The Inventive output, of an Effective implementation of Knowledge and Performance Management Perspectives

Pieris Chourides[1], Lycourgos Hadjiphanis[1] and Loukia Ch. Evripidou[2]
[1]European University Cyprus, School of Business Administration, Department of Management and Marketing, Cyprus
[2]European University Cyprus, School of Business Administration Department of Accounting, Economics and Finance, Cyprus
p.chourides@euc.ac.cy

Abstract: The purpose of this research study was to examine the correlation, if any, between knowledge and performance management and associated strategies employed by today's organizations to increase stakeholder and shareholder value.: Each strategy was individually examined using the quantitative causal method research design in order to examine the relationship/correlation of the level of knowledge and performance activities within participant organizations, and then collaboratively examine their inter-relations. The independent variables and the dependent variables vary in each correlation research questions. The findings endorsed that effective use of organizational explicit knowledge and efficient performance are practices worth doing. Correlations between knowledge and performance and innovation and value added were found to be relatively strong. A moderately strong predictive correlation between effective implementation of knowledge strategy and performance was also found and presented, and similar findings showing a moderately strong predictive correlation between effective implementation of performance strategy and innovation are also established and shown.: Organizations can increase and create vital added value to both stakeholders and shareholder members by implementing effectively a holistic approach as an integrated part of routine practices that enhances knowledge creation and exceptional performance, which will contribute to superior results – tangible and intangible ones. The practical implications of this research will contribute to the academic discipline of knowledge and performance management. Paper relevance: This paper will contribute to the debate regarding the linking of knowledge and performance management. Further, this paper will contribute to the in-depth analysis/discussion of the importance of knowledge in innovation and velocity management.

Keywords: knowledge management, knowledge transfer, innovation, performance, strategy, velocity

1. Introduction

There is considerable interest in knowledge and performance management at the present time – witness the output of books, papers and conferences on this subject over the past few years. According to international conference organizers IRR, knowledge management has been the top theme for business and management from 2002 and onwards, with major events oversubscribed and speakers at a premium. Why is this? According to some leading academics it is because we are living in the knowledge age, in addition to a fast-changing environment that needs constantly updated and accurate knowledge that will enhance superior performance and develop a learning approach towards innovation. Armstrong (2015) argues that environmental factors, such as competition, globalization and technology, are stretching organization capabilities to the limit, requiring ever higher levels of skills and intelligence in order to respond effectively. Furthermore, Bessant and Tidd (2011) highlight and analyze the knowledge and innovation relationship as a key facilitator for creating value-added organization. Clearly, in this scenario the effective management and transfer of knowledge may not be just a passing fad, but potentially an essential tool for survival, and possibly the base for developing the ability to thrive through creating a source for competitive advantage through performance (Osseo-Asare et al, 2007).This paper reports on research within European case organizations that are at various stages of approaching and deploying knowledge and performance management programs. It builds upon previous work (Chourides & Longbottom 2001, 2002; Chourides et al, 2003; Chourides, 2004; Armstrong 2015) to establish practice and key factors likely to enhance successful implementation. Specifically, this research paper assesses critical areas and identifies relationships and procedures over a range of organizational perspectives in order to establish the affiliation in the diffusion and transfer of organizational knowledge and performance, aiming to support existing organizational activities/policies/ procedures and projects, and to advance their goals, market competiveness and meet customer demands/needs.

2. Literature analysis

According to Nonaka and Konno (1998), organizational knowledge can be created through socialization, externalization, combination and internalization. Socialization refers to sharing tacit knowledge and externalization is

about making tacit knowledge explicit. Combination refers to transforming explicit knowledge into further explicit knowledge and internalization is about turning explicit knowledge into tacit knowledge (Torrington et al, 2011).

Tacit knowledge is a continuous activity of knowing and embodies an "analogue" quality with its main purpose being the "parallel or simultaneous processing" of the complexities and dimensions of current issues. On the other hand explicit knowledge is more discrete or digital; it is captured in records of the past (libraries, archives and databases) and is assessed on a sequential basis (Nonaka, 1994)

3. Performance management

Goncharuk and Monat (2009) have developed a model focused on performance management processes. Their suggested model is developed upon the internal benchmarking system of intra-firm competition. The main purpose of this model is to "provide selective encouragement of and rewards for the best divisions (leaders) of the enterprise, and also sanctions on heads of the poorest performing divisions (lagers) along with opportunities for improvement." This process is conducted by an internal benchmarking team (IBT) responsible for performance estimation, and the identification of the leaders and lagers of the company, but also for the main causes of growth or efficiency problems. The suggested performance management model is divided into five continuous phases and is completed in 12 steps, as shown below.
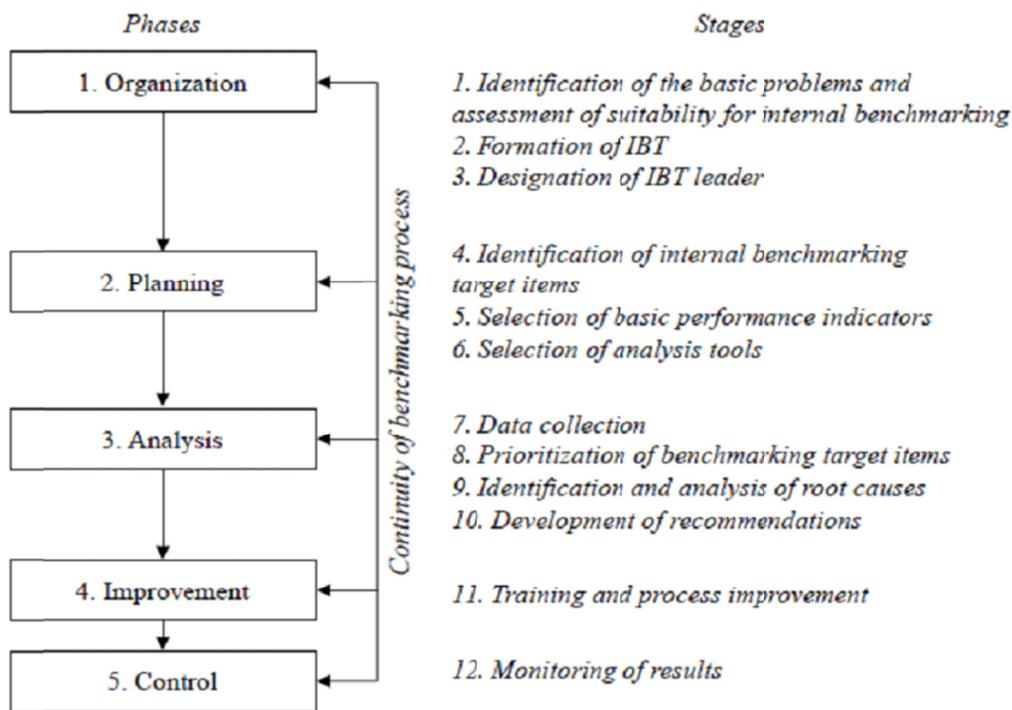

Figure 1: Performance management model [Source: Concharuk, A. and Monat,P. (2009).]

A difference from the other frameworks is the emphasis given on the "Training and Process Improvement" step, which is directly related to the skills and thereafter tacit and explicit knowledge. The authors proceeded with a deeper analysis of this step, reporting that employees should be motivated to improve, and willing to change their habits and existing work patterns for a successful incorporation of the organizational goals. They also report that employee goals, behaviors, metrics and rewards are a requirement to optimize performance. Monat (2005, 2007) analyzed those parameters in the form of an optimized employee performance system, which consisted of four main elements: *a) the establishment of goals*; *b) the establishment of supportive behaviors*; *c) the establishment of metrics*; *and d) the establishment of a rewards system*. This system becomes an effective, comprehensive and self-supporting system only if these elements are appropriately integrated and it is validated through quantitative measures of productivity and quality (Goncharuk & Monat, 2009). Likewise, Lawler et al (2012) conclude that successful performance management needs to go beyond the talent management practices and to make sure it is integrated into the organization's strategy. Additionally, Haines and St-Onge (2012) refer to a list of critical success factors in order to establish a successful outcome in performance management, highlighting the training and knowledge capital. Likewise, Biron et al

(2011) emphasize the above, going even further by stressing facilitators such as the strategic and tactical management process, the involvement and commitment of top management and training and knowledge sharing.

4. Knowledge management

O'Dell and Hubert (2011) define "knowledge" as: what employees know about their customers, one another, products, processes, mistakes, and successes, whether that knowledge is tacit or explicit, and "knowledge management" as a systematic effort to enable information and knowledge to grow, flow, create value (O'Dell & Huber, 2011), and meet tactical and strategic requirements (Frost, 2012). It is about creating and managing the processes to get the right knowledge to the right people at the right time, having as a main purpose helping people to share and act in accordance with this information to improve organizational performance (O'Dell & Huber, 2011). A similar definition was given by Skyrne (2011), who defines knowledge management as *"the explicit and systematic management of vital knowledge – and its associated processes of creation, organization, diffusion, use and exploitation – in pursuit of business objectives."*

By identifying, sharing and using the knowledge and practices internally, a company has the advantage of identifying, capturing and the ability to leverage this internal knowledge and compete and become a learning organization (O'Dell, Grayson, 1998). Even if a company is willing to proceed with an internal benchmarking and best practice transfer approach, it is a requirement that the crucial knowledge is at a first step identified and as a second step transferred throughout the internal environment. In other words, best practice transfer is one of the most profitable knowledge management approaches used to close performance gaps and achieve the same level of high performance as similar organizational divisions of an organization.

O'Dell and Hubert (2011) identified three main categories of knowledge, further divided into 7 subcategories. According to the area of interest, different maps are used to explore the knowledge of interest:

Enterprise Knowledge
>   Strategic-Level Knowledge map
>   (*Level of competency or expertise to meet strategic goals*)

Expertise-Level Knowledge map
>   (*What knowledge an organization has, key knowledge assets to be available, strengths and opportunities, sharing behaviors*)

Cross-Functional Knowledge
Expertise Tacit Knowledge map
>   (*Expert employees and their areas of expertise*)

Technical/Functional Knowledge map
>   (*Strengths and gaps within specific technical or functional knowledge domains*)

Process-Explicit Knowledge
Document-Explicit Knowledge map
>   (*Assets and content, knowledge needs and sources, recipients, knowledge locations and formats*)

Job or Role-Based Knowledge map
>   (*Required knowledge for jobs or roles to perform specific process*)

Competency/Learning Needs map
>   (*Learning or competency needs within various processes*)

Once the type of knowledge is identified and agreed, it should be incorporated into the knowledge management strategy. The following framework ensures that the elements needed for successful knowledge transfer should be incorporated in the KM strategy and it has been used as a tool to validate and target gaps, issues and strengths. For the needs of this research we will focus on the change of knowledge throughout the framework's levels.

This framework suggests that as knowledge management capabilities improve the nature of the organization's critical knowledge evolves, needing to be higher need to be the performance.
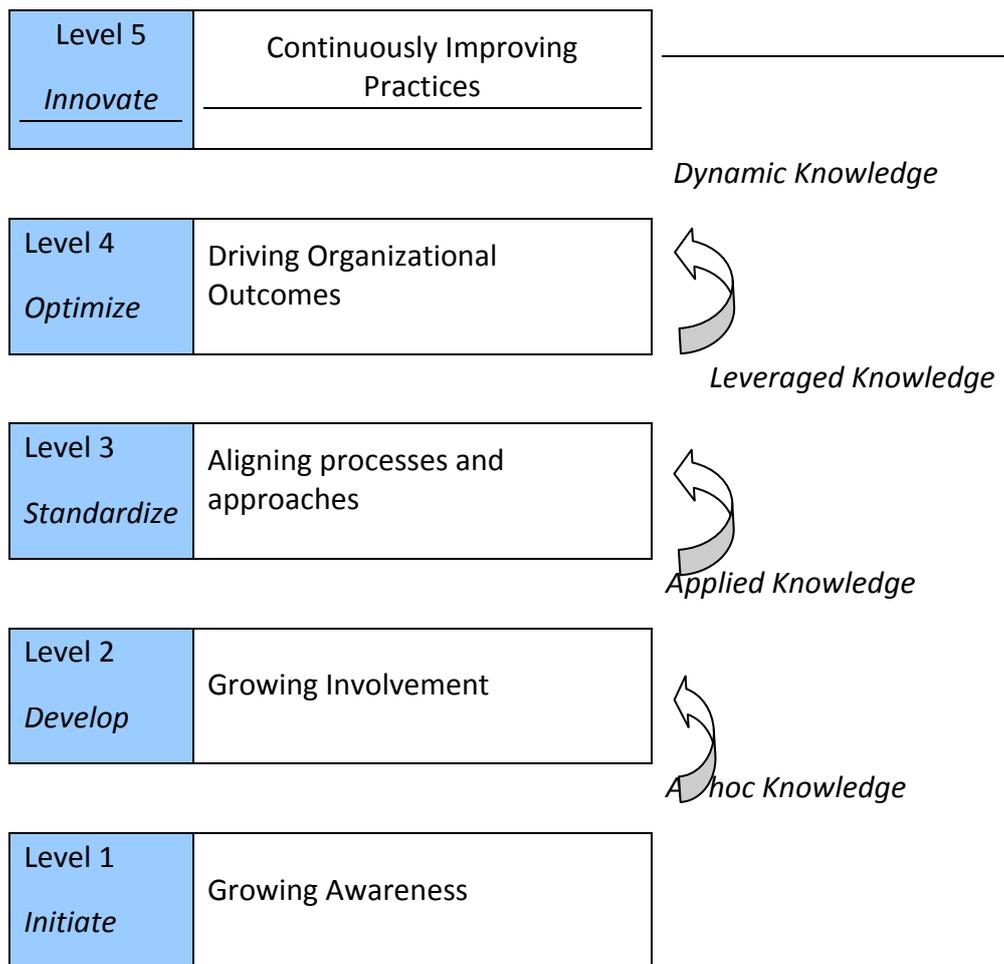
Figure 2: Knowledge management framework [Source: O' Dell, C. & Hubert, C. (2011)].

Nevertheless, over the years, several knowledge management models have been reviewed and developed, proposing key variables for the successful implementation of knowledge management. Central to the creation of a knowledge-based organization is quality training, since the demand for high quality, lower costs and faster cycle times is extremely high. This is done through continuous improvement of organizational performance in combination with advances in technology and improved processes. All these require a competent workforce and are achieved through continuous training and development efforts. Consequently, training should be treated as a strategic investment in order to become a "learning organization," and innovation needs to be accepted as an important tool towards that goal. The implementation of successful knowledge management has been related to different organizational factors, such as employee training, involvement and empowerment, open and trustworthy spirit of teamwork, visible top management leadership, information systems' infrastructure, performance measurement, knowledge-friendly culture, benchmarking, knowledge structure and elimination of organizational constraints (Choy & Suk, 2005).

5. Performance Management and Value Creation

In general performance management can be defined as the guidelines, strategies and systems with the only purpose to direct managers' and employees' actions towards the improvement of an organization's performance and hence to enhance the value of all stakeholders. Value creation is the most vital objective of any business. As suggested by Vester et al. (2007) performance management is one of the most essential devices that any organization can employ to generate shareholders value creation. The same study indicated that by having a clear picture on the central value drivers of a firm, by connecting mangers' incentives to the business value driver and by lining up their actions and interest with those of their shareholders, and finally by aligning peoples' performance with the expected targets would eventually lead to a healthy and strong circle of value creation and at the same time initiate performance culture.

One of the driving forces for the need of the performance management in today's business world is the diversified need and competing views from different stakeholders in regards to what should be accomplished and what creates value (PWC, 2015). Shareholders for example, since they are interested for their return on investment, can utilize performance a management as a tool to force out bad performers. On the other hand employees can see performance management as tools to assist them to grow professionally and at the same time reward them for their outstanding work. Policy makers use performance management to cope with business risk and employee behavior where managers use it to motivate employees towards the desired behavior.

Additionally, taking into account the increasing competition in today's business environment many organizations rely heavily on their employees for gaining competitive advantage over their rival and value creation. A successful performance management system would involve and at the same time motivate employees, give them secure rewards whereas at the same time promote risk-responsible actions. Additionally, this system should promote a culture where innovation, improvement, and the needs of the customers are of fundamental importance (PWC, 2015).

Based on the resource-based view model, company's resources are the primal sources for generating competitive advantage over rivals and at the same time enhance performance (Peteraf and Bergen, 2003). In essence, the employees are considered to be both resources and assets for a given company, and for that reason companies should incorporate strategies that boost, progress and reward employees' performance. In accordance and Stevers and Joyce (2002), performance management in conjunction with appraisal systems portrays a vital role in helping firms to obtain growth in performance and value.

Studies indicated that a large number of organizations today incorporate performance management systems as opposed to traditional financial oriented systems, with the most popular one being the balance score card with a utilization rate of 44%   on a global level (Marinez, 2005). Martinez and Kennerley (2005) found six reasons for the increasing use of performance management systems within firms; ' *(1) monitor productivity, (2) communicate strategy, (3) reduce costs, (4) review their business strategy, (5) support their compensation systems and (6) control operations'* (Martinez, 2005, pp 16).

Lingle and Schiemann (1996) found evidence that companies which utilize performance management systems generate better performance than other firms, where Lawson et al. (2003) found evidence that found evidence that companies which utilize performance management systems exhibited growth in sales and profits, reduction in costs, and at the same time improvement in return on assets and investments. Other literature have suggested those systems benefit indirectly performance through increase in customer and employee satisfactions (DeWall, 2003). Finally, it has been stated that performance management systems generate a better business model by motivating employees' actions, and generating new practices and procedures, than by just concentrate on increasing revenue and profits (Martinez, 2005). In essence more motivated and satisfied employees and better set of practices it is expected to lead in increase in value for a number of stakeholders.

On the other hand as Martinez (2005) pointed out some companies have not identified any positive results in their financial performance with the employment of performance management systems. Another point of notice is that they could not separate the benefits from those system in their performance, where in some cases they have generate negative financial results due to the high implementation costs.

Vester et al. (2007) examine the performance management system on a five successful companies so as to identify key lessons out of those examples. There results indicated that even though there was no single best practice in terms of planning, targets or controls, all features of those systems must be matching with both the culture as well as the behavioral features of the firm as well as to work together in a harmonizing mode. In more detail the example companies have demonstrated a range of different performance management approaches, but they all had four specific features. The first one was that they were clear and define roles and accountabilities for each manager. Managers felt totally empowered to deliver their roles and this in turn added value to their business units. The second feature is related to trust. Companies trust their manager that would in firm's best interest, and manager trust companies that would provide all the necessary tools for them to perform well. The third on relates performance evaluation. The starting point was the link of performance with actual results to together with the related drivers. After completing this task then the alternative actions together with the actual actions are compared. The last feature, all the systems incorporated both performance and health. In essence performance was depicted based on the deliverable by the firms in terms financial and operational terms to its stakeholders. On the other hand health was

portrayed as the qualities, characteristics and today's actions that would help to sustain performance tomorrow. The combination of the two, performance and health, leads to a sustain value for a given firm.

6. Knowledge Management and Value Creation

Knowledge management has drew the attention of both practitioners as well as academics all around the globe, based on the notion that real recourses have been replaced by intangible resources, such as knowledge, as the key force of performance increase in an organization (Massingham, 2014). Further, the increasing level of global competition, the diversity of product and services available to consumers, the growing technological advancement and the constantly changing demands of consumers have generated and extra pressure to firms to identify new methods and capabilities as well as competitive advantage to enhance value creation.

For that reason, it is evidence that the quick attainment and use of new knowledge is the key element to the creation of sustainable competitive advantage (Davenport and Prusak, 1998). As Kaplan et al. (2001) pointed out for a firm to increase its performance it must entail the capability to generate new knowledge by mixing existing knowledge with knowledge resources together with alteration of firm's internal procedures. Further to the above, Chong et al. (2000) stated that management of knowledge resources make the most of corporate prospects and at the same time diminish the risk of lacking or lost prospects. In essence it has been suggested that a successful utilization and administration of knowledge resources are the grounds for the development of corporate capabilities that lead to increase in performance and value creation (Schiuma et al., 2012).

Moustaghfir (2008) indicated that knowledge resources are characteristically dynamic and they interact with each other so as to create value. Knowledge resources can be defined as ''all the firms' assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a the firmto conceive of and implement strategies that improve its efficiency and effectiveness'' (Barney, 1991).

In more details the relevant literature argues that successful firms' in today's competitive business environment arise because of their competitive advantage over their rival. This competitive advantage emerges because of the manner that those firms administrate their knowledge resources as well as a competence knowledge management process that utilizes those knowledge resources and convert them into increased both firm value and performance (Massingham, 2014). The evolution as well as the improvement of the firm's knowledge resources is done through knowledge management and a set of education tools lead to an increase in the firm's capabilities whereas those capabilities are redeem into product and services that are more attractive to consumers. As suggested by Schiuma et al. (2012) value creation is generated in the progress of firm's knowledge resources as depicted in the figure 3 below.
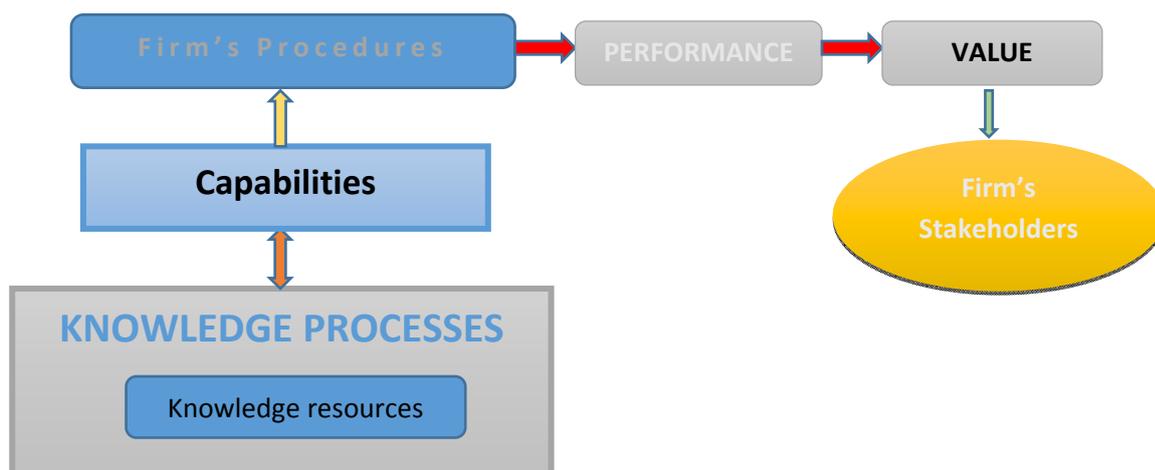

Figure 3: The connection between knowledge management and value creation [adopted from Schiuma et al. (2012)]

A number of prior literature has examine the effect of knowledge management on firm's performance and value growth. Kianto et al. (2014) suggested that for knowledge management to have a positive impact on performance a

company should not only take notice of n its intangible assets but similarly to focus on the management of these assets because is of equal importance. Bart et al. (2003) utilized brand as an indicative intangible asset and found that its value it's positively related with the company's share prices and in turn the related returns to its shareholders. On the other hand Hand (2003) indicated that in terms of intangible resources only marketing and research and development affect share prices and especially when the above mentioned two resources play a significant role in the strategy of the company. In line with Hand (2003) are the results of Lev and Sougiannis (2003) which also indicated a positive relationship between share prices and research and development.

7. Research Questions

The research questions that have been formulated to examine the purpose of this study were the following:

- To what extent, if any, is there a relationship between the implementation of a knowledge management strategy and innovation?

- To what extent, if any, is there a relationship between the implementation of a performance management strategy and innovation?

- Which, if any, of the strategies of knowledge management and performance management relate more strongly to innovation?

Hypotheses

The hypothesis questions for this quantitative research study are as follows:

$H1_0$: *There is no correlation between a knowledge management strategy and innovation.*

$H1_a$: *There is a correlation between the implementation of a knowledge management strategy and innovation.*

$H2_0$: *There is no correlation between the implementation of a performance management strategy and innovation.*

$H2_a$: *There is a correlation between the implementation of a performance management strategy and innovation.*

$H3_0$: *There is not a strong relationship between the strategies of knowledge management and performance management and innovation.*

$H3_a$: *There is a strong relationship between the strategies of knowledge management and performance management and innovation.*

8. Research methodology

This quantitative causal quantitative research study was conducted using questionnaires. The sample population of this research study was 600 respondents. Questionnaires were given to managers and employees in six different European organizations, striving for as large a sample as possible, with a hope of a 50% sample. This research did not examine the entire population because inferential statistics would not then be able to be conducted. Hence, a simple random sampling was used to select the participants. The researchers felt that establishing personal contact with the directors of the organizations helped to increase the response rate. For this reason the sampling procedure that was used is not wholly probabilistic as particular organizations were chosen to be included in this study. Probability sampling implied that the selection of participants was determined by chance. In purposive sampling, we sample with a purpose in mind. We usually would have one or more specific predefined groups we are seeking. For instance, have you ever run into people in a mall or on the street who are carrying a clipboard and who are stopping various people and asking if they could interview them? Most likely they are conducting a purposive sample (and most likely they are engaged in market research). They might be looking for Caucasian females between 30-40 years old. They size up the people passing by and anyone who looks to be in that category they stop to ask if they will participate. One of the first things they're likely to do is verify that the respondent does in fact meet the criteria for being in the sample. Purposive sampling can be very useful for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, you are likely to get the opinions of your target population, but you are also likely to overweight subgroups in your population that are more readily accessible. Therefore, purposive sampling was used to select participant organizations for this study. Purposive sampling involves obtaining information from specific types of individuals who can provide the desired information. The individuals chosen met the criteria set by the researchers. The non-probabilistic purposive sampling was used instead of a

probability sampling approach in choosing the six organizations, even though this sampling strategy limited the generalizability of the results (Zikmund et al, 2011).

Simple random sampling is the most common sampling design, in which researchers select a group of subjects (a sample) for study from a larger group (a population). Each individual was chosen entirely by chance and each member of the population had an equal chance of selection in the sample. Every possible sample of a given size has the same chance of selection. The main benefit of simple random sampling is that it guarantees that the sample chosen is representative of the population. This ensures that the statistical conclusions will be valid. In addition, simple random sampling requires an accurate list of the whole population. Hence, this research used the simple random sampling procedure because the researchers had access to names in the population and the questionnaires were distributed directly to the managers and employees in six different organizations. One way of achieving a simple random sample is to number each element in the sampling frame and then use random numbers to select the required sample. Random numbers can be obtained using a calculator, a spreadsheet, and printed tables of random numbers (Zikmund et al, 2011). The following are the **advantages of simple random sampling**:

1. One of the great advantages of simple random sampling method is that it needs only a minimum knowledge of the study group of population in advance.
2. It is free from errors in classification.
3. Simple random sampling is representative of the population
4. It is totally free from bias and prejudice
5. The method is simple to use.
6. It is very easy to assess the sampling error in this method.

Simple random sampling suffers from the following demerits:

1. This method carries larger errors from the same sample size than that are found in stratified sampling.
2. In simple random sampling, the selection of sample becomes impossible if the units or items are widely dispersed.
3. One of the major **disadvantages of simple random sampling** method is that it cannot be employed where the units of the population are heterogeneous in nature.
4. This method lacks the use of available knowledge concerning the population.
5. Sometimes, it is difficult to have a completely cataloged universe.
6. It may be impossible to contact the cases which are very widely dispersed.

This research was conducted using survey instruments and specifically questionnaires that were administered to managers and employees in six different organizations. The questionnaire survey is a research strategy often used when adopting a deductive approach in business and marketing research. By using quantitative surveys, the researcher administered a questionnaire to collect standardized data in an economical way. The sample size must be large enough to allow adequate statistical analysis and to better address potential confounding effects (Zikmund et al, 2011).

An a priori power analysis using GPOWER was carried out to determine an appropriate sample size. The power of a test indicates the probability of correctly rejecting a false null hypothesis. To detect a medium effect size (d = 0.5), a total sample size of 176 was needed to conduct a one-tailed paired sample t test on means with alpha = 0.05, and power = 0.95, and a sample of 140 was required for alpha = 0.01 and power= 0.99. The total employee target population for this study was 600 participants. Hence, a priori power analysis using GPOWER was carried out to determine an appropriate sample size.

9. Data analysis

Analysis of research question and hypothesis 1

In all cases, a Pearson two-tailed correlation was used with a 0.05 significance level for evaluation. However, the SPSS software also flags significant correlations down to the 0.01 level, and as such, if correlations were found within this level these were reported as indicated. Each of these outcomes is discussed below. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient, for short) is a measure of the strength of a linear association

between two variables and is denoted by r. Basically, a Pearson product-moment correlation attempts to draw a line of best fit through the data of two variables, and the Pearson correlation coefficient, r, indicates how far away all these data points are to this line of best fit (how well the data points fit this new model/line of best fit). The Pearson correlation coefficient, r, can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases. The stronger the association of the two variables, the closer the Pearson correlation coefficient, r, will be to either +1 or -1 depending on whether the relationship is positive or negative, respectively. Achieving a value of +1 or -1 means that all your data points are included on the line of best fit - there are no data points that show any variation away from this line. Values for r between +1 and -1 (for example, r = 0.8 or -0.4) indicate that there is variation around the line of best fit. The closer the value of r to 0 the greater the variation around the line of best fit.

The outcome of the correlation for the full sample is presented in Table 1. This demonstrates a correlation of $r(600) = .85$, $p < .01$ at the .01 significance level between the two variables identified in the full sample This correlation coefficient was found to be significant at the 0.01 level, exceeding the threshold of significance $p < .05$ that was set for analysis.Thus, in terms of the full sample, hypothesis 1 (alternative hypothesis) could be said to be supported and the null hypothesis was rejected.

Table 1: Correlation across full sample for perceived effectiveness of implementation of knowledge management on innovation

Correlations			
		Perceived effectiveness of implementation of knowledge management	Perceived impact of knowledge management on innovation
Perceived effectiveness of implementation of knowledge management	Pearson Correlation	1.000	.85**
	Sig. (2-tailed)		.000
	N	600	600
Perceived impact of knowledge management on innovation	Pearson Correlation	.85**	1.000
	Sig. (2-tailed)	.000	
	N	600	600
**. Correlation is significant at the 0.01 level (2-tailed).			

Analysis of research question and hypothesis 2

The outcomes of the correlation between the perceived effectiveness of implementation of performance management strategies and the perceived impact of performance management strategies on innovation for the full sample group are demonstrated in Table 2. As can be seen, this is not as strong a correlation as was seen in hypothesis 1, but nevertheless he correlation coefficient of $r(600) = .57$, $p < .01$, which is found to be significant at the 0.01 level (two-tailed), demonstrates that there is a significant correlation between these two variables. This correlation coefficient was found to be significant at the 0.01 level, exceeding the threshold of significance $p < .05$ that was set for analysis. Thus, for this hypothesis at the sample-wide level, the null hypothesis $H2_0$ was rejected and the alternative hypothesis $H2_a$ should be accepted.

Table 2: Correlation between the perceived effectiveness of implementation of performance management strategies on innovation - full sample

Correlations			
		Perceived impact of performance management on innovation	Perceived effectiveness of implementation of performance management strategies
Perceived impact of performance management strategies on innovation	Pearson Correlation	1.000	.57[**]
	Sig. (2-tailed)		.000
	N	600	600
Perceived effectiveness of implementation performance management strategies	Pearson Correlation	.57[**]	1.000
	Sig. (2-tailed)	.000	
	N	600	600
[**]. Correlation is significant at the 0.01 level (2-tailed).			

10. Research question and hypothesis 3

The analyses for research questions 1 and 2 focused on correlations, or identification of similarities in performance. However, this did not allow direct comparison of the results, nor did it allow direct identification of the relationships between variables that may be found in this case. Furthermore, as correlation did not imply causation, it did not say anything about the potential causal relationships between the variables. To determine if there was a relationship between these three factors and enrollment, linear regression was chosen to examine this relationship.

Two linear regression processes were used to explore the issues involved in this evaluation. Each of the three sets of variables identified above (X_1 and Y_1, X_2 and Y_2) were examined using an individual linear regression process. This was evaluated using a significance level of *p* = 0.05.

The variable pairings used in two separate linear regression determinations for each of the analysis levels are identified in Table 3. These variables are consistent throughout the analysis levels.

Table 3: Variable specifications for linear regression process

Variable	Description
X_1 (Independent)	Perceived effectiveness of implementation of knowledge management strategies
Y_1 (Dependent)	Perceived impact of knowledge management strategies on innovation
X_2 (Independent)	Perceived effectiveness of implementation of performance management strategies
Y_2 (Dependent)	Perceived impact of performance management strategies on innovation

All regression equations were specified in the form Y_i = slope * X_i + intercept, in which i = the number of the variable as specified above. Each variable number corresponded to the related correlation-based hypothesis above. Each equation was specified for the variable pair using the appropriate matrix determination (Constant/B for the slope and Variable/B for the intercept). R^2 values (from 0 to 1) were used to determine the strength of the relationship

described by each equation, and the ANOVA output from each was used to determine whether the relationship was statistically significant. Following the process of specification for each of the models, the R^2 values for each of the outcomes were considered to determine how strong the relationship between the two variables was. The R^2 value varies between 0 and 1, with 0 indicating no significant relationship and 1 indicating an absolute relationship. As in common with the rest of this analysis, a significance level of p = 0.05 was used to determine statistical significance. The R, R^2 (coefficient of determination) and regression equation determined for each of the three variable pairings in the full sample. In the case of the relationship between X_1 and Y_1, the R^2 = .72, $F(1, 600)$, $p < .01$ value indicate a moderate relationship between the two variables; colloquially, 72% of the variation in Y_1 can be explained by the corresponding value of X_1. The ANOVA output for this test indicates a significance of .000, which is below the significance threshold of p = 0.05. Thus, this is accepted as a valid and statistically significant relationship on the sample-wide level. The second relationship between X_2 and Y_2 demonstrated an R^2 = .33, $F(1, 600)$, $p < .01$ value, which was much lower than the other regressions involved. This indicates that 33% of the variation in Y_2 can be attributed to the X_2 variable. The ANOVA analysis for this variable did indicate that it was a significant relationship, with a significance level of .000. However, this relationship was much less substantial than the first, lending only partial support to a strong relationship between the two variables in this case.

11. Final thoughts

Such is the nature of knowledge and performance management, and a significant finding from this research is that critical success factors, such as speed, time, availability, decision-making process, response, performance, do emerge in association with the aforementioned authors (Chourides et al, 2003; Chourides, 2004; Bessant & Tidd, 2011; Marrioti and Glackin, 2013; Armstrong, 2015) indicating the strong correlation of knowledge management and performance management approaches. Consequently, these critical factors would empower the performance and more crucially will provide profound argument for better Scheduling/ Programming, Guidance, Evaluation and Reward within the organization

The demand and requirements for best practice in knowledge and performance management, as an emerging pattern from the analysis, intensify the argument for such efforts. Within the theoretical framework of knowledge and performance management parameters – such as internal and externa practices, people, customer demands and needs – time, accuracy, and information technology appear to share a common ground. Therefore the evolution of such an approach within the knowledge and performance management context appears to be in harmony and is not a fad. A logical integration will enable organizations and individuals to understand, implement, and assess their capabilities. Additionally, the approach of best practice contributes to an effective process of moderation and control at any given time of organizational activities. The future best practice needs to support the key processes of:

- Discovering and identifying the organizational knowledge assets,
- Mapping and auditing the organizational performance activities,
- Adding valuable sources and tools of understanding for the creation and transfer of knowledge within and outside the organization,
- Contributing and facilitating the level of performance in the organizations,
- Integrating the innovation process using performance and knowledge characteristics,
- Exploring the capabilities and contribution in distinctive competence of both organization and individuals,
- Strengthen the relationship among key stakeholders,
- Improving time and accuracy of innovation.

This level of engrossment and complexity has not been allowed for in previous research and this research has found and endorses that this parameter needs to be further investigated and developed. Furthermore, the velocity factor needs to be addressed in the near future, as it appears that the timing factor is an area that enables knowledge and performance to strengthen their strong relationship, which will enable the users to acquire a substantial competitive advantage. As the rapid change of business environment level increases it can be observed that the number of factors increases, and a senior participant refers to this as "*an indication of sufficient progress.*" The introduction of a link and association of critical success factors highlight the benefits of the approach that any knowledge and

performance management activities need to be addressed outside the typical organizational and personal boundaries. The relationship is of significance and can be regarded as a blueprint for current activities and level of involvement within the organization and the knowledge end-user.

By embedding knowledge and performance activities and initiatives within a holistic and sophisticated framework, organizations will be better able to fulfill their aims and objectives. Consequently, a better understanding and indication of knowledge transfer and investment will be able to be traced and reported. Managers will be in a better position of control, performance indicators and measurement will be developed and any strategic intent can be assessed at any given stage without the human interaction and innovation being lost.

References

Armstrong, M. (2015) Armstrong's Handbook of Performance Measurement – An Evidence-Based Guide to Delivering High Performance 5th ed. Uinted Kingdom, Kogan Page.

Barth, M.E., Clement, M.B., Foster, G. and Kasznik, R. (2003), 'Brand values and capital market valuation, in Hand, J. and Lev, B. (Eds), Intangible Assets: Measures, Values and Risks, Oxford University Press, New York, NY

Bessant, J. & Tidd, J. (2011) Innovation and Entrepreneurship. 2nd ed. United Kingdom Jon Wiley & Sons.

Biron, M., Farndale, E. & Paauwe, J. (2011) Performance management effectiveness: lessons from world-leading firms. International Journal of Human Resource Management, 22 (6), 1294–1311

Chourides, P (2004) *Best Practice in Knowledge Management: An Empirical Study of the Critical Success Factors in the Creation of a Knowledge Management Program*. Un-published PhD Thesis, University of Derby, UK.

Chourides, P. & Longbottom, D. (2001) 'Knowledge management: a survey of leading UK companies. *Proceedings of the 2nd MAAOE International Conference: 'Towards a Sustainable Excellence?', Versailles, France,* 26–28 September, pp. 113–26.

Chourides, P. & Longbottom, D. (2002) 'Climbing new heights: conquering K2. Knowledge Management Magazine. [Online] Bizmedia. Available from: www.kmmag.biz.com July 15th

Chourides, P., Longbottom, D. & Murphy, W. (2003) Excellence in knowledge management: an empirical study to identify critical factors and performance measures. *Measuring Business Excellence*, 7 (2), 29–45.

Choy, C. S. & Suk, C. Y. (2005) Critical factors in the successful implementation of knowledge management. *Journal of Knowledge Management*, 6 (1) pp:49-56

Davenport, T.H. and Prusak, L. (1998), Working Knowledge: How Organizations Manage What They Know, Harvard Business School Press, Boston, MA

De Waal, A. A. (2003), Behavioural factors important for the successful implementation and use of performance management systems, Management Decisions 41(8), 688-697

Frost, A. (2012)   A Synthesis of Knowledge Management Failure Factors [Online]. Available from: http://www.knowledge-management-tools.net/knowledge-management- definition.html#ixzz3UCcnNgrO) Accesses February 3rd

Goncharuk, A. & Monat, J. (2009) A synergistic performance management model conjoining benchmarking and motivation. *Benchmarking: An International Journal*, 16 (6), 767–784.

Haines,V. Y. & St-Onge S. (2012) Performance management effectiveness: practices or context? *International Journal of Human Resource Management*, 23 (6), 1158–1175.

Hand, J.R.M. (2003b), ''Profits, losses, and the nonlinear pricing of internet stocks'', in Hand, J. and Lev, B. (Eds), Intangible Assets: Measures, Values and Risks, Oxford University Press, New York, NY

Kaplan, S, Schenkel, A., von Krogh, G., Weber, C (2001). Knowledge Based Theories of the Firm in Strategic Management: A Review and Extension. MIT Sloan Working Paper 4216-01. MIT, Massachusetts

Kianto, A., Ritala, P., Spender, J. and Vanhala, M. , (2014),The interaction of intellectual capital assets and knowledge management practices in organizational value creation, Journal of Intellectual Capital, Vol. 15 Iss 3 pp. 362 - 375

Lawler E.E., Benson, G.S. & McDermott, M (2012) What makes performance appraisals effective? *Compensation and Benefits Review*, 44 (4), 191–200.

Lawson, R., Stratton, W. and Hatch, T. (2003), The benefits of a scorecard system, *CMA Management* June/July, 24-26

Lev, B. and Sougiannis, T. (2003), ''The capitalization, amortization, and value-relevance of R&D'', in Hand, J. and Lev, B. (Eds), Intangible Assets: Values, Measures and Risks, Oxford University Press, New York, NY.

Lingle, J. H. and Schiemann, W. A. (1996), From the balanced scorecard to strategic gauges: Is measurement worth it?, *Management Review*, 85(3), 56-61..

Mariotti, S. & Glackin, C. (2013) *Entrepreneurship*. 3rd ed. New Jersey Pearson Education.

Martinez and Kennerley (2005) Performance Measurement Systems: Mix Effects' EURAM Conference, online proceedings; 4-7 May, Munich, Germany (Online), Available from :http://euram2005.wi.tum.de/proceedings/trackdetail.php?trackid=22

Martinez V. (2005),'What is the value of using performance management systems?, *Practitioner's publication- PMA Newsletter*, 4 (2), 16-18

Massingham, P. , (2014), An evaluation of knowledge management tools: Part 2 – managing knowledge flows and enablers, Journal of Knowledge Management, Vol. 18 Iss 6 pp. 1101 - 1126

Monat, J.P. (2005), *The integrated approach to optimizing productivity*", *World at Work Journal*, Vol. 14 No. 2, pp. 61-70.

Monat, J.P. (2007), "*Motivational aspects of corporate productivity maximization: a field study*", *International Journal of Productivity and Quality Management*, Vol. 2 No. 2, pp. 177-92.

Moustaghfir, K. (2008), The dynamics of knowledge assets and their link with firm performance, Measuring Business Excellence, Vol. 12 Iss 2 pp. 10 – 24

Nonaka, J. (1994), A dynamic theory of organizational creation. *Organisational Science*, 5 (1), 14–37.

Nonaka, I. & Konno, N. (1998), "*The concept of 'ba': building a foundation for knowledge creation*", *California Management Review*, Vol. 40, pp. 40-54

O'Dell, C, & Grayson, C. (1998) If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practice. Simon & Schuster Publication, USA

O'Dell, C. & Hubert, C. (2011) How Knowledge Management is Changing the Way We do Business, The New Edge in Knowledge Wiley Publication, USA.

Osseo-Asare, A.E., Longbottom, D. & Chourides, P. (2007) Managerial leadership for total quality improvement in UK higher education. *The TQM Magazine*, 19 (6), 541–560.

Peteraf, M. and Bergen, M., (2003), Scanning dynamic competitive landscapes: a market-based and resource-based framework, *Strategic Management Journal*, 24, 1027-1041.

PWC, (2015), Performance adjustment: Improving the performance management model. [Online] Available from: https://www.pwc.com/us/en/financial-services/publications/assets/pwc-performance-management-model.pdf

Schiuma, G. and Carlucci, D., Lerro, A., (2012), Managing knowledge processes for value creation, VINE, Vol. 42 Iss 1 pp. 4 - 14

Skyrne,D (2011) in Frost (2014) A Synthesis of Knowledge Management Failure Factors pp 1-21 www.knowledge-management-tools.net/failure.html Accessed 10th March

Stevers, B.P and Joyce,T. (2000), "Building a balanced performance management system" SAM, Advanced Management Journal, 8, 22-28

Torrington, D., Hall, L. & Taylor, S. (2011)*Human Resource Management*, 8th ed. United Kingdom Pearson - Prentice Hall.

Vester, B., Wozniak, H., Manson, N., Dodds, R. and Gibbs, T., (2007), Performance Management: Case Study of World-Class Operators, (Online), Available from: https://www.aspeninstitute.org/sites/default/files/content/docs/education/Performance_Mgmt_Case_Studies.pdf

Zikmund, W., Bebin, B., Carr, J. & Griffin, M. (2011) *Business Research Methods*. 8th ed. South-Western CENGAGE Learning.