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E-learning and Knowledge Management: The development of an E-Learning System for Organisational Training

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E-learning and Knowledge Management: The development of an e-learning system for organisational training

Alain Muhire

A dissertation submitted in partial fulfilment of the requirements of Dublin Institute of Technology for the degree of M.Sc. in Computing (Knowledge Management)

July 2012
I certify that this dissertation which I now submit for examination for the award of MSc in Computing (Knowledge Management), is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the test of my work.

This dissertation was prepared according to the regulations for postgraduate study of the Dublin Institute of Technology and has not been submitted in whole or part for an award in any other Institute or University.

The work reported on in this dissertation conforms to the principles and requirements of the Institute’s guidelines for ethics in research.

Signed: _________________________________

Date: 11 JULY 2012
ABSTRACT

Information technology has major role in most successful companies and organisations around the world, most companies are using IT to reduce operation cost, while improving customer service by providing service twenty four hours, seven days a week and improving communication that helps keep pace with competitors. In most companies and organisation training is a process carried out on a regular basis; the quality of training offered to employee will be reflected on how knowledgeable the staff will become resulting in the organisation becoming more successful.

As organisations and companies are currently interested in improving knowledge management, employees are equally working hard to improve their knowledge and skills to ensure their job security, it is important to evaluate tools and techniques that can be used to achieve this objective.

This research looks at knowledge transfer and knowledge sharing processes through the development of an e-learning system which considers both the course material and the learner ability to provide individualised learning paths for learners that can be used in organisations to train staff and is made available to employees over the corporate intranet and online, and is thus readily available to people at any time anywhere.

The research will address the culture changes required, implementation process and an evaluation of the implementation. The work will be looking specifically at the use of e-learning tools to advance and enhance knowledge management within the organisation.

A group of people will be used to represent the organisation and will be participating in this work experiment.

Key words: Culture, E-learning, knowledge, Knowledge Management, Organisation, Training
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1. **INTRODUCTION**

Knowledge is one of the most valuable assets for any individual, company and organisation. Institutions use e-learning technologies to teach students, but fewer commercial organisations have e-learning tools implemented and used for training to enhance existing knowledge among staff. E-learning technologies provide a facility to create structure, store and disseminate knowledge, some of the most important features of any knowledge management system.

An e-learning approach can be used to provide training to global networks of staff in an organisation. It can be used to train sales professionals, customer service staff, field service technicians, manufacturing staff and extended channel partners with the exact same course contents, in virtually any language, virtually anywhere in the world. Therefore, it is important to evaluate the impact and benefit of e-leaning tools in knowledge management for business organisation.

Comet, one of the largest retailers of electrical goods in the United Kingdom wanted to improve staff training; they had a vision of becoming ‘Britain’s most trusted electrical specialist’, supported by key behaviours, to differentiate itself from other players in the market. The company took a step to improve and change Customer Support Centre staff training at Clevedon near Bristol in South-West England. One of the key challenges of the training department was to bring new entrants to competence as quickly as possible. In 2007 they introduced a new Kaidara system (a knowledge management software solution). With this new system the new staff spend less time in initial training because ongoing training is delivered in a Kaidara clinic on site. This consists of additional systems and product knowledge training where employees are able to reinforce their knowledge of the system. Apart from improving staff training the staff also appreciated the use of the new system as it provided much needed knowledge and extra skill that they needed when diagnosing fault that would have taken longer to acquire in a training room.

It is important to evaluate how Knowledge management in the organisation will be improved using the e-learning abilities to deliver a learning experience that meets the
needs of each of the four primary learning styles: Visual, Audio, Read/Write and Kinesthetic (VARK) to provide successful training in the organisation.

1.1 Background

The purpose of e-learning and knowledge management is to facilitate learning in organisation, “e-learning focuses on how to support individual learning process through pedagogical guidance, while knowledge management takes organisation perspective and practises as more naïve but more versatile peer to peer philosophy of sharing and transferring knowledge” (Andreas S. 2005). This demonstrates that e-learning is not considered to be a knowledge management practise but a tool that can be used to advance knowledge management process and practise in organisation.

E-learning technology can be used as a starting point to build a knowledge management system for the organisation.

Figure 1.1: Using Knowledge Management and E-learning for Strategic Change

As demonstrated in Figure 1.2, the tool developed or introduced in organisation can be used to provide training to individuals who are working on single project and gradually
to other projects in the organisation resulting in culture and total knowledge management changes in the organisation. The article “E-learning is not knowledge management, (2000-2001)” by Verna Allee, shares the view with Andrew that e-learning itself is not knowledge management but highlighted that it can act as a cornerstone of knowledge management. This will be achieved if the e-learning tools developers design the tool working with knowledge experts in the field so that the end product is not only to serve as an e-learning tool for individual users but also to be used by a community of knowledge experts. The e-learning tools for knowledge management should equally not contain knowledge and information only, but also point to other sources of knowledge such as books, website and expert in the field. The e-learning tools for knowledge management will also have to be updated regularly so that it helps experts to enhance their knowledge they use to do daily work.

The implementation of an e-learning tool in the organisation is like any other new system that is introduced in the organisation, it requires evaluating and planning how the tool will be used and the benefits the tool will bring. There should be a culture in organisation that supports changes. “A successful strategy involves developing a receptive culture toward e-learning and technology, getting key players on board, communicating its value, and leading through the change” (Rosenberg 2001). For e-learning to support knowledge management process and practises, the organisation culture should facilitate the introduction and implementing of the tools, the management should support this initiative if it is to be successful.

1.2 Research problem

This project will evaluate how e-learning can be used as a tool to advance knowledge management in an organisation. This project will evaluate the knowledge sharing and transfer in organisation, the organisation culture and the willingness for employees and management to implement the e-learning tools and how effective they are in advancing and supporting knowledge management in the organisation. The project looks at the use of e-learning to disseminate knowledge in the organisation.
1.3 Intellectual challenge

E-learning and knowledge management is not a new concept; there have been a lot of researches done in this area by others. This work focused on the role of ongoing training and the impact it will have in knowledge management in the organisation.

1.4 Research objectives

The aim of this work is to research the use of e-learning in organisation and the benefit it may have to advance knowledge management goals and objectives. The following objectives have been achieved throughout the dissertation and contributed to the overall outcome:

- Carry out research on knowledge management and implementation in the business organisation
- Investigate knowledge transfer and sharing within the organisation
- Develop a project management e-learning tool and associated website that can be used in organisation to train and improve staff project management skills
- Survey, discuss and analyse the result of the survey
- Make recommendation for future research work and improvement in this area

1.5 Scope and limitations

The project focused on the use of e-learning tools to advance and support knowledge management in business organisation, an e-learning tool was developed that provide modules in the field of project management and the tool will be used during the experiment process. The project management e-learning tools developed covered the use of Gantt chart in the project planning process and PRINCE2 project management methodology.

The survey method was used to get information and facts from participants who participated in the experiment process. These facts and information were used in the analysis and evaluation process.
1.6 Organisation of the dissertation

This dissertation work is organised in different chapters as follows:

- **Chapter 2**
The second chapter addresses the research work done on e-learning and knowledge management by other researches in this area and also my own views.

- **Chapter 3**
The third chapter contains organisation culture and change requirement to support the knowledge management process.

- **Chapter 4**
The fourth chapter provides the e-learning implementation strategy requirement to support knowledge management in business organisation.

- **Chapter 5**
The fifth chapter introduce technology requirement to implement an e-learning system.

- **Chapter 6**
The sixth chapter addresses the experiment carried out and the result of the experiment and the analysis of the work done compared with experiments done by others in the same area and those that can be adapter to this project.

- **Chapter 7**
The last chapter provides conclusion of the work done, recommendation for future research in this area and contribution to the body of knowledge.
2 KNOWLEDGE, E-LEARNING AND KNOWLEDGE MANAGEMENT OVERVIEW

2.1 Introduction

This work will look at the development of a knowledge management technology that can be used to advance knowledge management. This chapter provides an overview of knowledge, knowledge management and the role of e-learning in knowledge management.

2.2 Knowledge

Knowledge is one of the most valuable assets in the organisation. Knowledge is seen as an intellectual asset and people are not interested in sharing knowledge unless there is a reward in doing so. Knowledge is the fact of knowing something or how to do something obtained through investigation, reading or observation. It comes as a result of understanding information with direction or intent that can be used to facilitate a decision or an action. Knowledge can be considered to be explicit or tacit.

*Explicit knowledge* is knowledge that can be passed from one person to another easily. This knowledge can be articulated, codified and stored in different media. Knowledge found in text books or on the internet is a good example of this type of knowledge.

*Tacit knowledge* is the knowledge that is embedded in people that is difficult to be passed on from one person to another in books or through speech. “It is knowledge that is not explicated such as riding a bicycle, management, education, science, sport, art and our relationship with machines” (Harry, 2010). This knowledge is obtained through, observation and enhanced though experience. Companies and organisation hire talented individuals who have tacit knowledge or acquiring businesses that have personnel with skill and experience that the existing firm lack.
2.3 Knowledge management

Successful companies and organisations implement knowledge management processes that allow creating, transfer and sharing knowledge from one person to another. Knowledge management involves people, technology and processes in overlapping parts (Figure 2.1 Elias, Hassan, 2004). Knowledge management is considered to be a range of systems, processes and activities that are used to identify, create, represent and distribute knowledge within organisation.

![Figure 2.1: Overlapping Human, Organisational and Technological factors (Source: Awad E M and Ghaziri H M; 2004)](image)

Knowledge management is also considered to be a process of finding valuable information and transforming it into knowledge critical to decision making and action. Knowledge management helps companies remain competitive in this challenging market, it involves:

- The knowledge from client, staff, documents and processes
- The knowledge in database system and application
- The knowledge sharing among the staff members using the knowledge system implemented
- Other knowledge management processes used to create, store and disseminate knowledge.

One of the goals of KM is to view the organisation processes as knowledge processes that enables organisation survive and being competitive in the market. Knowledge management is not the re-engineering process which involves changing existing
processes and staff who perform different tasks. Knowledge management is concerned with improving existing processes, new treats and new opportunities. Within the organisation, the duties, roles and responsibilities of each individuals are outlined, a knowledge management system implemented should be designed with user’s needs in mind to make sure that the system serves the purpose, this can be achieved using existing staff and technologies. In the most case all the staff members of the organisation will be involved and new technologies may be introduced.

2.4 Knowledge management technologies

The purpose of knowledge management in organisation is not to manager the whole knowledge, but to collect, store and make knowledge available to the staff at the right time. “Management and coordination of diverse technology architectures, data architectures, and system architectures poses obvious knowledge management challenges” (Tsui 2005). In most organisations different software application and database system are used and those systems may have different data representation resulting in a challenge to integrate knowledge from those systems. Equally same information, data and knowledge may have different data type and values in two different systems because they are used differently by users, implementing a knowledge management system that requires fully integration of such system will be challenging.

Not all software or database systems can be considered knowledge management systems; there are a number of important features knowledge management systems should have (Robertson, S., 2002) these features include:

- Ability to store all types of data including any document types, voice and video files, images and web-pages
- Personalized access to the data with security features and privacy limitations
- Ability to modify the contents of the system and add comments
- Provide a search facility with user friendly interface
There are a number of tools and technologies that are used to enhance knowledge management within organisations:

- Wikis
- E-learning technologies
- Knowledge base systems
- Community of practise forums and more

When introducing knowledge management processes, the organisation can use one or more of those tools and technologies in combination with already existing application to enhance the process.

### 2.5 E-learning

E-learning is referred to as web-based training, or just-in-time training. It consists of modularised training courses that are available over the web anytime and anywhere you have access to the Internet (Ghirardini, 2011). It is available for personal use only to students who are eligible to register for classes, and staff. Many organisations, businesses, learning institution and individuals are using e-leaning tools to provide training, to teach, to learn and to enhance their existing knowledge.

The E-learning Research Agenda Forum 2004 in Ireland suggested “economic development will depend to a large degree on knowledge and innovation, both of which are essential in making the transition to higher value activities that support economic growth and wealth creation”. E-learning technologies will provide facilities to enhance knowledge and skill and it is important that companies have structures that will support e-learning to promote individual and group learning culture. E-learning provides a facility to enhance skill, knowledge and experience through digital media. They provide a study facility and also studying in a community helping professional development for individual and group of users.

There are a number of e-learning software technologies available on the market that organisation and companies can customize to create e-learning tools for staff training. These includes: Moodle, Microsoft Learning Content Development System, Adobe e-learning suite, CourseLab, and Mindflash online training. There are also other web
application platform that are used to provide a learning environment such as Twitter, Delicious, YouTube, Google Reader, Google Docs, Wordpress, Slideshare, and power point. It is important that organisation select the appropriate tools to use that suit their requirement.

Using the above mentioned technologies e-learning can improve training in the organization, “Forty independent studies found that e-learning yielded a time saving of 35-45% over traditional classroom instruction while obtaining equivalent or better gains in learning retention and transfer” (Fletcher, 1990).

According to Kevin Kruse, 2004,” synchronous e-learning is self-paced, advanced learners are allowed to speed through or bypass instruction that is redundant while novices slow their own progress through content, eliminating frustration with themselves, their fellow learners, and the course”. This allows the learners to complete course quicker and also this provide facilities to allow more participants with a range of learning styles, preferences and needs.

“Pedagogical approaches for sustainability must be experiential, inter-disciplinary, based on action-learning and provide ‘just in time’, real world learning and application opportunities” (Wheeler, Zohar, & Hart, 2005). The e-learning tools can be used to provides training in any subject in the organisation and the tools are used anywhere anytime providing an opportunity for real time training offering new opportunities to users at a right time. A technical support staff can use the e-leaning tool to gain insight on how to troubleshoot a fault arising from a new product by acquiring knowledge from the new topic related to the troubleshooting guide of the product on the e-learning tool.

However, not all organizations are really prepared for such a dramatic shift towards e-learning. No matter how dramatic changes the e-learning tools may bring to the organization, deliberate reflection and planning for implementation will focus efforts on effective deploying of the necessary resources and enhancing organizational acceptance. (Minton, 2000)
2.5.1 The spiral of knowledge and e-learning

The knowledge management process make it possible for knowledge to be transformed and shared from one person to another, Nonaka and Takeuchi’s spiral model shows how different categories of knowledge are created and passed form one to another (Nonaka and Takeuchi, 1995).

The Nonaka and Takeuchi KM Spiral model explains how the organizational knowledge is created and converted through a continuous dialogue between tacit and explicit knowledge via four patterns of socialization, combination, internalization and externalization (figure 2.2). “The spiral explains transformation of tacit knowledge into explicit knowledge and then back again as the basis for individual, group, and organizational innovation and learning” (Nonaka and Takeuchi, 1995).

![Figure 2.2: The knowledge Spiral (source: Nonaka 1995)](image)

**Socialization** involves the conversion and transfer of tacit knowledge from one individual to another. This form of tacit knowledge transfer is usually done during discussion, meeting this is facilitated in an informal and social setting there should be trust between the two parties that are sharing knowledge.
The e-learning tools have video facilities that can be used as a knowledge management tool to allow courses or training class providers to share training materials and lessons using the video facilities. The training provider also can implement the real-time video conferencing option in order to enhance training and encourage interaction between tutors and learners. The lessons learned can also be stored for future reference on the e-learning tool via text, audio and video.

- **Externalization** - tacit knowledge is converted into explicit knowledge, the tacit knowledge that is embedded in people’s head is translated into comprehensible forms that can be understood by others. This process involves expressing the idea or view of a person into image or words and transforms this into a form readable by others. The e-learning tools are traditionally used to provide information in a readable form and can be used to codify and document this knowledge so that it is accessible to many people.

- **Combination** - explicit knowledge are converted into another form of explicit knowledge, the process is concerned with adding the new explicit knowledge combined with existing knowledge within the organization, the e-learning tool have facilities to provide training on existing knowledge and new innovation ideas, the knowledge should be codified and shared by staff members. The management and trainers will be concerned with how the new knowledge gained will be organized with other small pieces of explicit knowledge in organization.

- **Internalization** – explicit knowledge is converted into tacit knowledge during this process. The staff and other users of the e-learning tools will have gained explicit knowledge by accessing materials on the e-learning tools and transfer that knowledge and ideas into tacit knowledge resulting in them performing action that they were unable to do before and also enhancing their existing skills.

“Using e-learning tool to share knowledge, people can be provided with on demand performance support by getting just the training that they need at the time that they are completing a business task” (Woelk & Agarwal, 2002), thus the e-learning tool will not only be useful during the training to gain new knowledge but also used as a point of reference and knowledge source while people are working.
2.6 E-learning and knowledge management

Institutionalization of knowledge starts with providing tools to employees in which information and knowledge can be gathered and captured, analysed, stored, organized, structured, shared, published and made accessible and personalized (Leezenberg Tonningen & Schoonhoven, 2005). When e-learning tools are implemented properly they can be used to organise and store knowledge gained and shared in the training process, in the process new information and knowledge sources is created that will be used in organisation for innovation.

E-learning technologies have improved in the past few years and when implemented properly they can play an important role in advancing knowledge management goals and objectives in the organisation. It is important to examine to what extend e-leaning technologies can be classified as knowledge management systems.

Although a number of companies say that they sell KM systems, they sell training management (Verna A, 2000). E-learning system are used to provide training and can be improved to knowledge management system if the start focusing on knowledge community, point to knowledge repository and experts.

2.6.1 Creating community of expert

One of the main focuses of KM is to create a community of experts; this is achieved by creating a group of experts who share a common goal. The e-learning tools are generally used to provide training and learning new concepts; the tools should focus not only on teaching new concepts but becoming part of process for personal and group development and to be used as the main source of knowledge within the organisation.

2.6.2 Knowledge repository

Knowledge repositories are created through a knowledge development process. The process involves Knowledge Acquisition; identifying knowledge within and outside the organization followed by finding a better way of dealing or utilizing the new generated and improved ideas. “The knowledge management development includes all management efforts consciously aimed at producing capabilities which are not yet present within the organization, or do not yet exist either inside or outside the
organization” (Bettina, Gilbert 2000). The e-learning tools in organization must provide a facility for staff to access the knowledge that was supplied by other staff members, the training department or personnel and other knowledge sources. The tools will be used by staff to gain new ideas and create new skills and also to provide the necessary help to assist users to better use the gained skills.

2.6.3 Point to knowledge experts
Effective e-learning knowledge management tools must therefore ensure sufficient transparency, and help individual users to locate what they need. The e-learning tools will be used by many users, but not all knowledge can be codified and documented. The e-learning tools for KM provide knowledge sources to facilitate the users contact or go beyond the tool to gain more knowledge from the source. The e-learning tool should have an expert locator option to help the users locate the expert. “The expert locator assist user if they can’t find the right knowledge that should exist somewhere in the organization” (Dr. Ronald Young, 2010), It makes it simple if one wants to find someone who has certain knowledge or experience; the tool provides a facility to search by name, using key word or sentence and help find the right person. The tools should have a good user friendly interface and have facilities for users to register their knowledge and experience.

2.7 E-learning Benefit in organization
Training and learning are the foundation of knowledge management. The selections of appropriate e-learning tool contents are important to make sure that the outcome of the learning process is not gathering facts and information on a given topic. The e-learning contents should enhance knowledge and equip learners with practical skills and help learners develop competency in the given domain so that the learners become more productive.

In most cases training is provided manually in training rooms and staff are given handouts of notes with information and explicitly knowledge they acquired during training. As staff attend more training, they stockpile a lot of training materials and it becomes difficulty to refer to the training manuals all the time while working.
As a result, the organizations do not know what they know. In simple terms, they have incomplete knowledge of explicit and tacit data, information, and decision models available within the enterprise and the knowledge may not be visible to all users. “Since the organisation survival may sometimes hinge on what they know” (Eric Tsui, 2005), it is important the knowledge within organisation is visible and accessible. Using the e-learning tool in organisation training, the course will be arranged easily making it easier for users to locate what they need at anytime.

Electronic knowledge storage and management systems will benefit the organisation more, by providing access to knowledge anytime anywhere you have internet access and it will also make it easier to modify and update the knowledge.

“Implementing e-learning promises substantial benefits for organizations: it will potentially eliminate corporate training travel budgets, save 50% in training time” (Diane Khirallah, 2000). The organisation that implement e-learning system allow training to be conducted anywhere the staff has access to internet without the trainer or the employee travelling from site to site this also allows organisation with employees in different geographic location to have the same training at the same time.

With the e-leaning materials available online; employees are able to refer back to the learning contents while working to gain more knowledge anytime they need more knowledge on a given subject.

The desired outcome of learning should be knowledge acquisition and in combination with some practical skills gained in the past through education or work experience. The competent learner should be able to use knowledge acquired in their professional duties and execute tasks correctly. The just in time training with e-learning in the organisation will be important for successful knowledgeable team development.

Activities involved in standard education have to be implemented in different types of training delivered in the organizations and institutions using e-learning. This way communication and collaboration will be improved and free exchange of competencies will be provided. E-learning system can be used to provide training and increase the
level of expertise in a team and practical exercises and communication involved in training can give workers more experience and skills in execution of their professional duties.

“However, not all organizations are really prepared for such a dramatic shift towards e-learning. No matter how dramatic changes e-learning may bring to the organization, deliberate reflection and planning for implementation should have more efforts focused on effective deployment of resources and enhance organizational acceptance of the positive changes that the e-learning system will bring” (Minton, 2000).

2.8 Summary

This chapter provided an overview of knowledge, knowledge management, e-learning technology and the role of e-learning as a knowledge management tool in the organization. The main purpose of knowledge management is to make sure that the knowledge in the organization is applied productively for the benefit of that organization. For the e-learning tools to support knowledge management the tools will have to address or support the main goal and objectives of knowledge management; creating a knowledge repository, sharing knowledge, improving knowledge asset within the organisation, enhancing knowledge environment, managing knowledge as an asset and recognising the value of knowledge within the organisation.

Communication and collaboration are some of the important characteristics of a successful knowledge management practices, this can be achieved by having an e-learning tools that provide a facility for users to exchange information related to learning activities or specific topics of the proposed learning content.

Organization staff exchange knowledge and other resources during their daily work, this is sometime difficulty when staff working on the same project are in different offices or locations. The e-learning tool can be used to enhance this collaboration practice by acting as a knowledge source of the work practise within the organisation.
3 KNOWLEDGE MANAGEMENT AND ORGANISATION CULTURE

3.1 Introduction

The implementation of knowledge management involves technology changes, culture change, information processing and communication changes resulting in changing the way work is done in a business organization. This chapter addresses the culture changes required in order to successfully implement a successful knowledge management system in the private sector organisation HCL Technology. The chapter provides an overview of the organisation, organisation culture as barrier for knowledge management implementation, the strategy to change culture and the effect of having a knowledge driven organisation rather than industrial based culture.

3.2 HCL technology

HCL Technology is a leading global IT services company, working with clients in the areas that impact and redefines the core of their businesses. Since its inception into the global landscape after its IPO in 1999, HCL focuses on 'transformational outsourcing', underlined by innovation and value creation, and offers integrated portfolio of services including software-led IT solutions, remote infrastructure management, engineering and R&D services, Applications Consulting, BPO services, IT Hardware, Systems Integration and Distribution of Technology and Telecom products.

The operation and support department of Eircom is one if the client of HCL technology. The department currently needs a knowledge management system that can be used to change how work is done, this will be achieved by introducing a system that can be used to train staff and enhance the knowledge of existing staff and also be used as a knowledge sources to support staff while doing their daily work.
3.3 Knowledge sharing culture

Organisation culture plays a big role in knowledge creation and sharing among staff members, “it is viewed as a very important because it shapes assumptions about what knowledge is worth exchanging; it defines relationships between individual and organizational knowledge” (Karlsen & Gottschalk 2004). Figure 3.1 provides an overview of what makes up organisation culture; culture is embedded in organisation structure, activities, communication, sales, marketing, and products.

![Figure: 3.1 Organisation Culture (source: www.altoren.com)](image)

Culture is considered to be one of the main barriers of advancing KM initiatives in the organisation. “As new systems are rolled out, organisations lack culture to support collaborative work because people view knowledge as a way of securing their jobs” (David D. L1997). “Organisation should promote interaction and collaboration among employees when attempting to transmit tacit knowledge between individuals or converts tacit knowledge into explicit knowledge, thereby transforming it from the individual to the organizational level” (Gold A, Segars A 2001). An organisation should have a practise to encourage staff members to share knowledge from one another using KM systems in place. Having KM tools without the culture to share knowledge will not yield any result. A good knowledge management process in organisation will provides basic assumption of what knowledge needs to be processed
and passed from one another and also define the relationship between customers, individual staff and organisation knowledge.

Organisation culture can sometime be classified as industrial culture or knowledge culture. Knowledge management implementation works well in a knowledge driven organisation rather than in an industrial driven organisation. Table 3.1 below shows characteristics of industrial and knowledge culture organisation, it can be noticed that the knowledge culture driven organisation provides a platform to share knowledge.

<table>
<thead>
<tr>
<th>Industrial Culture</th>
<th>Knowledge Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited information distribution</td>
<td>Wide information distribution</td>
</tr>
<tr>
<td>Many management levels</td>
<td>Few management levels</td>
</tr>
<tr>
<td>Uneven responsibility</td>
<td>Shared responsibility</td>
</tr>
<tr>
<td>Rules based</td>
<td>Principles based</td>
</tr>
<tr>
<td>Structured</td>
<td>Unstructured</td>
</tr>
<tr>
<td>Risk adverse</td>
<td>Able to take some risks</td>
</tr>
<tr>
<td>Inward orientation</td>
<td>Outward orientation</td>
</tr>
<tr>
<td>Occasional training</td>
<td>Continuous learning</td>
</tr>
<tr>
<td>Financial focus</td>
<td>Marketing focus</td>
</tr>
<tr>
<td>Political</td>
<td>Open</td>
</tr>
</tbody>
</table>

*Table: 3.1 Industrial culture and Knowledge Culture organisation*

The industrial culture organisation have limited flow of information and have more control in the organisation activities, limiting the changes of accepting changes, while the knowledge culture organisation allows even distribution of information, with continuous learning that will facilitate knowledge management implementation.
3.3.1 Knowledge sharing barrier

There is a number of knowledge sharing barriers, some of them organization, individual and culture barriers. Collaboration in organizations usually takes the form of teaming. “Team performance increased with the amount of knowledge that employees shares” (Kayworth, & Leidner 2005/2006; Wang 2004).

**Staff don’t know the importance of sharing knowledge:** In most business organization employees are not educated the importance of sharing knowledge, when joining the organization if the existing staff members share little knowledge, every new staff member who join the team will work following examples of existing staff.

**The organization has no tools or platform to allow staff to share:** some organization encourage sharing knowledge between staff, the organization provides little or no platform for staff to share knowledge. Most of the case this may be caused by strict measures of confidentiality which turn out to be part of the barriers for staff to share knowledge.

**The organization hierarchy, power and reward can affect how employees share knowledge:** in organization where staff have no say or with hierarchy structure, this will prevent staff from sharing information due to limitation put in place for staff members to communicate. For example in some companies you discover that sales staff don’t know what the support staff does and may have little knowledge of the operation of the software or hardware they are selling. This result in sales agent or staff processing an order as requested by the customer with an agreement to provide all the necessary support required. After purchasing the service when the customer contact the support department the customer become disappointed when the support personnel advised the customer that the organization support team provides limited support on the product purchased.

**There is no time allocated to help staff share:** the organization management team are more interested in staff performance but little or limited time is allocated to help staff contribute to the organization knowledge by providing time to share knowledge or update the knowledge base.
Age: is another knowledge sharing barrier, in some companies, organization staff are interested in sharing knowledge among the same age group as they are able to communicate easily. As the older staff leave the organization, the new staff or young generation will have little knowledge of the work done and retiring can become costly for organization if little is done to retain knowledge that older staff have.

General support: lack of IT support to support knowledge sharing is also a barrier as most staff in the companies are not IT experts; there is a need to provide support so that the new users are facilitated to use the organization’s knowledge system.

Job Security: employees value their knowledge and guard it for job security, staff don’t wish to share what they know due to fear that they may lose their job or position as a result they are not encourage in sharing with others what they know.

“Organizational factors, such as hierarchy, power, available resources, support, reward systems and, ultimately, attitude about knowledge sharing, could either impede or promote knowledge sharing behaviours” (Keyes, 2008). when implementing a knowledge management system it is important that all culture issues that will affect the process are addressed in advance.

3.4 Organisation culture change requirement

The way we work and share knowledge is the biggest part of organisation culture, “advancing knowledge management starts by acknowledging that there is a culture in organisation that affect the activities of the organisation and also determine what changes required” (Wellman, 2009). The organisation knowledge manager will have to raise awareness of culture change requirement by speaking openly to the staff and informing them of the culture change required in order to improve how work is done. The knowledge manager should continue to work with staff members to help them understand and accept the change required to improve work practices in order for then to commit to the changes that will help enhance knowledge management in the organisation. Figure 3.2 provides a roadmap with steps that organisation will take toward culture change.
Culture review: The culture change involves an investigation and analysis of the activities of the organisation and knowledge sharing process. This is normally conducted through research questionnaires, interviews and also observation.

Plan culture change: the culture change start from anywhere within the organisation, but it is up to the organisation to plan the process. The higher up in the organisation, the more effective it will be.

Acceptance and involvement: the staff or team accepts that there may be value in knowledge management and also accepts to participate in the knowledge management implementation process.

Education and changing individuals: the organisation will need to educate all staff members the benefit of knowledge sharing and involve every member of staff in sharing knowledge. With knowledge sharing culture in the organisation staff will have
to adapt their ways of working and have an open mind and accept sharing with others at a level that was never done before.

**Reward and recognition:** The organisation should have a system in place to encourage knowledge sharing by providing reward or recognising individuals who motivate others to enhance knowledge sharing and also do acknowledge their valuable support in transforming the organisation.

**Result:** The knowledge management culture change will result in all organisation staff getting involved in knowledge management activities, with a will to share knowledge and also helping one another to achieve the common goals. This will be reflected in knowledge sharing embedded in work and organisation culture.

E-learning can play a vital role in transforming the organisation into a more learning and knowledge sharing organisation. The e-learning tool provides a facility to educate staff members by attending or following training online. The tool also provides a forum facility that can be used to increase collaboration and communication among the staff who share a common goals and activities within and outside the organisation.

**3.5 Effect of knowledge sharing**

“Implementation of knowledge management doesn’t try to change the organisation culture to fit the knowledge management approach. The knowledge management approach is built to fit organisation culture” (Richard and Carla, 2005). Having a knowledge sharing culture will enhance knowledge management in organisation, and will bring many benefits.

- **Create a learning environment:** an organisation that has a knowledge sharing culture can easily create an e-learning system that can be used for staff training and also individual learning and staff will feel more encouraged to learn more.

- **Staff will be able to know what they need to know:** an organization that has a knowledge sharing culture provides staff with easily access to information and also acquires knowledge easily without barriers. Staff can ask their colleagues and manager
anything they need to know anytime without fear that they will be undermined by others. Implementing a knowledge system in such an organization becomes much easier as staff will use the system to communicate and collaborate more.

- *Reduced cost of training*: the new employees who join the organization will be given training and their existing knowledge and experience will be enhanced by their colleague with a knowledge sharing culture, this can reduce the initial period allocated to training for new staff within the organization since staff will have opportunities to learn from their colleague.

- *Performance and productivity*: when the staff learn and have opportunity to get knowledge, it becomes easier to perform their duties in a workplace as they will have access to all required tools, skills and knowledge they need to work. This will result in increasing productivity in the organization.

*Quick responses to changes*: in an organization with knowledge sharing culture, employees communicate quicker and if they notice something that requires attention they easily communicate with management or the personnel responsible resulting in increasing information flow leaving politics that will hinder organization advancement or responding to changing environment.

### 3.6 Summary

Changing organisation culture is not easy; it requires changing individual’s ways of working, to become open to one another and sharing knowledge. *The most effective way to create a knowledge sharing culture – is first to start to practice it at your level. The higher up the organisation the more effective you will be in changing the culture but even if you are low down the hierarchy – you have an influence* (David Gurteen, 1999).

The organisation needs to encourage people to share knowledge more effectively, by educating staff on the importance of sharing knowledge; that you gain more than losing. It is also important that infrastructure is provided which will act as a platform for staff to share knowledge. E-learning tools can be used to train staff on the
importance of sharing knowledge and also providing the fundamental knowledge sharing technology that will be used as a source of reference.

It is important that the tool is not loaded with a lot of unwanted information that will confuse the users. Knowledge sharing is not for certain individuals; it requires effort and support from everyone within the organisation. This will result in an increase of staff performance in their duties and the organisation becoming more productive.
4 THE E-LEARNING IMPLEMENTATION STRATEGY

4.1 Introduction
The implementation of any new system requires planning on how the system will be implemented. It requires staff and management support for the process to be successful. Knowledge management strategy is the practical objective of changing the process how knowledge is created, identified, stored and transferred. The knowledge management implementation strategy must not only address the main goal of becoming a ‘knowledge-enabled organisation’ but also address the real need of knowledge management process, requirements and resources that will be used during implementation. E-learning system implementation also requires a good strategy in order to make sure that it fits well into operations of the organisation. This chapter discusses knowledge management implementation strategies and also the evaluation of the knowledge management system after implementation.

4.2 KM Implementation approach
“There are different ways of developing a knowledge management strategy each supported by a holistic model of KM processes”. (James Robertson, 2004). The main purpose of any approach will be to implement a KM system that will enhance knowledge creation, storage and sharing within the organisation. The KM implementation strategy will include identifying the problem, the needs, the group that will participate in the development and implementation, analysing the requirements, select an approach to solve the problem and making recommendation of the strategy and tactical initiative to use. All the approaches can be classified into two main approaches: Top-down and Bottom-up approach.

4.2.1 Top-down approach
The implementation of a knowledge system will be aligned with organisation goals and objectives and the strategy used in this case will be aligned with existing strategy of the business. A top-down strategy has the advantage of the support and direction from the upper management. The management chooses a department or project in the
organisation the changes are implemented in first then spread in other areas. Knowledge management can be implemented first in the front-line units such as sales, support or manufacturing where such option exists; where the operational knowledge can be collected and shared within the unit or beyond.

Implementation can equally be started by middle managers, when knowledge management process is initiated by middle managers; they can coordinate units to reduce redundancies or overlapping workflows and thus ensure a better efficiency.

4.2.2 The Bottom-up approach

Bottom-up Knowledge Management implementation is “a valuable low-cost and low risk way of proving the viability of a Knowledge Management approach” (Quintas, 2003). The approach is used in a small team or department; the organisation selects a small group to identify key issues, opportunity and the need to implement a KM initiative. The organisation analyses and implements a knowledge management system in one department and upon successful implementation; the process is spread through out the organisation.

4.3 Knowledge management implementation process

The development and implementation of the system requires planning all steps that will be taken along the way. Figure 4.1 highlight key points to consider when developing a knowledge management strategy.

The organisation will have to establish the need for the system and identify the objectives and make a plan that will be followed during the design and implementation of the knowledge management system.

![Figure 4.1: Developing a knowledge management strategy (source: www.steptwo.com)](image)
4.3.1 Initiation

The initiation stage of KM development starts by addressing the real needs of the new approach on how knowledge is managed within the organisation. In order to implement an e-learning tool the real needs of having an e-learning tool will be identified and an expert group will be selected in the department that will handle the development and implementation process.

4.3.2 Knowledge management implementation objectives

The main objective of knowledge management is to facilitate the sharing of knowledge within the organization, the implementation of the new e-learning tools will also address the objectives of the advancing knowledge management in the organization and how the main goal will be achieved. The objectives of the new system will include but is not limited to the following:

- A facility for staff to learn and enhance their existing knowledge.
- The ability for staff to find, share and exchange knowledge that will enhance their skills.
- Promote culture and environment change that will help transform the organization.

For this to occur, embedding the sharing of knowledge within the daily work routine of the organization is required if the organization is to be transformed to become a more knowledge sharing organization.

4.4 Knowledge management successful implementation

The improvement in technologies has generated a lot of applications software that can be uses to implement a successful knowledge management, those software make it possible to link the knowledge system to existing organisation’s technologies. The implementation involves technologies, culture and best practises. Organisation has to follow necessary steps that would guide them to have a successful implementation. Those steps include;

- Step 1: Define the business problem
- Step 2: Address culture change issue
• Step 3: Identify the KM group
• Step 4: Perform the knowledge audit and analysis
• Step 5: Implement the knowledge management system
• Step 6: Link knowledge to people
(Dataware Technologies, 98)

4.4.1 Identifying the business problem

The beginning of any project requires identifying the goal and objectives of the project. “The main objective of any organisation knowledge management program is to support the achievement of strategic business objectives” (Hariharan, 2002). Knowledge management project requires identifying the business problem that it will address. Otherwise the organisation will be working on a project that will not yield results. In most cases the process may start by addressing small problem then once success has been achieved the project is spread in the organisation.

The knowledge management objectives identified at the beginning of the project will be useful during evaluation process, they will be used to determine the success of the project and also to analyse what went wrong and recommending correction. Some of those objectives include; increasing knowledge-sharing, change the organisation to a learning organisation and having an organisation knowledge base system.

4.4.2 Culture change

One of the biggest challenges to overcome is fear among organisation employees. It is important that staff are informed and advised in advance on their involvement in the project, changes in working practises that are being made, and the benefits of the new approach to their working culture.

4.4.3 Identify the group

Experts address one of the biggest concerns when introducing knowledge management processes in the organisation. A group of experts must be identified within the organisation, these experts or knowledge workers should be ready to participate in the transformation process. The experts will provide the needed knowledge as they understand better the working practices and activities of the organisation. They will
also play a big role in testing the new system and recommend improvements. It is important that the information and knowledge presented by the experts is documented properly so that they are consulted for more assistance when required during and after the new system implementation.

4.4.4 Knowledge audit and analysis

Knowledge management implementation requires identifying what tacit and explicit knowledge to capture and store. A knowledge audit is a systematic method of determining the status of critical knowledge in the organization or department, a way of ‘knowing what you know’. It is essential to the development of a KM strategy.

“Knowledge audit can reveal the organization’s KM needs, its strengths, weaknesses, opportunities, threats and risks for the implementation of KM. Although knowledge audit has been identified as an important activity in the knowledge management, there is lack of a systematic approach in its conduction and the audit practice varies with different industries and companies” (Cheung, Ko Kam, Lee, August, 2005). The knowledge audit examines the knowledge that organization staff require to do their work. The auditing process also determines and examines knowledge assets including location, source, and utilization within and outside the organisation that are used within the organisation.

Figure 4.2: Audit Roadmap
The audit roadmap above provides a guide on the stages of knowledge management audit. The audit starts with pre-auditing preparation which will involve orientation and culture readiness survey. “The objectives of the orientation are firstly to brief the people involved about what the knowledge audit is about in order to clear their fears and secondly to align on what areas the focus of knowledge audit should be on and gain the management support from the business unit affected” (S. Choy, Cheung, 2004). The second stage should be a full auditing process that will be carried out through deep interviews and the last stage carry out the analysis. The audit process should provide detailed knowledge required to solve the targeted problem, it provides answers to question on what knowledge does the organization have, what knowledge is missing, Who needs this knowledge, and how we will use the knowledge.

“Knowledge audit process suggest that the audit process should begin at the top; identifying the client’s key decision making areas and tasks, and move down to evaluate the types, level, and location of knowledge required to support those decisions. Then identify the gap and weakness of information and knowledge details “(Cio Enterprise, 1998). The end of the process is to have a knowledge inventory and a knowledge map that shows the relationship and location of organization or department knowledge.

4.4.5 Analyse the requirement

After identifying the knowledge required, the next step is to identify the requirement of the new system. The requirement document will be produced at the end of this process outlining the detailed plan of what will be done, how and when. For the purpose of this work, an e-learning tool was developed with module in project management.

Once the decision have been made and requirement specification was produced, the approach that will be used to solve the problem will be chosen and make a recommendation of the strategy and tactical initiative to use.

4.4.6 Implement the knowledge management system

Once the knowledge audit has been conducted and the requirement of the new system has been analyzed the next step is to define the features of the knowledge base system that are required so that the best solution can be implemented. Figure 4.3 shows some
of important KM features and capabilities. The organization will then make a decision on the software applications within the organization that can be used as the backbone of the new knowledge management system or if new software or other technologies are needed, the new system will be determined at this stage. A check list of the necessary features will be useful to make sure that the best solution is used.

![Figure 4.3: Personal and organisation knowledge capabilities (Source CEN, 2004)](image)

The KM team at this stage can make a plan on how the implementation will be done and proceed with the development or implementation of the knowledge management system.

“Implementing knowledge management is about bringing together, people, skills, business processes and technology infrastructure including content management in order to exploit an organisation’s knowledge base” (Knight and Howes, 2003).

The result of the implementation process is to have the individual and organisation knowledge made visible and stored in the knowledge base system.

4.4.7 Link Knowledge to People

Once the system has been implemented it must be made available to be used by employees, the users of the new knowledge base system will need to update their profile as to make sure that knowledge is linked to the expert. A database administrator or the knowledge manager must be assigned so that the database remains updated as new employees are hired and existing employees leave or move within the
organization, equally to update the knowledge within the knowledge base system. A knowledge directory can be used to list employees within the organization and their area of expertise.

4.5 Knowledge management evaluation

Knowledge management strategy should not only focus on implementing KM systems, but also provide an evaluation mechanism to measure the effectiveness and efficiency of the strategy. A knowledge evaluation framework can be used to evaluate the impact of the KM initiative. For this to be achieved KM initiatives have to be aligned to organisation's business improvement strategic objectives.

The Knowledge Management for Improved Business Performance (KnowBiz) project, a three years UK Government founded project on project management, developed a framework that can be used to evaluate knowledge management implementation strategy, the framework was refined through a follow-up technical workshop with the project's industrial collaborators (Carrillo, Robinson, Anumba and Ghassani, 2003).

Figure 4.4: IMPaKT Framework (Electronic Journal of Knowledge Management, Volume 1 Issue 1 (2003) 1-12)
The framework has three stages;

- **Stage one**: At the start of the knowledge management project, the organisation defines goals and objectives that the knowledge management strategy will address. This is achieved by identifying a business problem with a knowledge dimension.

- **Stage two**: the process involves identifying knowledge from process, people and product, determining the knowledge gap from process, people and product perspective and developing a knowledge management initiative aligned to improvement measures identified.

- **Stage three**: assessment of the impact of the knowledge management strategy, this involves assessing the result of the process people and product measured and also the result of the key performance indicators.

A KM evaluation strategy plan must be developed at the beginning of the project and provides the guideline for evaluating the knowledge management initiative, the details of the plan should include the knowledge management initiative success factors.

### 4.6 Knowledge management implementation success

It is difficult to measure the economic benefit of a successful KM Project. The successful KM project can be measured using certain indicators, these point indicators are observer at one point in time and we can not predict if these performance indicators will persist afterward. Examples of such indication include:

- Growth on the resources attached to a project
- Growth of the knowledge contents
- Project and KM initiatives continuity without key individuals
- Financial or economic growth
Table 4.1 below provides some of knowledge management implementation success factors.

| **Growth on the resources attached to a project** | Any project has resources that are used and have aims and the objectives that determine and measure the successes. The aim of KM project is to enhance knowledge management in the organisation; the resources used include human resources and information technology systems. |
| **Growth of the Knowledge contents** | Knowledge management will be improved by having knowledge management system with contents that contains knowledge used by the staff and other users within the organisation. The usefulness of such content will determine the success of the km project. |
| **Project and activities continuity without certain key individuals** | The main activities of knowledge management are knowledge creation, storage and sharing. The knowledge manager or KM project management would have set up a team responsible to advance knowledge management within the organisation; the knowledge management culture should be continued even if the team that was more involved at the beginning are no longer available. |
| **Financial or economic growth** | It is difficult to measure or evaluate the KM project in monetary value, the staff performance and other organisation activities associated with KM project success can determine if the introduction of KM benefited the organisation financially. |

*Table 4.1: Knowledge management implementation Success Factors*
4.7 Knowledge management failure

Most knowledge management studies address development, implementation and success of a knowledge management project, it is also important to analyse what could be the major causes of failure for knowledge management projects. Knowledge management implementation does not always go to plan, there is times when the organisation wishes to change the way they work and change to a knowledge driven organisation and things don’t go to plan. Figure 4.5 provides a summary of the main contributors for failed KM projects. For implementation to be considered successful “the organisation must maintain learning loops in all organizational processes, systematically disseminating new and existing knowledge throughout an organization, and applying knowledge wherever it can be used in an organization” (Ron Sanchez, 2005).

Figure 4.5: KM failure (Peyman, Jafari & Fathian 2005)

KM projects fail due to lack of proper planning and implementation, some of the major cause of failure are not aligning knowledge management with organisation objectives, inadequate resources for knowledge management projects, and failing to align knowledge management with organisation daily work.
4.8 Summary

The implementation of knowledge management in the organisation can start anywhere; the two common approaches used are top-down and bottom-up approaches. No matter where knowledge management starts, knowledge management will definitely increase the operational efficiency and thus enhance services and benefit the organization operations. This chapter discussed the step toward developing a successful knowledge management system starting with defining the business problem, addressing culture change issue, identifying the KM group, performing knowledge audit and analysis, Implement the knowledge management system and linking knowledge to people. These steps will help changing the organisation into a learning organisation taking advantage of technologies. The chapter also looked at the characteristics of a successful implementation strategy and the contributors for failures of knowledge management system.
5 E-LEARNING TECHNOLOGY AND IMPLEMENTATION

5.1 Introduction

The development of an e-learning system requires proper planning and selecting the best method, tool and contents that can be used to provide knowledge to the users of the developed tool.

The focus of this chapter will be on learning methodologies and techniques, the e-learning contents and the e-learning application that can be used to present course contents to the learner.

5.2 Instructional design

“Instructional Design is the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs” (UM 1996).

The main focus of instructional design is to bridge the gap or merge technology and learning to ensure that using technology users are able to advance and enhance their skill using learning contents on the e-learning tool.

5.2.1 ADDIE model and Elaboration theory

Instructional design models insure that e-learning tools developed meet their objectives, the main objective is to make sure that learners achieve their outcome of using the tools.

ADDIE - refers to Analyze, Design, Develop, Implement, and Evaluate. This is possibly the best known design model, and is frequently used in academic circles.

According to elaboration theory, instruction should be organized in increasing order of complexity for optimal learning. This means that if one is introducing or teaching a new concept, the simple version of the task is presented first, then the next subsequent lessons presents additional versions until the full range of tasks are taught.
The learner must be reminded on what is covered first so that he easily follows the concept being thought.

Using ADDIE and Elaboration Theory will guide the development of the e-learning tools in order to ensure that the tool developed serve the purpose and be more usable, equally the evaluation process will be done in line with the design completed.

5.3 Universal design Principles Application

“The principles of Universal Design Version 2.0” (Center for Universal Design,1997) were examined carefully on how they can be used during the e-learning tool design process to measure how the designed tool satisfy the universal design guideline, These guideline areas follows:

- Equitable of use
- Flexibility in use
- Simple and intuitive
- Perceptible information
- Tolerance of error
- Low physical effort
- Size and Space for Approach and Use

It was observed that not all principles guidelines are applicable to the tool to be developed. The e-learning tool may not be measured against all the design principles, only those relevant were considered to make sure that a quality tool is developed at the end.

5.3.1 Equitable use

All the potential users should use the tool without any difficulties and the tool should be appealing to all users. The new e-learning tool should be useful and marketable to people with diverse abilities, different ages and sizes. The tool must be tested by different people with different skills, knowledge and ability in order to analyse how the tool can be evaluated on supporting knowledge management in organisation.

5.3.2 Flexibility in use

The tool to be designed should be flexible - accommodating a wide range of individual preferences. It should be accessible on different computer devices such as desktop,
laptops, and mobile devices. The tool should also be accessible on internet with the minimum speed of connection possible to allow pages to load as quickly as possible. It is also important that the tool is accessible on all major internet browsers to accommodate users’ choices. Equally users should find it easy to navigate through the e-learning tool.

5.3.3 Simple and intuitive
The e-learning tool was designed using English, any potential user can understand the language used, the language used should not be complex.

5.3.4 Perceptible information
The e-learning tool should be usable by those with no sight and those who cannot hear. The tool should be designed to be accessible on special devices (assistive devices) used by people with disabilities.

5.3.5 Tolerance of error
The tool should provide error message as appropriate and tolerate minimum errors. Equally the tool should provide warning to users in case they are performing unauthorised operation or inputting incorrect data or information.

5.3.6 Low Physical effort
Users of the tools do not need to use much effort to concentrate and use the tools

5.3.7 Size and Space for Approach and Use
The tool should be designed with good screen resolution size using correct fonts so that all elements of the tool are visible to all users as much as possible.

5.4 E-learning Application: Moodle
A number of e-learning tool applications were evaluated in order to select the best application that can be used to present the knowledge to the users. As the tool will be implemented online, the Moodle application was used, the application is used all over the world by universities, schools, companies and independent teachers. Moodle is
open source and completely free to use. Moodle software was chosen as it more user-friendly and the tool was developed as an e-learning application.

Moodle is an open source application, it is free to use and to distribute the code, members who tried or adopted Moodle report high satisfaction rates, low costs, and easy implementation and use. “Ninety-five percent of users indicated they did not intend to find an alternative solution” (Martinez & Jagannathan, 2008). During this project Moodle was chosen as it was more users friendly and a stable application to use. Moodle has an ability to hold a huge database of courses and information and to support multiple users. The Moodle application was tested and installed on a web server online so that users will be able to access the site, learn and acquire knowledge in project management.

5.5 Course contents

The development of any new e-learning system requires identifying information and details of knowledge that need to be captured and passed on to the users while using the tools. Two project management modules were developed and used during this research work: Project Planning using Gantt Charts and PRINCE2 Project management Methodology.

5.5.1 Project planning using Gantt chart

A course was created and used during the evaluation of e-learning to advance and support knowledge management in organisation. The main course contents included the following:

• Introduction
• Project Planning
• Project Plan
• Gantt Charts
• Computer Based Gantt Charts
• Conclusion
The learning outcomes of this course were to make sure that at the end of the course learners should be able to:

- Demonstrate an in-depth knowledge of project planning using Gantt Charts
- Develop a complex project Gantt charts plan for a business solutions
- Understand the use of Gantt Charts for project planning

The Gantt chart course provided the knowledge required for an individual to become expert in developing Gantt Charts, the course included references to other sources that can enhance user’s skills and knowledge on Gantt Charts.

A course test quiz was included at the end of the module, as the user will be answering the question provided, this will help determine if users have gained any knowledge after using the tool.

5.5.2 PRINCE2 Project Management methodology

PRINCE2 Project management methodology was another course used during this process, the purpose of the course was to educate users on the general skills and knowledge on using PRINCE2 Project Management Methodology. The course contents include:

- Introduction
- Prince Processes
- Conclusion
- Quiz

The course was designed to benefit Individuals seeking project management skills and greater employment prospects, Project managers, Directors/executives (senior responsible owners) of projects, and organisations.
5.6 E-learning Tools: EPMTS

EPMTS (Electronic Project Management Training System) was developed to provide courses in project management.

![EPMTS Interface](http://www.epmts.org)

The tool is hosted on Hosting365 web hosting using UNIX operating system, on Apache server and it uses MYSQL database system.

### 5.6.1 EPMTS Tool features

A number of features that are important to support a knowledge management system in an organisation were implemented on the Moodle application, the features of the tool implemented includes the following:

- Course
- Discussion forum
- Online calendar
- Online news and announcement (College and course level)
- Online quiz
Course: The course features provide an environment to design a course on any subject or topic. Different users will have defined roles and responsibilities to perform certain activities on the course. For the purpose of this work, project management modules were included as the course contents.

Discussion Forum: The discussion forum is an important feature of any knowledge management system; the forum provides a platform for participants to hold conversations in the form of posted messages. The employees will benefit in using this feature by communicating with their colleagues, especially those they are participating in the same course or they share interest in a given topic. This feature also has an added advantage where the course participant will be asking question to the tutors and the tutor responds and this will benefit the other course participants or those interested in the same modules as the conversation will be recorded and will be available for others in future.

Calendar: The calendar is useful in any working environment, if there are modules running at certain time, the calendar will be useful to help the participants knowing when certain modules will be available and also determine when certain contents were added or updated on the tools.

Online news and announcement: There are certain important announcements that the organisation may wish to communicate with staff, in terms of changing working practices, making improvement or changes on the system in use. The online news and announcement features should provide environments to pass on such information to the users and the record is kept.

Quiz: This feature will allow the participants in any given course to assess themselves as a way to get an idea if they learn from the module they have followed. This will also provide an opportunity for the course tutor to determine if the participants are gaining any knowledge or not. It will be important that the quiz include some practical questions, which will help the users to use the knowledge they acquired while attending the course.
File download and upload: These features are useful for course tutor to download and upload course material and student details and other information as required.

5.6.2 Additional Contents
The following are other important features of the system that could enhance the system more.

- **User Guide/ Help:** The feature is needed to guide users on how to use the system so that people with less computer skills can be assisted on using the system.

- **GLOSSARY:** The Glossary will be useful in providing key word meaning, definition and also location of the course contents or other system documents that those words are used.

- **POINT OF REFERENCE:** A knowledge management system does not only hold knowledge but also point to other sources of knowledge, the e-learning tools developed will be enhanced by having a feature that provide all sources of information used, contact information of the people that provided the content materials and also other research areas that can help users to enhance their skills and gain more knowledge.

5.7 Summary
This chapter discussed the work that was done in developing the EPTMS tool that was used during the experiment process. The purpose of the tool is to educate and enhance participants’ project management skills and knowledge. The tool was designed and developed using Moodle learning management system, Moodle was used as it is an enormously versatile system for course and learning management.

The designed tool provides knowledge to participants on developing Gantt Charts that can be used in any given project. The second course was PRINCE2 Project
Management Methodology. This was designed to educate users on the process of managing a project through the use of PRINCE2 project management methodology.

The next chapter will discuss the experiment process carried out, how users were able to interact with the tools and the analysis of the result of the responses from users after they have used the EPMTS tool.
6 EXPERIMENTATION & EVALUATION

6.1 Introduction

The main purpose of this work is to evaluate the use of e-learning as a tool to advance knowledge management in the organisation.

The experiment process involved different participants who have to use the system developed and attend the surveys created to provide their views on the use of e-learning system for the organisation training in order to enhance knowledge management. A survey method was used to gather facts during this experiment process. The participants provided their views and attitudes toward e-learning before using the tool. After using the tools developed, they were asked again to complete the second part of the survey. The result of the two surveys were analysed and evaluated, other studies done in this area were also used during the evaluation process.

The participants were advised through an email of the development being done to develop the system. A pilot study was done in advance asking a group of participants to test the system after development and give their view on how they were accessing and navigating through the system. Afterward an invitation was sent to users to attend the course and fill in the survey.

6.2 Survey

After developing the e-learning tools, a pilot study was carried out with HCL employees, the employees were asked to use the tool and fill the survey after they have used the e-learning tool so that the results of the survey are analysed.

The main study was conducted by inviting more participants working on different projects. The purpose was to acquire responses from them on how they value the use of e-learning tools for providing training in the organisation. 12 people participated in the pilot survey and 18 people participated in the main experiment process.

The survey methods was chosen due to total number of people who will be participating in the study and with time limitation it was difficult to consider
interviewing everyone who participated in the experiment process. It also gave an opportunity to get valuable information from many people in a more flexible way, resulting in making the results statistically significant even when analysing multiple variables.

6.2.1 Survey Preparation

The survey purpose is to gain responses form the users of the e-learning tool developed and analyse how they view using e-learning as a training tool to disseminate and share knowledge in the organisation.

A pilot survey was conducted first with a small group of HCL employees the participants were asked to use the tool and fill in the survey after they have used the tool. The pilot survey and answers are presented in appendix B.

Afterward the survey process was revised; the survey was divided into two parts: the first part was a pre-survey questionnaire that was given to participants prior to using the e-learning tool developed and the second part was a post-survey after they have used the tools developed. The participants were invited through an email presented in Appendix A. The following present survey question used in the main experiment process.

6.3 Main Survey Question

The survey questions were divided into two main parts so that the response of the users be analysed and evaluated before using the tools and after they have used the tool.

6.3.1 Pre-Survey Questions

1. Have you used e-learning or received courses online before?
   (a) Yes
   (b) No

2. If you answered yes to Question 1, how many different e-learning modules have you previously taken?
   (a) < 3
   (b) 3 – 6
   (c) > 6
3. If you answered yes to Question 1, please indicate how strongly you agree or disagree with the statements below

(a) I am able to enhance my knowledge and skills using e-learning tools
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(b) The knowledge that I acquire from e-learning tools is effective in helping me complete tasks
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(c) I believe that the organization of lesson and content on web pages must be clear to help me learn
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(d) I find it difficult to learn if the content of the online course does not meet my expectations
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

4. In your opinion, how much more effective is learning using e-learning tools compared with attending training in class with an instructor?

(a) e-learning is considerably more effective than in-class instruction
(b) e-learning is somewhat more effective than in-class instruction
(c) e-learning is comparable to in-class instruction
(d) in-class instruction is more effective than e-learning
(e) in-class instruction is considerably more effective than e-learning

5. Please state your level of agreement with the following sentences:

(a) “I can learn more using e-learning than reading books or other online resources.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(b) “I can learn more using e-learning than with traditional classroom and instructor techniques.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(c) “E-learning can improve knowledge management in an organization.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree
(8) I would like e-learning to be used to provide training in my organization
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

9. Please indicate your age grouping below:
(a) < 25
(b) 25 – 34
(c) 35 – 44
(d) 45 – 64
(e) > 65

10. Please indicate the occupation which best describes you below:
Student;
Other, Please Specify

6.3.2 Post-Survey Questions

1. How much did success in the course depend upon understanding ideas, rather than memorizing facts?
(a) A great deal
(b) A moderate amount
(c) Some what
(d) Not at all

2. Please indicate your level of agreement with the statements below:
(a) I found the online course to be useful
(b) The online course was poorly designed
(c) The online course improved my knowledge of project management
(d) Other

3. Please indicate how strongly you agree or disagree with the statements below
(a) I am able to enhance my knowledge and skills using e-learning tools
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree
(b) The knowledge that I acquire from e-learning tools is effective in helping me complete tasks
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(c) I believe that the organization of lesson and content on web pages must be clear to help me learn
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(d) I find it difficult to learn if the content of the online course does not meet my expectations
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree.

4. In your opinion, how much more effective is learning using e-learning tools compared with attending training in class with an instructor?
(a) e-learning is considerably more effective than in-class instruction
(b) e-learning is somewhat more effective than in-class instruction
(c) e-learning is comparable to in-class instruction
(d) in-class instruction is more effective than e-learning
(e) in-class instruction is considerably more effective than e-learning

5. Please state your level of agreement with the following sentences:
(a) “I can learn more using e-learning than reading books or other online resources.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(b) “I can learn more using e-learning than with traditional classroom and instructor techniques.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(c) “E-learning can improve knowledge management in an organization.”
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

(d) I would like e-learning to be used to provide training in my organization
1. Strongly agree; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 strongly disagree

6. Do you have any additional comments that you would like to make?
There is a number of key questions that were asked in both pre-survey and post-survey in order to analyse the result of the participant before and after using the e-learning tools developed. Those include:

- How the participants agree or disagree with the following statements:
  
  (a) *I am able to enhance my knowledge and skills using e-learning tools*
  
  (b) *The knowledge that I acquire from e-learning tools is effective in helping me complete tasks*
  
  (c) *I believe that the organization of lesson and content on web pages must be clear to help me learn*
  
  (d) *I find it difficult to learn if the content of the online course does not meet my expectations*

- How much more effective is learning using e-learning tools compared with attending training in class with an instructor?
  
  (a) *e-learning is considerably more effective than in-class instruction*
  
  (b) *e-learning is somewhat more effective than in-class instruction*
  
  (c) *e-learning is comparable to in-class instruction*
  
  (d) *in-class instruction is more effective than e-learning*
  
  (e) *in-class instruction is considerably more effective than e-learning*

- 5. Please state your level of agreement with the following sentences:
  
  (a) "*I can learn more using e-learning than reading books or other online resources.***"
  
  (b) "*I can learn more using e-learning than with traditional class room and instructor techniques.*"
  
  (c) "*E-learning can improve knowledge management in an organization.***"
  
  (d) *I would like e-learning to be used to provide training in my organization*

Following the studies pre-and post-survey results were compared and analysed.
6.4 Evaluation

The Kirlpatrick taxonomy provides the criteria for evaluating instruction widely used to evaluate training. This taxonomy will be used to evaluate the use of e-learning in organisation training. Kirlpatrick taxonomy is divided into layers;

- Learner satisfaction,
- Learner demonstration of understanding,
- Learner demonstration of skills or behaviours on the job, and
- Impact of those new behaviours or skills on the job.

The evaluation of the project management training e-learning system was done with HCL Staff and others, participants were invited to use the tools and learn following the course provided, answer the quiz and fill the survey prepared. Survey Monkey was used as survey platform.

The evaluation process had the following objectives:

- Understand the learners’ needs and their experience using e-learning technologies
- Understand the learner objectives and learning outcome.
- The course and material provided
- The knowledge acquired using the tool
- The recommendation for using e-learning as a training tool in organisation
- Individual use and benefit of using the e-learning tool

6.4.1 Pilot survey

The pilot survey was done after the e-learning tool was ready. Participants were asked to fill in the survey after using the tool, the survey was designed taking into account the evaluation objectives established.
6.4.1.1 Analyse and understand learning environment, and the use of E-learning technology

The users were asked if they have used the e-learning technology before either in formal education or during their previous organisation training.

![Pie chart showing yes and no responses to the question](image)

Figure 6.1: question1 results

The 81.8% of the participant said that they have used e-learning or attended courses online before while 18.2% others have not used or attended training online before.

6.4.1.2 Analyse and understand the learners’ needs, the e-learning objectives and outcomes

Needs analyses were conducted with the HCL organisations, the user were presented with a course on project management taking into account the learner’s ability. A quiz was added at the end of the lesson, the purpose of the quiz was to evaluate if the users were able to acquire knowledge after using the tools and also to get more information that will help to analyse the results of the survey.
After using the tools the users were to give their views on experience using the e-learning tool provided, Figure 6.2 shows the breakdown of the survey result.

46% of participants believe that they are able to learn online effectively while 31% can efficiently learn online and complete their work online using e-learning technologies. Not every one find it easier to learn online, 23 % still finds it difficult to learn online.

6.4.1.3 Course Material Developed and Presented

Courses in project management were adapted and delivered specifically for the experiment within the organization, taking into account their different cultures and learning preferences.

Results

It was important to evaluate how users perceive using e-learning tools; the purpose was to find out how easy it was using the tools and how comfortable their experience was. 35 % believe it was simple, 24 % said it was easier, 23 % were comfortable and 18 % believe they become more productive using the tools. The results of the question are shown in the figure 6.3.
6.4.1.4 E-learning and knowledge sharing

The participants were asked to describe their experience using e-learning and how it affects their interaction with others in the organisation.

**Table 6.1: question 4 result**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>18.1%</td>
<td>2</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Knowledge sharing plays an important role in knowledge management, for this to be achieved, employees should be able to interact and exchange ideas, information and knowledge, for e-learning tool to be considered as KM tool, e-learning should provide facilities for interaction among users. The result displayed in table 6.1 shows that 27.3 % strongly agrees that they find e-learning more useful in increasing their level of interaction with their work colleague. 18.1% agree, 27.3 % neither agree nor disagree while another 27.3% somehow disagree.
Participant were asked to express their views on the benefit the users have while using e-learning technology, *table 6.2* present the result of the participants.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applying e learning in organization encourages me to continue learning on the Internet by myself</td>
<td>90.9%</td>
<td>10</td>
</tr>
<tr>
<td>Using e learning is more beneficial than using traditional method</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Using e learning is a waste of time</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 6.2: question 8 result*

The purpose of this part was to evaluate how users appreciate the use of e-learning technology; the users were asked if the e-learning technologies encourage them to learn more either with others or on their own, if they benefit more following courses online or in class and equally if they found learning online as a waste of time. 90% of the users response and expressed that through the module they attended, they were encouraged to attend training online.

After the pilot study was done it was important to invite more people to participate in the main study. Another study was designed after analysing the result of the pilot study; this was done as a way to have a better analysis on the use of e-learning to advance Knowledge management in organisation. 18 people participated in the main survey, both pre and post survey. The following section provides the result of the pre and post survey.

**6.5. Pre- survey**

The pre-survey was used to gather information from participants before using the e-learning tool provided. The pre-survey result was used to get much needed information on their prior experience using e-learning technologies.
Question 1

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>94.4%</td>
</tr>
<tr>
<td>No</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

*Figure 6.4: pre-survey question 1 result*

The first question was to identify if participants had experience in attending course online or done any training online using e-learning, the responses are displayed in *Figure 6.4*, 94.6% of the participants have attended training online, while 5.6% have no experience in attending or participating in training online.

Question 2

*Figure 6.5: pre-survey question 2 result*

As some participants have attended courses online, the next question was trying to get more information on how much experience they had with online training. The question was designed to find out how many course or modules they have attended online. As shows on *Figure 6.5* above, 64.3 % who uses e-learning have attended training online less than three times, 28.6% have attended between 3 to 6 courses online while 7.1 % have done more than 6 course or modules online. Based on this result it can be noted that majority of the users had attended less than three courses online before.
Question 3
Having experience learning online may not be easy for everyone, this question was designed to find out the experience of users using online learning. This question had four subs question and users well asked to rate how they agreed or disagree with the statements provided.

![Figure 6.6: pre-survey question 3.a result](image)

40% of the participants that have attended training online agree that they do enhance their knowledge using online learning tools while 34 % strongly agreed that they strongly benefit and enhance their knowledge and skill using online learning tools, and then 13% remain neutral while 13% said they didn’t enhance or learn something new.

![Figure 6.7: pre-survey question 3.b result](image)
The second sub question was to find out how the knowledge they acquire on the tools is used effectively in helping them completing their work tasks, 67% of the participant who have used online learning agree that e-learning help them complete their task while 20% strongly agreed that knowledge gained is used more effectively in completing their task and another 13% remained neutral.

![Figure 6.8: pre-survey question 3.c result](image)

The third sub question of this question was design to find out if the arrangement of the course or learning material affects their learning attitude and how it affects their learning style. 42.85% believe that the arrangement or presentation of the course contents strongly affects their learning style and another 42.85% agreed at certain extent while 14.3% remain would not agreed or disagree on how the presentation of the course affects their learning style.

![Figure 6.9: pre-survey question 3.d result](image)
The last sub question was used to find out again how the learning materials affect their studies. 13% strongly disagree that the course content has to meet their expectation, 40% of the participants remain neutral, 20% agree that this will affect them and 27% strongly agree that learning material will affect how their acquire knowledge.

Based on the answer that the participant provided, they believe that learning online improves knowledge and skills of the majority of participants who attended the online course agree that the learning tool enhance their knowledge. Their knowledge acquired through e-learning is also useful in helping participants to do their tasks. The learning material and course contents affect participants learning style. Also lesson presentation affects some participant’s learning style preference.

**Question 4**

![Pie Chart](image)

*Figure 6.10: pre-survey question 4 result*

The purpose of this question was to find out how the participant values attending training online can be compared with other learning style. Attending training online was compared with attending training in classroom/training room environments. *Figure 6.10 and table 6.3* shows the result of this question.
It can be concluded that majority of participants agreed that e-learning is comparable with in-class instruction while 25% believe that in-class instruction is more effective than using online learning tools to acquire and enhance knowledge and skills.

**Question 5**

Participants were asked how they would compare using e-learning technology with reading books and in classroom training instructor techniques to acquire knowledge. They were also asked to provide their views on how they value using e-learning to enhancing knowledge management within the organisation and if they would recommend using e-learning technology to provide training in organisation.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-learning is considerably more effective that in-class instruction</td>
<td>6.0%</td>
<td>1</td>
</tr>
<tr>
<td>e-learning is somewhat more effective than in-class instruction</td>
<td>6.0%</td>
<td>1</td>
</tr>
<tr>
<td>e-learning is comparable to in-class instruction</td>
<td>50.0%</td>
<td>8</td>
</tr>
<tr>
<td>in-class instruction is more effective than e-learning</td>
<td>25.0%</td>
<td>4</td>
</tr>
<tr>
<td>in-class instruction is considerably more effective than e-learning</td>
<td>13.0%</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 6.3: pre-survey question 4 result

Figure 6.11: pre-survey question 5.a result
As Shown in Figure 6.11, 6% said that they learn more using books than online, 19% neither agree nor disagree that e-learning was more effective than using the books, and 38% agreed that they learn more using online training tools than reading books while 37% strongly agreed that they learn more online.

![Figure 6.12: pre-survey question 5.b result](image)

The participants were asked again how they would compare learning online with classroom training and instruction techniques. Figure shows the result; 6% of participants considered e-learning to be more effective, 19% also considered e-learning to be effective, 63% remained neutral, 6% percent of the participant didn’t consider e-learning to be effective and another 6% strongly disagreed that e-learning was effective like training with instruction techniques in a classroom.
**Figure 6.13: pre-survey question 5.c result**

Users were again asked to provide their view on using e-learning to enhance knowledge management in the organisation, Figure 6.13 shows the result; 75% recommended that the tools can be used to advance knowledge management while 25% remained neutral.

The last question on this section was to find out how the participant would recommend the use of e-learning technology to provide training in their organisation, Figure 6.14 shows the result.

**Figure 6.14: pre-survey question 5.d result**
25% strongly recommended the use of e-learning in their organisation, another 37% agreed that they would love to have training enhanced by the use of e-learning while 38% neither did they agree nor disagree.

**Question 6, 7, 8 and 9**
The last question was designed to gather more details about the users to find out their age group, their occupations and if they were working and studying at the same time. Figure 6.15 provided the age groups of the participants.

**Question 6**

![Please indicate your age grouping below](image)

*Figure 6.15: pre-survey question 6 result*

The participant were asked to provide details of the age group, in order to gain more information on the people who participated in the survey, the age group was between 18 years and 44, majority of those responded were aged between 25 to 34 years. Table 6.4 provides the responses of the participants in percentage.

<table>
<thead>
<tr>
<th>Please indicate your age grouping below</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) &lt; 25</td>
<td>12.5%</td>
<td>2</td>
</tr>
<tr>
<td>(b) 25 – 34</td>
<td>62.5%</td>
<td>10</td>
</tr>
<tr>
<td>(c) 35 – 44</td>
<td>25.0%</td>
<td>4</td>
</tr>
<tr>
<td>(d) 45 – 64</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>(e) &gt; 65</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 6.4: pre-survey question 6 result*
Question 7

The purpose of the question was to identify the gender of the participants; more male participated in the survey than Female as shown on figure 6.16. There were 73.3 % male and 26.7 % Female participants.

Question 8

Figure 6.17:pre-survey question 8 result
It was also important to find out if the participants were in education or if they were only working. 15.4% of the participants were both working and studying while the rest were just working. As displayed on Figure 6.17, the 15.4% of participants were working and studying while 84.6% were just working and not in full time education.

**Question 9**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educator</td>
<td>5.0%</td>
<td>1</td>
</tr>
<tr>
<td>IT Consultant</td>
<td>13.0%</td>
<td>3</td>
</tr>
<tr>
<td>IT Management</td>
<td>24.0%</td>
<td>5</td>
</tr>
<tr>
<td>Business Management</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Other, Please Specify</td>
<td>57.0%</td>
<td>12</td>
</tr>
</tbody>
</table>

*Table 6.5: pre-survey question 9 result*

Question 9 was designed to find out the occupation of the participant, the responses of the participant are displayed in Table 6.5. Majority of other participants were working as technical support professionals, technical writer/editor, Customer service professional, Test Engineer, Business Intelligence and IT consultant.

**6.6 Post Survey result and evaluation**

After using the tool, the participants attended the second part of the survey to describe their experience after using the tool and how important the tool can be used to provide training in the organisation and advancing KM goals and objectives. The result are discussed and analysed in comparison with the pre-survey results.

**6.6.1 T-Test**

The T-Test was used to carry out further evaluation of the result from the two survey conducted, the pre survey result and the post survey result. “T-test is a very useful Method to assess whether the means of two groups are statistically different from each other, this analysis s appropriate whenever you want to compare the means of two groups” (William, 2006).
The paired and unpaired t-test was used to compare the actual difference between two survey results obtained during the pre and post survey.

6.6.2 Procedure
The results of the survey were arranged into two tables, and they were given numeric values.
The standard deviation and the mean were calculated; afterward the p value of the two numbers was calculated.
An Excel sheet was used to calculate the p value and then same calculation was done using an online testing tool “studentttest.com” to calculate the mean, standard deviation and standard of errors.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 6.6: T-test value*

T-Test was used to analyse answers to question that were asked during the survey, the questions answers were given scale of numbers from 1 to 5 as shown on table 6.6.

**Question 1**
Learning is a complex process, when learners are learning they may have different criterial they consider to be their successful factors. This part of the survey was used to analyse what learning means to the participants as way to find out if they were just gathering facts and information or gaining knowledge. The results are shown on figure 6.18 and responses percentages are displayed in *table 6.7* on the following page.
71.4% of the participants strongly agreed that learning to the was more understanding ideas and while 28.6% also conside success as understanding ideas rather than just memorising facts.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) a great deal</td>
<td>71.4%</td>
</tr>
<tr>
<td>(b) a moderate amount</td>
<td>28.6%</td>
</tr>
<tr>
<td>(c) somewhat</td>
<td>0.0%</td>
</tr>
<tr>
<td>(d) Not at all</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

The above result indicates that those who participated in process were more concerned in using the tools to enhance their knowledge. The responses of this question will be valuable in making a conclusion on how important e-learning can be used in advancing knowledge management in organisation.

**Question 2**

The participants were asked provide their views on their experience using the tools and how they considered the experience. The main objectives of this part were:

- Analyse how useful was the course
- The module design quality
- How the tools impacted their project management knowledge
• If they learn anything new from the courses provided.

Figure 6.19 and Table 6.8 provide the result of the responses for the participants.

![Figure 6.19: post-survey question 2 result](image)

42.9% considered the course to be useful, 14.2% of the participant found the course to be poorly designed while 42.9% said the course improved their project management knowledge.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) I found the online course to be useful</td>
<td>42.9%</td>
</tr>
<tr>
<td>(b) The online course was poorly designed</td>
<td>14.2%</td>
</tr>
<tr>
<td>(c) The online course improved my knowledge of project management</td>
<td>42.9%</td>
</tr>
<tr>
<td>(d) I didn't learn anything new</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 6.8: post-survey question 2 result

**Question 3**

The participant were asked to provide information again on how they value e-learning after they have used the tools provided, the result will be very useful in comparing their views before and after using the tool. This question had four sub-questions and users well asked to rate how that agreed or disagree with the statements provided.
67% strongly agreed that they strongly benefit and enhance their knowledge and skill using online learning tools, 27% of the participants agreed that they do enhance their knowledge and skill using online learning tools while 6% were neutral neither agreed nor disagreed.

T-Test was used to analyse and evaluate the result obtained from the pre and post survey results. The T-Test results are displayed in Table 6.9.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>3.93333</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>1.0328</td>
<td>0.63246</td>
</tr>
<tr>
<td><strong>Standard of Error</strong></td>
<td>0.26667</td>
<td>0.1633</td>
</tr>
</tbody>
</table>

**P value = 0.04192**

*Table 6.9: T-test result*

An independent t-test was conducted to compare the result of the responses from survey before and after using the tool in order to find if they enhanced their knowledge or skill by using online learning tools. There was a significant difference in the scores for pre-survey (M=3.93333, SD=1.03) and post survey (M=4.6, SD=0.63) conditions with p = 0.04192. These results indicate that the participants learnt after using the tool and this can be demonstrated by the result of the t-test.
The second sub question was used to find out how the knowledge they acquired on the tool is used effectively in helping them completing their work tasks.

27% strongly agreed that the knowledge they gain was more useful and effectively in completing their tasks and 46% of the participants who have used online learning tool agree that the tool would help them in completing their tasks. 27% of the participants remained neutral they didn’t provide any information on how effective the tool was in helping them to completing their tasks.

![Pie chart showing post-survey question 3.b result](image)

Figure 6.21: post-survey question 3.b result

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.06667</td>
<td>4</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.59362</td>
<td>0.75593</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.15327</td>
<td>0.19518</td>
</tr>
</tbody>
</table>

P value= 0.79018

Table 6.10: T-test result

The T-test was conducted to find out how effective the knowledge their acquired from the tools was in performing their daily tasks, compare the result of the responses from
survey before and after using the tool in order to find if they enhanced their knowledge or skill by using online learning tools. There was no significant difference in the scores for pre-survey (M=4.06667, SD=0.59362) and post-survey (M=4, SD=0.75593) conditions with p = 0.79018 as shown in Table 6.9. The result were not that significant due to the fact that some of the participants would had knowledge on the modules presented to them while majority of participants may not be using project management in their daily work.

The third sub-question of this question was designed to find out if the arrangement of the course or learning material was affecting their learning attitude and how this affects their learning style Figure 6.22.

![Figure 6.22:post-survey question 3.c result](image)

40% believes that the arrangement or presentation of the course contents strongly affects their learning style and another 53% agreed at certain that the presentation of the course affect their learning style and 7% remained neutral.
The last section on this question was designed to find out if the course contents has to meet the participant expectation to help them learn, the result are displayed in figure 6.23.

**Figure 6.23: post-survey question 3.d result**

13% strongly disagree that the course contents was suppose to meet their expectation, 40% of the participant remain neutral, 34% agreed that the course contents affect their learning if the contents don’t meet their expectation while 13% strongly agree that learning materials did affect how their acquired knowledge.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.28571</td>
<td>4.35714</td>
</tr>
<tr>
<td>Standard</td>
<td>0.72627</td>
<td>0.63332</td>
</tr>
<tr>
<td>Standard</td>
<td>0.1941</td>
<td>0.16926</td>
</tr>
</tbody>
</table>

**P value = 0.7837**

**Table 6.11:T-test result**

The t-test was used again to compare the response from the participants from the pre-survey and post-survey to find out how the arrangement and presentation of the learning contents affect the participants learning style. **Table 6.11** displayed the result of the T-Test result. There was no significant difference in the scores for pre-survey.
(M=4.28571, SD=0.72627) and post survey (M=4.35714, SD=0.63332) conditions with p=0.7837. These results conclude that there were no changes from the participants’ responses after using the tools and therefore the presentations of the course do affect learner’s style of learning. Hence it is important that the course contents are presented in a suitable way that will accommodate learners learning style. Following the universal design guideline as described in chapter 5.3.

Based on the answer that the participant provided it can be concluded that learning online improves knowledge and skills for the majority of the participants, the participants who attended the online course agree that the learning tool enhanced their knowledge. Their knowledge acquired using the tool was useful for some participants while for others it was not useful. This will be the case as some users are not involved in any project management activities in their daily work.

Some participants again expressed the point that the learning material and course contents affected their learning style, while for the majority of participants were not affected by the learning contents presentation and the learning material.

**Question 4**

Some participants prefered to be trained using e-learning than in being trained in classroom. The participants were asked again to rate their experience using learning tools compared with being trained in classroom or training room with an instructor.

![Figure 6.24: post-survey question 4 result](image-url)
Figure 6.24 provides a summary of the responses. It can be observed that 64.5% of participants agreed that e-learning is comparable with in-class instruction, 7.1% participants preferred to use e-learning and considered it more effective while 14.2% also agreed that somehow e-learning will be more effective in acquiring and enhancing knowledge and skills. 7.1% concluded that in-class instructions were more effective than e-learning and another 7.1% said that in-class instruction is considerably more effective than e-learning.

Question 6
The participants were asked again to evaluate their view on learning online using e-learning tools compared with the use of the books, attending training in a classroom and instructor techniques. Also to provide their view on the use of e-learning to advance Knowledge Management in the organisation and if they would like e-learning to be used to provide training in their organisation after using the tools provided.

![Figure 6.25: post-survey question 6.a result](image)

As shown on Figure 6.25; 7% said that they learn more using text books than online, 33% agree that e-learning is more effective than using the books, 60% agreed that they learn more using online training tools than reading books.
<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.7746</td>
<td>0.61721</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.19365</td>
<td>0.15936</td>
</tr>
</tbody>
</table>

P value = 0.55886

Table 6.12: T-test result

A further analysis was done using t-test to find out how learning using a book can be compared by learning online from the pre-survey and post-survey. *Table 6.1 provides* the T-test result. There was no significant difference in the scores for pre-survey (M=4, SD=0.7746) and post-survey (M=4.4, SD=0.61721) conditions with p = 0.55886. These results concluded that there were no changes from the participants’ responses after using the tools, it would be difficult to analyse the results more since users were not presented with the same material to learn using a book and also using the e-learning tool developed.

The participants were asked again how they rate learning online or attending training in a classroom. *Figure 6.26 displays the results.*

![Figure 6.25: post-survey question 6.b result](image_url)
In this case 6% didn’t consider e-learning to be more effective than classroom learning with instruction techniques, and 67% remained neutral while 27% considered e-learning to be more effective than attending training in a classroom. Table 6.13 shows the T-Test result.

Table 6.13: T-test result

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.26667</td>
<td>3.2</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.70373</td>
<td>0.56061</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.1817</td>
<td>0.14475</td>
</tr>
</tbody>
</table>

P value = 0.78174

The T-test was used to analyse the responses from the pre-survey (M=3.26667, SD=0.70373) with post survey (M=3.2, SD=0.56061) on how they compare learning online and learning through a classroom with an instructor techniques. Most of the participants remained neutral in both the pre and post survey and the result was not significant different with P value = 0.78174. This was an indication that people still consider to be able to enhance their knowledge and learn using e-learning tool but still don’t think it can completely replace classroom learning techniques.

After using the tools it was important to find out if the participants still regard e-learning as an important tool to use to advance knowledge management in the organisation.

Figure 6.27: post-survey question 6.c result
47% of the participant still agreed that e-learning can play a big role in advancing knowledge management in the organisation and 53% strongly agree that e-learning is an important tool that can be used to support knowledge management in the organisation.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.8</td>
<td>4.53333</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.41404</td>
<td>0.5164</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.169</td>
<td>0.13333</td>
</tr>
</tbody>
</table>

P value = 0.000019

*Table 6.14: T-test result*

The T-test was used again to analyse the response from the participants from the pre-survey and post-survey to find out how they value e-learning in advancing knowledge management within the organisation. Table 6.14 provides the T-Test result. There was a significant difference in the scores for pre-survey (M=3.8, SD=0.41404) and post-survey (M=4.5, SD=0.5164) conditions with p = 0.000019. These results conclude that there were changes from the participants’ responses after using the tools and therefore e-learning tool would be important in improving knowledge management within the organisation if it is used properly to provide training on the work being done.

Participants were asked how they would recommend the tool being used in their organisation, *Figure 6.28* displays the result.

*Figure 6.28: post-survey question 6.d result*
43% strongly recommended the use of the tool in the organisation and 43% also agreed that they would love to have the tool used to provide training in their workplace 14% remained neutral.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>4</td>
<td>4.28571</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>0.78446</td>
<td>0.72627</td>
</tr>
<tr>
<td><strong>Standard Error</strong></td>
<td>0.20966</td>
<td>0.1941</td>
</tr>
</tbody>
</table>

P value = 0.32653

Table 6.15: T-test result

The t-test was used again to compare the response from the participants from the pre-survey and post-survey to find out how they would recommend using e-learning within the organisation. Table 6.25 provides the T-Test result. There was no significant difference in the scores for pre-survey (M=4, SD=0.72627) and post-survey (M=4.28571, SD=0.72627) conditions with p = 0.32653. These results shows that there were no changes from the participants’ responses after using the tool most of them they were more positive in recommending e-learning to be used within the organisation.

6.7 Discussion

The experiment carried out to analyse how e-learning can be used to advance and support knowledge management within an organisation, the e-learning tool was used successfully and the survey was used to get information and the views of the participants.

There were few responses from people requested to participate in the survey, more survey results would have been more valuable although the result and conclusion was more likely to be the same based on the fact that the pilot survey result and the main survey result provided similar results even though two different groups were involved.

The majority of those that took part in the survey have used e-learning tools and attended course online. They agreed that using e-learning tools they are able to
enhance their knowledge. “Studies of major companies comparing training using e-learning technology to classroom instruction show that learning gains were up to 56 percent greater. ‘Consistency of learning’ (variance in learning across learners) was 50 to 60 percent better, and ‘content retention’ was 25 to 50 percent higher” (Karl M, 2011).

It was difficult to analyse how e-learning can be compared with using books to learn, as the course material provided was not provided using text book. The analysis was based on the fact that all participants have attended training using books before.

A question was posed on how participants valued using e-learning to provides training within the organisation, the responses from the participants was positive, the majority agreed that e-learning can be used as a tool to enhance knowledge management in the organisation.

For e-learning to be more effective and enhance knowledge management and training in the organisation it will be important to improve the interaction between tutor and learners if possible, also have tutors available to support and provide answers to question that may be raised by learners. (as published by autonomy.com)”The e-learning tools provide a complementary approach to knowledge storage and sharing by profiling user behaviour, such as consumption and sharing of information, which adds greater insight into each user’s activities and interests and provides a powerful way to deliver highly relevant contents”.

The course material provided has to meets learner’s style of learning. The analysis done indicated that the majority of participants remain neutral and there were some who indicated that the course contents has to meets their expectation while others disagreed that the course contents have to meet their expectations. This may depend on the course or learning contents and the purpose of the knowledge provided by the learning tools. If the contents were to be used to provide revision of the lesson done before, the contents must meet users’ expectation while for new concepts this may not be the case. Equally this will depend on user’s preferences and the objectives of the course provided. The course material also must be revised and updated while keeping record of previous lessons for future reference. There is a need to include video tutorial to assist course participants especial for procedure and practical lessons.
From the work done it was observed that not everyone recommend learning using technology, some still prefer the classroom techniques equally some people find learning online more difficult and intimidating sometime.

Based on the result of the work done it can be concluded that e-learning technology can play an important role in advancing knowledge management in organisation and also people are more willing to use the tool in their work place to enhance their skills and knowledge than before.

6.8 Summary

This chapter focuses on the experiment conducted while carrying out a study on how e-learning tools can be used to support knowledge management within organisations. The chapter focuses on the survey conducted, the chapter discusses the survey conducted, both the pilot survey, the pre and post surveys that were carried out before and after the participant have used the e-learning tool provided to use during this study.

The results of the survey were discussed and analysed using T-Test method. It can be concluded that the e-learning tools can be used to enhance knowledge management within the organisation and currently people are more willing to embrace and learn using technology, but there still progress on learning tools developed to make sure that the tools meet users learning style and also to improve communication and interaction between tutors and participants.

Many of organisations are currently improving staff training, e-learning technologies will be used more useful in future when the tool are improved to support knowledge management and becomes the foundation for creating organisation knowledge base systems.
7 CONCLUSION

7.1 Introduction
This chapter concludes the research work toward the development of an e-learning system for organisation training to support and advance knowledge management within the organisation. The chapter summarised the research definition and overview of the work done, the research contribution to the body of knowledge, the limitation of the study and evaluation process. The chapter also included a suggestion of future research work in the area of e-learning and knowledge management conclusion.

7.2 Research Definition & Research Overview
The purpose of this study was to evaluate e-learning as knowledge management tools, the organisation culture, knowledge management implementation strategy and the attitude of people toward e-learning.

The role of e-learning in knowledge management was in reviewed. The investigation was done by reading books, journal and other material online relating to the research done.
The organisation culture was investigated and evaluated on how it influences knowledge management implementation, HCL technology implementation and support department was used during this studies.

An e-learning tool with the project management module was developed and used during the studies, the tools was used to analyse Knowledge Management implementation strategies and evaluate the attitude of people toward e-learning as tools to advance Knowledge Management in the organisation.

7.3 Contributions to the Body of Knowledge
The following are the findings of the research work done and the contribution the body of knowledge.
7.3.1 E-learning as Knowledge Management tools
The study was able to determine that e-learning tools can play a big role in advancing knowledge management in the organisation. However it can be noted that not all training can be done using e-learning tools, some training requires instruction training interaction with the tutors and hands-on demonstration. This is because it is difficult to pass certain knowledge online without demonstration and certain people find it difficult to learn using e-learning technologies. In this case a combination of classroom training and online training will be required.

7.3.2 Culture
Training and enhancing the employees' knowledge and skill base is essential for achieving high productivity levels in any business institution and organisation. The organizations hold a huge amount of relevant information and knowledge spread across their knowledge repositories and in some cases employees are not aware of the existences of such knowledge bases or how to access them. Equally employees have highly specific and specialized areas of interest that cannot be explained by single or simple keywords. E-learning technologies can be used bridge the gap.

The e-learning tools and technologies links people and information and knowledge using concepts identified from explicit profiling in natural language hence employees can search for information and ask to see content similar to that which they are looking for easily.

7.3.3 Attitude of people toward e-learning technology
The attitude of people towards technologies was evaluated and the result shows that currently people are more willing to use technologies to communicate, learn and share ideas but they lack organisation support and time resulting in slow advancement of knowledge management in organisations. E-learning technology can be used to bridge the gap by organisation providing extensive training using e-learning tools providing opportunities for employees to learn more and also advance their knowledge.
7.4 Experimentation, Evaluation and Limitation

The experiment was done by developing a project management e-learning tool, the modules on the tool included; project planning with Gantt charts and introduction to PRINCE2 Project management methodology. A pilot Study was conducted with HCL support staff; the staff used the tool and carried out a survey after using the tools. Afterward the main study was done with two surveys a pre-survey before using the e-learning tool and a post-survey after using the tool.

After the experiment the results of the survey were gathered and analysed and evaluated. The evaluation compared the results of the survey done before the tool was used and the survey result after using the tools.

The main limitation of the survey was the response from the survey sent; it was important to get more survey results so that more valuable input can be used during the analysis and evaluation. Initially, interviews were supposed to be conducted but due to the fact that people involved in the study were in different location, this was not going to be possible.

7.5 Future Work & Research

Future research efforts will be dedicated in exploration of the two fields e-learning and Knowledge management. The researches should focuses on how e-learning influence KM and how changes in e-learning field can foster changes in knowledge management. It will also be important to evaluate how e-learning improve overall performance of the KM processes.

KM has the potential to increase productivity by decreasing the amount of time required per search session. The purpose of this study was to evaluate the use of e-learning as a tool to advance Knowledge Management within the organisation.

7.5.1. Knowledge sharing culture

Future research should be conducted on how to improve knowledge sharing culture among staff that will help in implementing and advancing knowledge management in organisation. The research can focus on how e-learning technology can also be used as
a tool to influence culture change so than knowledge management implementation due to organisation culture.

### 7.5.2 Storage and sharing of knowledge.

The type of knowledge that need to be store have to be identified and also manager how the knowledge will be shared across business or organisation departments. The organisation has a vast amount of knowledge, it will be important to identifies the knowledge that will be required by each business unity in the organisation and decide what part of the e-learning system or knowledge base system will contains such knowledge and how such knowledge will be shared with other business units.

### 7.5.3 Improvement on the knowledge management in organisation

This research was able to establish that employees are willing to share knowledge but lack organisation support. The organisations don’t promote knowledge management by allocating time to share knowledge and emphasising the need for sharing knowledge. Future researches should equally focuses on knowledge sharing and also establish the best approach that can be used to find time for employees to share knowledge.

### 7.6 Conclusion

Cultures play an important role in knowledge management; Organisation that succeeded in implementing a knowledge management system they have a strong culture that supports knowledge management.

E-learning technologies are cheaper to produce and maintain as they can be produced using existing technologies, some of which are free and customise them to suite the organisation needs. The e-learning tools also provide more information in a smaller, cost-effective format. The tool can be updated more easily and quickly because of using digital formats. This allows providing a more consistent training over a large audience that can improve knowledge sharing and management in the organisation.
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### APPENDIX A

The letter used to invite the participants to fill the survey and used the tool.

<table>
<thead>
<tr>
<th>Hi,</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am currently carrying out a research project on E-learning and Knowledge management in business organisations. The purpose of this research is to assist me toward the completion of my Masters Degree in Knowledge Management in Computing.</td>
</tr>
<tr>
<td>In order to finish my research, I'm looking for participants to complete a short study that I have put together. I would be very grateful if you could help me out by participating in the study, and/or passing this email on to any of your work colleagues or friends.</td>
</tr>
<tr>
<td>The study itself is based around a short e-learning module that I have built. The learning module deals with the PRINCE2 project management method. Altogether, all you have to do is answer some survey questions, read through the module contents, and then answer a couple more questions. Altogether participation should only take between 5-10 minutes.</td>
</tr>
<tr>
<td>You can start with the initial survey <a href="https://www.surveymonkey.com/s/VC7TQPM">https://www.surveymonkey.com/s/VC7TQPM</a></td>
</tr>
<tr>
<td>At the end of the survey you will be given instructions on how to move on to the test module and the final survey. For completeness I've repeated these instructions below:</td>
</tr>
<tr>
<td>• Now take the e-learning module plus a short quiz at <a href="http://epmts.org/mod/lesson/view.php?id=12">http://epmts.org/mod/lesson/view.php?id=12</a>, You can login with the following details:</td>
</tr>
<tr>
<td>Username: user</td>
</tr>
<tr>
<td>Password: Password1-</td>
</tr>
<tr>
<td>• Finally, please complete the last set of questions at <a href="https://www.surveymonkey.com/s/KWZVKHR">https://www.surveymonkey.com/s/KWZVKHR</a></td>
</tr>
<tr>
<td>Your positive response will be appreciated, once again thank you for your support.</td>
</tr>
<tr>
<td>Regards</td>
</tr>
<tr>
<td>Alain Muhire</td>
</tr>
<tr>
<td><a href="mailto:D09116796@mydit.ie">D09116796@mydit.ie</a></td>
</tr>
</tbody>
</table>
APPENDIX B

The Pilot Survey result and analysis

Question 1

The first question was to identify if user’s experience in attending course online or done any training online using e-learning tool. 81% of the participants have done so in the past while the rest have never attended course online.

Question 2

The table below shows the percentage of people participated in the survey who attended the second question and their responses, the figure represent the percentage of those who attended the question.
After using the tools the users were to give their views on experience using the e-learning tool provided, more than 46% believe that they are able to effectively learn online independently while 31% can efficiently learn online and complete their work online using e-learning technologies. Not every one find it easier to learn online 23% still finds it difficult to learn online.

**Question 3**
It was important to evaluate how users perceive using e-learning tool; the purpose was to find out how easy it was using the tools and how comfortable their experience was. 24% believe it was easier, 23% were comfortable, 35% said it was simple and 18% believe they become more productive using the tools.

Question 4

Evaluating the course requires to analyse if users were able to access the course material and learn and also the quality of the course content. 19% of the users were able to find information easily, 37% were able to understand the course contents. 13% said the content meet their expectations, 19 % believe the organisation of the lesson was clear and 12 % said the knowledge they acquired was effective in helping them complete their project planning task. The users also provided their view on how important it was to have quality course and if they were satisfied with the course contents.
Question 5

How much did success in the course depend upon understanding ideas, rather than memorizing facts?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A great deal</td>
<td>63.6%</td>
<td>7</td>
</tr>
<tr>
<td>A lot</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>A moderate amount</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>A little</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

The users were asked to also demonstrate their understanding of learning. 63% believe e-learning is more understanding the content rather than memorising ideas and this question was done to evaluate if the users were learning or just gathering fact rather than enhancing their skills.
Question 6

The user preferences and learning style was considered during this survey part and users were asked to express their views, not everyone find it easier to learn online.

Question 7

Knowledge sharing pays an important role in knowledge management, this can only be achieved if employees are able to intact and exchange ideas, information and knowledge, for e-learning tool to be considered as km tools, it should provides facilities to arrow the interaction among users. 27.3 % find e-learning more useful to increase their level of interaction with work colleague, this will be achieved through the use of the forum and also having a direct email contact to the users whom they are sharing learning material.
Question 8

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Applying e learning in organization encourages me to</td>
<td>90.9%</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Using e learning is more beneficial than using traditional</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Using e learning is a waste of time</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The purpose of this part was to evaluate the benefit the users have while using E-learning technology, 90% of the users response and expressed that through the module they attended, they were encouraged to continue individual and attend more training online.

Question 9

<table>
<thead>
<tr>
<th>I would like e learning to be used to provide training in the organization</th>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree</td>
<td>72.7%</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Somewhat agree</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Neither agree nor disagree</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Somewhat disagree</td>
<td>18.2%</td>
<td>2</td>
</tr>
</tbody>
</table>

Training in organisation is normally handed manually and employees are given hound out material, Users expressed them self on how they later being offered training online and 72.7 % believe their training can be enhance using online learning tool.

Question 10

Finally I would like to thank you for your time and response that you provided. Do you have anything more or additional comments to make?

- I enjoyed learning online and would do so in future again
- The training was well laid out, easy to follow using simple English with out talking down to the reader
- I am totally impressed with the work on this site. I would definitely visit the site on a regular basis to participate on the activities and forums as they evolve.
- Great job, well done.

The last question was an open question asking the users to express themselves and provides any extra information and makes comments.

**Conclusion**

Based on the result of the survey, it was observed that many users have attended courses online before and they are more positive in using e-learning in future. The result of the analysis so far indicates that people are different and not everyone is comfortable e-learning online.