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Knowledge Transfer for Project Site Based Construction Management Team of Abc Company: Basis for the Development of a Knowledge Transfer Plan

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Abstract

The study determines the readiness of ABC Company and the status of the project site-based construction management team (CMT) on knowledge transfer (KT) as basis for the development of the proposed knowledge transfer plan (KTP).

Descriptive method was used to obtain information on the levels of readiness on organizational characteristics and resources requirement of ABC Company and on the gaps in terms of idea creation, sharing, dissemination, evaluation and adoption in the project site based CMT. Descriptive statistics was used to present the data on readiness; anything below 100% in terms of idea creation, sharing, dissemination, evaluation and adoption was considered a gap.

The study revealed that ABC Company has a moderately ready status on its readiness. Improvement was needed on KT strategy, rewards systems, knowledge hoarding, knowledge required, budget, and even on the core and support team that was essential in the development of the proposed KTP.

The project site based CMT had gaps to be attended to on idea creation, sharing and dissemination. Those gaps were considered valuable input in the development of the proposed KTP.

The development of the proposed KTP was grounded on quality management system that considered the readiness of ABC Company and the gaps found in the project site based CMT as inputs. The proposed KTP composed of four stages, namely, Management Responsibility, Resource Management, Knowledge Transfer Realization and Measurement, Analysis and Improvement. Intervention strategies presented in the KTP would address the particular area determined to be either absent or not consistently implemented with feed forward and feedback for continual improvement.

Introduction

Any organization whether big or small will undertake projects at one time or another to improve operations and meet customer's requirements. This is also true to the construction industry and the projects they handle would require effective and efficient management to ensure profitability of business and growth of the entire organization, (http://ir.uiowa.edu/etd/2456, 10 Sept 2015).

Construction Management (CM) is the process and activity of planning, organizing, motivating, and controlling human and other resources, procedures and protocols to achieve specific goals of the project site-based organization managing a specific project. The prime responsibility of CM is to achieve the project goals and objectives by resolving issues, challenges and constraints related to construction activities. The

issues, challenges and constraints which are commonly associated with the construction are considered to have an impact on scope, time, quality and budget. The secondary and more ambitious challenge is to optimize the allocation of necessary inputs and integrate them to meet pre-defined objectives. CM is all about bringing together the different components of the project such as human and other resources to accomplish the main objective, (http://pmbook.ce.cmu.edu/02_Organizing_Project_Management.html, 05 Sept 2015).

Construction management is a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end usually time-constrained, and often constrained by funding or deliverables undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value,(http://www.pmi.org/About-Us/About-Us-What-is-ProjectManagement.aspx, 05 Sept 2015).

According to a renowned Architect, Annette P. Wilkus, founding Principal of Siteworks Landscape Architecture in New York, University of Wisconsin – Madison, in this struggling economy, a new field of opportunity in CM is emerging. As Construction Managers, the profession can contribute in a meaningful way to the environment. With technically savvy Landscape Architects on the construction end of any landscape-driven project, details are attended to and contractors are held accountable. CM has transformed its vision of these possibilities into a profitable firm. Such landscape-driven projects demand a Construction Management Team (CMT). The unique perspective that CM bring is valued by clients and designers alike. One important element of the CM is to work well with others and act as translators between client, designers and contractors, which requires both technical expertise and patience. Managing a project and a full team of diverse individuals is not an easy task, but those who prepare accordingly and take the appropriate actions know that doing so will significantly increase the chances of success on a project.

It is important to understand that the scope of the CMT has a temporary timeframe and a specific goal. That is why it is important to plan properly and allocate the right resources at the early stages of the project. Although systems, policies and procedures are documented and available in any CM organization, knowledge transfer (KT) provides a clear and common understanding of goals and measures. It allows people to align their actions and decisions with the overall strategic direction of the construction management team of the company, (http://www.pmi.org/About-Us/About-Us-What-is-Project-Management.aspx, 05 Sept 2015).

The goal of knowledge transfer is to train new employees to recognize and apply knowledge acquired from previous tasks to new tasks or domains. An effective knowledge transfer facilitates the learning processes for novel tasks (Si-Chi Chin, 2013). A Knowledge Transfer Plan (KTP) will be a tool to enable the beginners or novices to be integrated into the CMT organization in the soonest possible time and later enhance/ improve the performance of the CMT as a unified team in dealing with the construction supervision activities.

Background of the Study

The ABC Company is a design and project management firm founded in 1946 with an initial focus on structural engineering. The company first came to the world's attention with the structural design of the Sydney Opera House, followed by its work on the Centre Pompidou in Paris which has since then grown into a truly multidisciplinary organisation. Most recently, ABC Company has reaffirmed its reputation for delivering innovative and sustainable designs and project management that reinvent the environment by bringing together broad-minded individuals from a wide range of disciplines and encourages them to look beyond the constraints of their own specialization. The firm is owned in trust on behalf of its staff where

the result is an independence of spirit that is reflected in the firm's work, and in its dedicated pursuit of technical excellence and is committed to an approach to its work that embodies quality, a concern for the environment, and fair dealings with staff and clients.

It is important to understand that the scope of the CMT has a temporary timeframe and a specific goal. That is why it is important to plan properly and allocate the right resources at the early stages of the project. Any inaccuracy in the planning process can result to delays or non-completion of the project hence, following proper steps in construction management is important. The construction management process is basically composed of the following steps or procedure to attain the project's goals or objectives:

A. Definition of the goals and objective of the project are clearly identified
B. Planning how the objective is best accomplished which includes designating the people for appropriate roles, allocating resources, and setting milestones.
C. Execution to effectively manage constraints such as budget, people, schedule and project scope.
D. Control the project so that it will progress properly by establishing the necessary controls in place. It is the effective administration of a project.
E. Closure of the project to meet client expectations is completed within a prescribed milestone (deadline).

The study was conducted in the project site of the Construction Management Team (CMT) of ABC Company involved in the construction management and supervision of the two Sewage Treatment Plants (STP) and pipe network projects in Muntinlupa City, Philippines. The project site based CMT has been organized by ABC Company with the prime responsibility of supervising the construction of sewage treatment plants and pipe network at Muntinlupa City, Philippines to ensure that the projects are carried out by the appointed contractors in accordance with the contract documents and specifications. The services provided by the project site based CMT covers review of the STP design, assess technical submittals, analyze construction methodologies, project documentation, testing, financial evaluation, training, standards setting and knowledge transfer to client's personnel.

Construction management in the consultancy and construction industry is a very volatile business. The middle managers, engineers, technical personnel and project site support staff that comprises the construction management team (CMT) are either contractual or project-based contract. Those contractual or project-based contract employees will either be terminated from work or moved to another site after their tasks are complete. It is a usual practice from ABC Company that project managers and construction managers are the only personnel who are permanently employed. Very seldom middle the managers and rank-and-file are absorbed by the organization as regular or permanent employees. Hiring of new employees when new projects are acquired is the usual practice in ABC Company. Those newly hired employees will be having a considerable time adjusting to the organization's working culture, its systems and processes on project management. Figure 1, shows the organization chart for project site based CMT of ABC Company. It shows the relationships of the construction manager who is usually a regular employee and its staff/ subordinates who are newly hired.

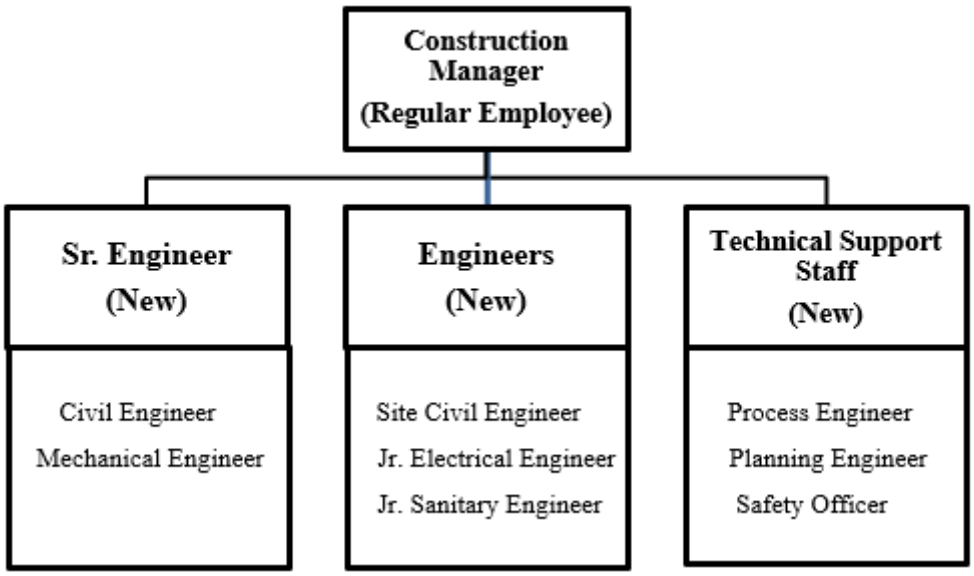

Figure 1. Typical organizational chart of a project site based CMT

Knowledge transfer provides a clear and common understanding of goals and measures. It allows people to align their actions and decisions with the overall strategic direction of the construction management team of the company. It has long been known that an organization has, within itself, much of the knowledge it needs to solve its own project obstacles. The major issue has been finding who has this knowledge and the ways to access it. This involves not only capturing and storage mechanisms, but also developing knowledge-friendly culture that encourages knowledge sharing and discussion among workers. The very efficiency valued in construction management is not always the best perspective of knowledge sharing which requires time and reflection to be ultimately successful but also knowledge transfer to turn ideas into action.

Knowledge has long been recognized as a driver of productivity and economic growth. The importance of knowledge on how it is acquired, used and shared is key to project and program success. In 1969 Peter Drucker's book, The Age of Discontinuity: Guidelines to Our Changing Society, said, "The next society will be a knowledge society. Knowledge will be its key resource, and knowledge workers will be the dominant group in its workforce".

Knowledge Transfer, according to the book, Capturing the Value of Project Management Through Knowledge Transfer by Larry Prusak and Langley, President and CEO, Project Management Institute, "in our knowledge-based economy, is talent – the knowledge worker – that differentiates an organization". Our most unique and dynamic employees with experience, initiative, creativity, and a commitment to excellence possess the type of knowledge that sets an organization apart from competition. When organizations create environments where those employees can effectively transfer their knowledge to others, strategic initiatives are completed more successfully. As organizations explore employee development, it is encouraged to recognize knowledge transfer as a means to ensuring successful implementation of projects that are central to achieving their goals. Therefore, knowledge is power and transferring that knowledge is powerful. In 2013, the University of Iowa has published a research entitled Knowledge Transfer: What, How and Why by Si-Chi Chin (http://ir.uiowa.edu/etd/2456, 15 September 2015). According to the researcher, people learn and induce from prior experiences. Transferring knowledge from one situation to another related situation often increases the speed and quality of learning. Learning from

the contribution of management to the enhancement of the performance of the CMT, the researcher of this study adopted the same principles in the development of a knowledge transfer for the CMT of ABC Company to address the challenges and problems identified in this research. The locale in which the study was conducted was the organization involved in the supervision of the projects at Muntinlupa City, Philippines.

Statement of the Problem

Although systems, policies and procedures are documented and available in the construction management system of any organization, this study determined the levels of readiness of knowledge transfer (KT) of ABC Company in terms of organizational characteristics and resources requirements and identified the status of KT of the CMT of ABC Company in terms of idea creation, sharing, dissemination, evaluation and adoption. This led to the development of a knowledge transfer plan (KTP) to be utilized in educating the novices or neophytes of the CMT of ABC Company. Further, the KTP would be a tool to enable the beginners to be integrated into the CMT organization in the soonest possible time and later improve the performance of the CMT as a unified team in dealing with the construction supervision activities.

Specifically, this study provided answers to the following sub-challenges:

1. What is the level of readiness of the ABC Company on knowledge transfer in terms of the following:
   a. Organizational characteristics and
   b. Resources requirements
2. What is the status of knowledge transfer of the project site based CMT of ABC Company on idea creation, sharing, evaluation, dissemination and adoption of knowledge transfer?
3. What knowledge transfer plan should be developed for the project site based CMT of the ABC Company?

Objectives of the Study

The study aimed to develop a knowledge transfer plan to enhance the performance of the CMT of the ABC Company on construction management. To make it possible, the study accomplished the following:

1. Assessed the readiness levels of the ABC Company in terms of organizational characteristics and resources requirements on knowledge transfer.
2. Identified the status of the project site based CMT of ABC Company in terms of idea creation, sharing, evaluation, dissemination and adoption on knowledge transfer.
3. Developed a knowledge transfer plan to enhance and improve the performance of the project site based CMT

Significance of the Study

The study is significant to the following group of beneficiaries:

The Construction Management Team (CMT) of ABC Company. The CMT of the ABC Company will be able to maximize and manage available resources to achieve the set objectives and continually improve their performance as required by the industry. It will be able to detect potential problems in the organization and do necessary actions immediately. The true root cause of unmet objectives will be easier to identify because every contributor to the KTP will be considered. Proactive approach will be developed and more preventive measures will be generated than corrective actions as the company continually carry-out its operations. In utilizing knowledge transfer as a pro-active approach, the company will be able to enhance the CMT's performance, thus, eventually ensure improved construction management operations.

Field of Construction Management. Going back to the roots of the project management practices which are based on the existence of project management processes, systems and procedures, the knowledge transfer would intensify transparency of all the constituents of the construction management operations (CMO) for proper project planning, implementation, monitoring and control in providing services that will meet organization's and clients' expectations.

Knowledge transfer is commonly used in the consultancy and construction operations and will be tried in managing the CMO. The knowledge transfer plan can be used as basis for further studies as well as in the development of concepts existing in the project management business that requires knowledge transfer in addressing the cause of lapses and gaps.

Engineering Management Program. The study can be significant to the Engineering Management Program because, knowledge transfer is a methodical replication of the expertise, wisdom, insight and tacit knowledge of key professionals into the heads of and hands of their co-workers. Masters in Engineering Management students can learn the rudiments of knowledge transfer which they can utilize in their own organization.

The Researcher and Future Research. The study is significant to the researcher due to his involvement to the project locale from which the respondents are associated and future research of similar type of study.

Scope and Limitations

This study was conducted with the project site based CMT of ABC Company in their on-going construction of sewage treatment plants (STPs) and pipe network in Muntinlupa City, Philippines. The respondents of the study, were limited only to the middle managers, engineers and technical support staff of the project site based CMT of ABC Company associated with the supervision of the STP. The study considered the current status of the locale in the current year (2015).

The study developed a knowledge transfer plan based on the identified levels of readiness of the ABC Company and the status of project site based CMT in terms of idea creation, sharing, evaluation and dissemination. An implementation procedure was likewise presented.

Top management representatives of the ABC Company were asked on the acceptability status for implementation scheme of the knowledge transfer plan developed for the CMT. No generalization had been made with respect to other project management companies because the study was limited only to the project site based CMT of ABC Company undertaking the Muntinlupa STP and pipe network projects. Moreover, the findings of the study were considered true and valid to the locale of the study. Any implications to other locales will depend on the reader's discretion.

Theoretical Framework

According to the study of Levine and Gilbert (2009) on knowledge transfer managerial practices underlying one piece of the learning organization, knowledge management is something of a trend in today's business. It addresses key issues that can lead to success within organizations. It also systematically considers how advanced information technology can be used to leverage existing knowledge and create new knowledge. Also, organizations nowadays value the growing importance of knowledge transfer. Knowledge transfer has always been a challenge for organizations. Its importance has grown in recent decades. Knowledge appears to be an increasing proportion of many organizations' total assets and have moved away from hierarchical methods of control towards more decentralized organizational structures and increased employee involvement (Levine, 1995). This has resulted in more creativity by frontline

employees and subunits. Advances in technology have created new means of knowledge transfer. Innovations such as Lotus Notes, the Internet, and Intranets all hold the potential for increased diffusion of innovations. However, technology alone cannot solve the problem of knowledge transfer. Organizational structures, practices, and resources must facilitate and motivate knowledge transfers.

In principle, knowledge transfer has been broken down into distinct stages known as the components of knowledge transfer that comprises of five steps to describe the process: idea creation, sharing, evaluation, dissemination and adoption. These stages often overlap, are combined, or are skipped. They also have important setbacks, http://faculty.haas.berkeley.edu/levine/papers/knowledge_transfer.pdf, 15 August 2015. Figure 2 shows the theoretical framework based on the components of knowledge transfer.

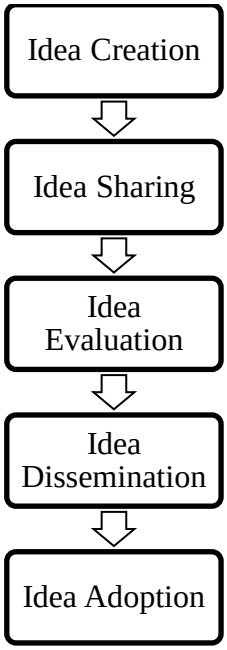

Figure 2. Theoretical Framework: Components of Knowledge Transfer by Levine & Gilbert, 2007

In *idea creation,* set of questions were formulated on the variety of knowledge in the group, attitude toward knowledge if new ideas were encouraged and if they were constantly practicing experimentation and idea innovation.

In practice, *idea sharing* is often combined with validation and dissemination. For example, a work group might share their ideas in a meeting, where the merits of the ideas are discussed and relevant potential adopters hear the new methods. Here, sharing refers to the need to expose others to the idea in order for it to be evaluated. Dissemination takes place once the idea has passed some minimum level of evaluation.

For information sharing to occur, two conditions must be satisfied. First, ideas must be in a form that others in the organization can interpret. Dissemination is easier when the knowledge can be made explicit or formal. For many skills and ideas, this involves transforming the idea into a codified, often written, format. Tacit, or informal, knowledge can be shared as well but the means of sharing are different, requiring face-to-face contact and opportunities for experiential learning. Apprenticeships often follow this time-intensive and sensory-rich means of transmitting knowledge. Nonaka, (1994) emphasized the rich interactions between tacit and explicit knowledge. While conventional wisdom on why knowledge is difficult to transfer within firms has focused on motivational barriers, Szulanski (1996) found that features of the

knowledge itself and the receiver's inability to interpret it were two of the most important factors in inhibiting knowledge transfer.

In the principle of *idea dissemination*, more important information is better than less. At the same time, too much information creates overload.

In *idea evaluation*, organizations must evaluate their new ideas. They must assess whether new ideas have worked in the past, are likely to work at new places, and actually work at new places. Employees must have the capability, incentives, and structures to perform the validation studies.

According to idea adoption, if people knew the right thing to do, they would do it. It is the act of receiving an information or knowledge willingly taken up and practice as their own.

Conceptual Framework

The components of knowledge transfer had provided basis for the conceptualization of the present study. Other knowledge transfer prerequisites had been considered. One of them was the awareness on the readiness level of the organization and the resources to facilitate knowledge transfer for continuous improvement. Knowledge transfer has a tremendous impact on execution, morale, and productivity. It is not just about information access. A dynamic knowledge transfer in the workplace energizes employees, builds pride and ownership, and conveys the strength and currency of the organization. Far from simply prettying up the office, the organization needs to create an environment of knowledge that convey goals and expectations, that engenders a collaborative attitude, and most important, that which cannot be ignored (Carillo & Robinson, 2004). To apply the concept of knowledge transfer, the study explored the status of knowledge transfer of ABC Company by assessing the knowledge transfer practices of the CMT at the project sites since they have direct contact with the construction management operations. The mandated functions, duties and responsibilities of the CMT in the project site were used as the basis for creating the knowledge transfer plan (KTP). The conceptual framework for knowledge transfer is shown in Figure 3.

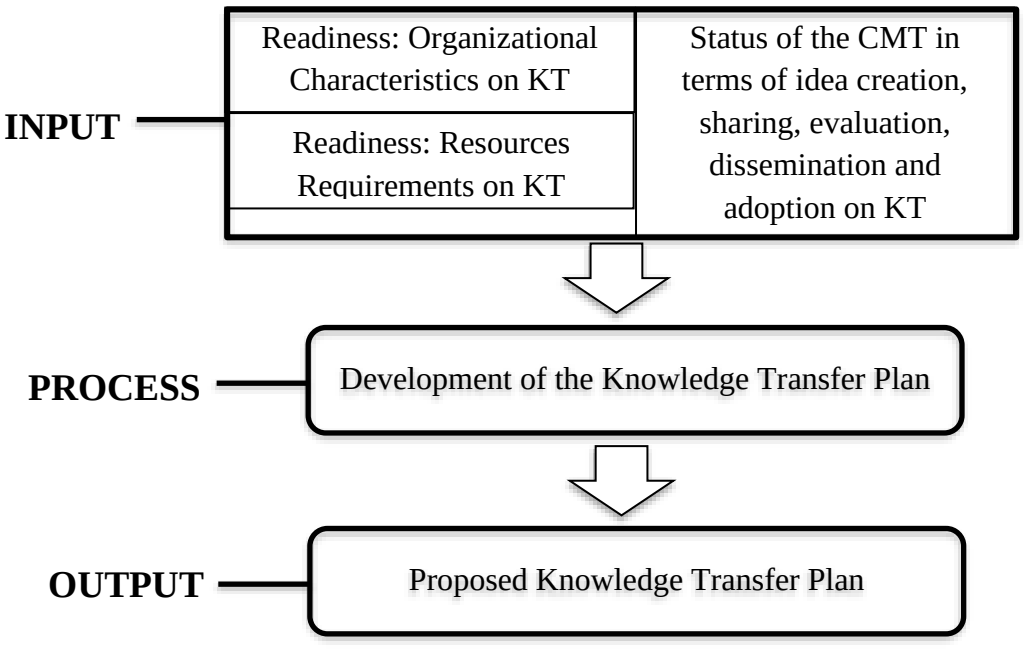

Figure 3. Conceptual framework for Knowledge Transfer for the CMT of ABC Company

Definition of Terms

The following terms were defined theoretically, conceptually and operationally to ensure better understanding of this study:

ABC Company. This is the organization from which the construction management team is employed.

Communication. The process of providing and receiving information to and from other personnel either in written, verbal, formal, and informal means.

Construction Management Operation (CMO). The day-to-day activities of the construction management team.

Construction Management Team (CMT) of ABC Company. The project site-based construction management team of the company that is responsible for the management and supervision of a project.

Digital knowledge repository. An online "container" of content used to convey what is known about a specific topic or practice.

Idea creation. The process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be either visual, concrete or abstract.

Idea sharing. An activity through which knowledge, namely, information, skills or expertise is exchanged among people, friends, colleagues or organizations.

Idea dissemination. The scattering of information, skills or expertise to different people, friend, or colleagues.

Idea evaluation. The process of examining an information to determine the potential use for its success.

Idea adoption. The act of receiving an information or knowledge by willingly taking up and practicing as their own.

Knowledge Management. A systematic approach to create, find, capture, understand, use, and transfer knowledge important to the organizations' mission and vision.

Knowledge Sharing. The exchange of knowledge between and among individuals and among teams, organizational units, and organizations. (www.ejkm.com**)**

Knowledge Transfer. The process of extracting and transferring tacit knowledge and/or facilitating learning explicit knowledge.

Management. The process and activity of planning, organizing, motivating and controlling resources, procedures and protocols to achieve specific goals.

Organizational characteristics. People, organization, technology, and their relationships that highlights on organizational theory and organizational learning on organizational conditions for knowledge management prerequisites and barriers, (Spinger, et al. 2002)

Readiness. A specific work-related skill that a company or its employees need in order to be successful in any formal sector business or industry.

Records. The evidence of the activities undertaken by the CMT from the acceptance of the requests, planning, monitoring, recording, reporting to the feedback from customers that should be available, properly maintained and updated based on the quality management system of the organization.

Resources requirements. The means used to achieve project objectives. The primary resource are people with applicable skills and competencies. The other main grouping of resources includes capital, facilities, equipment material and information. (Joubert, 2010).

REVIEW OF RELATED LITERATURE

This chapter includes the review of the relevant literature that has provided background to the achievement

of the objectives of the research. The literature has also provided a much clearer definition of the research voids of the study which is presented in the current form that provides clarity and focus.

The review provided in this research includes a discussion on the management practices, concepts and theories, project management practices, trends in construction management, the need for changes, managing a project, knowledge management, knowledge transfer and knowledge transfer plan as tool in ensuring successful implementation of projects that are central to achieving goals.

The review is arranged in a specific form to provide a much clearer description of the foundation of the present study. Likewise, this review has further illustrated the objective of an organization that promotes innovation by creating and maintaining an innovative environment striving for efficiency and effectively.

Development of Management Practices

Many of the challenges faced by managers during earlier periods were similar to those faced by managers today. The challenge of meeting rigid competition is often addressed as the challenge of declining worker's productivity. Among the challenges that managers have faced are increasing worker productivity, meeting the challenge of rigid competition, replacing obsolete work methods and equipment with the latest, more expensive equipment, maintaining employee motivation and morale, integrating the changes into workplace on methods and organization policies.

With the growth of computer technology, more managers can use quantitative tools, excel spreadsheets, microsoft project, primavera and other software programs for planning and analysis. Tools such as linear programming and simulation models may be used in managerial decision making. Project evaluation and review technique (PERT)/ Critical Path Method (CPM) as another quantitative aid, is useful for both planning and control. Inventory-control and quality-control tools are necessary in many organizations (http://www.netmba.com/operations/project/cpm, 15 August 2015).

Because of the complexity of organizations today, no single managerial strategy is correct in all situations. It depends on the knowledge and the need for managerial strategies. Each managerial situation must be viewed separately and a wide range of external and internal factors must be considered. The emphasis is on diagnosis, and managers must have different approaches for situations when different constraints prevail. The factors that lead to different approaches are: (1) compatibility of the new product or policy with existing products and policies, (2) skills and abilities of the employee who created the idea, and (3) constraints imposed by existing processes.

Project Management Processes

Project management is the process and activity of planning, organizing, motivating, and controlling resources, procedures and protocols to achieve specific goals in scientific or daily problems. A project is a temporary endeavour designed to produce a unique product, service or result with a defined beginning and end (usually time-constrained, and often constrained by funding or deliverables) undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value. The temporary nature of projects stands in contrast with business as usual (or operations), which are repetitive, permanent, or semi-permanent functional activities to produce products or services. The primary challenge of project management is to achieve all of the project goals and objectives while observing the preconceived constraints. The primary constraints are scope, time, quality and budget. The more ambitious challenge is to optimize the allocation of necessary inputs and integrate them to meet objectives (http://pmbook.ce.cmu.edu/02_Organizing_For_Project_Management.html, 05 September 2015)

Project management is all about bringing the different components of the project together to accomplish the main objective. Any organization, whether big or small, will undertake projects at one time or another to improve company operations or to meet client requirements. When talking about project management, it is important to understand that a "project" is not a part of normal business operations. It has a temporary timeframe and a specific goal (13d.cs.colorado.edu/Ostwald, Sept 2015). That is why it is important to plan it properly and allocate the right resources early. Any mistake in the planning process can result to delays or the non-completion of the project. Following the proper steps in project management is important. The project management process is basically composed of five steps including but not limited to:

1. **Definition –** In this stage of project management, the goals and objectives of the project are identified. This phase involves setting expectations and knowing what the end product would be. All the stakeholders in a project, including the project manager, business executive, and client (if applicable), must be involved in defining the project.
2. **Planning –** After the goal has been identified, the next step is to think of how the objective is best accomplished. This includes designating people to appropriate roles, allocating resources, and setting milestones. The project manager should also analyze how long each task will take to complete and how it will affect the deadline. Additional staff can be assigned to work at the critical points of the project if this is required.
3. **Execution –** This phase involves implementing the plan that has been created by the project manager and other stakeholders. The project manager has to manage the project constraints such as the budget, people, schedule, and project scope effectively. Each team member must start working on the tasks that are assigned to him/ her.
4. **Control –** To ensure that the project is progressing properly, there must be controls in place. The project manager must know the details of the project's progress. Team members must submit a report of whenever a work is completed. This facilitates the effective administration of the project.
5. **Closure –** If the project meets the expectations and the work is completed within the deadline, then it is time to close the project.

Trends in Construction Management Operations

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion. While the relevant technology, institutional arrangements or processes will differ, the management of such projects has much in common with the management of similar types of projects in other specialty or technology domains such as construction, aerospace, pharmaceutical and energy developments.

Construction management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time and quality. In contrast, the general management of business and industrial corporations assumes a broader outlook with greater continuity of operations. Nevertheless, there are sufficient similarities as well as differences between the two so that modern management techniques developed for general management may be adapted for construction management.

The basic ingredients for a project management framework may be represented schematically in Figure 4. A working knowledge of general management and familiarity with the special knowledge domain related to the project are indispensable. Supporting disciplines, such as computer science and decision science,

may also play an important role. In fact, modern management practices and various special knowledge domains have absorbed various techniques or tools which were once identified only with the supporting disciplines. For example, computer-based information systems and decision support systems are now com-mon-place tools for general management. Similarly, many operations research techniques, such as linear programming and network analysis, are now widely used in many knowledge or application domains. Hence, the representation in Figure 4 reflects the sources from which the project management framework evolves. (http://pmbook.ce.cmu.edu/02_Organizing_For_Project_Management.html, July 2015).

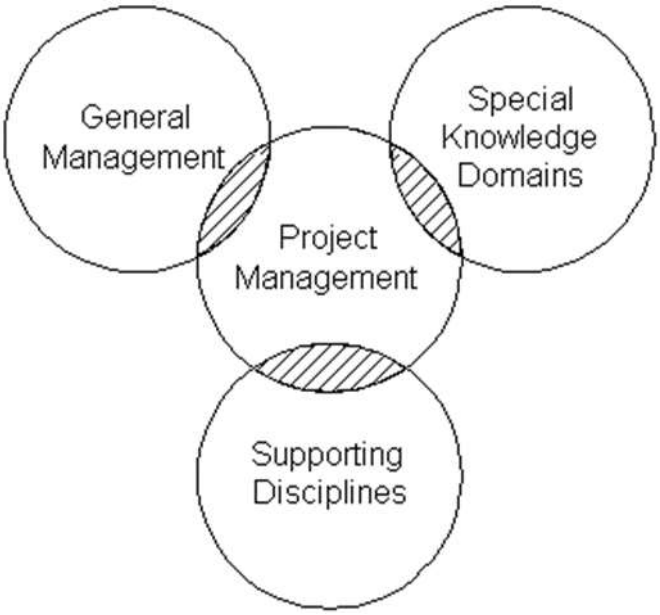

Figure 1: Basic Ingredients in Project Management

Specifically, project management in construction encompasses a set of objectives which may be accom-plished by implementing a series of operations subject to resource constraints. There are potential conflicts between the stated objectives with regard to scope, cost, time and quality, and the constraints imposed on human material and financial resources. These conflicts should be resolved at the onset of a project by making the necessary trade-offs or creating new alternatives. Subsequently, the functions of project man-agement for construction generally include the following functions:

1. Specification of project objectives and plans including delineation of scope, budgeting, scheduling, setting performance requirements, and selecting project participants.
2. Maximization of efficient resource utilization through procurement of labor, materials and equipment according to the prescribed schedule and plan.
3. Implementation of various operations through proper coordination and control of planning, design, estimating, contracting and construction in the entire process.
4. Development of effective communications and mechanisms for resolving conflicts among the various participants.

The Project Management Institute focuses on eight distinct areas requiring project manager's knowledge and attention as follows:

1. Project integration management to ensure that the various project elements are effectively coordinated.

2. Project scope management to ensure that all the work required (and only the required work) is included.
3. Project time management to provide an effective project schedule.
4. Project cost management to identify needed resources and maintain budget control.
5. Project quality management to ensure that functional requirements are met.
6. Project human resource management to develop and effectively employ project personnel.
7. Project communications management to ensure effective internal and external communications.
8. Project risk management to analyze and mitigate potential risks.

Enormous data and records are available in the construction management operations and they need to be monitored, interpreted, analyzed and reported. Results and important information are available but mostly they are kept in folders, logbooks or in soft copies in the computers. Most often than not, relevant information are available and kept as objective evidence for auditing and assessment purposes.

The knowledge transfer is not devoid of rules and structure. In fact, it must be carefully designed with clearly defined structures that support its mission. It is a general view of the organization where its people must meet a set of clear standards and expectations as set by the organization and their performance must focus on achieving the missions and the goals. The knowledge transfer reinforces beliefs and enhances the ability of employees at all levels to get the job done. Change should happen everywhere especially when it is needed the most. However, change should be seen as something necessary and practicable at all cost. There are a lot of managers who cannot exactly identify where change should begin. In many industries, people find it hard to introduce change because of the belief that they may not be understood and the worse is their clients might not be able to appreciate the intention of the change that is being introduced. But this should not put any manager to a halt or else development will not happen. Strategies and innovative techniques will be necessary to carry out the changes. With these, resistance may be lessened in the end.

Resistance can still happen even if knowledge transfer as a strategy to change is used to implement techniques of carrying out organizational mission, vision and goals, or to present data and report that need to be communicated to the organization. However, this can be lessened if benefits will be clearly communicated or conveyed to the individuals concerned. It must be understood that knowledge sharing and knowledge transfer are means and devices, or mechanisms designed to manage or control operation. In fact, these are made to meet the following purposes: make the challenges, abnormalities or deviation from the standard visible to everyone and thus take corrective action immediately; display the operating or progress status in an easy to see format; provide instruction; convey information; and provide immediate feedback to people.

Developing Project Management Best Practices

According to Gina Abudi, MBA (2009), executives today are interested in developing a best practice around project management within their organizations. Some of this interest stems from the economy and the need to do more with less, like, reduced timelines to get a product/service to market to increase revenue, smaller budgets to get projects completed, and reduced project management staff due to layoffs and/or restructuring. However, exactly what a “best practice” means is different from organization to organization and in many situations, within the organization the definition of a “best practice” differs from department to department or business unit to business unit. Many organizations are unsure of how to go about

defining what a "best practice" means for their organization as a whole and how to effectively go about developing a best practice that works for their organization.

No best practice is best for every organization, and every situation will change as individuals find better ways to reach the end result (Businessdictionary.com, 24 July 2015). Organizations define the term "best practice" differently. For some, best practice refers to a consistent way of doing something. For others, best practice is simply ensuring that everyone in the project management function uses the same templates and software. Most organizations have some best practice already in place; they just don't know it because it was not developed by someone high up in the organization and rolled out through the organization. However, project managers have their way of doing things – even if those methods are not formal within the organization. This "way of doing things" can be considered a best practice.

The continued success of organizations in an ever-changing, competitive marketplace requires that they have formalized their project management function and find improved ways of accomplishing their strategic goals. With a best practice in place, organizations are better able to make decisions on the types of projects to undertake in any given time period.

Knowledge Management in Construction

According to the book of Knowledge Management in Construction by Anumba, Egbu and Carillo (2008), the lessons learned in many construction projects are often lost when the project team is disbanded at the end of the project and the parties involved move on to new projects. This results in much reinventing of the wheel and repetition of past mistakes. The situation is compounded by the fact that there are few appropriate mechanisms for capturing and sharing the new knowledge gained in projects among all members of the project team. Post project reviews go some way towards capturing lessons learned, but the haphazard manner in which these are usually conducted means that insufficient time is normally available, or participants have forgotten key aspects of learning events. Furthermore, very few companies willingly share their learning from projects for fear of exposing their mistakes.

In the light of the above, knowledge management is essential for improving the construction project delivery process. The importance of sharing knowledge and learning is now increasingly being recognized in the construction industry, with many organizations appointing knowledge managers or others with the merit to harness and nurture the organization's knowledge. This may work well with in the organization's level but there is still considerable scope for better collaborative learning at project level which is best undertaken within the context of the collaborative working practices. It is essential that appropriate knowledge management processes are put in place if the construction industry is to continuously improve its business processes and sustain the productivity and other improvements (Latham, 2008).

A considerable proportion of rework, delays, mistakes and cost overruns on construction projects can be attributed to poor knowledge management. While many organizations have some elements of knowledge management practice, there is much more that can be done to improve the construction project delivery process through better management of the knowledge generated on projects and in individual firms. There are serious dangers for companies that ignore knowledge management, as they run the risk of simply repeating past mistakes or worse, taking decisions that can lead to major disasters. On the other hand, organizations that proactively manage their knowledge stand to reap considerable rewards in cost savings, process efficiencies, reduction in errors and reworks (Anumba, Edbu & Carillo, 2008).

Knowledge management is something of a fad in today's businesses. At the same time, it addresses key issues that can lead to success within organizations. Knowledge management addresses how organizations

can manage the knowledge embedded in its systems and contained in the heads of its employees. It also systematically considers how advanced information technology can be used to leverage existing knowledge and create new knowledge (Levine & Gilbert ,1998). One aspect of knowledge management which is the knowledge transfer is a means by which how good ideas are moved from one part of the organization to others that can use the information.

The Growing Importance of Knowledge Transfer

Knowledge transfer has always been a challenge for organizations. Its importance has grown in recent decades for three related reasons. Knowledge appears to be increasing proportion in many organizations' total assets. Also, organizations have moved away from hierarchical methods of control towards a more decentralized organizational structures and increased employee involvement (Levine, 1995). This has resulted in more creativity by frontline employees and subunits. Advances in information technology have created new means of knowledge transfer. However, technology alone cannot solve the problem of knowledge transfer. Organizational structures and practices also must facilitate and motivate transfers. Knowledge transfer is valuable when it is integrated into a set of policies for knowledge generation and capture (Levine & Gilbert, 1998).

According to Levine and April Gilbert (2007), knowledge management is something of a fad in today's business. It addresses issues that can lead to success within organizations. Knowledge sharing and knowledge transfer addresses how organizations can manage the knowledge embedded in its systems and contained in the heads of its employees.

In principle, knowledge transfer can be broken down into distinct stages. Five steps describe the process: idea creation, sharing, evaluation, dissemination, and adoption. These stages often overlap, are combined, or are skipped; they also have important feedbacks.

Idea creation is often assessed by looking into the following: variety of knowledge in the group, attitude towards knowledge, encouraging new ideas, constant experimentation and idea innovation.

In practice, idea sharing is often combined with validation and dissemination. For example, a work group might share their ideas in a meeting where their merits of the idea are discussed and relevant potential adopters hear the new methods. Here, sharing refers to the need to expose others to the idea in order for it to be evaluated. Dissemination takes place once the idea has passed some minimum level of evaluation.

For information sharing to occur, two conditions must be satisfied. First, ideas must be in a form that others in the organization can interpret. Dissemination is easier when the knowledge can be made explicit or formal. This involves transforming the idea into a codified, often written format. Tacit or informal knowledge can be shared as well but the means of sharing are different, requiring face-to-face contact and opportunities for experiential learning. Apprenticeships often follow this time-intensive and sensory-rich means of transmitting knowledge. Nonaka (1994) emphasized the rich interactions between tacit and explicit knowledge. While conventional wisdom on why knowledge is difficult to transfer within firms has focused on motivational barriers. Szulanski (1996) found that features of the knowledge itself and the receiver's inability to interpret it are two of the most important factors in inhibiting knowledge transfer.

The second condition required for sharing to occur is that employees with ideas must be willing to share them. Sharing takes place at multiple levels, with overlapping but distinct concerns: from a worker to a workgroup, between workgroups, between departments, between business units, and between organizations. Unsurprisingly, Szulanski (1996) found that when the relationship between the source and recipient was distant or problematic, knowledge transfer was more difficult.

In idea evaluation, organizations must evaluate their new ideas. Assess whether they have worked in the past, are likely to work at new places, and actually work at new places. Employees must have the capability, incentives, and structures to perform the validation studies.

In the principle of idea dissemination, more important information is better than less. At the same time, too much information creates overload. The Internet is a classic example where nobody can read even a fraction of everything that is there.

According to idea adoption, if people knew the right thing to do, they would do it. Scholars of organizational inertia have developed complex theories of why, even after knowledge has been transmitted to the right people, it may not have been transferred to the organization. These theories fall into the categories of inadequate capability (known as "absorptive capacity" in the literature), poor incentives (the famous "not invented here" syndrome), and inadequate structures (for example, rigid operating procedures that are difficult to update).

Organizations worry a lot about promoting creativity and innovation but, in many cases, useful ideas already exist in some form. The key is to capture the existing knowledge from within and outside the organization and adopt those ideas that are relevant. This essay steps through five stages of knowledge transfer: creation, sharing, evaluation, dissemination, and adoption. For each stage, the how training, incentives, structures and technology can be used to enhance the process are examined. In order for an organization to be a true "learning organization", it must acknowledge the importance of all phases of knowledge creation and transfer and endeavour to create a culture of sharing and continuous improvement. Focusing on some stages but not others is less effective than moving along with all stages in an integrated fashion. Creating knowledge but not sharing it, or finding that other groups cannot learn it, makes knowledge creation less relevant.

Knowledge Generation and Transfer: Essential in Organizations

Knowledge generation and transfer is a vital source of firms' sustainable competitive advantage. Today, a company's competitive advantage is largely built on the knowledge it possesses. Organizations are increasingly recognizing the need to support knowledge sharing amongst employees. This is why the role of knowledge management, in particular, knowledge sharing, has become an important issue for companies everywhere (www.sciencedomain.org, 15 August 2015).

Knowledge is always shared and transferred within or between organizations. Knowledge sharing increases competitiveness of a company and participates significantly in knowledge creation. Organizations usually possess abundant resources of unknown and unused knowledge in the form of 'know-how', 'best practices' and specialized knowledge. Communicating this individual knowledge to others is a vital activity to reach the status of knowledge-creating company (Birkinshaw, 2001).

Knowledge is a critical organizational resource that provides a sustainable competitive advantage in a competitive and dynamic economy (Davenport & Prusak, 1998). To gain a competitive advantage, it is necessary but insufficient for organizations to rely on staffing and training systems that focus on selecting employees who have specific knowledge, skills, abilities, or competencies or helping employees acquire them (e.g., Brown & Duguid, 1991). Organizations must also consider how to transfer expertise and knowledge from experts who have them to novices who need to know. That is, organizations need to emphasize and more effectively exploit knowledge-based resources that already exist within the organization (Damoradan & Olphert, 2000). Because of the potential benefits that can be realized from knowledge sharing, many organizations have invested considerable time and money into knowledge

management initiatives including development of knowledge management systems which use state-of-the-art technology to facilitate collection, storage, and distribution of knowledge.

Knowledge management initiatives have proliferated in recent years because of the desire to have employees share their knowledge throughout the organization. Fostering knowledge sharing within projects and across projects can improve both the efficiency and effectiveness of project management (Ramprasad & Prakash, 2009).

Knowledge Transfer as Tool in Effective Management

Transferring knowledge from one situation to another related situation often increases the speed and quality of learning. This observation is relevant to human learning, as well as machine learning (Chin, 2013). In the study of Sheng Wang & Raymund A. Noe (2010) on Knowledge sharing: A review and directions for future research, Human Resource Management Review of Chalmers University of Technology, Guthenburg, Sweden, the success of knowledge management initiatives depends on knowledge sharing and knowledge transfer emphasizing on organizational context, interpersonal and team characteristics, cultural characteristics, individual characteristics and motivational factors. Knowledge is a critical organizational resource that provides a sustainable competitive advantage in a competitive dynamic economy (Foss & Pedersen, 2002). To gain a competitive advantage, it is necessary but insufficient for organizations to rely on staffing and training systems that focus on selecting employees who have specific knowledge, skills, abilities, or competencies or helping employees acquire them. Knowledge sharing between employees and within and across teams allows organization to exploit and capitalize on knowledge-based resources (Cabrera & Cabrera, 2005). Research has shown that knowledge sharing and knowledge transfer and combination is positively related to reductions in production costs, faster completion of new product development projects, team performance, firm innovation capabilities, and firm performance including sales growth and revenue from new products and services (Mesmer-Magnus & Dechurch, 2009). Understanding the potentials through knowledge sharing and knowledge transfer would enable managers to show blueprint of the strategies ensuring organized conduct of the plan, important points to monitor and critical areas of the operation to control.

It is also interesting to note that communication and coordination are important in the success of any activity of the CMT. Without which, failure is guaranteed. Many organizations fail due to under communication. After the loss, how they wish they have communicated ten times more to ensure gaps will not materialize. Knowledge transfer essentially uses communication aids such as previous documentations and reports, photographs, diagrams, charts, tables, brief texts, and digital displays to increase employee involvement in their work. Rather than an exclusive management system, it is intended to extend and reinforce traditional methods. On a daily basis, this type of management is based on certain clear indicators associated with reasonable objectives (http://www.negarina.com/ps/7.htm; Rhodia ChiRex, 2002; Eric Cocchi, 2002).

The idea of knowledge transfer in transforming written orders and procedures to new employees has been a long-time vision of many organizations. These were identified based on a number of reasons. Knowledge sharing and knowledge transfer will make a lasting impression, create more impact on employees or to their work, and stimulate work environment. Using knowledge transfer, one can judge that such organization is customer focused. Other clients would also see lots of evidence that employees are valued and are considered critical asset by making their work more interesting to achieve.

As one knowledge-centered activity, knowledge transfer is the fundamental means through which employees can contribute to knowledge application, innovation, and ultimately the competitive advantage of the organization (Jiang, & Joseph, 2006). Knowledge sharing between employees and within and across teams allows organizations to exploit and capitalize on knowledge-based resources (Cabrera & Cabrera, 2005). Research has shown that knowledge sharing and knowledge transfer is positively related to reductions in production costs, faster completion of new product development projects, team performance, firm innovation capabilities, and firm performance including sales growth and revenue from new products and services (Mesmer-Magnus & DeChurch, 2009).

Because of the potential benefits that can be realized from knowledge sharing and knowledge transfer, many organizations have invested considerable time and money into knowledge management (KM) initiatives including the development of knowledge management systems (KMS) which use state-of-the-art technology to facilitate the collection, storage, and distribution of knowledge.

Synthesis

Knowledge is a critical organizational resource that provides a sustainable competitive advantage in a competitive and dynamic economy (Davenport & Prusak, 1998; Foss & Pedersen, 2002; Grant, 1996; Spender & Grant, 1996). Many companies are concerned with transferring knowledge from older to younger workers (Piktialis & Greenes, 2007). Learning from the contributions of the different sources related to management trends, practices, processes, importance and tools to the enhancement of the performance of the construction management team (CMT) of ABC Company, the researcher has adopted the same principles in the development of the study. The review of related literature (RRL) provided background to the achievement of the objectives of this research. It also provided a much clearer definition of the research voids that provides clarity and focus to the reader.

In the field of construction management (CM), it is important for the readers to be familiar with the development of managerial practices in order to address the declining worker's productivity, meeting the challenges of rigid competition, replacing obsolete methods, maintaining employee motivation and morale, and integrating changes into the workplace on methods and organizational policies. It is also equally essential to understand that project management is the process and activity of planning, leading, organizing and controlling human and other resources to achieve specific goals. When talking about project management which is synonymous to CM, it is important to note that a "project" is not a part of normal business operations. It has a temporary timeframe and a specific goal (13d.cs.colorado.edu/Ostwald, Sept 2015). The literatures on the development of management practices and project management process are vital sources in the development of the survey questionnaire that was administered to the respondents in terms of employees' motivation, morale and encouragement to knowledge sharing. The literature on project management made the readers understand the work of the CMT of ABC Company.

The literature on the trends in construction management operation defined the basic ingredients of a project management framework that interconnects general management, special knowledge domains and supporting disciplines with the project management as its core. It also identifies the functions of project management in construction and distinct areas that requires project manager's knowledge and attention. In addition to the trends in construction management operation, the development of project management best practices that describes the current interest of executives to develop the best practice within their organizations also added insights.

The literature on knowledge management in construction discussed about the lessons learned from many construction projects that are often lost when the project team is disbanded at the end of the project. It also outlines appropriate mechanisms for capturing and sharing new knowledge gained on projects among members of the project team and the willingness to share their learnings from previous projects.

To complement the review of related literature of construction management process to the study, three important references were identified as the following: (1) the growing importance of knowledge transfer; (2) knowledge generation and transfer: essential in organizations and; (3) knowledge transfer as tool in effective management. The growing importance of KT focused on the challenges of organizations in transferring knowledge to new employees or novices, outlining the organizational structures and practices to facilitate and motivate KT. From this literature, the theoretical framework was formulated in linear progression in terms of the idea creation, sharing, dissemination, evaluation and adoption.

Knowledge generation and transfer to the company's competitive advantage that is largely built on the knowledge they possess and the knowledge that is always shared and transferred within or between organizations. KT increases the company's competitiveness and allows its employees to significantly participate in knowledge creation. Knowledge transfer as tool in effective management applies to transferring knowledge from one situation to another which often increases the speed of quality learning and sustains the company's advantage in a competitive and dynamic economy.

The contributions of the abovementioned literatures became bases in formulating the survey questionnaire of this study and the same principles were adopted in the development of the proposed knowledge transfer plan (KTP).

RESEARCH METHODOLOGY

This chapter presents the research design and methodology used in this study. This includes discussion of the research locale, research instrument, respondents of the study, data gathering tool, data gathering procedure and the data analysis.

Research Design

The descriptive method was used in this study to obtain information concerning the current status in knowledge transfer of project site based CMT of ABC Company to describe "what exists" with respect to chosen variables. Both quantitative and qualitative methods of research were used in this study, employing survey and unstructured interview techniques. The study determined the levels of the readiness of the project site based CMT of sewage treatment plant construction using tools identified in the study. Likewise, this study also identifies the readiness of the CMT in terms of organization and resources to get the overall picture of the gaps that were considered in the development of the Knowledge Transfer Plan (KTP).

Research Locale

The study was conducted in the project site of ABC Company involved in the construction management and supervision of the two sewage treatment plants (STP) and pipe network projects in Muntinlupa City, Philippines.

ABC Company is a design and project management firm founded in 1946 with an initial focus on structural engineering. The company first came to the world's attention with the structural design of the Sydney Opera House, followed by its work on the Centre Pompidou in Paris which has since then grown into a

truly multidisciplinary organisation. Most recently, ABC Company has reaffirmed its reputation for delivering innovative and sustainable designs and project management that reinvent the environment by bringing together broad-minded individuals from a wide range of disciplines and encouraging them to look beyond the constraints of their own specialization. The firm is owned in trust on behalf of its staff where the result is an independence of spirit that is reflected in the firm's work, and in its dedicated pursuit of technical excellence. It is committed to an approach that embodies quality, concern for the environment, and fair dealings with its staff and clients.

The project site based CMT has been organized by ABC Company with its prime responsibility to supervise the construction of sewage treatment plants and pipe network in Muntinlupa City, Philippines, and to ensure that the projects are carried out by the appointed contractors in accordance with the contract documents and specifications. The services provided by the project site based CMT covers review of the STP design, assessment of technical submittals, analysis of construction methodologies, project documentation, testing, financial evaluation, training, standards setting and knowledge transfer to client's personnel.

Population of the Study

The population of this study was composed of the Muntinlupa City project site based CMT of ABC Company comprising of managers, engineers and technical personnel involved in the construction of the STPs and pipe network. Inputs from the respondents were presented the challenges encountered by the CMT of the company. The respondents accomplished the research instrument of this study in close supervision. All the respondents contributed to the data gathering, verification, development and assessment of the level of readiness of the CMT in terms of organization and resources. They also contributed in determining the status of the project site based CMT on knowledge transfer in terms of idea creation, sharing, dissemination, evaluation and adoption.

Total enumeration sampling technique was used in collecting data for this study. The population composed managers, engineers and technical staff with a total of 15 respondents. The composition of respondents for the project site based CMT is shown in Table 1.

Table 1. Project site based CMT distribution of respondents

Strata	Population
Construction Managers	3
Civil Engineers	4
Electrical Engineers	2
Mechanical Engineers	2
Technical Support Staff	4
Total	15

Research Instrument

Survey questionnaires were utilized to determine the readiness of ABC Company based on the templates provided in the book, Knowledge Transfer Framework by the Department of Civil and Building Engineering, Loughborough University, 2004. The questionnaire was the main research tool in gathering the data on the readiness of ABC Company in terms of organizational characteristics and resource requirements. It was validated by Dr. Carillo on November 26, 2004.

The survey questionnaire focused on the CMT involved in the construction of the sewage treatment plants and pipe network. It determined the readiness of ABC Company and the status or gaps of the locale of the research on idea creation, sharing, dissemination, evaluation and adoption. The responses were tabulated and analyzed based on the following reports:

1. Summary of average ratings and scores in each category
2. A table showing the overall readiness on organizational characteristics, and resource requirements
3. The status of the CMT of ABC Company in terms of absence or presence of idea creation, sharing dissemination, evaluation and adoption.

Other data collection tool was used in the gathering of the needed data, such as documentary analysis involving a review of ABC Company records and other relevant documents.

Validation of Research Instrument

The research instrument used passed expert's external validation. After the initial validation, the comments and suggestions given were included in the revision of the questionnaires. The administrability of the instrument was likewise confirmed by the expert. The same instrument was returned back to them after the revisions were made. The research panelist's comments were also included for the enhancement and validation of the instrument before it was finally administered to the respondents.

Data Gathering Procedure

The study commenced from the approval of Managing Director of ABC Company to conduct the research. Upon receipt of the approval, the researcher personally administered the questionnaires to the target respondents who were in the project site based CMT assigned in Muntinlupa City, Philippines. The respondents for were informed of the process of the data gathering as well as the manner of answering the survey questionnaires.

The researcher explained the objectives of the study and guided the respondents on how to accomplish the questionnaires. In order to obtain an accurate, clear and discernible response from the respondents, the researcher asked each respondent to fill up the questionnaire one at a time. Close supervision was done so that each respondent could be guided in answering the questionnaire. The respondents were encouraged to consult the researcher in case further explanation and/or clarification was needed. After the respondents had completed the questionnaires, the researcher reviewed their answers to ensure that the respondents' responses were complete and could be used according to the requirement of the study.

The researcher had a 100% retrieval of the survey questionnaire from the project site based CMT. After the accomplished survey instruments had been retrieved from the respondents, the gathered data were tabulated and analyzed using the average scores for the level of readiness and summary of responses. All available existing standard protocols and visual representations were considered in the research process. The development of the questionnaire was part of the same format using the template obtained by the researcher to facilitate data gathering.

Data Analysis Plan

The survey questionnaires were retrieved and data were tabulated using excel program. The responses from the CMT personnel were analysed using the average scores and table to show overall readiness and the summary of responses of the respondents. Descriptive analysis was used to analyze the data as shown

in Table 2. The degree of readiness of the ABC Company was identified using a 5-point Likert Scale which is shown in Table 3.

On the other hand, the status of the project site based CMT of ABC Company was determined by finding out the presence or absence of idea creation, sharing, dissemination, evaluation and adoption in the organization.

Table 2. Data analysis plan

RESEARCH QUESTION	DATA	INSTRU-MENT	ANALYSIS
What is the readiness level of the ABC Company on knowledge transfer in terms of organization and resource requirements?	Quantitative	Questionnaire	Descriptive Analysis

Table 2. Data analysis plan (Continued)

RESEARCH QUESTION	DATA	INSTRU-MENT	ANALYSIS
What is the status of KT of the project site based CMT of ABC Company in terms of idea creation, sharing, dissemination, evaluation and adoption?	Qualitative	Interview/ Questionnaire	Descriptive Analysis
	Quantitative	Questionnaire	
What knowledge transfer plan should be developed?			

Table 3. Degree of readiness

SCALE	RANGE	INTERPRETA-TION	DESCRIPTION
5	4.50 – 5.00	Ready	Respondents strongly agree that ABC Company is ready for KT
4	3.50 – 4.49	Somewhat Ready	Respondents somewhat agree that ABC Company is ready for KT
3	2.50 – 3.49	Moderately Ready	Respondents agree that ABC Company is ready for KT
2	1.50 – 2.49	Somewhat Not Ready	Respondents somewhat disagree that ABC Company is ready for KT
1	1.00 – 1.49	Not Ready	Respondents strongly disagree that ABC Company is ready for KT

RESULTS AND DISCUSSION

Knowledge is the central resource of many organizations and is a critical organizational resource that provides sustainable advantage in a competitive and dynamic economy. The operating core of organizations consists to a great extent of specialists and their expert knowledge (Wang, Sheng & Noe, Raymund, 2009). Knowledge transfer among members of an organization is a basic necessity and the most common term to describe knowledge exchange process. It also signifies the creation of new knowledge through exchange of information. In an attempt to apply the concept of knowledge transfer (KT) into the organization, this chapter presents the results of the study on (1) the level of readiness on knowledge transfer of ABC company in terms of organizational characteristics and resource requirements, and, (2) the status of knowledge transfer of the CMT of ABC company on (a) idea creation, (b) idea sharing, (c) idea evaluation, (d) idea dissemination and (e) idea adoption, and the creation of knowledge transfer plan for the project site CMT of the ABC company. This research determined the abovementioned areas to develop suitable knowledge transfer plan for the project site CMT of the ABC Company. The processing and results of the survey are discussed in the following:

Readiness levels of the ABC Company on knowledge transfer in terms of organizational characteristics and resource requirements.

Organization is the foundation upon which the whole structure of management is built. It is the structure or mechanism that enables living things to work together towards a common goal, (www.publishyourarticles.net/knowledge-hub/978/, January 2016). Organizational characteristics in the study pertains to people, organization, technology and their relationship which highlights on organizational theory and learning that focuses on organizational conditions for knowledge management prerequisites and barriers (Frey B.S. & Osterloh, M, 2002).

The status of ABC Company's organizational characteristics and resource requirements on KT was determined through survey with the members of the project site based CMT in Muntinlupa projects associated with the construction supervision of the sewage treatment plants and pipe network.

The results showed a mean of 3.41 on the overall readiness of KT of ABC Company's organizational characteristics and 3.60 for the resource requirements. Both means indicated that ABC Company needed to put more attention to achieving capability and maturity for knowledge transfer. Detailed interpretation and description of the analysis conducted on organizational characteristics and resource requirements are shown on Tables 7 and 8, respectively.

Organizational characteristics of ABC Company

Investigation on the readiness levels on knowledge transfer of ABC Company in terms of organizational characteristics revealed the current level of participation, the key issues of the project that needs improvement, the existing knowledge transfer practices and organizational capability to support the delivery of projects. According to Knowledge Transfer Framework by Carillo and Robinson, to investigate knowledge transfer issues in terms of the characteristics and barriers is needed to develop an outline for knowledge transfer.

The overall readiness on organizational characteristics on knowledge transfer of ABC Company has an overall average mean of 3.41 which shows that ABC Company is moderately ready for KT. However, there are some aspects on organizational characteristics that need attention to achieve capability and maturity. This is shown on Table 4.

According to the survey, ABC Company has adequate capability and maturity on the recognition of the importance of knowledge sharing as reflected in the obtained mean of 4.47 as well as in the obtained mean of 3.87 on the willingness and motivation of its personnel in sharing their knowledge. The respondents also agreed that ABC Company has knowledge transfer strategies that can be accessed by all its employees worldwide.

ABC Company needed to put attention on the organizational culture power relations, barriers promoting behaviour, knowledge hoarding, issues relating to confidentiality, copyright and reliability in order to achieve capability and maturity. According to Knowledge Transfer Framework by the research team Dr. Carillo, Dr. Robinson and Professors Anumba and Bouchlaghem from Loughborough University, a company needs to identify existing techniques that should be improved, new techniques required, organizational weaknesses, existing KT practices, KT issues in terms of the characteristics, transfer mechanisms and barriers, and develop an action plan for the implementation of an appropriate KT solution to address the current KT issues in order to attain capability and maturity in terms of organizational characteristics.

Although ABC Company has a change management program that is being implemented to facilitate knowledge transfer and rewards on incentive system for knowledge transfer, both of these aspects need attention to achieve capability and maturity. These two aspects got the lowest mean.

On the abovementioned bases, interventions were developed as the proposed knowledge transfer plan for the CMT of the ABC Company.

Table 4. Readiness of the ABC Company in terms of organizational characteristics

ORGANIZATIONAL CHARACTERISTICS	MEAN	VERBAL INTERPRETATION	DESCRIPTION
The organization recognizes the importance of sharing KT	4.47	Ready	Has adequate capability and maturity
People are willing and motivated to share knowledge	3.87	Ready	Has adequate capability and maturity
Organizational/ cultural such as power relations, barriers or knowledge hoarding are addressed	3.33	Moderately Ready	Needs attention to achieve capability and maturity
There is a knowledge transfer strategy	3.53	Ready	Has adequate capability and maturity
There is a reward and incentive system for KT	2.47	Moderately Ready	Needs attention to achieve capability and maturity
A change management programme has been implemented to facilitate KT	2.73	Moderately Ready	Needs attention to achieve capability and maturity
Confidentiality, copyright and reliability have been addressed	3.47	Moderately Ready	Needs attention to achieve capability and maturity

Overall readiness of organizational characteristics	**3.41**	**Moderately Ready**	**Needs attention to achieve capability and maturity**

Resource Requirements of ABC Company

Resources are the means we use to achieve project objectives. The primary resources are the people with applicable skills and competencies. Other groupings of resources include capital, facilities, equipment and information (Joubert, P, 2010). Given the potential benefits of effective knowledge transfer, organizations have invested substantial resources in creating systems and approaches to overcome obstacles and transfer critical knowledge through knowledge management systems, e-learning systems, operational and management processes and instructor-led trainings (Seidman, W & McCauley, 2005). The study determined the factors that needed to be considered in assessing the resources requirements of the organization in terms of resource requirements on knowledge transfer based on the responses of the project site based CMT of ABC Company. The overall readiness on resource requirements on knowledge transfer of ABC Company obtained an overall average mean of 3.60 which shows that ABC Company is ready for KT. However, there are some aspects on resources requirements that needed attention to achieve capability and maturity. This is shown on table 5.

According to the survey, ABC Company had adequate capability and maturity on identifying the type of knowledge needed and there were dedicated tools to support knowledge transfer. In addition, ABC Company had the infrastructure, such as hardware and software applications, to support knowledge transfer. ABC Company was moderately ready and has capability and maturity on the aforementioned aspects. According to Knowledge Transfer Framework by the research team Dr. Carillo, Dr. Robinson and Professors Anumba and Bouchlaghem from Loughborough University, a company needs to identify the IT and non-IT tools that are currently used for KT, assess if there are issues relating to reliability, confidentiality, copyright and availability of knowledge, individual, team or organizational barriers that need to be addressed and identify the barriers relevant to moving from the existing to future characteristics, and develop an action plan for the implementation of an appropriate KT solution to address the current KT issue to attain capability and maturity in terms of resource requirements. Leadership should be supported by the management and budget to develop and implement the knowledge transfer strategy and, the core and support teams ABC Company needed attention to achieve capability and maturity.

Another important aspect of resource requirements to be addressed was the problem related to the learning capacity of the recipients of knowledge they needed to improve their capability in receiving new knowledge. This aspect obtained the lowest mean of 3.07. On the abovementioned bases, interventions were established to develop the proposed knowledge transfer plan for the CMT of the ABC Company.

Table 5. Readiness of the ABC Company in terms of resource requirements

RESOURCE REQUIREMENTS	MEAN	VERBAL INTERPRETATION	DESCRIPTION
The organization has identified the type of knowledge needed	3.60	Ready	Has adequate capability and maturity
There is a budget to develop and implement the knowledge transfer strategy	3.20	Moderately Ready	Needs attention to achieve capability and maturity

Leadership supported by senior management for developing and implementing KT strategy	3.40	Moderately Ready	Needs attention to achieve capability and maturity
There are core and support teams to implement knowledge transfer	3.40	Moderately Ready	Needs attention to achieve capability and maturity
There are dedicated tools to support knowledge transfer	3.73	Ready	Has adequate capability and maturity
There is an infrastructure to support knowledge transfer	3.87	Ready	Has adequate capability and maturity
Learning capacity of the recipients of knowledge have been addressed to improve their capability to receiving new knowledge	3.07	Moderately Ready	Needs attention to achieve capability and maturity
Overall readiness of resources requirements	**3.60**	**Moderately Ready**	**Needs attention to achieve capability and maturity**

The status of the project site based CMT of ABC Company on idea creation, sharing, evaluation, dissemination and adoption of knowledge transfer

Knowledge transfer has always been a challenge for organizations. Its importance has grown in recent decades. Knowledge appears to be an increasing proportion of many organization's assets; organizations have moved away from hierarchical methods of control towards more decentralized organizational structures and increased employee involvement (Levine & Gilbert, 1998). Knowledge transfer (KT) has been broken down into distinct stages namely idea creation, idea sharing, idea dissemination, idea evaluation and idea adoption to describe the process. Gap analysis was conducted in this study by using questionnaire to determine the status of knowledge transfer of the project site based CMT of ABC Company on idea creation, sharing, dissemination, evaluation and adoption. Results are shown in table 6. The overall rating on the problems of the project site based CMT was 78%. The results show that there is a 22% gap to be addressed for KT to proceed with the implementation. The gaps identified were problems of the project site based CMT on idea creation, sharing and dissemination. Idea creation got the highest gap having a value of 38% while Idea sharing and idea dissemination got gaps of 21% and 29%, respectively. Detailed description of the CMT's status on idea creation, sharing and dissemination are presented on Tables 6, 7, & and 8.

No gaps were identified on idea evaluation and idea adoption since they obtained 100% ratings which means that there were no problems on those aspects.

Table 6. Overall Ratings of the Status and Gaps of CMT

PROBLEMS	RATING	GAP
Idea creation	62%	38%
Idea sharing	79%	21%
Idea dissemination	71%	29%
Idea evaluation	100%	0%

Idea adoption	100%	0%
Overall	**78%**	**22%**

Status on idea creation

Massive literature exists on how to promote idea creation or creativity. In order to assess the group's potential for creativity, the group was asked on its variety of knowledge, its attitude towards knowledge, what it knows and what it does not know, its engagement in constant experimentation, and the group's attitude to support innovation, (Levine, 1998).

Based on the survey, the aspect on idea creation had certain gaps that needed attention from the management. The status of knowledge transfer of the project site based CMT of ABC Company had gaps on idea creation, having obtained a rating of 62%; hence, a gap of 38%.

All aspects of idea creation had gaps to be addressed as shown in Table 7. The highest gap determined was on the reward system of ABC Company which acquired a rating of 26%; thus, a gap of 74%. This means that ABC Company did not have a fully in-place reward system for employees to create new ideas. Regarding the variety of knowledge in the group and the tendency of the employees to experiment and innovate, the rating acquired was 60%; thus had a gap of 40%. This means that ABC Company's employees had a variety of knowledge but they did not have the inclination to experiment and innovate. Other remaining aspects of idea creation acquired a rating of 74% and a gap of 26%. This means as follows;

A. The company promulgated, promoted and encouraged its employees to create ideas relative to their line of profession;
B. The company granted autonomy to its personnel in creating ideas for knowledge transfer and;
C. The employees were willing to create ideas based on the knowledge they possessed from previous work experiences.

All aspects on idea creation had gaps to be addressed by ABC Company. Therefore, the management had to make interventions in order to close the gaps and then obtain a rating of 100%. The recommended interventions on idea creation are presented on the KT Plan in the succeeding part of this study.

Table 7. Status and gaps on idea creation

ASPECTS ON IDEA CREATION	RATING	GAP
The company promulgates, promotes and encourages their employees to create ideas relative to their line of profession	74%	26%
The company grants autonomy to its personnel in creating ideas for knowledge transfer	74%	26%
The employees are willing to create ideas based on his/ her knowledge he/ she possesses from previous work experiences	74%	26%
There is a variety of knowledge in the group and the employees have the tendency to experiment and innovate	60%	40%

Rewards encourages knowledge creation. There is a reward from the company that encourages personnel to create new ideas	26%	74%
Overall	**62%**	**38%**

Status on idea sharing

In practice, sharing is often combined with validation and dissemination. In this study, sharing refers to the need to expose to others to the idea in order for it to be evaluated. Dissemination takes place once the idea has passed some minimum level of evaluation. For information sharing to occur, ideas must be in a form that others in the organization can interpret and that, employees with ideas must be willing to share them. Sharing takes place at multiple levels, with overlapping but distinct concerns from a worker to work groups, between departments, between business units, and between organizations (Levine & Gilbert, 1998).

According to the survey, idea sharing had certain gaps that needed attention from the management. The project site based CMT of ABC Company had gaps on idea sharing having obtained a rating of 67%; hence a gap of 33%.

Three aspects of idea sharing had gaps to be addressed as shown in Table 8. The highest gap determined was found in the defined personnel to plan, organize, lead and control idea sharing, obtaining a rating of 53% and a gap of 47%. This means that ABC Company did not have specific personnel assigned to conduct knowledge transfer.

Regarding individuals who had high opportunities to communicate were likely to share knowledge than individuals who had few opportunities to share. This aspect obtained a rating of 67% and a gap of 33%. This means that there were only few chances for personnel who had less opportunities to share knowledge. The aspect of sharing an idea in the group so that its merits are discussed and potential adopters hear new methods, obtained a rating is 73% and a gap of 27%. This should be addressed by the ABC Company to encourage personnel to share their ideas in the group. The two remaining aspects of idea sharing which acquired a rating of 100% and a gap of 0% are as follows;

a) The idea to be shared is in the form that others can interpret; and
b) The employee is willing to share his/ her idea to his/ her colleagues and subordinates.

Three aspects on idea sharing had gaps to be addressed by ABC Company. Therefore, the management had to make interventions in order to close the gaps and obtain a rating of 100%. The recommended interventions on idea sharing are presented on the KT Plan on the succeeding parts of this study.

Table 8. Status and Gaps on Idea Sharing

ASPECTS ON IDEA SHARING	RATING	GAPS
The employee is willing to share his/ her idea to his/ her colleagues and subordinates	100%	0%
The idea to be shared is in a form that others can interpret	100%	0%
The idea is shared to the group so that its merits are discussed and potential adopters hear new methods	73%	27%

Individuals who have high opportunities to communicate are more likely to share knowledge than individuals who have few opportunities to communicate	67%	33%
There is defined personnel to plan, organize, lead and control idea sharing	53%	47%
Overall	**79%**	**21%**

Status on idea dissemination

In principle, more information is better than less. At the same time, too much information creates overload. The key to disseminating knowledge is that people receive it so that they can use it (Levine & Gilbert, 1998). Tailoring the knowledge transfer and exchange to the audience's needs, knowledge, and the sorts of practices they face on a daily basis is critical in an effective knowledge transfer and exchange activity (Zarinpoush & Sychowski, 2007).

Based on the survey, idea dissemination had certain gaps that needed attention from the management. The project site based CMT of ABC Company had gaps on idea dissemination, as it obtained a rating of 79% and a gap of 21%.

Two aspects of idea dissemination had gaps to be addressed as shown in Table 9. The highest gap determined was found on idea dissemination is focused on more important information and on specific but tailored messages for diverse audiences based on their specific needs. Both aspects got a rating of 27% and a gap of 73%. This means that the CMT did not agree fixated information and tailored messages on specific needs for KT.

Three other aspects of idea dissemination acquired a rating of 100% which means no gap. They are as follows;

a) The company encourages its personnel to connect in diverse ways;
b) Technology has a positive effect to promote knowledge sharing on individuals; and
c) Too much information cannot create overload and confusion to the group.

Two aspects on idea dissemination had gaps to be addressed by ABC Company. Therefore, the management had to make interventions in order to close the gaps and obtain a rating of 100%. The recommended interventions are presented on the KT Plan in the succeeding parts of this study.

Table 9. Status and Gaps on Idea Dissemination

ASPECTS ON IDEA DISSEMINATION	RATING	GAPS
The company encourages its personnel to connect in diverse ways	100%	0%
Technology has a positive effect to promote knowledge sharing on individuals	100%	0%
Too much information cannot create overload and confusion to the group	100%	0%
The principle of idea dissemination shall be better to be fixated on more important information	27%	73%
The idea dissemination is specific but tailored messages for diverse audiences based on their specific needs	27%	73%

Overall	**71%**	**29%**

Status on idea evaluation

Idea evaluation is done so that better ideas may exist than just good ideas. Thus, organizations must evaluate their new ideas and determine whether they have worked well in the past and if they are likely to work at new places. Employees must also have the capability, incentives, and structures to perform validation studies (Levine & Gilbert, 1998).

According to the survey, the project site based CMT of ABC Company agrees that the aspects on idea evaluation were all positive. The respondents agreed that it is important for the company to evaluate new ideas before it is shared for dissemination, assessment and evaluation to ensure that a particular idea makes the group aware that certain knowledge exists in the organization. As shown on Table 10, all the aspects on idea evaluation had obtained a rating of 100% which means that there are no gaps to be addressed by the management.

Table 10. Status and gaps on Idea Evaluation

ASPECTS ON IDEA EVALUATION	RATING	GAPS
The objective of the evaluation is to ensure that a particular idea makes the group aware that a certain knowledge exists in the organization	100%	0%
The company shall assess if the employees are enthusiastic to share and receive ideas	100%	0%
It is essential that the person to evaluate new ideas has the capability and structures to perform validation studies	100%	0%
It is essential to assess whether new ideas have worked in the past and are likely to work at new places	100%	0%
It is important for the company to evaluate new ideas before it is being shared or disseminated	100%	0%
Overall	**100%**	**0%**

Status on idea adoption

If people knew the right thing to do, they would do it. Scholars of organization have developed complex theories of why, after knowledge has been transmitted to the right people, it may not have been transferred to the organization. These theories fall into the categories of inadequate capability (known as "absorptive capacity), poor incentives and inadequate structures (Levine & Gilbert, 1998).

According to the survey, the project site based CMT of ABC Company agreed that the aspects on idea adoption were all positive. All the respondents agreed that the key to idea adoption is to capture knowledge within and outside the organization and to adopt those ideas that are relevant. They agree that it is necessary to adopt new ideas including those that are not part of one's work, that knowledge transfer should be part of the company's culture and that knowledge hoarding should be avoided. They agreed that knowledge transfer will create a culture of sharing and continuous improvement. As shown on Table 11, all the aspects had a rating of 100% which shows that there were no gaps to be addressed by the management on this aspect.

Table 11. Status and gaps on Idea Adoption

ASPECTS ON IDEA ADOPTION	RATING	GAPS
Creating knowledge but not sharing it or finding others cannot learn it, makes knowledge creation less relevant	100%	0%
Employees acknowledges that the importance of knowledge is to create a culture of sharing and continuous improvement	100%	0%
Employees consider knowledge transfer as part of the company's culture and more willing to adopt knowledge and that knowledge hoarding is not tolerated	100%	0%
It is essential to adopt new ideas including information that is/ are not part of his/ her work	100%	0%
The key for idea adoption is to capture knowledge from within and outside the organization and adopt those ideas that are relevant	100%	0%
Overall	**100%**	**0%**

According to the book Knowledge Transfer: Managerial Practices Underlying One Piece of the Learning Organization by David I. Levine and April Gilbert (1998), to effectively generate new ideas, employees need to be trained in problem solving, including the ability to think "outside the box". A typical program includes how to identify problems, prioritize, analyse root causes, identify counter-measures, implement solution, and check whether solution actually works. To share knowledge, workers need to be literate in the languages in which ideas are expressed in their work. In addition to spoken and written language, this may involve high-order "literacy" in more technical languages such as blue prints or statistics. Managers and workers must be trained to evaluate new ideas. Just as importantly, they must be trained in systematically understanding what evidence will be convincing. Training workers to disseminate and adopt new ideas may revolve around making them aware of where else in the organization their ideas may be useful and where else ideas may arrive from. Workers must also know how to use technology to post and search for new ideas. A receiver's ability to understand an idea "absorptive capacity", can be a barrier. This can only be resolved through increasing the worker's own knowledge base, requiring an increased emphasis on substantive education and training. The key to capture the existing knowledge from within and outside the organization and to adopt those ideas is relevant. This process steps through five stages of knowledge transfer: creation, sharing, evaluation, dissemination, and adoption. For each stage, the researcher examined how training, incentives, structures and technology can be used to enhance the process. In order for an organization to be a true "learning organization", it must acknowledge the importance of all phases of knowledge creation and transfer and endeavor to create a culture of sharing and continuous improvement.

Focusing on some stages but not on others is less effective than moving along with all stages in an integrated fashion. Creating knowledge but not sharing it, or finding that other groups cannot learn it, makes knowledge creation less relevant. If knowledge is transferred successfully, but not first validated, then lots of costly fads will sweep companies. Finally, true integration involves self-reflection, doing cost-benefit and cost-effectiveness analysis, and continuous improvement of the learning and knowledge processes.

Development of the proposed knowledge transfer plan for the CMT of ABC Company

The development of the proposed knowledge transfer plan is based on Quality Management Framework (QMF) Policy and Procedure Library by the University of Southern Queensland (http://policy.usq.edu.au/documents/13421PL, 16 February 2016). The University of Southern Queensland assures quality through the alignment and integration of its strategies and operation with its evaluation and review processes. The QMF provides structural management and support for quality issues and organisational management systems and is designed to assist in its organisational drive towards sustainability. The QMF operates to support and coordinate each of the pathways through specific, critical aspects of the organization to underpin understanding and achievement of quality. The QMF comprises of Approach, Deploy, Results and Improvement (ADRI). The ADRI was the basis for the four (4) steps in developing the proposed knowledge transfer plan.

The ABC Company's organizational characteristics and resource requirements showed readiness with neutral status at 3.41 and 3.60, respectively. Results show that ABC Company is ready with some improvement on knowledge transfer strategy, rewards and incentive systems, behaviour on knowledge hoarding, identification of the type of knowledge needed, budget to develop the KT and the core and support team for KT to be considered in the development of knowledge transfer plan (KTP).

Problems of the CMT of the project site-based organization of ABC Company on idea creation, sharing, evaluation, dissemination and adoption of knowledge transfer were also determined to have 38%, 21%, 0%, 29% and 0% gaps to be attended, respectively. Problems identified on idea creation, dissemination and evaluation based on the gap analysis were considered valuable input in the development of a knowledge transfer plan.

The development of knowledge transfer plan was grounded on quality management system and knowledge transfer process considering the readiness of ABC Company on organizational characteristics and resource requirements, and the problems of the CMT of the project site-based organization of ABC Company on idea creation, sharing and dissemination as input.

The knowledge transfer plan (KTP) developed was composed of four (4) stages covering four (4) major areas of Stage 1: Management Responsibility, Stage 2: Resource Management, Stage 3: Knowledge Transfer Realization and Stage 4: Measurement, Analysis and Improvement. Each stage had feed forward and feedback for contingency options and continual improvement mechanism. Figure 10 shows the components KTP developed.

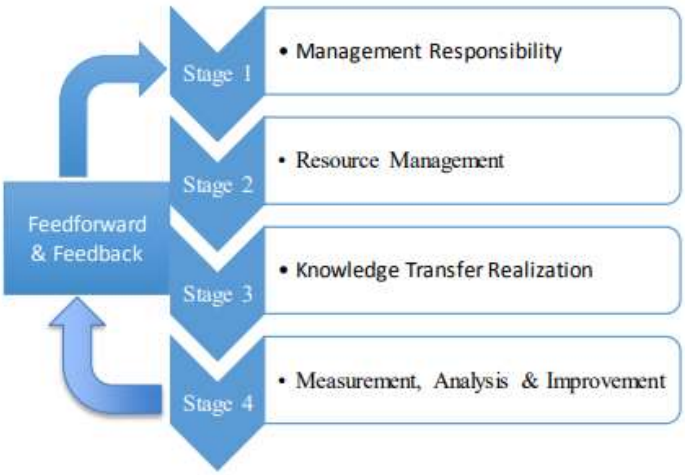

Figure 5. Components of the Proposed Knowledge Transfer Plan

Stage 1 of the KTP was about Management Responsibility which focused mainly on securing Management support and approval. Effective KTP requires the involvement and commitment of the organization's top management. Therefore, top management of ABC Company must be aware of the nature and importance of managing KT in the CMT of the project site based operation to improve effectiveness and efficiency in achieving goals and objectives of the entire organization. Management commitment through their support and approval must be secured first to ensure the KT as planned will be implemented.

The scope of activities under Stage 1 included awareness of the Top Management of the nature, significance and benefits of KT in ABC Company. This stage is also an opportunity to present and discuss the results of this study for their appreciation and basis for their decision to support the KTP. The improvement areas identified on organizational characteristics, resource requirements and problems of the CMT of project site-based organization of ABC Company will be presented to Top Management with corresponding interventions, timing and support needed for its effective and efficient implementation, monitoring and control. Top Management's approval on KTP presented will indicate their commitment to support and provide resources needed to proceed with the rest of the stages of the KTP.

Stage 2 of the KTP was about Resource Management which focused mainly on ensuring capabilities and addressing improvement points identified on resource requirements. This stage requires the provision of people, equipment, tool, and materials needed to implement the KTP, build and maintain the KT operation of the CMT of the project site-based operation of ABC Company. This stage is equally important with the rest of the stages of the KTP to continually improve the effectiveness of the KT and to meet stakeholders' requirements.

The scope of activities under Stage 2 of the KTP included provision of general resources, human resources' competence, awareness and training, infrastructure and work environment to achieve planned results. Stage 1 was about Management Responsibility and their commitment to support the KTP while Stage 2 was the actual management of resources from acquisition to provision, use and control. The improvement areas identified in this study related to resource requirements and management must be achieved in Stage 2. The implementation of Stage 2 is important for the rest of the KT to proceed as planned.

Stage 3 of the KTP was about Knowledge Transfer Realization which focused mainly on the knowledge transfer works that ABC Company goes through which covers the development, implementation and control from idea creation, idea sharing, idea evaluation, idea dissemination and idea adoption. Effective KTP requires inclusion of comprehensive approach from idea creation to idea adoption with the complete knowledge transfer (KT) as finished product. The Stage 3 of the developed KTP also included the improvement areas identified under organizational characteristics and resource requirements related to KT process. All the gaps determined in this study were also considered in the developed KTP under Stage 3.

The scope of activities under Stage 3 included awareness of the CMT of project site based organization of ABC Company on the nature, significance and benefits of improving the Knowledge Transfer that had been partially implemented. This stage is also an opportunity to present and discuss the results of this study for their appreciation and to serve as basis for their support and active participation in the implementation of KT as planned. The improvement areas identified on organizational characteristics, resource requirements and problems of the CMT of project site based organization of ABC Company would also be presented to CMT with corresponding interventions, timing and support needed for its effective and efficient implementation, monitoring and control. CMT's acceptance of the presented KTP would indicate their commitment to support and participate to the rest of the stages of the KTP.

Stage 4 of the KTP was about Measurement, Analysis and Improvement requirements which focused mainly on the KTP and implementation of inspection, test, measurement, analysis and improvement needed to assure that KT meets requirements and to assure that the KTP works as planned, improve the operation and results based on implementation of all the stages of the KTP. All the improvement areas on the organizational characteristics and resource requirements and the gaps determined in this study related to measurement, analysis and improvement were also considered in the developed KTP under Stage 4.

The scope of activities under Stage 4 covered general measurement, analysis and improvement, monitoring, control and improvement of stakeholders' satisfaction and KT process, control of nonconforming products and processes, analysis of data and improvement. The improvement areas identified on organizational characteristics, resource requirements and problems of the CMT of project site-based organization of ABC Company with corresponding interventions, timing and support needed for stage 4. Stakeholders' evaluation of KTP as implemented will be the objective deliverable of stage 4. Upon completing the cycle from stage 1 to stage 4 as shown on the process flow in Figure 5, feedback is to be carried-out to determine if the ABC Company has improved on its readiness on project site based CMT in terms of idea creation, sharing dissemination, evaluation and adoption. If all the readiness levels of ABC Company has achieved maturity and capability and the project site based CMT's gaps on idea creation, sharing, dissemination, evaluation and adoption are addressed, then it can be concluded that the organization is ready for the next phase of the proposed KTP.

To complete the proposed KTP, a matrix is shown in Table 12 specifying the details of the program and activities of the proposed KTP.

Table 32. Details of the Proposed KTP

STAGE 1	**STAGE 2**	**STAGE 3**	**STAGE 4**	**Feedforward & Feedback**
Management Responsibility	Resource Management	Knowledge Transfer Realization	Measurement, Analysis & Improvement	Feedforward & Feedback
Management awareness of the KT	Staff awareness of the KT	Readiness of ABC Company	Measure on readiness and gaps	Gather and document feedback
Purpose of the KT	Leader & core group to carry out KT	Status & gaps of CMT on ideas	Assessment on the gaps on readiness and ideas	Update the proposed KTP
Discuss the KT methodology	Develop the KT outline & contents	Conceptualize interventions	Assess improvements	
Timeline to develop & implement KT	Budget, logistics and venue for KT	Implement interventions	Make full report on KTP	
Management Approval	Resources allocation & identification	Readiness of ABC Company & CMT	Assessment, Improvement & Documentation	Feedforward for the stage 1 (next cycle)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The status of ABC Company's organizational characteristics and resource requirements on KT was determined through survey with the members of the project site based CMT of Muntinlupa projects associated with the construction supervision of the sewage treatment plants and pipe network.

The results showed a mean of 3.41 on the overall readiness on KT of ABC Company's organizational characteristics while the resources requirements showed a mean of 3.60, both interpreted as moderately ready which indicated that ABC Company needed attention to achieve capability and maturity in knowledge transfer.

Gap analysis was conducted using questionnaires to fifteen respondents to determine the level of readiness of ABC Company and the status of the project site based CMT of ABC Company in terms of idea creation, sharing, dissemination, evaluation and adoption. The overall rating on the status of the project site based CMT was 78%. The results showed that there was a 22% gap to be addressed for KT to proceed in the implementation. The gaps identified were problems on idea creation, sharing and dissemination. Idea creation has the highest gap having a value of 38% while Idea sharing and idea dissemination have gaps of 21% and 29%, respectively. No gaps were identified on idea evaluation and idea adoption which obtained a 100% rating. In means that there were no problems on the said aspects.

Conclusions

Gaps identified in idea creation included lack of enthusiasm of ABC Company to encourage their employees to create ideas, lack of willingness to grant autonomy to its personnel in creating ideas and on the part of the employees to create ideas based on their past similar work experiences.

Idea sharing likewise had gaps similar to idea creation. The management of ABC Company needs to pay attention to the type of knowledge to be shared if it is in a form that others can interpret and if the employees have the inclination or willingness to share their ideas to colleagues and subordinates. Idea dissemination faces three aspects that need to be addressed. These are to encourage its personnel to connect in diverse ways, to use technology in promoting knowledge sharing to others and to avoid overloading of information that are not relevant to the needed knowledge.

The CMT of ABC Company has gaps or problems on knowledge transfer in terms of idea creation, sharing, dissemination, evaluation and adoption.

Recommendations

To address the levels of readiness of the ABC Company in attaining maturity and capability on resource requirements, it was recommended that interventions be considered by the management of ABC Company to efficiently conduct a knowledge transfer. ABC Company should grant autonomy to its personnel in creating ideas for knowledge transfer so that all experienced personnel can contribute to the company's knowledge bank. ABC Company should address organizational culture of power relations, barriers promoting behaviour, knowledge hoarding, issues relating to confidentiality, and copyright through regular meetings, trainings and seminars.

Based the study, it was also recommended that interventions be carried-out in developing the type of knowledge to be created. That knowledge should aligned with personnel's line of work. Knowledge programme should not create information that will cause confusion to the trainees. KT leader and core team should be appointed and given authority by the management of ABC Company to develop and implement the knowledge transfer strategy. Budget should be provided to develop and implement the KT,

and to develop a monitoring mechanism, audit and feedback to make sure that the knowledge has been shared and absorbed by the trainees.

After re-assessment of ABC Company's readiness for knowledge transfer and closing the gap on the status of the project site based CMT, the proposed knowledge transfer plan for interventions should be implemented. The knowledge transfer plan (KTP) is composed of four stages covering four major areas which are: Stage 1 - Management Responsibility, Stage 2 - Resource Management, Stage 3 - Knowledge Transfer Realization and Stage 4 - Measurement, Analysis and Improvement. Each stage consists of feed forward and feedback for contingency options and continual improvement mechanism. The intervention strategies presented in the KTP would address the particular area found to be in need of improvement.

Therefore, in order for the CMT to attain capability and maturity, it was recommended that the proposed interventions be supported by the management of ABC Company. It was proposed that the management should promulgate, promote and encourage their employees to create ideas relative to their line of profession, grant autonomy to its personnel in creating ideas for knowledge transfer, encourage its employees to willingly create ideas based on knowledge they acquired from previous work experiences, experiment and innovate ideas subject to evaluation by ABC Company, conceive a plan to reward employees for creating knowledge transfer ideas. Specific leaders and core team should be assigned to plan, organize and lead the knowledge transfer. The KT team should make sure that the idea created to be shared and disseminated shall be focused on more important informations.

The KTP shall be for the use of the CMT of the ABC Company which will take effect on the new projects acquired. The KTP consists of the plan, timeline, scope and cost of implementation.

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3. Zarinpoush, F., Sychowski, S., & Sperling, Julie. (2013). Effective Knowledge Transfer & Exchange for Nonprofit Organizations: A Framework
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- Before you begin to format your paper, first write and save the content as a separate text file.
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- Finally, complete content and organizational editing before formatting.

2. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract.

3. Units

- Use either SI or CGS as primary units. (SI units are preferred.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as "3.5 inch disk drive".
- Avoid combining SI and CGS units, such as current in ampere and magnetic field in oersted. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.
- Do not mix complete spellings and abbreviations of units: "Wb/m^2" or "webers per square meter", not "webers/m^2". Spell out units when they appear in text: ". . . a few henries", not ". . . a few H".

- Use "cm^3", not "cc".
- Add space between amount and unit; for example - use "12 cm" instead of "12cm".
- Use upper or lower case properly according to the unit.

4. Equations

- Use equation editor feature of your word processing software to create equation if equation contains division, or multiple lines.
- Equations should be left aligned.
- It would be better to give serial numbers for the equations. Equation serial numbers, within parentheses, can be put after half the width of the page.
- If there are multiple equations, and serial numbers are assigned to them, then position all the equation serial numbers at a same tab stop.
- Do not give italic style to equations.
- Use × sign/character for multiplication sign (instead of *), and ÷ sign/character for division sign (instead of /) in equations which are not inserted using an equation editor.
- Add a blank paragraph before and after each equation.
- Use same font size as normal paragraph for the equations.
- Use a zero before decimal points: "0.25", not ".25".

$(a + b)^2 = a^2 + b^2 + 2ab$ (1)

$$y^4 + \frac{xy}{2} = \frac{x^3}{3} - xy^2 + y^2 - \frac{1}{7} \quad (2)$$

5. Headings

- Headings to be formatted with same font family and font size as normal text.
- Only apply bold style to the headings; no underline, no italic.
- Headings can be numbered or without numbering. It is recommended to use only numbers for numbered heading - means - do not use Roman and Alphabets for numbering headings. Hierarchical numbering (for example - 1.1, 1.1.2) may be used for sub-headings.
- Set "Keep with next paragraph" checkbox checked in the paragraph's settings/options for all the headings, to avoid heading in one page and its content on the next page.
- Do not add colon at the end of the headings.

6. Figures and Tables

- Add captions/headings for figures and table using their "caption" option/setting.
- Do not format captions with bold or italic or underline style; use same style as normal paragraphs.
- Do not apply background color(s) to cells/rows/columns of tables.
- Center align figures, tables and captions.
- It would be better to give numbers to figures and tables.
- Use Title Case for the captions.
- Set height and width of the cells in tables to minimum required. Tables should be "fit to content".
- It would be better to provide caption above the figures and tables rather than below them.
- Instead of using short text like "Fig. 1", use full text like "Figure 1" in captions.

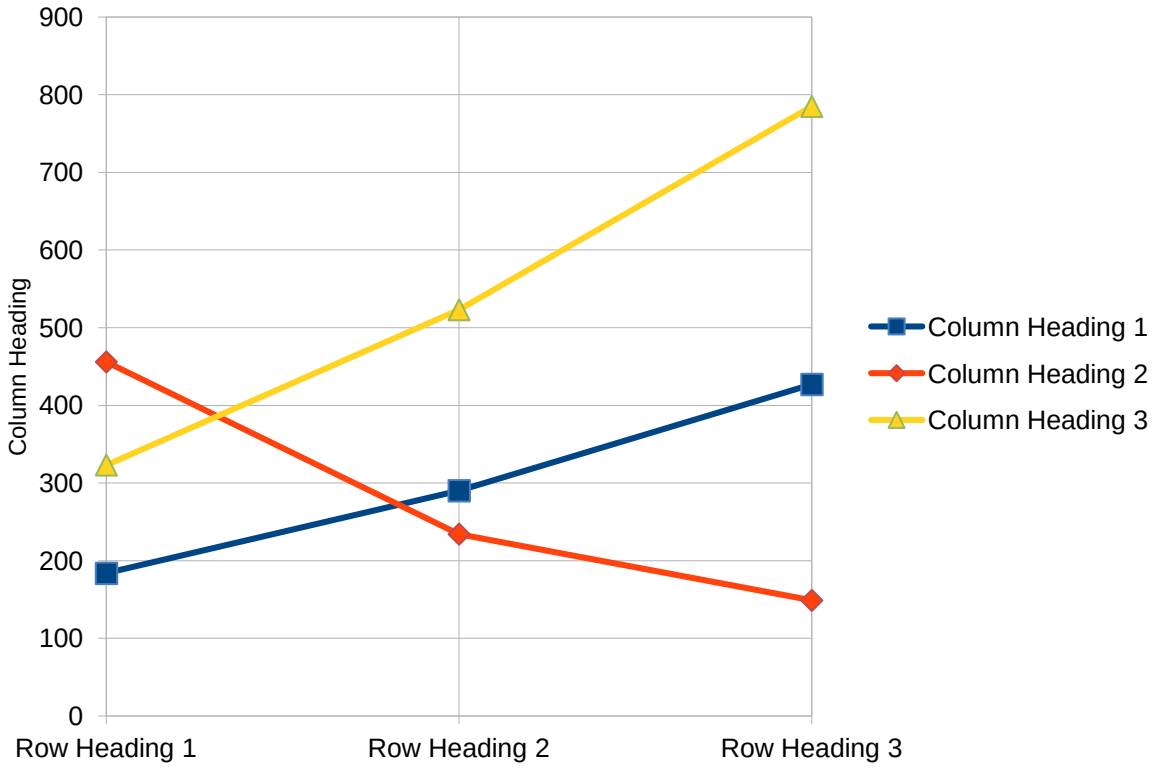
- If figures or images are smaller than half the width of the page then multiple consecutive figures and images may be put in one line. Use table to add multiple figures or images in one line/row.
- Do not write text in the same line as of any figure or table (no wrap).
- Set “bold” style for the column/row headings and footer in the table.
- Use same font size as normal paragraphs for tables' content. However, if table is wider than the available space in the page then set 10 pt font size for the table's content. If table is wider even after setting 10 pt font size then authors may consider breaking the table.
- Specify height and width in the same original proportions for images - they shouldn't be stretched or squeezed disproportionally. And images need to be clear with fine resolution.
- Add blank paragraphs above and below the figures and tables.

Table 4: Table Type Styles

	Column Heading 1	**Column Heading 2**	**Column Heading 3**
Row Heading 1	184	456	323
Row Heading 2	290	234	523
Row Heading 3	427	149	785
Total	901	839	1631

The above data is pictured in the next graph.

Figure 4: Temperature After Each Pass



7. Some Common Mistakes

- Using 0 (Zero) or O with superscript formatting for the degree symbol used for temperature (Celsius/Fahrenheit), angle (including latitude-longitude). (Proper usage: Use the degree symbol: °.)
- Add a full-stop/period after “et”. (Proper usage: There is no period after the “et” in the Latin abbreviation “et al.”.)
- Improper use of “i.e.” and “e.g.”. (Proper usage: The abbreviation “i.e.” means “that is”, and the abbreviation “e.g.” means “for example”.)

8. Appendix

This section may be added immediately after main content, before acknowledgment, authors' biography and references.

9. Conflict of Interest

Authors need to add this section if the research was sponsored, or any other way the research was - influenced by anybody/any organization - not fully neutral. Authors must clarify that whether the results of the research were affected by sponsors/influencers or not. If there is no conflict of interest with anybody/any organization then this section is not required.

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Put applicable sponsors acknowledgements in this section; do not place them on the first page of your paper or as a foot-note. Guide's name may be put either here or on the first page. Other supportive people's names can be mentioned in this section.

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Short biography of each author may be included, with/without photographs, after main content of the research paper and before references. The biography may only include details related to current position/designation of the authors. No personal detail can be included in biography.

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1. Enclose the citation number in square brackets, for example: [1].
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3. The reference numbers need to be within same referenced text sentence; i.e., the reference numbers must be before full stop mark of the sentence.
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5. When referring to a reference, if you want to use its reference number then, do not use “Ref. [3]” or “reference [3]”; only write reference number like this: “[3]”.
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2. Use "1." numbering format.
3. Do not format any part of the reference with italic style.
4. There must not be any broken link.
5. If website address is provided, it must link/point to the exact research paper or book, i.e., do not just provide www.xyzsite.com; provide full URL with "http://" or "https://" and the path to the exact page like https://www.xyzsite.com/books/path/to/book/abc-book. Write URL after all other details of the reference.
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Example of List of References

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2. Jack C.M., "Electromagnetic Effects on the Different Kinds of Water", Journal of Electromagnetic Effects, 1992, 2 (4), 47–76.
3. Samuel J., "Fine Particles, Thin Films and Exchange Anisotropy", Magnetism, 1963, 3 (1), 271–350.
4. Kate E., Title of the Research Paper. (Unpublished)
5. Andrew S. "Effect of Non-visible Electromagnetic Particles on Photosynthesis". https://www.example.com/volume-14/issue-5/effect-of-non-visible-electromagnetic-particles-on-photosynthesis