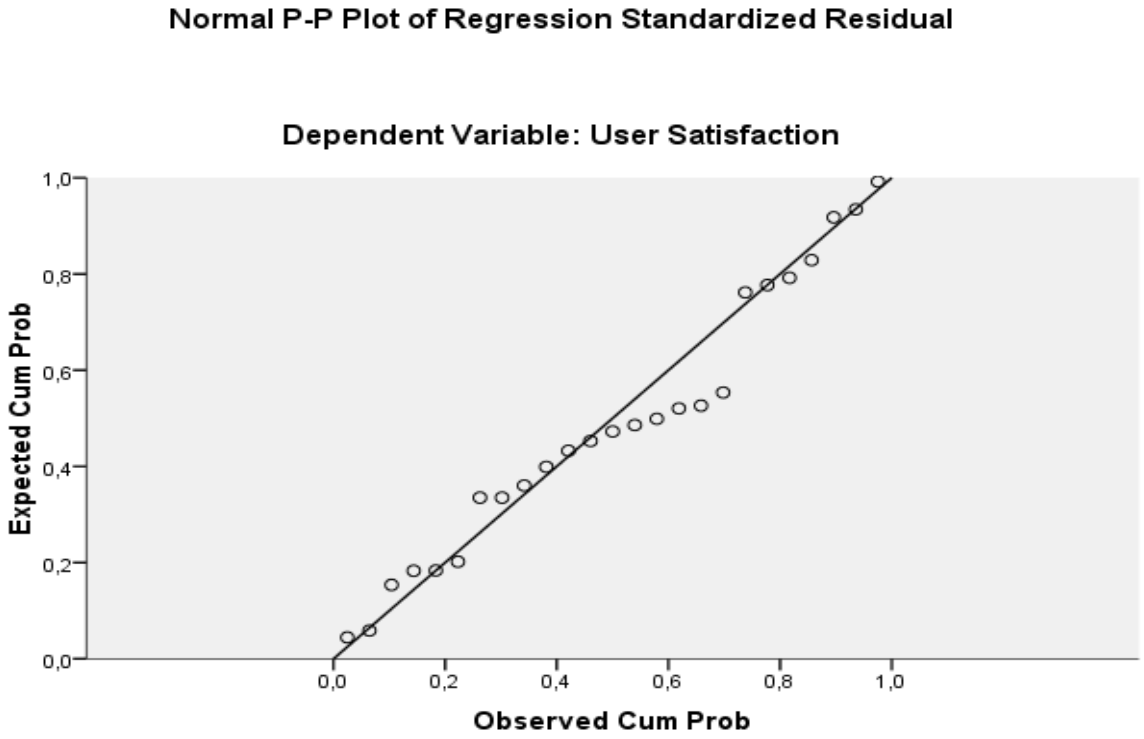
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**,866**	**,663**		**1,306**	**,205**
	Knowledge/Information Quality	**,415**	**,235**	**,376**	**1,770**	**,091**
	System Quality	**,425**	**,225**	**,402**	**1,894**	**,071**

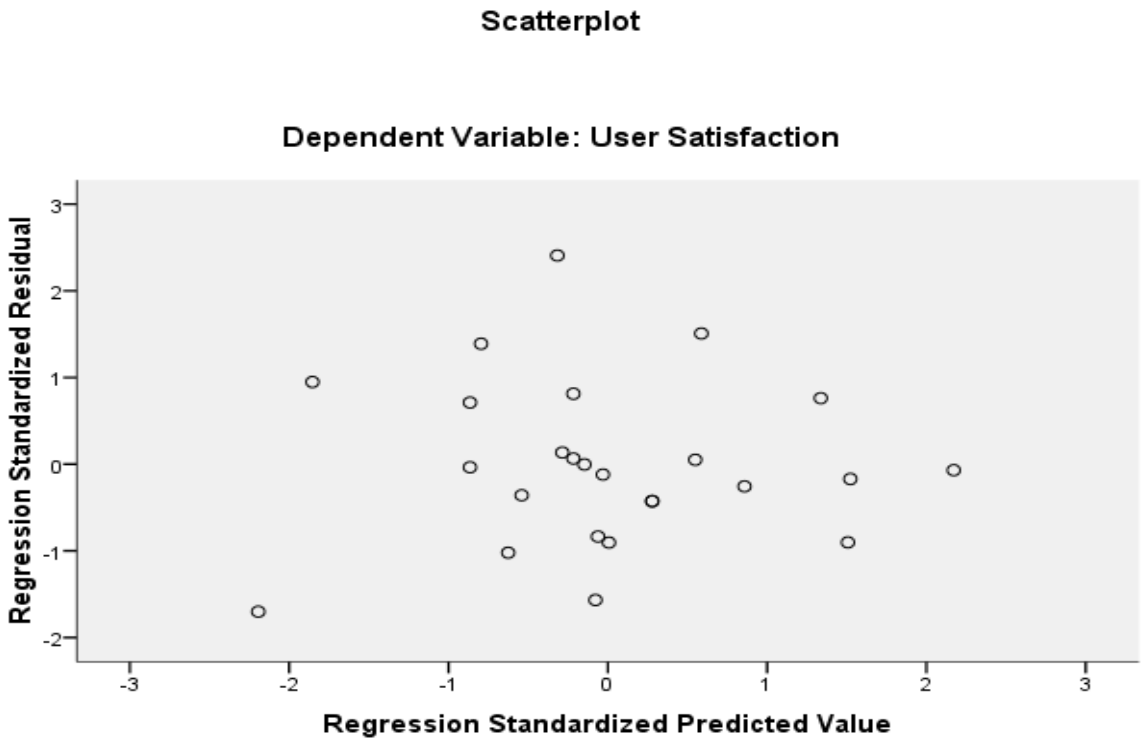
a. Dependent Variable: User Satisfaction

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**-,509**	**2,240**					
	Knowledge/Information Quality	**-,071**	**,902**	**,664**	**,353**	**,262**	**,485**	**2,062**
	System Quality	**-,040**	**,891**	**,672**	**,374**	**,280**	**,485**	**2,062**

a. Dependent Variable: User Satisfaction


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: User Satisfaction
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: User Satisfaction
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2
3

Codification

Descriptive Statistics

	Mean	Std. Deviation	N
User Satisfaction	**3,8000**	**,52705**	**25**
Knowledge/Information Quality	**3,8618**	**,43370**	**25**
System Quality	**3,8200**	**,54256**	**25**

Correlations

		User Satisfaction	Knowledge/Information Quality	System Quality
Pearson Correlation	User Satisfaction	**1,000**	**,603**	**,597**
	Knowledge/Information Quality	**,603**	**1,000**	**,530**
	System Quality	**,597**	**,530**	**1,000**
Sig. (1-tailed)	User Satisfaction	.	**,001**	**,001**
	Knowledge/Information Quality	**,001**	.	**,003**
	System Quality	**,001**	**,003**	.
N	User Satisfaction	**25**	**25**	**25**
	Knowledge/Information Quality	**25**	**25**	**25**
	System Quality	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**System Quality, Know-ledge/Information Quality[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: User Satisfaction

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Es-timate
1	**,686[a]**	**,471**	**,423**	**,40031**

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: User Satisfaction

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**3,141**	**2**	**1,571**	**9,801**	**,001[a]**
	Residual	**3,526**	**22**	**,160**		
	Total	**6,667**	**24**			

a. Predictors: (Constant), System Quality, Knowledge/Information Quality

b. Dependent Variable: User Satisfaction

Coefficients[a]

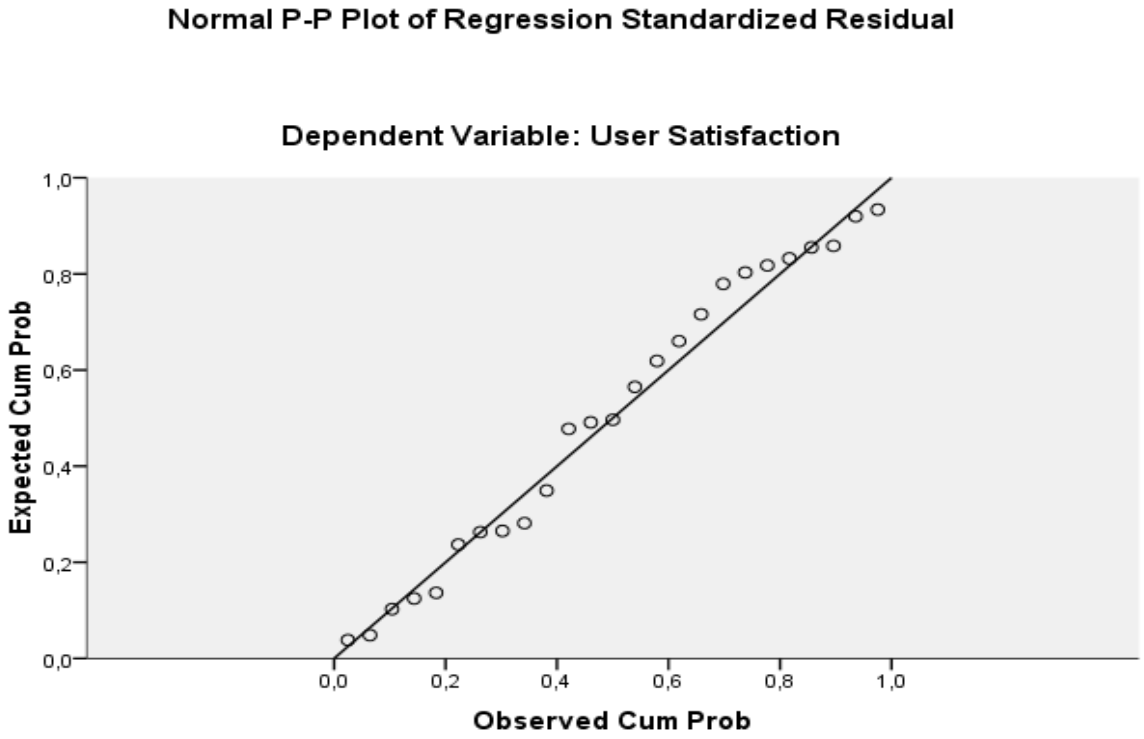
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**,496**	**,765**		**,648**	**,524**
	Knowledge/Information Quality	**,484**	**,222**	**,399**	**2,180**	**,040**
	System Quality	**,375**	**,178**	**,386**	**2,113**	**,046**

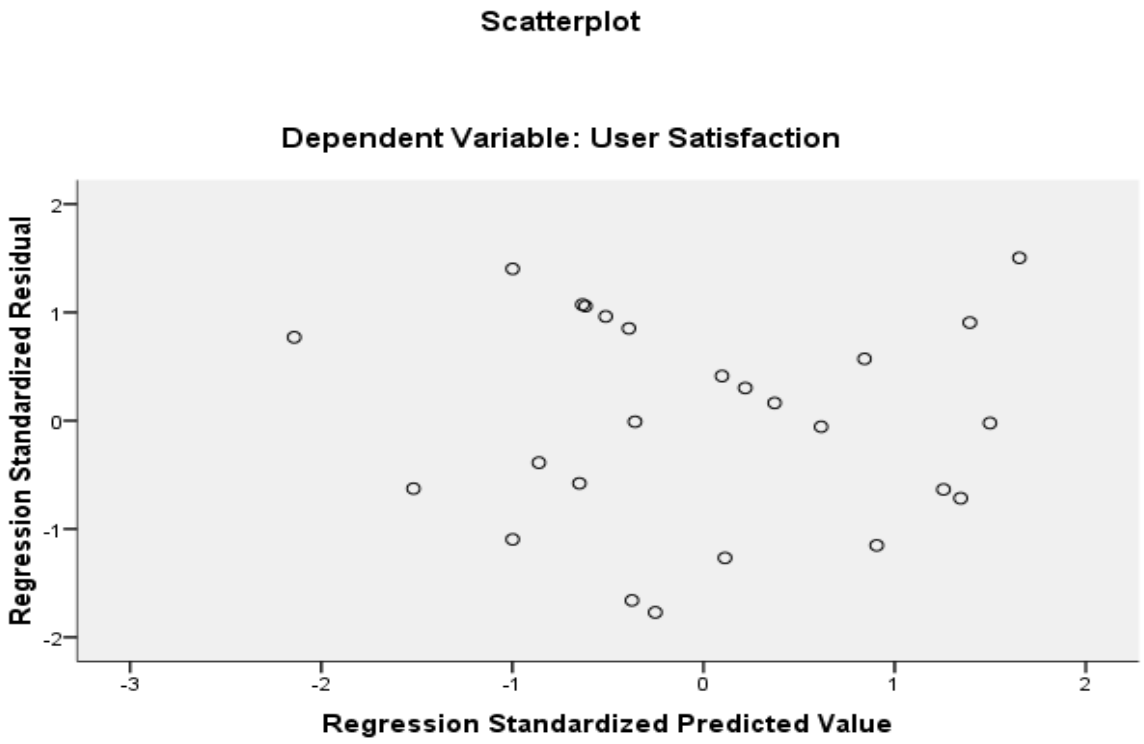
a. Dependent Variable: User Satisfaction

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**-1,091**	**2,084**					
	Knowledge/Information Quality	**,024**	**,945**	**,603**	**,422**	**,338**	**,719**	**1,390**
	System Quality	**,007**	**,743**	**,597**	**,411**	**,328**	**,719**	**1,390**

a. Dependent Variable: User Satisfaction


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: User Satisfaction
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: User Satisfaction
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2

System Use

Personalization

Descriptive Statistics

	Mean	Std. Deviation	N
System Use	**4,0320**	**,51536**	**25**
User Satisfaction	**4,0667**	**,61614**	**25**
Perceived KMS Benefits	**3,9840**	**,73919**	**25**

Correlations

		System Use	User Satisfaction	Perceived KMS Benefits
Pearson Correlation	System Use	**1,000**	**,308**	**,566**
	User Satisfaction	**,308**	**1,000**	**,631**
	Perceived KMS Benefits	**,566**	**,631**	**1,000**
Sig. (1-tailed)	System Use	**.**	**,067**	**,002**
	User Satisfaction	**,067**	**.**	**,000**
	Perceived KMS Benefits	**,002**	**,000**	**.**
N	System Use	**25**	**25**	**25**
	User Satisfaction	**25**	**25**	**25**
	Perceived KMS Benefits	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**Perceived KMS Benefits, User Satisfaction[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: System Use

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**,569[a]**	**,324**	**,263**	**,44255**

a. Predictors: (Constant), Perceived KMS Benefits, User Satisfaction

b. Dependent Variable: System Use

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**2,066**	**2**	**1,033**	**5,274**	**,013[a]**
	Residual	**4,309**	**22**	**,196**		
	Total	**6,374**	**24**			

a. Predictors: (Constant), Perceived KMS Benefits, User Satisfaction

b. Dependent Variable: System Use

Coefficients[a]

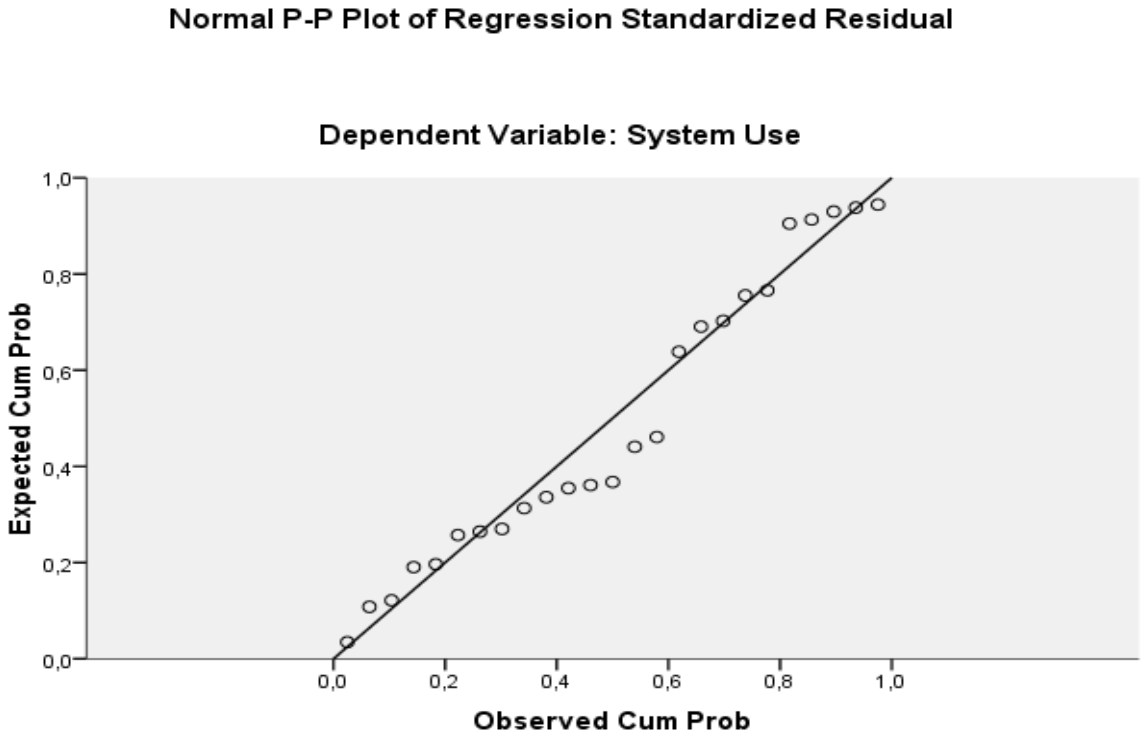
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**2,594**	**,619**		**4,188**	**,000**
	User Satisfaction	**-,068**	**,189**	**-,081**	**-,359**	**,723**
	Perceived KMS Benefits	**,430**	**,157**	**,617**	**2,732**	**,012**

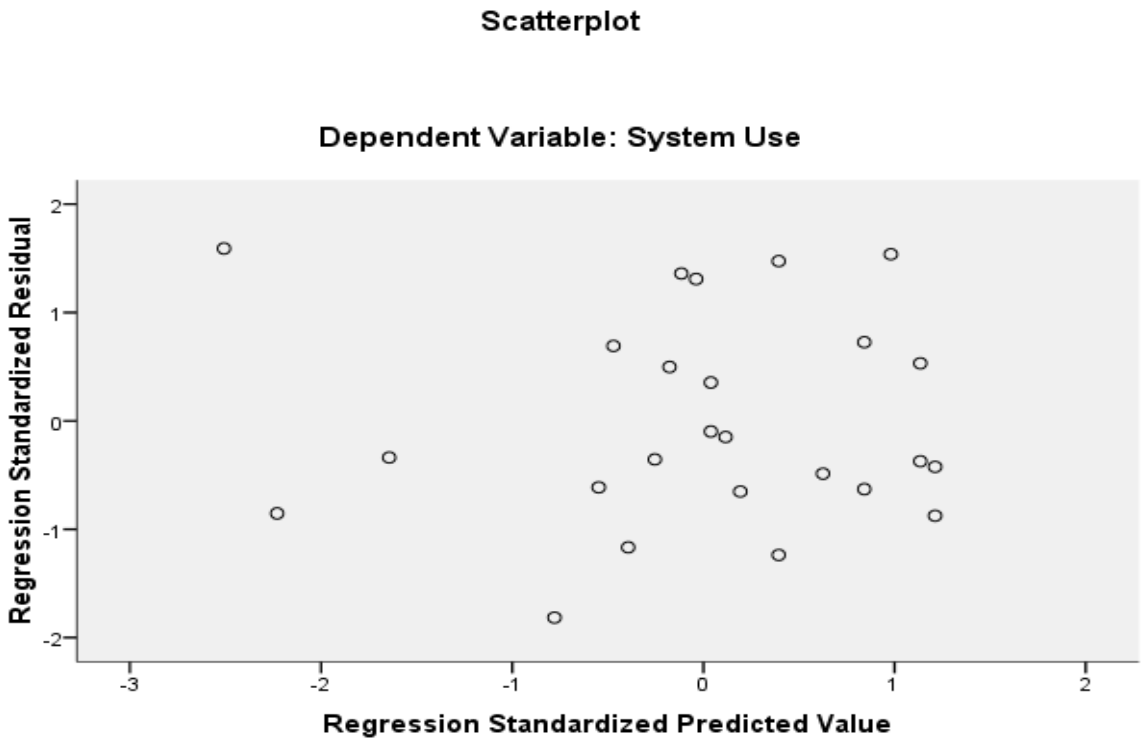
a. Dependent Variable: System Use

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**1,310**	**3,879**					
	User Satisfaction	**-,460**	**,324**	**,308**	**-,076**	**-,063**	**,602**	**1,660**
	Perceived KMS Benefits	**,104**	**,757**	**,566**	**,503**	**,479**	**,602**	**1,660**

a. Dependent Variable: System Use


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: System Use
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: System Use
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2

Codification

Descriptive Statistics

	Mean	Std. Deviation	N
System Use	**3,5760**	**,50767**	**25**
Perceived KMS Benefits	**3,8560**	**,59587**	**25**
User Satisfaction	**3,8000**	**,52705**	**25**

Correlations

		System Use	Perceived KMS Benefits	User Satisfaction
Pearson Correlation	System Use	**1,000**	**,506**	**,314**
	Perceived KMS Benefits	**,506**	**1,000**	**,409**
	User Satisfaction	**,314**	**,409**	**1,000**
Sig. (1-tailed)	System Use	**.**	**,005**	**,063**
	Perceived KMS Benefits	**,005**	**.**	**,021**
	User Satisfaction	**,063**	**,021**	**.**
N	System Use	**25**	**25**	**25**
	Perceived KMS Benefits	**25**	**25**	**25**
	User Satisfaction	**25**	**25**	**25**

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	**User Satisfaction, Perceived KMS Benefits[a]**	.	**Enter**

a. All requested variables entered.

b. Dependent Variable: System Use

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**,519[a]**	**,270**	**,203**	**,45314**

a. Predictors: (Constant), User Satisfaction, Perceived KMS Benefits

b. Dependent Variable: System Use

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**1,668**	**2**	**,834**	**4,062**	**,032[a]**
	Residual	**4,517**	**22**	**,205**		
	Total	**6,186**	**24**			

a. Predictors: (Constant), User Satisfaction, Perceived KMS Benefits

b. Dependent Variable: System Use

Coefficients[a]

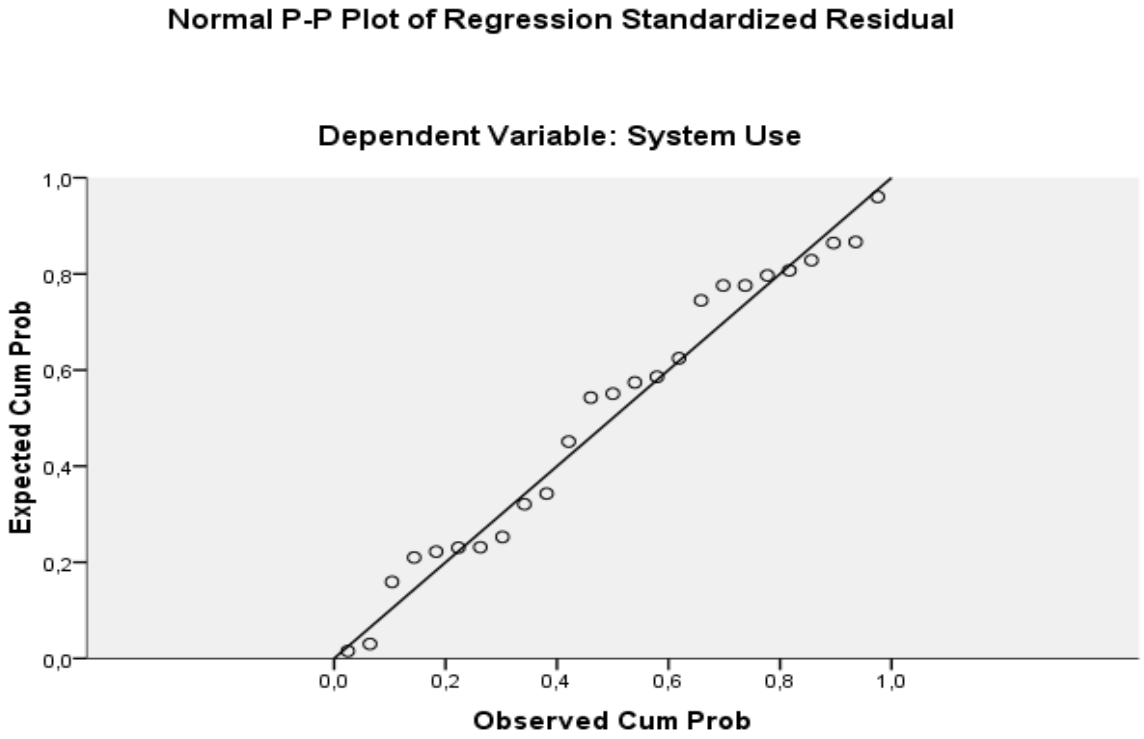
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	**1,617**	**,762**		**2,122**	**,045**
	Perceived KMS Benefits	**,386**	**,170**	**,454**	**2,272**	**,033**
	User Satisfaction	**,123**	**,192**	**,128**	**,642**	**,528**

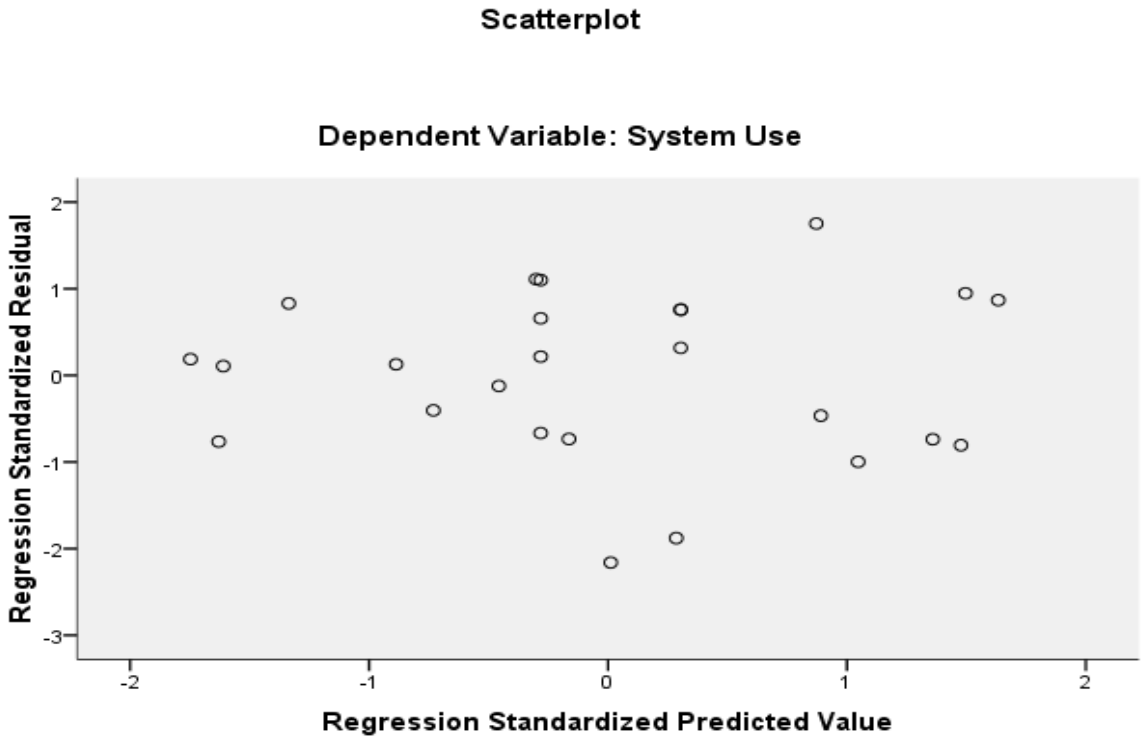
a. Dependent Variable: System Use

Coefficients[a]

Model		95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	**,036**	**3,197**					
	Perceived KMS Benefits	**,034**	**,739**	**,506**	**,436**	**,414**	**,833**	**1,200**
	User Satisfaction	**-,275**	**,522**	**,314**	**,136**	**,117**	**,833**	**1,200**

a. Dependent Variable: System Use


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: System Use
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: System Use
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2