

HAIGAZIAN UNIVERSITY

**THE IMPACT OF
KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL LEARNING
ON ORGANIZATIONAL PERFORMANCE
IN SELECTED KNOWLEDGE MANAGEMENT AND LEARNING
INTENSIVE ORGANIZATIONS IN LEBANON**

By

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A Thesis

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DEDICATION

This thesis is dedicated to the memory of my grandmother Mari Khederlarian and my grandfather Avo Avedis.

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First, I would like to thank GOD for providing me with perseverance and patience throughout this research study.

I would like to express my deepest gratitude to my advisor, Dr. Sona Jerejian, for her continuous support, guidance, and enthusiasm all throughout this study. Through her high standards and expectations, she has been an outstanding model for me.

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AN ABSTRACT OF THE THESIS OF

Maria Zadour Khederlarian For Master of Business Administration
Major: Management

**Title: The Impact of Knowledge Management and Organizational Learning on
Organizational Performance in Selected Knowledge Management and Learning
Intensive Organizations in Lebanon**

The purpose of the study was to examine the impact of knowledge management and organizational learning practices on organizational performance. Moreover, this study aimed to show whether knowledge management and organizational learning practices differed between higher-rated and lower-rated organizations and among five selected industries.

An empirical study was performed using a survey questionnaire, which was distributed to 130 organizations in the five industries. The sample included 36 higher-rated organizations and 94 lower-rated organizations. The listing of the Chamber of Commerce, Industry and Agriculture in Lebanon was used for the rating of the organizations. Out of 130 questionnaires, 102 were returned and were usable, reflecting a response rate of 78%.

Descriptive statistics were conducted followed by Reliability Test, Factor analysis, Multiple Regression with Stepwise method, Independent Sample T-Test and One-Way Anova.

Empirical evidence from this study showed that a number of knowledge management and organizational learning practices has a statistically significant positive relationship with different aspects of organizational performance: organizational effectiveness and efficiency,

innovation, customer satisfaction, employee motivation and satisfaction, workforce flexibility, and breakdown of communication barriers. Moreover, the study revealed that most of the practices that impact organizational performance differ in higher-rated and lower-rated organizations, as a result of which higher-rated organizations have increased organizational effectiveness and efficiency, enhanced innovation, increased workforce flexibility and less communication barriers than lower-rated organizations. Finally, the study revealed that the average knowledge management and organizational learning practices, as well as the average organizational performance, does not differ among the five selected industries.

The study recommended to the managers of organizations in Lebanon to better manage knowledge and encourage knowledge sharing, to empower employees, and nurture a learning culture where trust and transparency prevail.

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LIST OF ACRONYMS

AEC	Architecture, Engineering, Construction
BSC	Balanced Scorecard
IT	Information Technology
KIBS	Knowledge Intensive Business Services
KM	Knowledge Management
KMS	Knowledge Management System
LO	Learning Organization
OECD	Organization for Economic Co-operation and Development
OL	Organizational Learning
OP	Organizational Performance

CHAPTER ONE

INTRODUCTION

Purpose of Study

Working in an international organization, like Schindler, incited my interest to study how such big companies manage continuous organizational change to strengthen their global presence in the marketplace. “Good performance in a challenging environment” was an appealing title for Schindler Interim Report as of June 2012. The report stated that in a challenging environment the elevator and escalators business improved its profitability thanks to continued operational improvements. Nevertheless, where did these improvements come from?

Scheduled trainings (in-house and abroad), compliance coaching, constant corporate auditing, and commitment to people development are part of the organization routine in Schindler. The working atmosphere in Schindler demonstrates that keeping pace with the competitive reality triggers the need to continuously learn and adapt to changing circumstances through creating new knowledge and refining existing knowledge to gain a competitive advantage. Hence, I decided to research about the topic of learning organizations (LO) where knowledge management (KM) fosters a learning culture with the end goal of organizational performance (OP) improvement. I started my thesis journey with the literature review that provided me with the opportunity to examine the theories established by various authors and the studies conducted by academic and business professionals.

Despite the wide recognition of both learning organization and knowledge management concepts in academic and business press, the concepts are rather elusive and there is little empirical work on how learning organizations that manage knowledge efficiently and effectively influence organizational performance. Hence, this thesis aims at defining learning organizations and knowledge management more thoroughly and explaining why they relate to each other and to test whether they ultimately affect OP.

Managing Knowledge and being a Learning Organization: Key Strategies for the 21st Century

Kriegesmann, Kley, and Schwering (2005) stated that technological advancements, dynamics of global competition, corporate restructuring and unstable economic conditions are pressing on organizations to learn and adapt to make performance improvements. They affirmed that a common theme of the most popular strategies is a focus on intellectual capital or the knowledge of people as an important strategic resource for gaining and maintaining a competitive advantage. Alvesson and Karreman (2001) as well asserted that the level of interest in the fields of organizational learning, intellectual capital, and knowledge management has increased in recent years.

Ikujiro Nonaka profoundly contributed to this topic. In his work *The Knowledge-Creating Company*, Nonaka (1991) stated, “In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge” (p.96). He continued to explain that globalization, new technologies, increasingly demanding customers, increasingly service-driven nature of products, new aggressive competitors, and innovations in products with very short life cycles characterize our current competitive environment. Thus, organizations of the 21st century have no choice but to invest in new technologies, especially KM tools to enhance their services and products in order to meet the demands of today’s information-driven, globally competitive marketplace. He argued that successful companies consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products.

Like Nonaka (1991), Gupta and Sharma (2004) asserted that knowledge embedded in systems, brains and technology has always been essential to economic development. They

maintained that today organizations are increasingly considering KM as a strategy to leverage a firm's knowledge and best practices to gain strategic advantage and maximize organizational competitiveness.

Gorelick, Milton and April (2004) assessed that the rapid pace of change, increased turnover, reduced loyalty to a company, and the increased use of free agents and subcontractors amplified the need to capture and disseminate information and knowledge. Moreover, they maintained that the need for knowledge sharing coinciding with the acceleration of the knowledge worker and the wide recognition of the intangible assets of an enterprise, will be key to both its ability to create competitive advantage and to grow at an increased pace. According to them, easy access to information combined with an increased understanding that intangible assets are essential for organizational growth is contributing to the emerging field of KM. Hence, more and more organizations are paying increased attention to the creation of value through leveraging knowledge to increase performance.

Gorelick et al. (2004) asserted that KM is not an end in itself; the goal of KM is to increase organizational performance through learning by ensuring that each operational decision is made with access to all relevant knowledge and experience. According to them, KM aims to solve the problem of teams and individuals who perform sub-optimally due to lack of access to knowledge acquired through experience elsewhere. For Gupta and Sharma (2004), the goal of KM is to get the right knowledge to the right person at the right time so better decisions will enable correct action and stimulate performance. The KM challenge is to support this goal through the development of Knowledge Management Systems (KMS) that can readily adapt to change while dealing with complexity.

KM initiatives take time to plan, implement, embed, and evaluate but as Benjamin Franklin says “an investment in knowledge always pays the best interest” and “the beauty of an investment in knowledge and in learning is that it can continue to pay dividends each and every year” (Gorelick et al., 2004, p. 97).

In their work *Managing Professional Intellect*, Quinn, Anderson, and Finkelsetin (1996) highlighted the fact that in the postindustrial era, the success of a corporation lies more in its intellectual and systems capabilities than its physical assets. They explained that intellectual assets, unlike physical assets, increase in value with use because properly stimulated intangible assets – knowledge, information, and technology - will grow exponentially through sharing and application. Gupta and Sharma (2004) predicted that the capacity to manage intellectual assets and to convert them into useful products and services is fast becoming the critical executive skill of the age, since KM serves to create value for an organization’s intangible assets.

According to Leonard (1998), companies must reduce their cycle times, operate with minimum fixed assets and overhead, shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adaptation, capture information, create and share knowledge to serve customers well and to remain in business. For him, these activities are not possible without a continuous focus on the creation, updating, availability, quality and use of knowledge by all employees and teams at work and in the market place (Cited in Gupta & Sharma, 2004).

Prusak (1996) had an unwavering focus on KM, hence he said “The only thing that gives an organization a competitive edge – the only thing that is sustainable –is what it knows, how it uses what it knows, and how fast it can know something new” (Cited in Young, 2009).

Therefore, knowledge has become the key strategic asset for the 21st century and every organization has to manage knowledge as a critical resource and invest in developing the best strategy for identifying, developing, and applying the knowledge assets it needs to succeed. Davenport (1997) emphasized the importance of knowledge when he stated, “As free natural resources and cheap labor are exhausted, the last untapped source of competitive advantage is the knowledge of people in organizations” (p.191). Drucker believed that to remain competitive and maybe even to survive businesses will have to convert themselves into organizations of knowledgeable specialists. Spender (1996) and Choi and Lee (2003) provided empirical evidence that knowledge-based resources play an important role in increasing the sustainable competitiveness of the firm (cited in Lee, Lee, & Kang, 2005). As Quast (2012) cited in Forbes, according to Babcock (2004), Fortune 500 companies lose roughly “\$31.5 billion a year by failing to share knowledge” (p.46) which is a very scary figure in this global economy filled with turbulence and change. Knowledge serves as a type of glue in an organization; it holds the organization’s separated parts together and enables them to communicate.

Badarraco (1991), Davis (1994), Prahalad and Hamel (1990), and Quinn (1992) observed that the depreciation rate of organizational capabilities is accelerated by relentless technological and socioeconomic changes (Cited in Snyder, 1996) hence organizations can obtain competitive advantage by leveraging knowledge through becoming a learning organization. As Eric Hoffer, the author of *The Ordeal of Change*, stated “In times of rapid

change, the learners will inherit the future” (Cited in Harper & Glew, 2008). A major prerequisite for the success of LO is its ability to exploit its most precious asset, knowledge, which provides it with the flexibility to respond and adapt to the changes in the external and internal environments (Mládková, 2007).

In this competitive reality, we find continuous improvement programs that are sprouting up all over as organizations strive to better themselves and gain an edge. Garvin (1993) asserted that continuous improvement requires a commitment to learning. Senge (1990) explained the dynamics of learning organizations in terms of three overlapping but distinct motivations, which induce people to take on the difficult work of building learning organizations. According to him, learning organizations create better models to manage and lead change, build the organization’s overall capacity for continual adaptation to change, and create ways of managing and organizing work that is superior in both pragmatic and human terms, that significantly improves performance and creates the types of workplaces in which most people would truly like to work. Ford’s Marv Adams maintained that learning organizations not only could lead change but also have greater capacity to deal with ongoing change. That is why he believed that learning organizations are “adaptive organizations”. Adam said, “Today, two things stand out: the extraordinary level of connectedness of the organizations we are creating and the interdependent and volatile environments we are operating in.” (p. 275). He continued, “This connectivity and volatility mean that we have to manage in a very different way. Keeping pace with the pace of change is essential to succeed. We can’t do that through our traditional top-down control mentalities, but we also can’t do it with no structure and total chaos. Continually finding the right balance between too much and

too little structure will be a key to having the adaptive capabilities to survive” (p.276) (Cited in Senge, 1990).

Senge (1990) further analyzed that perhaps the most salient reason for building learning organizations is that we are only now starting to understand the capabilities such organizations must possess. According to him, what fundamentally will distinguish learning organizations from traditional authoritarian “controlling organizations” will be the mastery of certain basic disciplines by all members of the organization since it's just not possible any longer to "figure it out" from the top, and have everyone else following the orders of the "grand strategist" (p. 4). Senge (1990) foresaw that organizations would truly excel in the future if they discover how to tap people’s commitment and capacity to learn at all levels in the organization.

In addition, Owen (1991) explained further that today becoming an effective learning organization is a necessary approach for making profits and for competing in the marketplace because continuous learning enables growth. He claimed that “the business of business is learning – and all else will follow” (Cited in Gorelick et. al, 2004, p.25).

Gupta and Sharma (2004) added that current organizations must change constantly in order to survive for even one decade. Nevertheless, change itself is not sufficient; the change must be based on appropriate data gathered externally from the environment and internally from lessons learned. As Jack Welch stated, “Learning inside must be equal to or greater than change outside the organization – or the organization is in decline, and may not survive” (cited in Young, 2009). Thus, as Daft (1998) asserted, organizations should learn to survive in the fast-changing and intensely competitive environment by continually redesigning themselves into learning organizations (Cited in Gupta & Sharma, 2004).

Kreitner (1995) observed, “The concept of learning organizations is a valuable addition to organization theory, because it explains how managers can deal with today’s only certainty –change” (p. 277). Robey and Sales (1994) suggested that “without effective learning processes, organizations are less able to formulate strategies, implement needed innovations, and make other needed changes”(p. 419). They stated, “For an organization to learn, it must be able to acquire new knowledge and to add it to memory” (p.425). This need arises because today “the things and ways which got you where you are seldom are things to keep you there” (Handy, 1994, p. 49). For organizations, this necessitates “shifting out of the comfort zone” (Clarke, 1994, p. 147); it means that their learning must progress “beyond mere adaptation” if they are not to reach the stage of being what Garratt (1987) describes as “clinically brain dead” (Cited in Hayes, 1997).

The Link between Managing Knowledge and Becoming a Learning Organization

Before examining the link between KM and LO, we should clarify the distinction between learning organization (LO) and organizational learning (OL) respectively. As Tsang (1997) mentioned "...a learning organization is one which is good at organizational learning" (Cited in Marshall, Smith, & Buxton, 2009). Argyris and Schon (1978) and Duncan and Weiss (1979) asserted that learning is relatively organizational to the extent that it is applied for organization purposes, publicly shared, and institutionalized in an organization's systems and norms (Cited in Snyder, 1996). Leitch et al (1996) suggested that "the LO is an organization that excels at collective learning", whereas, "OL refers to the methods of collective learning" (Cited in Marshall et al., 2009). Hence, OL drives the organization towards becoming a LO.

Aggestam (2006) maintained that KM aims to create value for the organization through wise application of knowledge to enhance organizational learning, hence enabling the organization to become a LO. Gorelick et al. (2004) added that KM programs, processes and tools support organizational learning, and address more than the sum of the knowledge of each member of the organization or the sum of individuals learning, hence drive the accomplishment of organizational goals by increasing performance through learning. In other words, KM drives organizational learning to add value. During organizational learning, changes in knowledge take place. LO results in acquisition of new knowledge and refinement of existing knowledge, which need to be managed effectively in order to support organizational goals. Therefore, LO needs KM to support the effective use of knowledge and KM in turn aims to support LO. Hence, we conclude that the relationship between KM and LO is reciprocal. Schwandt and Marquardt (2000) asserted that creating new knowledge is a

critical component of LO abilities to learn and adapt and that KM enhances LO by allowing a dynamic synergy between people, actions, symbols and processes. R. King (2009) stated the organizational learning is the goal of KM. By motivating the creation, dissemination, and application of knowledge KM initiatives help the organization embed knowledge into organizational processes so that it can continuously improve its practices and behaviors and pursue the achievement of its goals. From this perspective, organizational learning is one of the important ways in which the organization can continuously improve its utilization of knowledge (R. King, 2009). As we shall further explain later, KM and LO are used as means to integrate systematic and systemized learning with business performance in order to sustain competitive advantage (Gorelick et al., 2004).

Aggestam (2006) emphasized that KM and LO complement each other and are highly synergistic. KM and LO cannot survive separately since they are both dependent on one another for success. To be a LO requires KM which in turn is dependent on LO.

Based on the knowledge obtained from the literature review, this study's research model was formulated as follows: KM enhances the opportunity to become a LO, which in turn provides an opportunity to stimulate the creation of new knowledge that needs KM and LO and KM together enhance OP. This model will be tested throughout the study.

The Figure 1 on the following page shows the link between Knowledge Management, Learning organization, and Organizational Performance.

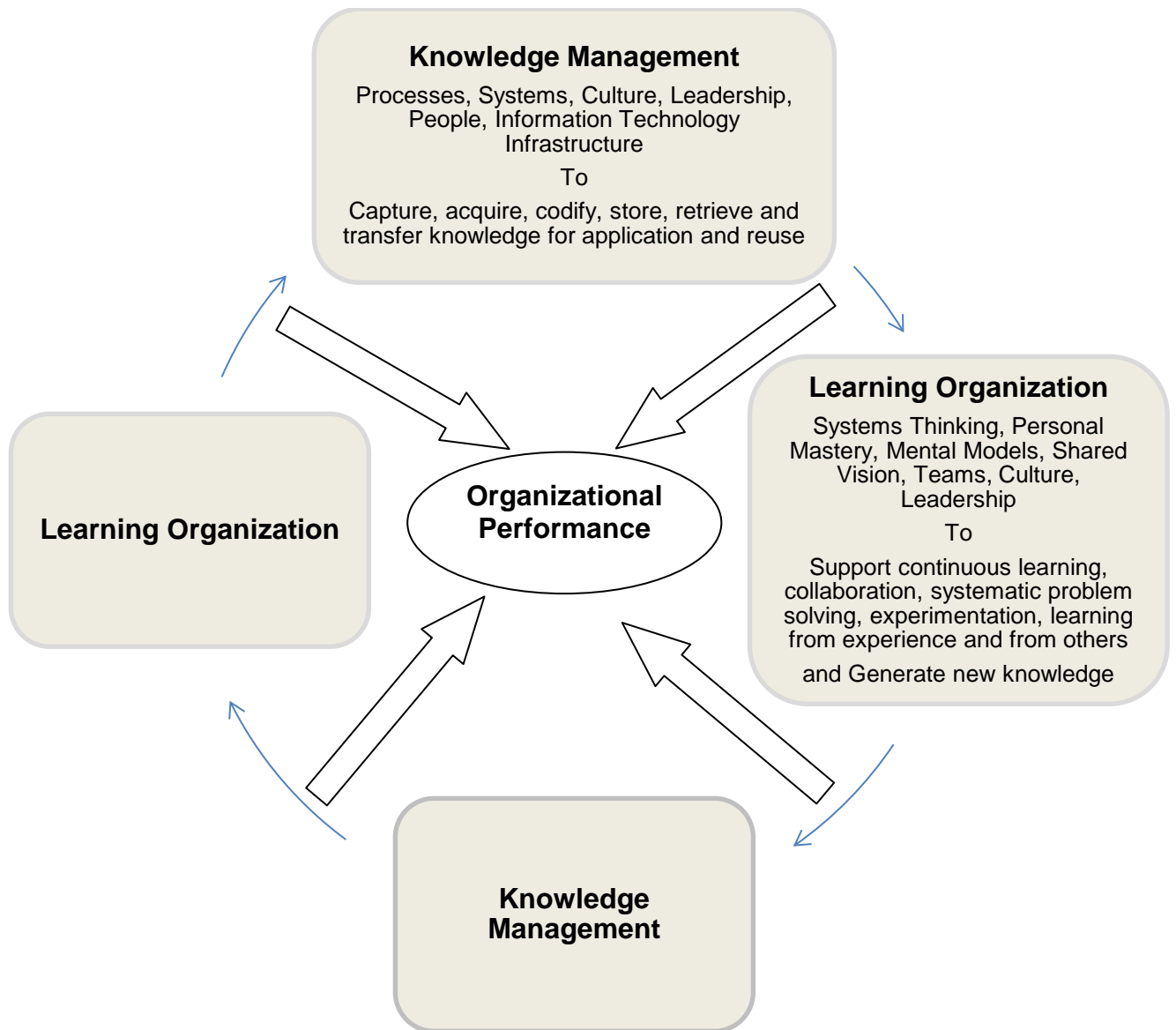


Figure 1: Link between Knowledge Management, Learning Organization, and Organizational Performance

Considering the link between KM and LO, this thesis aims to show the relationship of KM and LO with OP. The study is organized as follows: First, we discuss the relevant literature on knowledge management and learning organizations including definitions, brief histories, and characteristics of both constructs respectively. Then, a definition of organizational performance is provided followed by an explanation about the relationship of OP with KM and LO. Second, based on the literature review we formulate our research questions and hypotheses and discuss the research methodology. Third, we conduct statistical analyses to test the hypotheses. Finally, we provide a summary of the findings, limitations, and recommendations.

CHAPTER TWO LITERATURE REVIEW

2.1. KNOWLEDGE MANAGEMENT

2.1.1. Definition of Knowledge Management

Before defining KM, it is important to understand what constitutes knowledge and what falls under the category of data and information. Davenport and Prusak (1998), the authors of an influential KM study *Working Knowledge*, have defined data as simple observations of states of the world and information as data endowed with relevance and purpose (Cited in Knight & Howes, 2003). They defined knowledge as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, process, practices, and norms” (Cited in Alvesson & Karreman, 2001).

It is also important to look at the forms in which knowledge exists, namely explicit and tacit knowledge. Brown and Duguid (1998) used the terms know-what and know-how to refer to explicit and tacit knowledge respectively (Cited in Frost, 2010). Nonaka (1991) asserted that explicit knowledge is systematic, formalized, and can be easily communicated and shared. Wellman (2009) added that this type of knowledge is easy to identify, store and retrieve. On the other hand, tacit knowledge is intuitive and hard to define knowledge largely based on experience (Brown & Duguid, 1998). Nonaka (1991) defined tacit knowledge as divided into two dimensions: technical (informal, hard to pin down skills captured in the term know how)

and cognitive (engrained mental models, beliefs, and perspectives). He stated that tacit knowledge is highly personal, hard to formalize and difficult to communicate to others.

Frost (2010) maintained that KMS easily handles explicit knowledge by effectively facilitating the storage, retrieval, and modification of documents and texts. On the other hand, KMS has a very hard time handling tacit knowledge embodied in cultures, processes, structures, and routines. That is why firms that succeed in managing embodied knowledge will enjoy a significant competitive advantage.

As Gorelick et al. (2004) claimed, knowledge is a difficult asset to manage, being intangible, fluid, personal, elusive, invisible, and ever evolving. The benefits – which relate to things like “intellectual capital”, “knowledge sharing” and “innovation” are seldom directly calculable (Knight & Howes, 2003). However, even if the intangible nature of knowledge means it cannot be directly controlled, you can at least manage the systems, cultures, and pathways through which knowledge flows around the organization.

As defined by Gupta and Sharma (2004), “Knowledge Management is an emerging, interdisciplinary business model dealing with all aspects of knowledge within the context of the firm, including knowledge creation, codification, sharing, and using these activities to promote learning and innovation. It encompasses both technological tools and organizational routines of which there are a number of components. These include generating new knowledge, acquiring knowledge from outside sources, using this knowledge in decision making, embedding knowledge in processes, products and/or services, coding information into documents, databases, and software, facilitating knowledge growth, transferring knowledge to other parts of the organization, and measuring the value of knowledge assets and/or the impact of knowledge management” (p. 3).

Thus, Gupta and Sharma (2004) summarized that KM is the process of creating value from an organization's intangible assets. It consists of systems and processes that take information and turn into structured knowledge in order to support specific and general business purposes.

KM consultant Denham Grey put it "Knowledge management is an audit of *intellectual assets* that highlights unique sources, critical functions and potential bottlenecks which hinder knowledge flows to the point of use. It protects intellectual assets from decay, seeks opportunities to enhance decisions, services, and products through adding intelligence, increasing value and providing flexibility" (The Knowledge Management Forum, 2002). Furthermore, knowledge management complements and enhances other organizational initiatives such as total quality management (TQM), business process re-engineering (BPR) and organizational learning (OL), providing a new and urgent focus to sustain competitive position.

Similarly, William R. King (2009) described KM as the planning, organizing, motivating, and controlling of people, processes, and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed. The processes of KM involve knowledge acquisition, creation, refinement, storage, transfer, sharing, and utilization. He stated that KM is based on the premise that organizations are generally not able to fully utilize the knowledge they possess. Through KM, organizations seek to acquire or create potentially useful knowledge and to make it available to those who can use it at a time and place that is appropriate for them to achieve maximum effective knowledge use.

Gorelick et al. (2004) defined KM as a “systematic approach for optimizing the access, for individuals and teams within an organization, to relevant actionable advice, knowledge, and experience from elsewhere” (p. 3). According to them unused knowledge does not have measurable value that is why “actionable” is the critical element for knowledge management practices. They summarized KM as the grouping of systems, procedures, and culture organizations put in place to manage one of their more valuable corporate assets, knowledge. KM is a vehicle to systematically and routinely help individuals, groups, teams, and organizations to learn what the individual knows, learn what other individuals and teams know, learn what the organization knows, learn what you need to learn, organize and disseminate this learning effectively and simply apply this learning to new endeavors.

Gorelick et al. (2004) maintained that KM has various components. It consists of learning from experience, effectively using skills and expertise in the organization and energizing peoples’ experiences and thoughts to make the organization grow. Organizations use KM processes to formulate strategies and implement them to integrate knowledge or information, and to obtain external information, customer information, and competitive information. In other terms, KM is a systematic way of disseminating information and best practices and exchanging new and old ideas for the growth of the company. It consists of communication technology, electronic libraries, and databases, which include what the company knows about competitors and processes. KM is an enabler for “continuous improvement” in the organization to add value and obtain a higher level of productivity.

Gorelick et al. (2004) further analyzed that KM strategy needs to address and integrate people, processes, and technology to ensure performance and learning for sustainable growth, as well as to recognize the unique organizational culture and the external environment.

Ultimately, KM strategy drives the accomplishment of organizational goals by increasing performance through learning. As Knight and Howes (2003) stated, “ultimately, knowledge management must be about turning “what people know” and what they know “how to do” into outputs that create added value for an organization” (p.4).

Gorelick et al. (2004) maintained that KM promotes a collaborative environment for identifying and accessing existing knowledge, and creates opportunities to generate new knowledge and to apply existing knowledge to meet the organization’s strategic goals. According to them, KM facilitates knowledge movement both ways between knowledge owners and seekers, as well as between knowledge and action. An effective KM system identifies where performance is already high, and seeks to learn from this high performance to develop an even greater level of organizational knowledge. Therefore, the knowledge-performance relationship is a two-way connection, with both utilization and learning directions to support performance goals. The ability of an organization to learn from and leverage its existing knowledge base and expertise in an efficient and effective way is a distinct competitive advantage. Knowledge and experience serve to reduce the level of risk and assist in making well-informed decisions, all of which translate directly into added value.

2.1.2. History of Knowledge Management

In 1959, Peter Drucker coined the term “knowledge worker” in his book *The Landmarks of Tomorrow*. Drucker used the term to describe one who works primarily with information or one who develops and uses knowledge in the workplace. *Drucker* stressed the growing importance of information and explicit knowledge as organizational resources. During mid 1970’s, KM topic boomed when Leonard-Barton published his well-known case study of Chapparral steel which has had an effective KM strategy in place. The 1980’s witnessed the development of systems for managing knowledge that relied on work done in artificial intelligence and expert systems, giving us such concepts as "knowledge acquisition," "knowledge engineering," "knowledge-based systems”, and “computer-based ontologies”. In 1989, the International Knowledge Management Network (IKMN) was initiated in Europe. By 1990, a number of management consulting firms had begun in-house knowledge management programs, and several well-known U.S., European, and Japanese firms had instituted focused knowledge management programs. By the mid-1990s, KM initiatives were flourishing, thanks in part to the Internet. In 1994, IKMN went online and was soon joined by the U.S.-based Knowledge Management Forum and other KM-related groups and publications. In 1994, the European Community began offering funding for KM-related projects through the ESPRIT program in 1995. In 1995, Ikujiro Nonaka and Hirotaka Takeuchi published *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Today, KM has become big business for such major international consulting firms as Ernst & Young, Arthur Andersen, and Booz-Allen & Hamilton.

2.1.3. Characteristics of Knowledge Management

In his *The Coming of the New Organization*, Drucker (1988) characterized the knowledge-based organization (also called the information-based organization) as being composed largely of specialists who direct and discipline their own performance through organized feedback from colleagues, customers, and headquarters. In this type of organization, knowledge exists primarily at the bottom, in the minds of the specialists who do different work and direct themselves. Furthermore, work is done in task-focused teams, not in traditional departments, which serve as guardians of standards, as centers for training and assignment of specialists. The information-based business is structured around goals that clearly state management's performance expectations for the enterprise and for each part and specialist and around organized feedback that compares results with these performance expectations so that every member exercises self-control. Everyone takes information responsibility. Hence, the organization exhibits greater self-discipline and even greater emphasis on individual responsibility for relationships and for communications. According to Drucker (1988), the key to such a system is that everyone asks, "Who in this organization depends on me for what information? And on whom, in turn, do I depend?"

Nonaka (1991) also explored the characteristics of the knowledge-based organization in his famous work *The Knowledge Creating Company*. He stated that in the knowledge-creating company inventing new knowledge is not a specialized activity-the province of the R&D department or marketing or strategic planning. Instead, it is a way of behaving. In this company, everyone is a knowledge worker, that is, an entrepreneur. Since new knowledge always begins within the individual and then the individual's personal knowledge is

transformed into organizational knowledge valuable to the company as a whole, making personal knowledge available to others is the central activity of the knowledge-creating company. It takes place continuously and at all levels of the organization. The knowledge creating company is characterized by free access to company information and does not allow any discrimination in access to information among employees. Easy and free access to information enables the knowledge creating company to respond quickly to customers, create new markets, rapidly develop new products, and dominate emergent technologies.

Nonaka (1991) affirmed that the knowledge-creating company continuously challenges employees to reexamine what they take for granted. Managers are aware that creating new knowledge depends on tapping the tacit and highly subjective individual employee insights and making those insights available for testing and use by the whole company. Creating knowledge is not simply a matter of “processing” objective information. The key to this process is personal commitment, the employees' sense of identity with the enterprise and its mission.

Nonaka (1991) also stated the business activities, company information, and managerial responsibilities in a knowledge-creating company consciously overlap to create a “common cognitive ground” among the employees and to facilitate the transfer of tacit knowledge. Moreover, the use of strategic rotation between different technology areas and between organizational functions helps employees understand the business form of multiplicity of perspectives making organizational knowledge more “fluid” and easier to put into practice. Top management sets the standards for justifying the value of the knowledge developed by the employees in order to provide them with a sense of direction. To strengthen the sense of direction for employees, top management articulates the company's "conceptual

umbrella" - the grand concepts that in universal and abstract terms identify the common features linking seemingly disparate activities or businesses into a coherent whole. Nevertheless, they emphasize the open-ended nature of the company's vision, which is susceptible to a variety of different and even conflicting interpretations.

Nonaka (1991) emphasized the importance of teams, which play a central role in the knowledge-creating company by providing a shared context where individuals can interact with each other and engage in constant dialogue eventually integrating their diverse individual perspectives into a new collective perspective. Gorelick et al. (2004) also stressed the significance of teamwork on performance improvement. According to them, internal competition is one of the key enemies of KM.

Gorelick et al. (2004) maintained that KM is about providing employees with the tailored knowledge they need at the time they need it; KM is not about bombarding employees with information. They maintained that KM should become part of the job rather than an add-on; it has to be embedded into other management processes since they believed that as soon as KM is seen as "part of the job", it becomes part of the reward structure too. Moreover, they emphasized the importance of cultural transition in systematically managing knowledge. Although new technologies, processes, and roles are necessary elements of successful KM, a more fundamental requirement is a cultural shift in the way that knowledge is perceived. KM will flourish in a culture where collaboration and cooperation are the norm and where employees work in teams and are rewarded for collective performance. As Senge (1990) stated "collaboration is the flip side of knowledge management. You can't talk about one without the other. Knowledge is what we know how to do, and we do things with one another. Thus, to manage knowledge you need to address collaboration and tools that help people collaborate"

(p.270). Lee (2005) added that KM's major objective is to connect people with people and stimulate collaboration.

Gorelick et al. (2004) added that introducing a cross-business structure, such as peer groupings or communities of practice and providing tools for knowledge to flow in and out of the local teams or departments is necessary to generate a network focus, to bring individuals together and to build trust. Displaying of success is very powerful for changing the mindset and the culture to "knowledge is one of our key resources." The blame culture is a powerful disincentive to honest and open knowledge sharing; thus, it is important to expose the knowledge captured from disastrous projects in order to break this knowledge barrier. Managers are not afraid to learn from failures and do not punish employees learning from failures. Once a learning culture is established and everyone recognizes knowledge as a critical resource, it is necessary to address the people, process, and technology issues that support performance goals through learning actions.

Moreover, Gorelick et al. (2004) considered that leadership with strong passion for KM is necessary to communicate and model the basic values associated with the significance of KM because they believed that passion and motivation could overcome barriers such as unavailable structures and lack of resources. They claimed that waiting for the right conditions to exist at the right time leads to never accomplishing anything. The best leaders act as facilitators by favoring consensus and collaboration as decision-making methods whenever possible.

Education and training are elements of KM initiatives, which need to include both formal and informal training programs. Recognition, expectation, cultural and peer pressure,

and individual personal motivation are more effective to promote and encourage knowledge sharing. Team based rewards will consequently become more acceptable.

In knowledge-based organizations, narrative management (telling stories that describe experiences and events that occur during organizational life) is used to capture stories that are then codified and made available through the organization in the form of Knowledge Assets (Gorelick et al., 2004).

KM is a catalyst, i.e., a little investment goes a long way. KM is not asking people to do extra things, but rather asking them to do different things or do things in a different way. A KM initiative requires an investment in coaching, training, facilitation, and mentoring, but ultimately the initiative needs to become part of normal business. Part of the challenge with KM is that the benefits go way beyond the measurable, in bottom-line terms but as experience says, “What you get back will depend on the quality of the soil in which you are planting the seeds” (Gorelick et al., 2004, p.96).

Gorelick et al. (2004) asserted systematically capturing and reusing knowledge is necessary to improve organizational performance. According to them, knowledge needs to be stored for publication and reuse and to be “packaged” in a form, which makes it easily usable and understandable by future users. They labeled this packaged and stored knowledge as a “Knowledge Asset” (p.48) to indicate knowledge that is accessible to add value to the business. A knowledge asset is ideally owned by a group of people who share professional interests and responsibilities, defined as a community of practice. Hence, they summarized their KM framework to include the following steps: getting the organization ready for KM; raising awareness, learning, and engagement; managing knowledge in the form of assets; and finally leveraging knowledge and expertise. The principles that surround this framework are

never to reinvent if an adequate solution already exists, adopt a process of learning and doing together, and learning before, during, and after. Furthermore, voluntary participation is a main principle of KM. Gorelick et al. (2004) claimed that KM is a living “discipline”, that should become part of everyone’s job and should be linked to other initiatives that are going on at the same time. KM should have a dual approach, of building energy at the senior level and at the lower level with connections between these two levels so that the people in the business will engage both upward and downward within the organization. According to them, technology can make knowledge assets living to engage and stimulate people.

Gorelick et al. (2004) stated that knowledge-based companies extensively use After Action Review (AAR) – which is a short meeting focused on identifying and capturing learning. The purpose of the AAR is for the team to look at the activity just completed, compare what was planned against what actually happened, and understand why it happened and what could be done differently next time to improve performance.

Knight and Howes (2003) affirmed that KM strategy should be complementary to corporate strategy by setting out a vision and plan for knowledge and information within the business, in pursuit of the organization’s larger aims. KM strategy makes sense only if it derives directly from the vision, mission, goals, and objectives of the organization. Knight and Howes (2003) explained that setting the vision for knowledge involves four steps. First, it’s important to create the knowledge base including tangibles (books, articles, databases) and intangibles (expertise, skills, and social networks). Second, it is vital to make it available in user-friendly ways (exploit infrastructure, improve process, and join up information assets). Then it is necessary to encourage and skill people to seek out, use and share knowledge and

information. Finally, it is essential to build a culture that rewards, encourages, values, and supports knowledge and information sharing.

Knight and Howes (2003) added that if leadership, people and process are the levers for mobilizing knowledge in an organization, then technology and information are the enablers, that is, the crucial elements of infrastructure and support systems which need to be in place to realize the organization's potential to maximize the value of its knowledge and information assets.

Alevi and Leidner (2001) stated that in knowledge management, the focus on Information Technology (IT) is necessary but not sufficient to deliver competitive advantage because it is not merely the knowledge that resides in an organization that delivers competitive advantage but how it is leveraged. Davenport (1997), McDermott (1999) and Ruggels (1998) also emphasized the importance of focusing on people and process issues and argued that IT can only inspire KM but cannot deliver it (Cited in Crossan & Pabuji, 2003). KM definitions highlight mainly the information-processing dimensions of KM despite the importance of the people and process dimensions. Empirical evidence indicates that, in practice, managers concentrate on creating technology for KM. However, managers feel that human resource related issues in KM and soft issues such as people, behavior, culture, attitudes, lack of ownership and shared understanding are what they should be focusing on (Ruggels, 1998). KM efforts were limited in their ability to yield significant performance advantage since the efforts and investments made by organizations have largely remained confined to the arena of technology.

In the view of knowledge storage, dissemination, and sharing, IT is a prerequisite for effective KM and KM involves a combination of technical and human elements. Aggestam

(2006) maintained that people carry out the actual KM. R. King (2009) stated that social groups, teams, and networks must transmit knowledge for KM to be successful. Thus, KM processes are quite people-intensive and less technology-intensive than most people might believe. The people dimension is important because it is very difficult to separate knowledge from its owner without losing its context. This is why Mládková (2007) believed that in addition to managing knowledge we should also find the way to manage knowledge owners, so called knowledge workers. A learning organization cannot exist without knowledge workers and respectively the learning organization provides knowledge workers with everything they need to be productive. Theorists of management, managers, and employees themselves feel the shift from manual to knowledge worker. Learning organizations, if they want to stay “learning”, should pay attention to their knowledge workers. They should find out how to identify them, how to differentiate between groups of knowledge workers, how to manage and motivate them, and increase their productivity, how to get their loyalty, and how to measure their outputs and control their quality (Mládková, 2007).

2.2. LEARNING ORGANIZATION

2.2.1. Definition of Learning Organization

In his book, *The Fifth Discipline: The Art and Practice of the Learning Organization*, Peter Senge (1990) defined learning organizations as “Organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (p. 3).

According to Senge (1990), a learning organization continually expands its capacity to create its future. For such an organization, it is not enough merely to survive. “Survival learning” or “adaptive learning” is important and necessary, but for a learning organization “adaptive learning” must be joined by “generative learning”, i.e., learning that enhances our capacity to create. A learning organization is a place where people continually discover how they create their reality and how they can change it.

Senge (1990) claimed that five basic disciplines are necessary for establishing the LO. These are Systems Thinking, Personal Mastery, Mental Models, Shared Vision, and Team Learning. At the heart of a learning organization is a shift of mind—from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something "out there" to seeing how our own actions create the problems we experience. The basis is a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future.

The simple image of the learning organization is consistent with building organizations based on reflectiveness, deep aspirations, and the desire to see systemic barriers and enact systems more in line with what people want to create (Senge, 1990). In the words of Aris de Gues, a learning organization is a living system, i.e., it is a human community, not a machine for making money.

David Garvin (1993) defined the learning organization as “an organization skilled at creating, acquiring and transferring knowledge and at modifying its behavior to reflect new knowledge and insights” (p.80). He stated that “new ideas are essential for learning to take place and to trigger organization improvement” but they by themselves cannot create a learning organization. Behavior changes should accompany cognitive changes to achieve tangible improvements in results. He further explained that learning organizations are skilled at five main activities: systematic problem solving, experimentation with new approaches, learning from their own experience and history, learning from the experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organization.

Watkins and Marsick (1996) originally defined the learning organization as “one that learns continuously and transforms itself. Learning is a continuous, strategically used process – integrated with and running parallel to work” (p.4). Their proposed learning organization integrated two main organizational constituents: People and Structure. They identified seven distinct but interrelated dimensions of a learning organization at individual, team, and organizational levels. These dimensions are creating continuous learning, promoting inquiry and dialogue, encouraging collaboration and team learning, creating systems to capture and share learning, empowering people to create and share a collective vision, connecting the

organization to the environment and providing strategic leadership for learning. Watkins and Marsick (1996) viewed LO as an organization that has the capacity to integrate people and structure in order to move towards continuous learning and change.

In general, we can define learning organizations as those that have in place systems, mechanisms and processes that are used to continually enhance their capabilities and those who work with it or for it to achieve sustainable objectives, both for themselves and for the communities in which they participate (Gupta & Sharma, 2004).“The essence of organizational learning is the organization’s ability to use the amazing mental capacity of all its members to create the kind of processes that will improve its own” (Dixon, 1994).

Learning organizations are market-oriented, having an entrepreneurial culture as well as a flexible, organic structure, and having facilitative leadership (Gupta & Sharma, 2004).

Gorelick et al. (2004) defined the learning organization as an entity, which increases collective capacity through learning and emphasizes the organization’s behavioral changes because of increased knowledge and skills, as opposed to a focus on individuals’ learning. They stated that in learning organizations, individuals, groups, and teams continuously engage in new processes to capture and use knowledge effectively and claim that learning cannot be separated from performing. According to them, “Learning is the heart of productive activity...the new form of labor” (p.25).They stated that in a LO, performance and learning are so closely intertwined that they are inseparable.

According to Aggestam (2006), organizational learning depends on the collective cognitive processes of individuals since organizational knowledge is knowledge independent of specific members in the organization, e.g. knowledge in knowledge repositories, and knowledge embedded in policies, and routines. Hence, the concept of LO regards the

organization as an entity and focuses on what are the characteristics that encourage its members to learn.

According to Arie de Gues, Shell's Coordinator of Group Planning during the 80s, continuous adaptation and growth in a changing business environment depends on "institutional learning, which is the process whereby management teams change their shared mental models of the company, their markets, and their competitors. For this reason, we think of planning as learning and of corporate planning as institutional learning" (Cited in Senge, 1990, p.8).

2.2.2. History of Learning Organization

In 1978, Chris Argyris and Donald A. Schon, advocated the requirement for continuous learning in organizations in the *Organizational Learning: A Theory of Action Perspective*. Their key concepts revolved around single-loop and double-loop learning where single-loop learning results in the organization continuing in the existing policies while remedying the situation at hand, while double-loop learning examines and modifies norms, policies and objectives as necessary (Marrapodi, 2003). In 1990, Peter Senge popularized the “Learning Organization” with his book *The Fifth Discipline: The Art and Practice of the Learning Organization*. In 1991, Peter Senge founded the Center for Organizational Learning (OLC) at MIT with a mission of fostering collaboration among a group of corporations committed to fundamental organizational change and advancing the state of the art in building learning organizations. In 1997, the Society for Organizational Learning (SoL) was founded as a successor of MIT’s OLC. The SoL’s purpose was to discover, integrate, and implement theories and practices for the interdependent development of people and their institutions. In 1998, Kline published the book *Ten Steps to a Learning Organization* focusing primarily on cultural change. In 1999, Senge, Kleiner, Roberts, Ross, and Smith published *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization* to provide executives systematic guides for building learning organizations. In 2000, David Garvin published the *Learning in Action: A Guide to Putting the Learning Organization to Work* to provide a guideline for transforming the theory of leveraging knowledge into practice.

2.2.3. Characteristics of the Learning Organization

According to Peter Senge (1990), five disciplines are gradually converging to build learning organizations. Each discipline provides a vital dimension in building organizations that can truly "learn" and continually enhance their capacity to realize their highest aspirations. Hence, each discipline is critical to the others' success. For a successful LO, the five disciplines must be mastered at all levels of the organization.

1- Systems thinking (The fifth discipline – the title of the book)

According to Senge (1990) systems thinking is a discipline for seeing wholes, for seeing interrelationships rather than things, for seeing patterns of change rather than static "snapshots." Today, systems thinking is needed more than ever because we are becoming overwhelmed by complexity. Systems thinking is critical because we are living in the "age of interdependence". By enhancing each of the other disciplines, systems thinking continually reminds us that the whole can exceed the sum of its parts.

2- Personal Mastery

Organizations learn only through individuals who learn. Organizational learning cannot occur without individual learning; an organization's commitment to and capacity for learning can be no greater than that of its member. Personal mastery (mastery in context of special level of proficiency) is the discipline of continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively by consistently focusing on the results that matter most deeply. As such, it is an essential cornerstone of the learning organization—the learning organization's spiritual foundation.

3- Mental Models:

Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action. The discipline of working with mental models starts with turning the mirror inward; learning to unearth our internal pictures of the world, to bring them to the surface and hold them rigorously to scrutiny. It also includes the ability to carry on “learningful” conversations that balance inquiry and advocacy, where people expose their own thinking effectively.

4- Building Shared Vision:

Building shared vision is the capacity to hold a shared picture of the future we seek to create. Shared vision binds people together around a common identity and sense of destiny; they foster genuine commitment and enrollment rather than compliance. When there is genuine vision, people excel and learn, not because they are told to, but because they want to.

5- Team Learning

Team learning is the process of aligning and developing the capacities of a team to create the results its members truly desire. The intelligence of the team exceeds the intelligence of the individuals in the team and teams develop extraordinary capacities for coordinated action. The discipline of team learning starts with "dialogue," the capacity of members of a team to suspend assumptions and enter into a genuine "thinking together." Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations. This is where the rubber meets the road; unless teams can learn, the organization cannot learn.

Senge (1990) highlighted the importance of leadership in a LO. According to him, leaders in a LO have three roles: they are designers, teachers, and stewards.

Leaders in LO are “designers” of learning infrastructures that effectively integrate working and learning. They recognize the important need for communication and learning, have the courage and imagination to break the mold and do something very different to meet that need. Moreover, they are open to look critically at what is being achieved and to modify and adjust the approach, using patience and determination to persevere, not expecting to get it all right the first time. Leaders in LO are willing to allow others to continue to evolve the infrastructures to suit their own situations and not to feel the need to control the process.

The second role of leaders in LO is being great teachers who create space for learning and invite people into that space to learn. Robert Greenleaf called these people “servant leaders” to recognize the spirit of these leaders as growers of people.

The third role of leaders in LO is leaders as stewards. In *Servant Leadership*, Greenleaf says that “the servant leader is servant first...It begins with the natural feeling that one wants to serve...Then the conscious choice brings one to aspire to lead. That person is sharply different from one who is leader first, perhaps to assuage an unusual power drive or to acquire material possessions.”

Besides leadership, another important issue Senge (1990) focused on is team learning. In the words of Aris de Geus, “People who need one another to act”, are becoming the key learning unit in organizations. This is so because important decisions are now made in teams, either directly or through the need for teams to translate individual decisions into action. As Senge (1990) stated, “Individual learning, at some level, is irrelevant for organizational

learning. Individuals learn all the time and yet there is no organizational learning. But if teams learn, they become a microcosm for learning throughout the organization” (p.219).

Senge (1990) also stated, “At the end of the day, it is the people who are the drivers of any organizational transformation. Trust & focusing on how people in the organization relate to one another, form the basis of our core theory of success. As the quality of relationships strengthens, the quality of thinking improves. As the members of the team consider more facets of an issue and share a greater number of different perspectives, the quality of their actions improves, which ultimately improves the results we can achieve” (p.280).

According to Senge (1990), team learning is a collective discipline with three critical dimensions, which are the need to think insightfully about complex issues, the need for innovation and coordinated action, and the role of team members on other teams. Furthermore, the discipline of team learning involves mastering the practices of dialogue and discussion, the two distinct ways that teams converse. Team learning illustrates the potential of collaborative learning-that collectively, we can be more insightful, more intelligent than we can possibly be individually. One of the most reliable indicators of a team that is continually learning is the visible conflict of ideas. In great teams, conflict becomes productive. Learning teams learn how to learn together through a shared language for dealing with complexity, without which team learning is limited. As claimed by Senge (1990), team learning is a more human, more productive, and ultimately more creative way for people to work together.

According to Senge (1990), learning organizations develop learning infrastructures in several ways. First, they build learning communities where networks and relationships are based on common aims and shared meaning. Moreover, they create or redefine management roles to support systems thinking and encourage everyone to work with the “other”. Finally,

they establish regular practice fields and invest in technologies for information sharing and enabling working groups to connect with each other more easily.

Furthermore, Senge (1990) emphasized the importance of a shared vision in building a LO. Shared vision is the picture that people carry out throughout the organizations. It creates a sense of commonality that permeates the organization and gives coherence to diverse activities. Shared vision is a force in people's hearts, a force of impressive power. At its simplest level, a shared vision is the answer to the question, "What do we want to create?". Shared vision is vital for the learning organization because it provides the focus and energy for learning. Most importantly, it provides a rudder to keep the learning process on course when stresses develop. The hallmark of a learning organization is not lovely visions floating in space, but a relentless willingness to examine "what is" in light of our vision.

According to David Garvin (1993), the learning organization has five building blocks:

- 1- Systematic problem solving: Relying on scientific method for diagnosing problems (what Deming called the "Plan, Do, Check, Act" cycle) , insisting on data as background for decision making and using statistical tools to organize data and draw inferences since accuracy and precision are essential for learning.
- 2- Experimentation: Systematic searching for and testing of new knowledge. Takes two forms: ongoing programs (series of small experiments) and demonstration projects.
- 3- Learning from past experience: Companies must review their successes and failures, assess them systematically, and record the lessons in a form that employees find open and accessible. They should periodically think about the past and learn from their mistakes.

- 4- Learning from others: Of course, not all learning comes from reflection and self-analysis. Sometimes the most powerful insights come from looking outside one's immediate environment to gain a new perspective. Enthusiastic borrowing is replacing the “not invented here” syndrome. “Benchmarking is an ongoing investigation and learning experience that ensures the best industry practices are uncovered, analyzed, adopted, and implemented.” Benchmarking is one way of gaining an outside perspective; another, equally fertile source of ideas is customers. Conversations with customers invariably stimulate learning; learning organizations cultivate the art of open, attentive learning.
- 5- Transferring knowledge: For learning to be more than a local affair, knowledge must spread quickly and efficiently throughout the organization since ideas carry maximum impact when they are shared broadly rather than held in a few hands. A variety of mechanisms spur this process, including written, oral, and visual reports, site visits and tours, personnel rotation programs, education and training programs, and standardization programs. Personnel rotation programs are one of the most powerful methods of transferring knowledge. Education and training programs are powerful tools for transferring knowledge. But for maximum effectiveness, they must be linked explicitly to implementation. Knowledge is more likely to be transferred effectively when the right incentives, such as strong incentives for information sharing, are in place.

In addition, Garvin (1993) stated that in order to have a successful LO, it is important to foster an environment, which is conducive to learning through opening up boundaries with conferences, meetings, and project teams to ensure a fresh flow of ideas and competing perspectives. Moreover, it is important to train employees in brainstorming, problem solving, evaluating experiments, and other core learning skills and to create learning forums - programs or events designed with explicit forms strategic reviews, system audits, internal benchmarking reports, and study missions to foster learning by requiring employees to wrestle with new knowledge and consider its implications. Garvin (1993) asserted that in a learning organization, there is subtle shift in focus, away from continuous improvement and toward a commitment to learning.

Gorelick et al. (2004) divided the levers of the learning organization according to two interchange media, which they called structuring and sense making. Structuring includes organization structure, norms, roles, technology, leadership, education/training/development, and rewards and recognition (Schwandt, 1997). Gorelick et al. (2004) defined structuring as the process that moves, transfers, retrieves, and captures information and knowledge. Structuring levers, also referred to as enablers or tools are related to communication, networking, management, coordination, and implementing processes and norms that move (disseminate and diffuse) information and knowledge. Dissemination involves formal policies and procedures, while diffusion is accomplished through informal communication networks such as grapevines. On the other hand, Sense making includes shared contexts as mission, objectives and goals, language and symbols, values and assumptions, schema and stories.

Therin (2003) examined the relationship between LO and innovation. He stated that learning means integrating new knowledge or mixing existing knowledge in different ways,

hence learning leads to newness, and thus to innovation. According to him, innovation will be the by-product of a learning organization. Leonard and Straus (1997) highlighted the importance of diversity in a LO hence, they quoted, “If you want an innovative organization, you need to hire, work with, and promote people who make you uncomfortable” (p.117). According to them, creative abrasion (actively managing the process of bringing together a variety of people who think and act in potentially conflicting ways) is a characteristic of the LO. Even though complete homogeneity in an organization's cognitive approach can be very efficient, no matter how brilliant the groups of individuals, their contributions to innovative problem solving are enhanced by coming up against different perspectives. Leonard and Straus (1997) asserted that innovation requires both divergent and convergent thinking, both brainstorming and action plans. Diverse cognitive preferences can cause tremendous tensions in any group, yet innovation requires the cross fertilization of ideas.

Gupta and Sharma (2004) summarized the characteristics of the learning organization as following:

- A learning culture, an organizational climate that nurtures learning.
- Management processes that encourage interaction across boundaries.
- Tools and techniques that aid individual and group learning, such as creativity and problem-solving techniques.
- Skills and motivation to learn and adapt.
- Free exchange and flow of information through in place systems, which ensure that expertise is available where it is needed.
- Extensive networking of individuals who bypass organizational boundaries to develop their knowledge and expertise.

- Commitment to learning and personal development through support from top management, which encourages people at all levels to learn regularly and rewards learning.
- Free time to think and learn (understanding, exploring, reflecting, developing).
- Valuing people by stimulating, making use of and developing ideas, creativity, and “imaginative capabilities”.
- Recognition of diversity as a strength and challenge of views.
- Fostering a climate of openness and trust where individuals are encouraged to develop ideas, to speak out and to challenge actions.
- Learning from experience (since learning from mistakes is often more powerful than learning from success). Toleration of failure, as long as lessons are learned.

In conclusion, the LO which has successful KM is committed to lifelong learning, creating a learning environment, fostering a climate of openness and trust, encouraging free exchange and flow of information, learning & personal development (Young, 2009).

2.3. ORGANIZATIONAL PERFORMANCE

The main interest in examining KM and LO is their expected impact on organizational performance. Therefore, we first define organizational performance (OP) and then attempt to show how KM and LO affect OP.

2.3.1. Definition of Organizational Performance

OP is one of the most important constructs in management research. OP is the ultimate dependent variable of interest for researchers concerned with just about any area of management (Richard, Devinney, Yip & Johnson, 2008).

From a traditional perspective, OP is commonly referred to as financial performance where considerations of budgets, assets, operations, products, services, markets and human resources are crucial in influencing the over-all bottom-line of an organization (Dixon, 1999; Thurbin, 1994; Smith, 1999 – Cited in Snyder, 1996). As such, the financial benefits of organizational performance are often associated with organizational success (Thurbin, 1994). However, performance measurement cannot be done without taking into consideration organizational goals (Rejc, 2002). Since the modern business environment demands a multi-goal orientation neither profit theory (Cyert and March, 1963) nor approaches that only take into account the interests of shareholders (company owners) are valid measures of organizational performance. For a modern company performance assessment, emerging management paradigms are emphasizing a stakeholder perspective, where all stakeholders need to be taken into account (Atkinson et al, 1997; Berman et al, 1999; Harrison and Freeman, 1999; Hillman and Keim, 2001; Sirgy, 2002; Riahi-Belkaoui, 2003; Tangem, 2004).

Due to the significance of various stakeholders, OP should not be solely assessed by financial indicators (Hernaus, Skerlavaj, &Dimovski). Besides financial performance, non-financial performance must be assessed in order to evaluate the overall organizational performance of a modern company.

One of the most popular approaches for OP measurement that encompasses different stakeholder perspectives is the Balanced Scorecard (BSC) approach by Kaplan and Norton (1996). As Kaplan and Norton (1996) stated, "The balanced scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation." The BSC approach includes four perspectives of the organization: Learning and Growth, Business Process, Customer, and Financial perspectives.

- Learning & Growth: measures the “infrastructure that the organization must build to create long-term growth and improvement”. This perspective stresses the importance of investing for the future in three principle objective categories, which are enhancement of employee capabilities, information system capabilities and motivation, empowerment and alignment. It provides the infrastructure to enable ambitious objectives in the other three perspectives to be achieved.
- Internal Business Process: measures the “critical internal processes in which the organization must excel”. This perspective allows the managers to know how well their

business is running and whether its products and services conform to customer requirements.

- Customer: contains measures that “identify the customer and market segments in which the business unit will compete and the measures of the business unit’s performance in these targeted segments”. This perspective has an increased realization of the importance of customer focus and customer satisfaction in any business. Being unable to meet and satisfy customer needs is a leading indicator for decreased financial performance.
- Financial: summarizes “the readily measurable economic consequences of actions already taken”.

Kaplan and Norton (1996) did not underestimate the traditional need for financial data but claimed that emphasis on only financial perspective leads to an "unbalanced" situation with regard to other perspectives. As the strategic map of BSC showed, the objectives in the Learning and Growth perspective support the objectives in the Internal Process Perspective, which in turn support the objectives in the Customer perspectives. Delivering the customer objectives then lead to the achievement of the financial objectives in the Financial perspective. By learning and growing, the organization will be able to better improve its business processes thus will better be able to meet customer needs and therefore financial results should be improved (Knight & Howes, 2003).

Interestingly, companies that really care for all their stakeholders demonstrate better financial performance (Dimovski & Skerlavaj).

Evidently, companies of better financial health have more space to endorse better relationships with employees, customers and suppliers. Those groups of stakeholders are crucial for organizational effectiveness and efficiency in the modern, network economy characterized with high interdependence of business subjects on the global level.

2.3.2. Link between Knowledge Management, Learning Organization and Organizational Performance

Butuza and Illeana (2008) asserted that KM infrastructures are essential to support learning organizations, which embrace KM initiatives in order to become knowledge-based organizations. Moreover, they stated that it is not possible to have a LO without incorporating KM, it is not possible to support the process of organizational learning without KM nor it is possible to have a truly successful KM initiative without incorporating the processes of organizational learning or developing a LO. Hence, a knowledge-based business is also a LO. By proactively implementing KM, companies can re-write the old saying, “Change is inevitable, growth is optional” to “Change is inevitable, growth is *intentional*” (Quast, 2012).

LO aims to improve performance at the individual, team and organizational levels through increasing an organization’s problem solving capability and initiating behavior changes (Buckler, 1998) by integrating learning and working in on-going and systematic fashion (Watkins,1996). KM captures the collective expertise and intelligence in a LO and uses them to foster innovation through continued organizational learning (Nonaka& Takeuchi, 1995; 1995; Quinn et al., 1996; Davenport et al., 1998;Meso& Smith, 2000) (Cited in Saleh & Huang, 2011).

A primary justification for the interest of many researchers in examining LO and KM is their presumed impact on OP. Most researchers agree that the interrelationships of these elements are not simple and linear but involve a number of reciprocal relationships and causal loops; they are complex and cyclical.

From studies that have been conducted to examine the relationship between KM, LO, and OP we find the following as particularly helpful.

Purser and Pasmore (1992), Kogut and Zander (1992), Blackler (1993), and Spender (1993) established a model which suggests that OL processes influence performance indirectly through their effect on organization knowledge (OK). This model suggests that OK is directly related to OP and mediates the relationship between OL and OP. OL activities depend on an organization's current knowledge base for their effectiveness because what an organization knows determines its absorptive capacity to learn new skills and ideas (Chew, Leonard-Barton & Bohn, 1991; Cohen & Levinthal, 1990). Organizations that do not keep up their knowledge base risk being locked out of future learning opportunities (Kogut & Zander, 1992). Many researchers assert that OK is the outcome of learning processes (Blackler, 1993; Cook & Yanow, 1993; Dechant & Marsick, 1993; Duncan & Weiss, 1979; Fiol & Lyles, 1985; Garvin, 1993; Kogut & Zander, 1992; Purser & Pasmore, 1992; Spender, 1993). Hence, OL results in OK, which effects OP positively. OP influences an organization's capacity to support OL processes since they determine the amount of slack resources available for learning processes (Hedberg, 1981; Singh, 1986). Moreover, OP influences both OL and OK by providing feedback on the effectiveness of knowledge assets, which may heighten motivation to improve or to redirect learning activities. OP is affected by organization knowledge because the effectiveness of knowledge components and configurations is determined by their ability to achieve performance outcomes (Collis & Montgomery, 1995; Pentland, 1992).

Other researchers such as Liao and Wu (2009) provided empirical evidence, which supports the perspective that KM affects OP through OL. Their view was adopted also by Su, Huang and Heish (2003), Jerez-Gomez et al. (2005), and Ke and Wei (2006). All these

researchers established a model where KM causes OL and OL is a reaction to KM. They maintained that KM affects OL positively since higher KM capabilities enhance OL and in turn, OL affects OP positively. Hence, in their model OL is the mediating variable between KM and OP (Liao & Wu, 2009).

Dimovski (1994) demonstrated the positive impact of OL on both financial performance (FP) and non-financial performance (NFP), using one-industry research design and stratified sample of 200 credit unions in Ohio. He concluded that the impact of OL on FP and impact of OL on NFP are statistically significant, positive and strong and where FP and NFP do not correlate. In his research, Dimoskvi used two measurement variables for FP construct, which are ROA and value added per employee and 3 measurement variables for NFP construct which are stability of relationships with suppliers, customer complaints and net fluctuation of employees.

Marques and Simon (2006) conducted a research on the effect of KM practices on firm performance on a sample of 222 Spanish companies in the biotechnology and telecommunication industries. The aim of the research was to study the importance of KM as a source of sustainable competitive advantage for firms. The findings showed how the firms that adopted KM practices obtained better results than their competitors stressing the importance of distinctive competences in generating performance improvements. The results concluded that there is a strong and positive relationship between the adoption of KM practices and firm performance. The KM practices used for the study were orientation towards the development, transfer, and protection of knowledge; continuous learning in the organization; understanding of the organization as an overall system; development of an innovative culture to encourage R&D projects; individual based approach; and competence development and management

based on competences. Five measurement variables were used for financial performance construct, which are capital profitability, growth, operational and financial efficiency, stakeholder satisfaction, and competitive position and all of them had statistically significant positive relationship with KM practices.

Crossan and Pabuji (2003) took a different approach in their attempt to explain the relationship between OK and OP. They developed a model of firm motivations, level of knowledge investments and their relationship with OP. Building on Bansal and Roth (2000) and Suchman (1995) their model suggested that firms are motivated by three concerns: legitimacy acquisition, knowledge protection, and competitiveness. Each of these motivations would lead to a different type of KM efforts and to a different performance outcome as explained in the paragraphs below.

In the context of KM, firms that intend to gain legitimacy make investments in technology and employ knowledge managers and/or consult a KM committee (Level I investments) to send a positive signal to the environment. Firms that are motivated by knowledge protection create repositories of explicit knowledge to accumulate, refine, manage and distribute the knowledge with the help of knowledge managers (Level II investments) striving to maintain the existing knowledge of the organization to protect from future uncertainties. These firms believe that KM is important to maintain the status quo and the existing performance level. Finally, firms that are motivated by competitiveness make investments not only in the technology but also in people and processes (Level III investments) since investment in people and processes will facilitate the utilization of knowledge stored in the technology and available with individuals, groups, and the whole organization. In short, firms motivated by competitiveness invest in organizational learning

because they understand the strategic importance of KM and its impact on their long-term profitability. According to Bansal and Roth (2000), the firms that are motivated by competitiveness look for lower costs, better reputation, and highest returns; they are interested in long-term survival through maximization of returns. Crossan and Pabujis' (2003) model assumed that Level I investments will yield little, if any return, Level II investments are expected to yield higher performance, but far less than Level III investments which are expected to provide the greatest performance benefits to firms. The research resulted in concluding that Level III investments (aimed at organizational learning) are positively associated with performance whereas Level II investments and Level I investments are not significantly associated with performance.

Over the past 20 years, strategy researchers have built on the work of economists to propose that organization knowledge -“core competencies” (Prahalad & Hamel, 1990), “distinctive competencies” (Hitt& Ireland, 1985), “invisible assets” (Itami & Roehl, 1987), “core capabilities” (Schoemaker, 1992) - is a major determinant of sustained organization performance. Firms are particularly successful when they focus their learning efforts to develop a number of core competencies that can be leveraged across functions, products, business units, or geographies (Leonard-Barton, 1995; Nonaka&Takeuchi, 1995; Prahalad& Hamel, 1990). Core competencies must also be distinctive and provide a unique value to the market which competitors have difficulty imitating (Collis & Montgomery, 1995; Hitt & Ireland, 1985; Porter, 1985; Stalk et al., 1992). Arguments suggest that OK is most likely to lead to high levels of performance when firms focus their learning efforts in areas that can be leveraged broadly throughout the firm (Hamel &Prahalad, 1994; Leonard-Barton, 1995; Nonaka& Takeuchi, 1995).

Adrew (2001) stated that effective KM should contribute to key aspects of OP through development of capabilities since with greater KM capabilities, firms can obtain and use knowledge more effectively and efficiently resulting in above-normal performance (Snyder, 1996).

There are likely to be time lags between OL efforts and changes in OK and between changes in OK and corresponding improvements in OP (Snyder, 1996). While most people agree that learning leads to improved performance, there are several ways in which learning and performance in organizations can be at odds. First, when organizations take on a new learning challenge, performance often suffers in the short term, because new behaviors or practices are not yet highly skilled. Second, by revealing and analyzing their failures and mistakes (a critical aspect of learning) individuals or work groups may appear to be performing less well than they would otherwise. However, organizational learning is an important factor to achieve high organizational performance (Khandekar and Sharma, 2006) and becoming a LO will lead to high organizational performance since LO engages in ongoing learning (Cited in Tahir, Naeem, Sarfraz, Javed, & Ali, 2011).

In the paragraphs below, we discuss the impacts of KM and LO on OP through the examination of KM and LO benefits.

Gupta and Sharma (2004) stated that properly implemented KM can provide the following benefits to an organization: 1) fewer mistakes, 2) less redundancy, 3) quicker problem-solving, 4) better decision-making, 5) increased worker independence, 6) enhanced customer relations, and 7) improved products and services (p. 207).

Effective KM will greatly contribute to improved excellence, which is to dramatically reduce costs, provide potential to expand and grow, increase value and/or profitability,

improve products and services and increase the speed of response (Why KM – the importance of knowledge management, n.d.)

Moreover, effective KM, especially accelerated knowledge creation, is the driver for innovation since increasingly, products and services are becoming ‘smarter’ and more knowledge based (Why KM – the importance of knowledge management, n.d.). Nonaka (1991) maintained that the knowledge-creating company fuels innovation through creating new knowledge hence recreating the company and its employees in a nonstop process of personal and organizational self-renewal.

Quinn et al. (1996) added that once a company gains knowledge-based competitive edge, it becomes even easier for it to maintain its lead and ever harder for its competition to catch up. Those individuals and organizations that can best sense, become quickly alerted to, find, organize, and apply knowledge, with a much faster response time, will simply leave the competition far behind (Why KM – the importance of knowledge management, n.d.).

Gorelick et al. (2004) highlighted the importance of demonstrating ROI in the early stages of a KM program since the company will adopt KM initiatives that can determine measurable results and financial figures. However, many KM initiatives report intangible benefits, which cannot be converted into a monetary value but are very important in the evaluation process: increased employee satisfaction, increased organizational commitment, improved teamwork, improved customer service, reduced complaints, and reduced conflicts. The greatest measurable Return on Investment (ROI) for KM is in areas of repetitive high spending such as releasing a series of new products where KM can enable cutting the learning curve and releasing a lot of value.

According to Gorelick et al. (2004), capturing and applying best practices and sharing experiences provide a tangible means of using previous successes and failures for future benefit. They are also powerful ways for challenging preconceived notions and mind-sets, and for maintaining an external focus through the development of a culture, which is open to adopt practices from elsewhere those prove to be better than locally accepted practices. All of these will lead to reduction in mistakes, lack of “reinvention of the wheel”, access to best practices within the company and from outside and focus on value added work.

Knight and Howes (2003) have divided the benefits into three categories by emphasizing that a successful KM initiative will focus on building awareness of the importance of knowledge flows at every level of the organization:

- To improve efficiency through cost savings (from reuse rather than reinvention).
- To improve effectiveness through better quality of delivery and improved ability to perceive and meet the needs of customers and through development of a “corporate memory”.
- To increase the level of innovation through developing the ability to recognize, nurture and develop new ideas and approaches and to respond and react to the ever-changing business environment.

Given that most KM benefits are intangible, one of the most useful tools to link up KM initiatives with ultimate strategic benefit objectives is the “Balanced Scorecard” defined by Kaplan and Norton (1996). This tool includes four perspectives, which aim to represent a balanced view of business. The perspectives are:

- Financial: It is very important to demonstrate the cost savings that result from KM initiatives through knowledge reuse (reusing or repurposing existing content).
- Customer: Better knowledge about customers' preferences and behaviors helps the company better meet its customers' needs, which results in improved customer satisfaction leading to more repeat business, lower cost of sales and reduced medium/long-term cost of business with loyal customers. Overall, the organization is more likely to have a stronger financial performance.
- Internal business process: Knowledge and information are used in and produced by business processes. Initial energies should focus on knowledge-intensive processes that actually make the most difference to an organization because the potential for business processes to add value will probably not be realized if knowledge creation, sharing, and reuse are poor within an organization.
- Learning and growth: This perspective is the very essence of knowledge management. It deals with how people obtain information, and whether they have the means and motivation to add meaning to it, act on it, and build value from it.

Knight and Howes (2003) asserted that efforts to improve employees' ability to learn and innovate, and to develop and share knowledge they hold, directly affects their performance and of those around them. This has many positive side effects. People become more flexible as they understand more choices and the "bigger picture". They can better uncover and deal with business process inefficiencies – leading to continuous improvement. Consequently, they are better able to add value to the organization and its customers, as well as increasing their own value in the employee marketplace. They claimed that knowledge management efforts should focus on the learning and growth

perspective, which underpins all the other perspectives, and it is where knowledge management efforts should focus.

According to Knight and Howes (2003), there are five common mobilizing knowledge benefit categories:

- 1- Knowledge and information availability, which focuses on providing increased access to experienced/expert people, skills and training, formal business processes, structures and standards, reference material for professional roles, drivers for customers, suppliers and markets, organizational information, individual and workgroup support and social, human resources and personal information.
- 2- Development of personal competencies, which focuses on reduced time to competence, increased competence profile and increased personal value of people.
- 3- Improvement of internal business processes, which focuses on sharing of best practice knowledge, increasing quality of knowledge resources, managing knowledge resources, increasing individual and workgroup effectiveness and efficiency, increasing capacity and capability to innovate and change, and enhancing customer understanding.
- 4- Improvement of customer and stakeholder satisfaction, which focuses on increasing customer value delivered and maintaining the “right” customer prices.
- 5- Achievement of corporate objectives, which are the ultimate benefits. Ultimately, improvements in financial indicators must be the goal of any KM initiative, which arise from increased customer base, reduced risk/lower cost of business, increased exploitation of intellectual assets, managed headcount, controlled costs, and finally improved profit and increased shareholder value.

Blair (n.d.) maintained that the learning organization enhances organizational performance on the individual, team, and organizational levels:

On the individual level, a learning organization:

- Enhances people development by encouraging its members to improve their personal skills and qualities, to learn and benefit from their own and from others' experiences.
- Provides greater motivation through appreciating employees for their skills, values, and work. This results in greater employee job satisfaction.
- Encourages flexibility of workforce by preparing employees to learn skills and acquire knowledge beyond their specific job requirements. This enables them to appreciate or perform other roles and tasks. Flexibility allows workers to move freely within the organization, whilst at the same time it removes the barriers associated with a rigidly structured company. It also ensures that any individual will be able to cope rapidly with a changing environment.
- Encourages individual creativity by providing its employees room for freethinking and for trying out new ideas without having to worry about mistakes. Employees' creative contribution is recognized and new ideas are free to flourish.
- Improves social interactions and interpersonal communication skills during the learning process.

On the team level, a learning organization:

- Encourages knowledge sharing by enhancing the free flow of information and knowledge within the organization and particularly within teams. Team productivity increases as teams build on each other's strengths.
- Creates interdependency through increasing the awareness that people depend on each other for the completion of their work, allowing team members to know more about each other's roles, needs, and tasks, and improving the relations between people at a personal level.

On the organization level, the learning organization:

- Encourages the breakdown of traditional communication barriers by transforming the old hierarchical communication between manager-worker into a coach-team member scenario where leaders support team members instead of dictating them. As a result, communication between and across all layers of the organization provides a sense of coherence, making each individual a vital part of the system.
- Strengthens customer relations by better understanding customer needs and striving to satisfy customer needs. The learning organization cuts the excess bureaucracy normally involved in customer relations allowing greater contact between the two. Moreover, if customers demand changes, the learning organization can adapt faster and more efficiently to these changes.
- Builds information resources by building up a pool of learning in the form of data repositories and human expertise. These increased resources allow the LO to meet new problems and challenges rapidly.

- Fuels innovation and creativity since employees in every level can make a significant contribution and engage in continual learning. Being innovative and creative allows LO to adapt to changes in the state of the market, technology and competition efficiently.

Bapuji and Crossan (2004) , Pedler et al.(1997), Maqsood and Walker (2007) asserted that the learning organization ensures acquisition and diversification survival and success, increases customer orientation, serves innovation, facilitates IT implementation and organization re-engineering, enhances capability to cope with change, improves quality and raises productivity.

Mchugh et al. (1998) summarized the basic benefits of LO as maintaining levels of innovation, remaining competitive and being better placed to respond to external pressures. Pedler and Borgoyne (1997) summarized the benefits of LO as having the knowledge to link resources to customer needs, improving quality of outputs at all levels, improving corporate image by becoming more people oriented and increasing the pace of change within the organization (Vargas-Hernandez & Noruzi, 2010).

2.4. SUMMARY OF LITERATURE REVIEW

In summary, knowledge management is the process of creating value from one of the organization's key resources, namely knowledge, through organizing and integrating information and technology, culture, people, leadership and processes to ensure the effective utilization of knowledge, enable correct action and promote learning to stimulate performance. Therefore, organizations that have good KM are characterized by having leaders who have a strong passion for KM; a culture of openness and trust where actively managing knowledge is part of everyone's job at all levels of the organization, where knowledge sharing, cooperation, and collaboration are encouraged and rewarded; where most of the work gets done in task-focused teams; processes systematically identify and capture internal knowledge, acquire external knowledge, identify and capture best industry practices, codify, store, transfer, apply and reuse knowledge; and IT infrastructure allows free and easy access to information. Therefore, KM stimulates performance and enables correct action by getting the right knowledge to the right person at the right time.

A learning organization is one that continuously learns and transforms itself not only to adapt to the never-ending changes of the environment but also to continually expand its capacity to create the future. A LO is skilled at implementing knowledge and at modifying its behavior to reflect new knowledge and insights. The LO is characterized by a shared vision; leaders who support continuous learning through designing learning infrastructures, teaching, coaching, and mentoring people; a culture that nurtures learning by promoting inquiry and dialogue; systems that capture and share learning; empowered employees who are proficient at personal mastery; team learning and collaboration; processes that continuously examine

deeply engrained assumptions; and systems thinking through seeing wholes, interrelationships and connection of the organization with the environment. A LO is characterized by systematic problem solving, experimentation and continuous innovation, learning from experience and mistakes, learning from others, and efficient knowledge transfer throughout the organization. Thus, by continually redesigning themselves as learning organizations, organizations can sustain competitive advantage and perform better.

Literature review shows that organizations that do have knowledge management and are learning organizations perform better in the sense that they have enhanced decision making, improved organizational efficiency and effectiveness, rapid development of new and existing products, enhanced customer satisfaction, improved shareholder value, enhanced employee satisfaction, flexible workforce, breakdown of communication barriers, increased knowledge sharing and social interaction, fueled innovation and creativity and enhanced corporate image.

CHAPTER THREE

RESEARCH FRAMEWORK AND METHODOLOGY

3.1. RESEARCH QUESTIONS

Reflecting the literature review, the research questions were clarified as follows:

- 1- Whether knowledge management and organizational learning practices impact organizational performance in terms of enhancement of decision making process, increase in organizational effectiveness and efficiency, fueling innovation, enhancement of customer satisfaction, development of employee personal competencies and skills, increase in employee motivation and satisfaction, increase in workforce flexibility and breakdown of communication barriers.
- 2- Whether knowledge management and organizational learning practices and organizational performance differ in higher-rated and lower-rated organizations
- 3- Whether knowledge management and organizational learning practices and organizational performance differ among the five selected industries.

3.2. HYPOTHESES

First set of hypotheses:

Hypothesis 1.1: Knowledge management and organizational learning practices are positively related to the decision making process.

Hypothesis 1.2: Knowledge management and organizational learning practices are positively related to organizational effectiveness and efficiency.

Hypothesis 1.3: Knowledge management and organizational learning practices are positively related to innovation.

Hypothesis 1.4: Knowledge management and organizational learning practices are positively related to customer satisfaction.

Hypothesis 1.5: Knowledge management and organizational learning practices are positively related to employee personal competencies and skills.

Hypothesis 1.6: Knowledge management and organizational learning practices are positively related to employee motivation and satisfaction.

Hypothesis 1.7: Knowledge management and organizational learning practices are positively related to workforce flexibility.

Hypothesis 1.8: Knowledge management and organizational learning practices are positively related to breakdown of communication barriers.

Second set of hypotheses:

Hypothesis 2.1 Knowledge management and organizational learning practices are different in higher-rated and lower-rated organizations.

Hypothesis 2.1.1 Consideration of knowledge as a strategic asset (KM1) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.2 Processes to capture, codify, store, retrieve, use, and reuse knowledge (KM2) are different in higher-rated and lower-rated organizations.

Hypothesis 2.1.3 Leadership with strong passion for knowledge management (KM3) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.4 Teamwork, collaboration, and cooperation being part of work processes (KM4) are different in higher-rated and lower-rated organizations.

Hypothesis 2.1.5 Leadership facilitating and rewarding teamwork and team decision-making (KM5) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.6 Individual responsibility for communications (KM6) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.7 Free access to company information (KM7) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.8 Extensive use of After Action Review (KM8) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.9 User friendly IT software (KM9) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.10 Benchmarking industry best practices (KM10) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.11 Efficient knowledge transfer (KM12) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.12 Investment in knowledge management technology, people, and processes (KM13) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.13 Implementation of different knowledge management technologies (KM32) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.14 Constant conversations with customers (LO11) are different in higher-rated and lower-rated organizations.

Hypothesis 2.1.15 Shared vision (LO14) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.16 Systematic problem solving (LO15) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.17 Learning from history, experiences and mistakes (LO16) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.18 Continuous learning (LO17) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.19 Employee empowerment (LO18) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.20 Leaders sharing up to date information with employees (LO19) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.21 Leaders as designers, teachers, and stewards (LO20) are different in higher-rated and lower-rated organizations.

Hypothesis 2.1.22 Culture which nurtures learning through multi-way communications (LO21) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.23 Easy identification of expertise availability (LO22) is different in higher-rated and lower-rated organizations.

Hypothesis 2.1.24 Diversity recognized as strength (LO23) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2 Organizational Performance is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.1 Decision making process (OP1) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.2 Organizational effectiveness and efficiency (OP2) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.3 Innovation (OP3) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.4 Customer satisfaction (OP4) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.5 Employee personal competencies and skills (OP5) are different in higher-rated and lower-rated organizations.

Hypothesis 2.2.6 Employee motivation and satisfaction (OP6) are different in higher-rated and lower-rated organizations.

Hypothesis 2.2.7 Workforce flexibility (OP7) is different in higher-rated and lower-rated organizations.

Hypothesis 2.2.8 Breakdown of communication barriers (OP8) is different in higher-rated and lower-rated organizations

Third set of hypotheses:

Hypothesis 3.1 Knowledge management and organizational learning practices differ among the five selected industries.

Hypothesis 3.2 Organizational performance differs among the five selected industries.

3.3 . METHODOLOGY

3.3.1. Instrument

The survey questionnaire, attached as an appendix, was used as the main data-collection instrument for gathering the data used in the statistical analyses. The questionnaire is composed of 32 statements, which aim to explore the knowledge management and organizational learning practices of Lebanese organizations and to see whether these practices affect various aspects of organizational performance.

Based on the literature review, the formation of the questionnaire was based on three sections: Knowledge Management Practices, Organizational Learning Practices, and Organizational Performance Dimensions. The three sections were refined separately and integrated into one questionnaire (Please refer to Figure 2 below).

The questionnaire was structured using a five-point Likert scale where respondents were asked to indicate their level of agreement with the implementation of each of the practices according to the following scale: Strongly Disagree-Disagree-Neutral-Agree-Strongly Agree.

In order to test the clarity of the questions used in this research study, a face-to-face pilot study was conducted with two managers who provided their feedback about the formulation of questions, their wording, and on the length of the questionnaire. After lengthy and extensive testing of all the questions, the questionnaire was revised based on the recommendations and suggestions of the managers by changing the sentence structure for the organizational performance questions and by striving to reduce the length of the questionnaire as much as

possible. The length of some questions was not reduced due to the necessary explanatory characteristics of the statements.

The questionnaire did not contain any questions on demographics since they do not add to the research in a significant way.

Survey Questionnaire	No. of Item	Total No. of Items
Knowledge Management Practices		13
Consideration of knowledge as a strategic asset	1	
Processes to capture, codify, store, retrieve, use and reuse knowledge	2	
Leadership with strong passion for knowledge management	3	
Teamwork, collaboration and cooperation part of work processes	4	
Leadership facilitating and rewarding team work and team decision making	5	
Individual responsibility for communications	6	
Free access to company information	7	
Extensive use of After Action Review	8	
User friendly IT software	9	
Benchmarking industry best practices	10	
Efficient knowledge transfer	12	
Investment in KM technology, people and processes	13	
Implementation of different KM Information Technologies	32	
Learning Organization Practices		11
Constant conversations with customers	11	
Shared vision	14	
Systematic problem solving	15	
Learning from history, experiences, and mistakes	16	
Use of knowledge and actionable advice for continuous learning	17	
Employee empowerment	18	
Leaders sharing up to date information with employees	19	
Leaders as designers, teachers and stewards	20	
Culture which nurtures learning through multi-way communications	21	
Easy identification of expertise availability	22	
Diversity recognized as strength	23	

Survey Questionnaire	No. of Item	Total No. of Items
Organizational Performance Dimensions		8
Decision making process	24	
Organizational effectiveness and efficiency	25	
Innovation	26	
Customer satisfaction	27	
Employee personal competencies and skills	28	
Employee motivation and satisfaction	29	
Workforce flexibility	30	
Breakdown of communication barriers	31	
Total No. of Items		32

Figure 2: Detailed Specification of Instrument Items

3.3.2. Sample size

Since multiple regression analysis was to be used for testing the hypothesis that knowledge management and learning organization practices affect organizational performance, the number of observations to each independent variable should not fall below five to avoid the risk of over fitting, i.e. making the results specific to the sample, thus lacking generalizability (Bartlett, Kotrlik, and Higgins, 2001).

Moreover, since factor analysis was to be used to detect the structure of variables, a researcher cannot factor analyze a sample of fewer than 50 observations and preferably the sample size should be 100 or larger to provide an adequate basis for the calculation of the correlations between variables. As Hair, Black, Babin, Anderson, and Tatham (2006) recommend, we should have at least five times as many observations as the number of independent variables.

In this study, 13 items were used for knowledge management practices and 11 items were used for organizational learning practices producing a total of 24 items. Hence, the corresponding number of observations on the basis of 5:1 ratio is 120 (24 x 5).

Therefore 120 was defined to be the appropriate sample size for carrying out both multiple regression and factor analysis. However, 10% was added to count for non-responses making the sample size 132. For simplicity of calculations, the sample size was rounded to 130 organizations.

3.3.3. Industry selection

The 130 organizations were chosen from five industries where proficient management of intangibles is indispensable for business success. The five industries chosen are the following:

1. **Architecture, Engineering, & Construction:** The AEC industry is a knowledge intensive field, which encompasses heterogeneous expertise from multiple fields and diverse occupational groups. This industry is characterized by significant heterogeneity of the forms of mobilized knowledge (Svetel & Pejanovic, 2010).
2. **Advertising services:** Advertising services are considered from the main Knowledge Intensive Business Services (KIBS) and have a key role in facilitating innovation and knowledge transfer in the knowledge based economy (Andersen et al. 2000, Miles et al. 1995, & Antonelli, 1999) (Cited in Roberts, 2000).
3. **Pharmaceutical:** The OECD used the International Standard Industrial Classification (ISIC) to define Pharmaceuticals as a high-technology industry (ISIC 2423) which needs knowledge management (Organization for Economic Co-operation and Development [OECD], 2001).
4. **Consulting services:** Consultants play a key role in knowledge development, circulation, and implementation in organizations. Consultants are knowledge workers; they are carriers and developers of knowledge and knowledge management and learning organization platforms have the capabilities to tap the tacit knowledge of the consultants and provide them with all they need to be productive.
5. **Real Estate services:** The European Commission categorizes real estate activities as knowledge-intensive market services. Samuells (2001) stated that real estate groups are

knowledge intensive organizations where there is a need to put knowledge management to work due to the need for real-time access to market knowledge, information on the core business and conditions affecting it, current objectives of business units and corresponding real estate requirements, and the latest thinking in approaches to real estate (Filstad & Gottschalk, 2009).

3.3.4. Sample Selection

Stratified random sampling was used for the sample selection since the population of this study was divided into two strata: higher-rated and lower-rated organizations based on the rating of the Chamber of Commerce, Industry and Agriculture in Lebanon (CCIA).

Based on the listing of the CCIA, the registered organizations with “Excellent” and “First” categorization were combined to define the first subpopulation, that is, the higher-rated organizations while the registered organizations with “Second” and “Third” categorization were combined to define the second subpopulation, that is, the lower-rated organizations.

The total number of the registered organizations was counted and the number of organizations in each subpopulation was totaled. The higher-rated organizations accounted for 28% and lower-rated organizations accounted for 72% of the total number of registered organizations. Hence, out of the 130 organizations, 36 organizations were selected from the first subpopulation and 94 organizations were selected from the second subpopulation proportionate to the number of the organizations in each industry.

3.3.5. Survey Participants

The questionnaire was addressed to the Chief Executive Officer (CEO) or General (GM) of the organization due to the necessity to have a strategic and interdisciplinary perspective on the company in question. The GM or CEO is most likely aware of all aspects of the business and has a consolidated view of the organization's interdependent functional departments. In an executive leadership-training seminar, attended by my colleague, who is the Business Development Manager of our company, the ROLE of the top executive was defined as the person who Represents the company, Overviews its business operations, Learns and disseminates information, and Executes strategy. Hence, we see that learning is a major part of the executive's role.

3.3.6. Survey Administration

The survey administration period was three weeks during which the questionnaires were sent through emails and reminder emails and frequent phone calls were made.

3.3.7. Response Rate

As explained in section 3.3.2 Sample Size, it was deemed appropriate to distribute a total of 130 questionnaires, of which 102 were filled and returned, reflecting a response rate of 78%.

	Questionnaires Distributed	Questionnaires Returned
Higher rated organizations	36	32
Lower rated organizations	94	70
Total	130	102

3.3.8. Ethical Considerations

During the administration of the survey, certain ethical issues were taken into consideration. Among these were the respondents' right to anonymity and the right to confidentiality of shared information. As addressed in the face sheet of the survey questionnaire, the respondents were not required to disclose any personal information, to identify themselves or their organizations. Moreover, the data collected from the survey was promised to remain strictly confidential and to be reported in the thesis anonymously. Finally, the right to informed and voluntary consent were addressed by clarifying the purpose of the survey questionnaire which was explained as exploring the knowledge management and learning practices of Lebanese organizations.

CHAPTER FOUR STATISTICAL ANALYSES

4.1. DESCRIPTIVE STATISTICS

To facilitate the display and interpretation of data descriptive statistics were computed from the responses obtained.

Descriptive Statistics of Instrument Items

Knowledge Management Practices		Mean	S. D
KM1	Consideration of knowledge as a strategic asset	4.47	.592
KM4	Teamwork, collaboration and cooperation part of work routine	4.28	.723
KM3	Leadership with strong passion for KM	4.04	.688
KM32	Implementation of different KM Information Technologies	3.91	1.824
KM8	Extensive use of After Action Review	3.89	.911
KM5	Leadership facilitating and rewarding team work and team decision making	3.86	.912
KM2	Processes to capture ,codify, store, retrieve, use and reuse knowledge	3.81	.767
KM6	Individual responsibility for communications	3.75	.841
KM9	User friendly IT software	3.69	.783
KM12	Efficient knowledge transfer	3.68	.834
KM13	Investment in KM technology, people and processes	3.61	.987
KM10	Benchmarking industry best practices	3.38	1.090
KM7	Free access to company information	2.89	1.168
Total for Knowledge Management Practices		3.79	0.93

Organizational Learning Practices		Mean	S. D
LO20	Leaders as designers, teachers and stewards	4.02	.856
LO14	Shared vision	4.01	.790
LO11	Constant conversations with customers	4.01	.906
LO23	Diversity recognized as strength	3.93	.915
LO17	Continuous learning	3.76	.811
LO22	Easy identification of expertise availability	3.75	.713
LO16	Learning from history, experiences and mistakes	3.74	.889
LO15	Systematic problem solving	3.69	.985
LO19	Leaders sharing up to date information with employees	3.51	.972
LO21	Culture which nurtures learning through multi-way communications	3.46	.817
LO18	Employee empowerment	2.93	.978
Total for Organizational Learning Practices		3.71	0.88

Descriptive Statistics of Instrument Items

Organizational Performance Dimensions		Mean	S. D
OP1	Enhancement of the decision making process	4.30	.541
OP6	Increase in employee motivation and satisfaction	4.24	.720
OP4	Enhancement of customer satisfaction	4.21	.800
OP2	Increase in organizational effectiveness and efficiency	4.07	.707
OP5	Development of employee personal competencies and skills	4.04	.644
OP3	Fuel innovation	3.73	.858
OP7	Increase in workforce flexibility	3.72	.958
OP8	Breakdown of communication barriers	3.71	.851
Total for Organizational Performance Dimensions		4.00	0.76

Among the KM practices, KM1 (Consideration of knowledge as a strategic asset) has the highest score (4.47) with the lowest standard deviation (0.592). KM7 (Free access to company information) has the lowest score (2.89).

Among the OL practices, LO20 (Leaders as teachers, designers and stewards) has the highest score (4.02). In addition LO20, LO11 (Constant conversation with customers) and LO14 (Shared vision) have high scores (4.01 both). LO18 (employee empowerment) has the lowest score (2.93).

Among the OP dimensions, OP1 (Enhancement of the decision making process) has the highest score (4.3) and OP8 (Breakdown of communication barriers) has the lowest score (3.71).

4.2. RELIABILITY TESTS

Cronbach's alpha (α), also known as the coefficient of reliability, was used to estimate the internal consistency of the scale since it is most commonly used when we have multiple Likert questions in a questionnaire that form a scale and we wish to determine if the scale is reliable. Cronbach's alpha measures the extent to which a set of items are related to each other. Hence, Cronbach's alpha increases as the inter-correlations among the items increase. The generally agreed upon lower limit for Cronbach's alpha is 0.70.

The Cronbach's alphas for all the variables of this study were computed using SPSS, Version 20. First, the reliability of all the independent variables was tested. The Case Processing Summary and the Reliability Statistics of the 24 independent variables are shown respectively in the tables below:

		N	%
Cases	Valid	102	100.0
	Excluded ^a	0	.0
	Total	102	100.0

a. Listwise deletion based on all variables in the procedure.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.898	.903	24

The Cronbach's alpha is 0.898, which indicates a high level of internal consistency for our scale.

Since the questionnaire included three sets of questions, knowledge management practices, organizational learning practices and organizational performance, there was a chance that Cronbach's alpha would not be able to distinguish among them. Hence, reliability analysis was performed on each set of questions.

Cronbach's alpha for the Knowledge Management practices was calculated to test the internal consistency of these practices.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.840	.855	13

The Cronbach's alpha for KM practices is 0.840, which indicates a high level of internal consistency for the KM construct.

The "Corrected Item-Total Correlation" displays the correlation between a given item and the sum score of the other items assessing how well one item's score is internally consistent with composite scores from all other items. De Vaus (2004) suggests that any item-total correlation less than .30 is weak for item-analysis purposes and the item should be removed from the study.

The "Cronbach's Alpha if item Deleted" displays Cronbach's alpha that would result if a given item is deleted. Like the item-total correlation, it determines which items from among a set of items contribute to the total alpha. As long as the value for the "Cronbach's Alpha if item Deleted" is lower than Cronbach's alpha, there is no tendency to remove the item.

Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KM1	.411	.836
KM2	.499	.830
KM3	.375	.837
KM4	.519	.829
KM5	.480	.830
KM6	.596	.823
KM7	.445	.834
KM8	.501	.829
KM9	.575	.825
KM10	.479	.830
KM12	.591	.824
KM13	.570	.824
KM32	.612	.832

Since all the corrected item-total correlations of KM practices are above 0.30 and since the removal of any item results in a lower Cronbach's alpha, none of the KM practices items are removed from the study.

Similarly, Cronbach's alpha for the Organizational Learning practices was calculated to test the internal consistency of these practices.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.813	.814	11

The Cronbach's alpha for OL practices is 0.813, which indicates a high level of internal consistency for the OL construct.

The Item-Total Statistics of the KM practices are shown in the table below:

Item-Total Statistics		
	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LO11	.384	.807
LO14	.372	.807
LO15	.442	.802
LO16	.563	.789
LO17	.420	.803
LO18	.661	.777
LO19	.433	.803
LO20	.506	.795
LO21	.419	.803
LO22	.542	.793
LO23	.512	.794

Since all the corrected item-total correlations of OL practices are above 0.30 and since the removal of any item results in a lower Cronbach's alpha, none of the OL practices items are removed from the study.

Finally, reliability analysis was also performed on Organizational Performance. The SPSS output is shown below.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.794	.791	8

The Cronbach's alpha is 0.794, which indicates a high level of internal consistency for our scale.

The Item-Total Statistics for the eight dependent variables, which represent Organizational Performance, are shown below.

Item-Total Statistics		
	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OP1	.305	.796
OP2	.474	.775
OP3	.521	.768
OP4	.576	.758
OP5	.542	.767
OP6	.463	.776
OP7	.579	.759
OP8	.553	.762

Removal of any item, except OP1, results in a lower Cronbach's alpha. However, since the removal of OP1 leads to a very small improvement in alpha (0.796 instead of 0.794) and since all the corrected item-total correlations of OP are above 0.30, none of the items are removed from the study.

4.3. FACTOR ANALYSES

Hair et al. (2006) stated, “Factor analysis is an interdependence technique whose primary purpose is to define the underlying structure among the variables in the analysis” (p. 104). Factor analysis provides the tools for analyzing the structure of the interrelationships (correlations) among a large number of variables by defining sets of variables that are highly correlated, known as factors. In other words, it identifies the broader evaluative dimensions, which are composites of specific items that are highly correlated.

In this study, exploratory factor analysis was used to test construct validity, that is, the extent to which a measure or set of measures correctly represents the concept of the study.

To determine the appropriateness of factor analysis the entire correlation matrix was examined using the Bartlett Test of Sphericity and Kaiser-Myer-Olkin Measure of Sampling Adequacy (KMO MSA).

The Bartlett Test of Sphericity tests the overall significance of all correlations within a correlation matrix. It examines the hypothesis that the variables are uncorrelated in the population, that is, the population correlation matrix is an identity matrix; each variable correlates perfectly with itself ($r = 1$) but has no correlation with the other variables ($r = 0$).

If the Bartlett’s Test of Sphericity is significant, that is, less than alpha (0.05) the null hypothesis (the correlation matrix is an identity matrix) will be rejected and factor analysis can be conducted on the study.

Kaiser-Myer-Olkin Measure of Sampling Adequacy (KMO MSA) is used to quantify the degree of inter-correlations among the variables. The KMO MSA ranges from 0 to 1 reaching 1 when each variable is perfectly predicted without error by the other variables. The researcher should always have a measure of sampling adequacy above 0.50 before proceeding with the factor analysis.

Communality is the total amount of variance an original variable shares with all other variables included in the analysis. It is the estimate of the variable's shared (common) variance among the variables as represented by the derived factors. The size of the communality is a useful index for assessing how much variance in a particular variable is accounted for by the factor solution. Higher communality values indicate that a large amount of the variance in a variable has been extracted by the factor analysis. Small communalities show that a substantial portion of the variable's variance is not accounted for by the factors. The factor should explain at least half of each original variable's variance, so the communality for each variable should be 0.50 or higher.

Factor analysis was performed on the KM practices, OL practices, and OP respectively.

1. Factor Analysis on Knowledge Management practices:

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.834
Approx. Chi-Square		431.871
Bartlett's Test of Sphericity	Df	78
	Sig.	.000

The KMO for KM practices is 0.834 which is greater than 0.50 and the Bartlett's Test of Sphericity is 0.000 which is less than 0.05 so it is significant. Based on the tests' results it is satisfactory to proceed with the factor analysis on KM practices.

Principal component analysis was performed on the KM practices to summarize the total variance in a minimum number of factors.

The communalities of the variables for KM practices are shown below. None of the variables are removed from the factor analysis since all of them have a communality greater than 0.50.

Communalities

	Initial	Extraction
KM1	1.000	.602
KM2	1.000	.671
KM3	1.000	.737
KM4	1.000	.617
KM5	1.000	.534
KM6	1.000	.554
KM7	1.000	.841
KM8	1.000	.746
KM9	1.000	.660
KM10	1.000	.510
KM12	1.000	.549
KM13	1.000	.766
KM32	1.000	.655

Extraction Method: Principal
Component Analysis.

The latent root criterion was used to define the number of factors extracted. The rationale is that any individual factor should account for the variance of at least one variable and since with component analysis each variable contributes a value of 1 to the total eigenvalue only the factors having latent roots or eigenvalues greater than 1 are considered significant.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
				Loadings			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.798	36.911	36.911	4.798	36.911	36.911	2.349	18.066	18.066
2	1.525	11.729	48.640	1.525	11.729	48.640	2.251	17.319	35.385
3	1.111	8.545	57.185	1.111	8.545	57.185	2.117	16.288	51.673
4	1.009	7.760	64.945	1.009	7.760	64.945	1.725	13.272	64.945
5	.814	6.259	71.203						
6	.700	5.388	76.591						
7	.659	5.067	81.658						
8	.517	3.976	85.635						
9	.438	3.370	89.005						
10	.410	3.154	92.159						
11	.377	2.899	95.058						
12	.348	2.678	97.735						
13	.294	2.265	100.000						

Extraction Method: Principal Component Analysis.

With reference to the above “Total Variance Explained” table and based on the latent root criterion, four factors are extracted for the KM practices accounting for 64.945% of the total variance.

The rotated component matrix makes the interpretation of the factor analysis easier showing the factor loadings of the variables on the extracted components. The factor loadings represent the correlation of each variable and the factor. Loadings indicate the degree of correspondence between the variable and the factor, with higher loadings making the variable representative of the factor. Factor loadings interpret the role each variable plays in defining each factor. Factor loadings of 0.50 and above are necessary for practical significance. The table below shows the four factor structure of KM practices based on the rotated component matrix.

Four Factor Rotated Structure of Knowledge Management Practices

Item #	Label	Factor 1	Factor 2	Factor 3	Factor 4
KM8	Extensive use of After Action Review	0.837			
KM4	Teamwork, collaboration, and cooperation part of work processes	0.668			
KM10	Benchmarking industry best practices	0.570			
KM12	Efficient knowledge transfer	0.535			
KM13	Investment in knowledge management technology, people and processes		0.842		
KM2	Processes to capture, codify, store, retrieve, use, and reuse knowledge		0.690		
KM6	Individual responsibility for communications		0.510		
KM3	Leadership with strong passion for knowledge management			0.844	
KM5	Leadership facilitating and rewarding teamwork and team decision making			0.653	
KM1	Consideration of knowledge as a strategic asset			0.599	
KM7	Free access to company information				0.891
KM32	Implementation of different KM Information Technologies				0.583
KM9	User friendly IT software				0.513
Eigenvalues		2.349	2.251	2.117	1.725
Percentage of variance explained		18.066%	17.319%	16.288%	13.272%
KMO Measure of Sampling Adequacy				0.834	
Bartlett's Test of Sphericity				0.000	

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization.

**Factor loadings less than 0.50 are not shown and variables are sorted by highest loading.*

Based on an in-depth understanding and analyses of knowledge management literature, the four factors are identified as:

Factor 1 as Knowledge Management Processes.

Factor 2 as Knowledge Management Strategy.

Factor 3 as Knowledge Management Leadership.

Factor 4 as Knowledge Management Information Technology.

2. Factor analysis on Organizational Learning practices:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.801
Approx. Chi-Square		295.300
Bartlett's Test of Sphericity	Df	55
	Sig.	.000

The KMO for OL practices is 0.801 which is greater than 0.50 and the Bartlett's Test of Sphericity is 0.000 which is less than 0.05 so it is significant. Based on the tests' results it is satisfactory to proceed with the factor analysis on OL practices. All communalities are greater than 0.50 therefore none of the variables are removed from the factor analysis.

Communalities

	Initial	Extraction
LO11	1.000	.759
LO14	1.000	.730
LO15	1.000	.660
LO16	1.000	.609
LO17	1.000	.655
LO18	1.000	.744
LO19	1.000	.742
LO20	1.000	.591
LO21	1.000	.589
LO22	1.000	.616
LO23	1.000	.674

Extraction Method: Principal

Component Analysis.

With reference to the “Total Variance Explained” table below and based on latent root criterion, four factors are extracted, accounting for 67.003% of the total variance.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.902	35.474	35.474	3.902	35.474	35.474	2.241	20.371	20.371
2	1.253	11.391	46.864	1.253	11.391	46.864	1.837	16.701	37.071
3	1.124	10.222	57.086	1.124	10.222	57.086	1.754	15.947	53.019
4	1.091	9.917	67.003	1.091	9.917	67.003	1.538	13.985	67.003
5	.705	6.407	73.411						
6	.665	6.041	79.452						
7	.603	5.482	84.934						
8	.504	4.579	89.514						
9	.458	4.163	93.677						
10	.379	3.444	97.121						
11	.317	2.879	100.000						

Extraction Method: Principal Component Analysis.

The table below shows the four factor structure of OL practices based on the rotated component matrix.

Four Factor Rotated Structure of Organizational Learning Practices

Item #	Label	Factor 1	Factor 2	Factor 3	Factor 4
LO15	Systematic problem solving	.755			
LO23	Diversity recognized as strength	.751			
LO16	Learning from history, experiences, and mistakes	.613			
LO18	Employee empowerment	.599			
LO19	Leaders sharing up to date information with employees		.827		
LO17	Use of knowledge and actionable advice for continuous learning		.780		
LO11	Constant conversations with customers			.792	
LO22	Easy identification of expertise availability			.665	
LO21	Culture which nurtures learning through multi-way communications			.616	
LO14	Shared vision				.833
LO20	Leaders as designers, teachers and stewards				.618
Eigenvalues		2.241	1.837	1.754	1.538
Percentage of variance explained		20.371%	16.701%	15.947%	13.985%
KMO Measure of Sampling Adequacy			0.801		
Bartlett's Test of Sphericity			0.000		

Extraction Method: Principal Component Analysis
 Rotation Method: Varimax with Kaiser Normalization.

**Factor loadings less than 0.50 are not shown and variables are sorted by highest loading.*

Again, based on comprehensive understanding of organizational learning literature, the four factorize summarize the following concepts:

Factor 1 summarizes the Facilitative Framework of Learning

Factor 2 summarizes Information, Knowledge, and Advice for Continuous Learning

Factor 3 summarizes Multi-way communications in a culture that nurtures learning

Factor 4 summarizes Leadership with Shared Vision and Stewardship

3. Factor analysis on Organizational Performance.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.782
Approx. Chi-Square		214.389
Bartlett's Test of Sphericity	Df	28
	Sig.	.000

The KMO for OP is 0.782 which is greater than 0.50 and the Bartlett's Test of Sphericity is 0.000 which is less than 0.05 so it is significant. Based on the tests' results it is satisfactory to proceed with the factor analysis on OP.

	Initial	Extraction
OP1	1.000	.356
OP2	1.000	.735
OP3	1.000	.617
OP4	1.000	.558
OP5	1.000	.465
OP6	1.000	.557
OP7	1.000	.704
OP8	1.000	.483

Extraction Method: Principal

Component Analysis.

Three variables (OP1, OP5, OP8) have communalities below 0.50 hence we have a tendency to remove these three variables.

To make sure that the removal of any variable is the right decision, multiple regression (explained in the next section) was run on each of the three variables (regressed against all the independent variables). The test discovered violation of the assumption of normal distribution of the error term for OP1 and OP5 since the Normal P-Plot is not aligned with the 45 degree slope. The lg10 transformation failed to transform the error term of these variables into

normally distributed. Hence, these variables (OP1 and OP5) were removed from further analyses.

For OP8, there is no violation of the assumption of normal distribution of the error term and since the extracted communality is 0.483 which is very close to 0.5 and the rotated communality is greater than 0.50, this variable is retained.

Factor analysis was re-performed on the six variables (OP2, OP3, OP4, OP6, OP7, OP8)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.733
Approx. Chi-Square		161.194
Bartlett's Test of Sphericity	Df	15
	Sig.	.000

The KMO for OP (with six variables) is 0.733 which is greater than 0.50 and the Bartlett's Test of Sphericity is 0.000 which is less than 0.05 so it is significant. Based on the tests' results it is satisfactory to proceed with the factor analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.801	46.684	46.684	2.801	46.684	46.684	2.030	33.835	33.835
2	1.125	18.752	65.436	1.125	18.752	65.436	1.896	31.601	65.436
3	.758	12.633	78.069						
4	.538	8.975	87.044						
5	.413	6.881	93.924						
6	.365	6.076	100.000						

Extraction Method: Principal Component Analysis.

As shown in the "Total Variance Table" table above and based on the latent root criterion, two factors are extracted, accounting for 65.436 % of the total variance.

The table below shows the two factor structure of Organizational Performance based on the rotated component matrix.

Two Factor Rotated Structure of Organizational Performance

Item #	Label	Factor 1	Factor 2
OP2	Increase in organizational effectiveness and efficiency	0.857	
OP3	Fueling innovation	0.770	
OP4	Enhancement of customer satisfaction	0.643	
OP7	Increase in workforce flexibility		0.852
OP6	Increase in employee motivation and satisfaction		0.835
OP8	Breakdown of communication barriers		0.510
Eigenvalues		2.030	1.896
Percentage of variance explained		33.835%	31.601%
KMO Measure of Sampling Adequacy		0.733	
Bartlett's Test of Sphericity		0	
Extraction Method: Principal Component Analysis			
Rotation Method: Varimax with Kaiser Normalization.			

The table above shows that the items of Factor 2 lead to the achievement of the organizational performance dimensions of Factor 1, hence we conclude that:

Factor 1 summarizes the Consequential Components of Organizational Performance.

Factor 2 summarizes the Foundational Components of Organizational Performance.

4.4. MULTIPLE REGRESSION ANALYSES

Due to the large number of the independent variables, *multiple regression with stepwise method* was used to find the most parsimonious set of predictors that are most effective in predicting the dependent variable. Stepwise is the method of selecting variables for inclusion in the regression model that starts by selecting the best predictor of the dependent variable. The independent variable with the greatest contribution to the regression model is added first. Additional independent variables are selected in terms of the incremental exploratory power they can add to the regression model. Independent variables are added as long as their partial correlation coefficients are statistically significant. Independent variables may also be dropped if their predictive power drops to a non-significant level when another independent variable is added to the model.

Variables are added to the regression equation one at a time, using the statistical criterion of maximizing the R^2 of the included variables. When none of the possible addition can make a statistically significant improvement in R^2 , the analysis stops.

In stepwise multiple regression, the independent variables are entered according to their statistical contribution in explaining the variance in the dependent variable.

Since variables will not be added to the regression equation unless they make a statistically significant addition to the analysis, all of the independent variables selected for inclusion will have a statistically significant relationship with the dependent variable.

While multicollinearity for all variables can be examined, it is only a problem for the variables not included in the analysis. If a variable is included in the stepwise analysis, it will not have a collinear relationship.

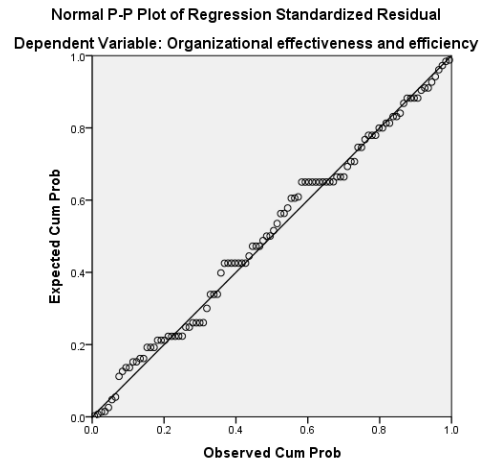
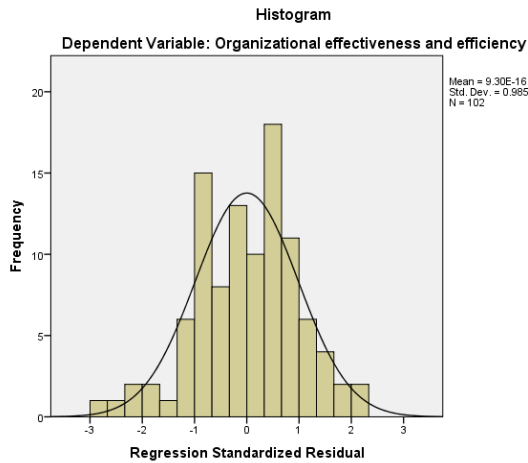
Taking into account the relationships between KM and OL practices, multiple regression (stepwise method) with all the independent variables (both KM and OL practices) was performed on each of the six dependent variables (OP2, OP3, OP4, OP6, OP7, OP8)

Before performing the regression analyses, we test the assumption of Normality of the Error Term Distribution. The Histogram of standardized residuals allows visual check for a distribution approximating normal distribution and the Normal P-P Plot of Regression Standardized Residual compares the observed standardized residuals against expected standardized residuals from a normal distribution. For a normal distribution, the residual line closely follows the straight diagonal line of the normal distribution.

The ANOVA table shows the goodness of fit of the model, that is, how significantly the regression model predicts the outcome variable.

The coefficients for the independent variable show how much the dependent variable changes when the independent variable changes by one unit.

All the independent variables regressed against OP2, Organizational effectiveness and efficiency.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points close to the diagonal line.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed
1	LO16 Learning from history, experiences and mistakes	.
2	KM2 Processes to capture, codify, store ,retrieve, use and reuse knowledge	.
3	KM32 Implementation of different KM Information Technologies	.

- a. Dependent Variable: OP2 Organizational effectiveness and efficiency
 Method: Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100)

Model Summary^d

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.549 ^a	.301	.294	.594	.301	43.084	1	100	.000
2	.661 ^b	.436	.425	.536	.135	23.760	1	99	.000
3	.713 ^c	.508	.493	.503	.072	14.363	1	98	.000

- a. Predictors: (Constant), LO16
 b. Predictors: (Constant), LO16, KM2
 c. Predictors: (Constant), LO16, KM2, KM32

d. Dependent Variable: OP2 Organizational effectiveness and efficiency

In regression model 1, 30.1% of the total variance in Organizational effectiveness and efficiency (OP2) is explained by Learning from history, experiences, and mistakes (LO16).

In model 2, Processes to capture, codify, store, retrieve, use, and reuse knowledge (KM2) is added leading to 13.5% increase in the total variance explained from 30.1% to 43.6%.

In model 3, Implementation of different KM Information Technologies (KM32) is added leading to 7.2% increase in the total variance from 43.6% to 50.8%.

Regression Model 3 includes the best subset of independent variables (LO16, KM2, KM32) explaining 50.8% of the total variance in Organizational effectiveness and efficiency (OP2).

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
3	Regression	25.686	3	8.562	33.787	.000 ^d
	Residual	24.834	98	.253		
	Total	50.520	101			

a. Dependent Variable: OP2

b. Predictors: (Constant), LO16

c. Predictors: (Constant), LO16, KM2

d. Predictors: (Constant), LO16, KM2, KM32

The probability of the F statistic (33.787) for the regression Model 3 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that there is a statistically significant relationship between the best subset of independent variables and the dependent variable, that is, the regression model (Model 3) is statistically significant in predicting the dependent variable.

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	1.441	.296	4.877	.000
3 LO16	.289	.061	4.731	.000
KM2	.288	.070	4.144	.000
KM32	.114	.030	3.790	.000

We can represent the regression equation as:

$$OP2 = 1.441 + 0.289(LO16) + 0.288(KM2) + 0.114(KM32)$$

Where OP2 represents Organizational effectiveness and efficiency,

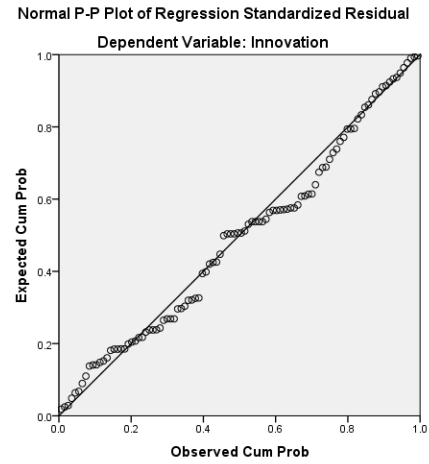
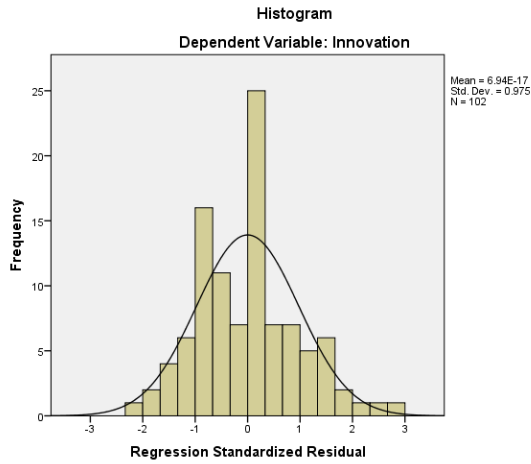
LO16 represents Learning from history, experiences, and mistakes,

KM2 represents Processes to capture, codify, store, retrieve, use, and reuse knowledge,

KM32 represents Implementation of different KM Information Technologies.

Since the significance of the t-values for all the variables are 0.000 that is lower than 0.05 and since all the coefficients have a positive value, we conclude that there is a statistically significant positive linear relationship between LO16 and OP2, KM2 and OP2, and KM32 and OP2 respectively.

All the independent variables regressed against OP3, Innovation.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points close to the diagonal line.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed
1	KM13 Investment in KM technology, people and processes	.
2	LO23 Diversity recognized as strength	.
3	KM12 Efficient knowledge transfer	.
4	KM7 Free access to company information	.
5	KM2 Processes to capture, codify, store, retrieve, use, and reuse knowledge	.

a. Dependent Variable: OP3 Innovation

Method: Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

Model Summary^f

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.527 ^a	.277	.270	.733	.277	38.391	1	100	.000
2	.660 ^b	.435	.424	.651	.158	27.634	1	99	.000
3	.695 ^c	.483	.467	.626	.048	9.036	1	98	.003
4	.725 ^d	.526	.507	.603	.043	8.879	1	97	.004
5	.744 ^e	.554	.531	.588	.028	5.966	1	96	.016

- a. Predictors: (Constant), KM13
- b. Predictors: (Constant), KM13, LO23
- c. Predictors: (Constant), KM13, LO23, KM12
- d. Predictors: (Constant), KM13, LO23, KM12, KM7
- e. Predictors: (Constant), KM13, LO23, KM12, KM7, KM2
- f. Dependent Variable: OP3 Innovation

In regression Model 1, 27.7% of the total variance in Innovation (OP3) is explained by Investment in KM technology, people, and processes (KM13).

In model 2, Diversity recognized as strength (LO23) is added leading to 15.8% increase in the total variance explained from 27.7% to 43.5%.

In model 3, Efficient knowledge transfer (KM12) is added leading to 4.8% increase in the total variance explained from 43.5% to 48.3%.

In model 4, Free access to company information (KM7) is added leading to 4.3% increase in the total variance explained from 48.3% to 52.6%.

In model 5, Processes to capture, codify, store, retrieve, use, and reuse knowledge (KM2) is added leading to 2.8% increase in the total variance explained from 52.6% to 55.4%.

Regression model 5 includes the best subset of independent variables (KM13, LO23, KM12, KM7, KM32) explaining 55.4% of the total variance in Innovation (OP3).

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
5	Regression	41.161	5	8.232	23.838	.000 ^f
	Residual	33.153	96	.345		
	Total	74.314	101			

- a. Dependent Variable: OP3
- b. Predictors: (Constant), KM13
- c. Predictors: (Constant), KM13, LO23
- d. Predictors: (Constant), KM13, LO23, KM12
- e. Predictors: (Constant), KM13, LO23, KM12, KM7

f. Predictors: (Constant), KM13, LO23, KM12, KM7, KM2

The probability of the F statistic (23.838) for the regression Model 5 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that there is a statistically significant relationship between the best subset of independent variables and the dependent variable.

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
5 (Constant)	-.098	.376	-.261	.795
KM13	.155	.078	1.993	.049
LO23	.262	.071	3.699	.000
KM12	.253	.083	3.048	.003
KM7	.157	.054	2.927	.004
KM2	.224	.092	2.443	.016

a. Dependent variable: OP3 Innovation.

We can represent the regression equation as:

$$OP3 = -0.098 + 0.155(KM13) + 0.262(LO23) + 0.253(KM12) + 0.157(KM7) + 0.224(KM2)$$

Where OP3 represents Innovation,

KM13 represents Investment in KM technology, people, and processes,

LO23 represents Diversity recognized as strength,

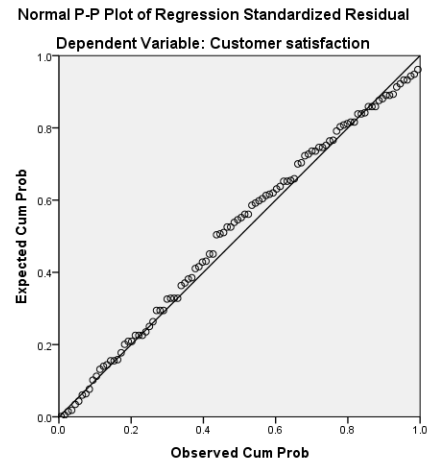
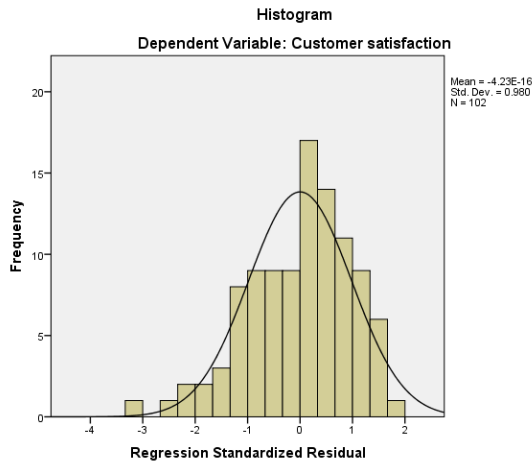
KM12 represents Efficient knowledge transfer,

KM7 represents Free access to company information,

KM2 represents Processes to capture, codify, store, retrieve, use and reuse knowledge.

Since the p-value of the t-tests are less than alpha and since the coefficients are positive, there is enough evidence that there is a statistically significant positive relationship between KM13 and OP3, LO23 and OP3, KM12 and OP3, KM7 and OP3, and KM2 and OP3.

All the independent variables are regressed against OP4, Customer Satisfaction.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points close to the diagonal line.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed
1	LO11 Constant conversations with customers	.
2	KM5 Leadership facilitating and rewarding team work and team decision making	.
3	LO18 Employee empowerment	.
4	KM13 Investment in KM technology, people and processes	.

- a. Dependent Variable: OP4 Customer satisfaction
 Method: Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to remove >= .100).

The table above shows that four independent variables are statistically significant in explaining the variance in customer satisfaction.

Model Summary^e

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.489 ^a	.239	.231	.702	.239	31.354	1	100	.000
2	.578 ^b	.334	.320	.660	.095	14.148	1	99	.000
3	.625 ^c	.391	.373	.634	.057	9.232	1	98	.003
4	.647 ^d	.419	.395	.623	.028	4.581	1	97	.035

- a. Predictors: (Constant), LO11
- b. Predictors: (Constant), LO11, KM5
- c. Predictors: (Constant), LO11, KM5, LO18
- d. Predictors: (Constant), LO11, KM5, LO18, KM13
- e. Dependent Variable: OP4 Customer satisfaction

In regression Model 1, 23.9% of the total variance in Customer satisfaction (OP4) is explained by Constant conversations with customers (LO11).

In model 2, Leadership facilitating and rewarding team work and team decision-making (KM5) is added leading to 9.5% increase in the total variance explained from 23.9% to 33.4%.

In model 3, Employee empowerment (LO18) is added leading to 5.7% increase in the total variance explained from 33.4% to 39.1%.

In model 4, Investment in KM technology, people, and processes (KM13) is added leading to 2.8% increase in the total variance explained increases from 39.1% to 41.9%.

Regression Model 4 includes the best subset of independent variables (LO11, KM5, LO18, KM13) explaining 41.9% of the total variance in Customer satisfaction (OP4).

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
4 Regression	27.079	4	6.770	17.466	.000 ^e
Residual	37.597	97	.388		
Total	64.676	101			

a. Dependent Variable: OP4 Customer satisfaction

b. Predictors: (Constant), LO11

c. Predictors: (Constant), LO11, KM5

d. Predictors: (Constant), LO11, KM5, LO18

e. Predictors: (Constant), LO11, KM5, LO18, KM13

The probability of the F statistic (17.466) for the regression Model 4 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that there is a statistically significant relationship between the best subset of independent variables and the dependent variable.

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	1.238	.364	3.399	.001
4 LO11	.287	.074	3.899	.000
KM5	.204	.075	2.711	.008
LO18	.168	.069	2.433	.017
KM13	.148	.069	2.140	.035

a. Dependent Variable: OP4 Enhancement of customer satisfaction

We can represent the regression equation as:

$$OP4 = 1.238 + 0.287(LO11) + 0.204(KM5) + 0.168(LO18) + 0.148(KM13)$$

Where OP4 represents Customer satisfaction,

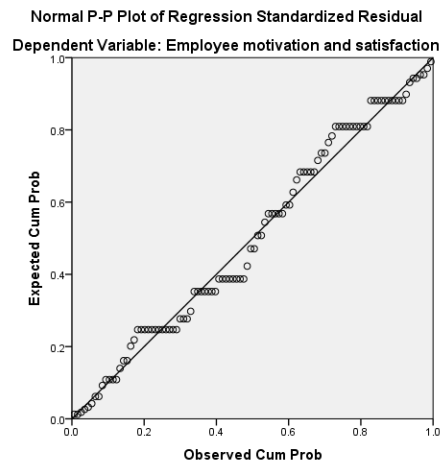
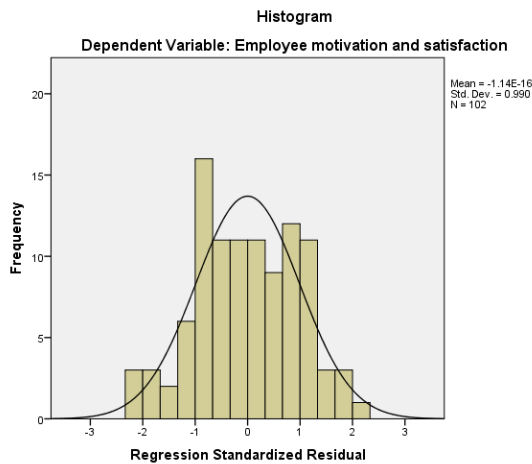
LO11 represents Constant conversations with customers,

KM5 represents Leadership facilitating and rewarding teamwork and team decision-making,

LO18 represents Employee empowerment,

KM13 represents Investment in KM technology, people, and processes.

All independent variables regressed against OP6, Employee motivation and satisfaction.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points approximately close to the diagonal line.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed
1	KM10 Benchmarking industry best practices	.
2	KM12 Efficient knowledge transfer	.

a. Dependent Variable: Employee motivation and satisfaction

Method: Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.376 ^a	.141	.133	.670	.141	16.479	1	100	.000
2	.472 ^b	.223	.207	.641	.082	10.332	1	99	.002

a. Predictors: (Constant), KM10

b. Predictors: (Constant), KM10, KM12

c. Dependent Variable: OP6 Employee motivation and satisfaction

In regression Model 1, 14.1% of the total variance in Employee motivation and satisfaction (OP6) is explained by Benchmarking industry best practices (KM10).

In model 2, Efficient knowledge transfer (KM12) is added leading to 8.2% in the total variance explained from 14.1% to 22.3%.

Regression model 2 includes the best subset of independent variables (KM10, KM12) explaining 22.3% of the total variance in employee motivation and satisfaction (OP6).

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.	
2	Regression	11.654	2	5.827	14.174	.000 ^c
	Residual	40.699	99	.411		
	Total	52.353	101			

- a. Dependent Variable: OP6
- b. Predictors: (Constant), KM10
- c. Predictors: (Constant), KM10, KM12

The probability of the F statistic (14.174) for the regression Model 2 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that there is a statistically significant relationship between the best subset of independent variables and the dependent variable.

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	2.634	.315	8.363	.000
2 KM10	.196	.061	3.228	.002
KM12	.255	.079	3.214	.002

a. Dependent Variable: OP6 Increase in employee motivation and satisfaction

We can represent the regression equation as follows:

$$OP6 = 2.634 + 0.196(KM10) + 0.255(KM12)$$

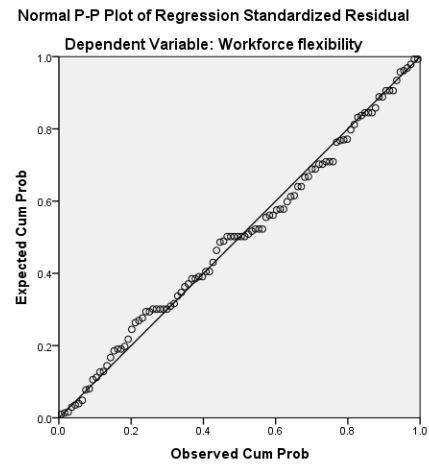
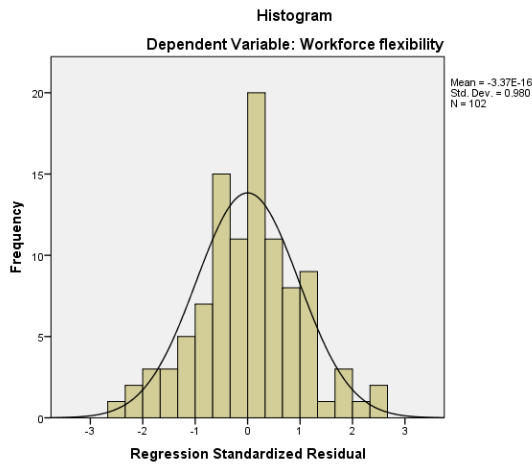
Where OP6 represents Employee motivation and satisfaction,

KM10 represents Benchmarking industry best practices,

KM12 represents Efficient knowledge transfer.

Since the p-values of the t-test are less than alpha (0.05) and since the coefficient have a positive sign, there is enough evidence that statistically significant positive relationship exists between KM10 and OP6 and KM12 and OP6.

All the independent variables regressed against OP7, Workforce flexibility.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points close to the diagonal line.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed
1	LO17 Continuous learning	.
2	KM5 Leadership facilitating and rewarding team work and team decision making	.
3	LO21 Culture which nurtures learning through multi-way communications	.
4	LO16 Learning from history, experiences, and mistakes	.

a. Dependent Variable: OP7 Workforce flexibility

Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).

Model Summary^e

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.423 ^a	.179	.171	.873	.179	21.779	1	100	.000
2	.555 ^b	.308	.294	.805	.130	18.558	1	99	.000
3	.605 ^c	.366	.347	.775	.058	8.894	1	98	.004
4	.626 ^d	.392	.367	.763	.026	4.117	1	97	.045

a. Predictors: (Constant), LO17

b. Predictors: (Constant), LO17, KM5

- c. Predictors: (Constant), LO17, KM5, LO21
- d. Predictors: (Constant), LO17, KM5, LO21, LO16
- e. Dependent Variable: OP7 Workforce flexibility

In regression model 1, 17.9% of the total variance in Workforce flexibility (OP7) is explained by Continuous learning (LO17).

In model 2, Leadership facilitating and rewarding teamwork and team decision-making (KM5) is added leading to 13% increase in the total variance explained from 17.9% to 30.8%.

In model 3, Culture which nurtures learning through multi-way communications (LO21) is added leading to 5.8% increase in the total variance explained from 30.8% to 36.6% .

In model 4, Learning from history, experiences, and mistakes (LO16) is added leading to 2.6% increase in the total variance explained from 36.6% to 39.2%.

Regression Model 4 includes the best subset of independent variables (LO17, KM5, LO21, LO16) explaining 39.2% of the total variance in Workforce flexibility (OP7).

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
4 Regression	36.343	4	9.086	15.623	.000 ^e
Residual	56.412	97	.582		
Total	92.755	101			

- a. Dependent Variable: OP7
- b. Predictors: (Constant), LO17
- c. Predictors: (Constant), LO17, KM5
- d. Predictors: (Constant), LO17, KM5, LO21
- e. Predictors: (Constant), LO17, KM5, LO21, LO16

The probability of the F statistic (15.623) for the regression Model 4 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that there is a statistically significant relationship between the best subset of independent variables and the dependent variable.

Model	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	.157	.530	.296	.768
4 LO17	.417	.099	4.220	.000
KM5	.401	.086	4.656	.000
LO21	.328	.098	3.337	.001
LO16	-.186	.092	-2.029	.045

a. Dependent Variable: OP7 Increase in workforce flexibility

We represent the regression equation as:

$$OP7 = 0.157 + 0.417(LO17) + 0.401(KM5) + 0.328(LO21) - 0.186(LO16)$$

Where OP7 represents Increase in workforce flexibility,

LO17 represents Continuous Learning,

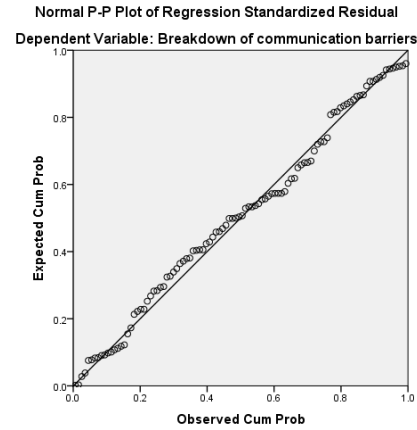
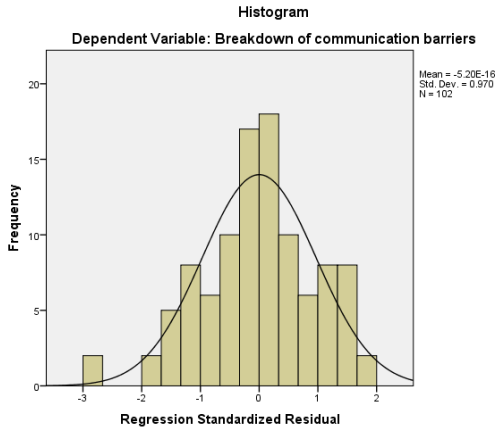
KM5 represents Leadership facilitating and rewarding teamwork and team decision-making,

LO21 represents Culture which nurtures learning through multi-way communications,

LO16 represents Learning from history, experiences, and mistakes.

Based on the p values and the coefficient signs, there is enough evidence that there is a statistically significant positive relationship between LO17 and OP7, KM5 and OP7, and LO21 and OP7 and there is a statistically significant negative relationship between LO16 and OP7.

All the independent variables regressed against OP8, Breakdown of communication barriers.



The histogram shows a bell-shaped curve and the normal plot of the residuals shows the points close to the diagonal line.

Variables Entered/Removed ^a		
Model	Variables Entered	Variables Removed
1	KM4 Teamwork, collaboration and cooperation part of work processes	.
2	LO19 Leaders sharing up to date information with employees	.
3	KM10 Benchmarking industry best practices	.
4	KM6 Individual responsibility for communications	.
5	LO14 Shared vision	.
6	KM5 Leadership facilitating and rewarding team work and team decision making	.

a. Dependent Variable: OP8 Breakdown of communication barriers
Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).

As shown in the table above, six independent variables are statistically significant in explaining the variance in Breakdown of communication barriers (OP8).

Model Summary^g

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.491 ^a	.241	.234	.745	.241	31.828	1	100	.000
2	.617 ^b	.381	.368	.677	.140	22.257	1	99	.000
3	.668 ^c	.446	.429	.643	.065	11.542	1	98	.001
4	.700 ^d	.490	.469	.620	.044	8.456	1	97	.005
5	.717 ^e	.513	.488	.609	.023	4.602	1	96	.034
6	.730 ^f	.533	.504	.599	.020	4.023	1	95	.048

a. Predictors: (Constant), KM4

b. Predictors: (Constant), KM4, LO19

c. Predictors: (Constant), KM4, LO19, KM10

d. Predictors: (Constant), KM4, LO19, KM10, KM6

e. Predictors: (Constant), KM4, LO19, KM10, KM6, LO14

f. Predictors: (Constant), KM4, LO19, KM10, KM6, LO14, KM5

g. Dependent Variable: OP8 Breakdown of communication barriers

In Regression model 1, 24.1% of the total variance in the Breakdown of communication barriers (OP8) is explained by Teamwork, collaboration, and cooperation being part of work processes (KM4).

In model 2, Leaders sharing up to date information to employees (LO19) is added leading to 14% increase in the total variance explained from 24.1% to 38.1%.

In model 3, Benchmarking industry best practices (KM10) is added leading to 6.5% increase in the total variance explained from 38.1% to 44.6%.

In model 4, Individual responsibility for communications (KM6) is added leading to 4.4% increase in the total variance explained from 44.6% to 49%.

In model 5, Shared vision (LO14) is added leading to 2.3% increase in the total variance explained from 49% to 51.3%.

In model 6, Leadership facilitating and rewarding teamwork and team decision-making (KM5) is added leading to 2% increase in the total variance explained from 51.3% to 53.3%.

Regression Model 6 includes the best subset of independent variables (KM4, LO19, KM19, KM6, LO14 and KM5) explaining 53.3% of the total variance in Breakdown of communication barriers (OP8).

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
6	Regression	39.034	6	6.506	18.102	.000 ^g
	Residual	34.142	95	.359		
	Total	73.176	101			

a. Dependent Variable: OP8 Breakdown of communication barriers

The probability of the F statistic (18.102) for regression model 6 is 0.000 which is less than 0.05 hence we accept the alternative hypothesis that regression model 6 is statistically significant in predicting the dependent variable.

Model	Unstandardized Coefficients		T	Sig.	
	B	Std. Error			
6	(Constant)	.192	.467	.411	.682
	KM4	.304	.093	3.251	.002
	LO19	.251	.067	3.749	.000
	KM10	.206	.061	3.392	.001
	KM6	.225	.078	2.887	.005
	LO14	-.194	.080	-2.416	.018
	KM5	.147	.073	2.006	.048

a. Dependent Variable: OP8 Breakdown of communication barriers

We represent the regression equation as:

$$OP8 = 0.192 + 0.304(KM4) + 0.251(LO19) + .206(KM10) + 0.225(KM6) - 0.194(LO14) + 0.147(KM5)$$

Where OP8 represents Breakdown in communication barriers,

KM4 represents Teamwork, collaboration and cooperation being part of work processes,

LO19 represents Leaders sharing up to date information with employees,

KM10 represents Benchmarking industry best practices,

KM6 represents Individual responsibility for communications,

LO14 represents Shared vision,

KM5 represents Leadership facilitating and rewarding teamwork and team decision-making.

Based on the p-values of the t-tests and the coefficient signs, there is enough evidence that there is statistically significant positive relationship between KM4 and OP8, LO19 and OP8, KM10 and OP8, KM6 and OP8, KM5 and OP8 and there is statistically significant negative relationship between LO14 and OP8.

4.5. INDEPENDENT-SAMPLES T TEST

The independent-samples t-test, also called the student's t-test, is an inferential statistical test that determines whether there is a statistically significant difference between the means of two independent groups. The assumptions used to run the student's t-test are the assumption of the normality of the dependent variable and the assumption of homogeneity (equality) of variance. The assumption of equal variances is tested by Levene's Test for Equality of Variances. If the significance for Levene's test is greater than 0.05 then the two group variances can be treated as equal and the is used to test the equality of means.

If the significance for Levene's test is equal or below 0.05, the assumption of homogeneity of the variances is rejected and the "Equal Variances Not assumed" is used to test the equality of means. In both cases, the basic criterion for statistical significant difference between the two population means is a "2-tailed significance" less than 0.05, where we reject the null hypothesis that the two population means are equal and accept the alternative hypothesis that two population means are not equal.

First, the independent t-test was performed on the average of the independent variables to see whether knowledge management and organizational learning practices differ in higher-rated and lower-rated organizations in Lebanon.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	Sig. (2-tailed)
AvLOKM	Equal variances assumed	2.294	.133	3.175	.002
	Equal variances not assumed			3.391	.001

The Levene's Test is 0.133, which is greater than 0.05 hence equal variances assumed.

The t statistics is 0.02 which is less than 0.05 hence we accept the alternative hypothesis that the average knowledge management and organizational learning practices differ in higher-rated and lower-rated organizations.

Then the independent t-test was performed on each independent variable to see whether it differs in higher-rated and lower rated organizations.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	Sig. (2-tailed)
<u>KM1</u> Consideration of knowledge as a strategic asset	Equal variances assumed	0.849	0.359	1.428	0.157
	Equal variances not assumed			1.467	0.147
<u>KM2</u> Processes to capture, codify, store, retrieve, use and reuse knowledge	Equal variances assumed	5.262	0.024	3.183	0.002
	Equal variances not assumed			3.447	0.001
<u>KM3</u> Leadership with strong passion for KM	Equal variances assumed	1.226	0.271	0.850	0.397
	Equal variances not assumed			0.838	0.405
<u>KM4</u> Teamwork, cooperation and collaboration part of work processes	Equal variances assumed	1.392	0.241	3.041	0.003
	Equal variances not assumed			2.808	0.007
<u>KM5</u> Leadership facilitating and rewarding of team work and team decision making	Equal variances assumed	7.449	0.008	1.746	0.084
	Equal variances not assumed			1.988	0.05
<u>KM6</u> Individual responsibility for communications	Equal variances assumed	11.979	0.001	1.838	0.069
	Equal variances not assumed			2.074	0.041
<u>KM7</u> Free access to company information	Equal variances assumed	0.682	0.411	2.522	0.013
	Equal variances not assumed			2.657	0.01

<u>KM8</u> Extensive Use of After Action Review	Equal variances assumed	0.118	0.732	1.281	0.203
	Equal variances not assumed			1.277	0.207
<u>KM9</u> User friendly IT software	Equal variances assumed	0.930	0.337	4.828	0.000
	Equal variances not assumed			4.889	0.000
<u>KM10</u> Benchmarking industry best practices	Equal variances assumed	1.535	0.218	2.782	0.006
	Equal variances not assumed			2.916	0.005
<u>KM12</u> Efficient knowledge transfer	Equal variances assumed	2.218	0.140	1.638	0.105
	Equal variances not assumed			1.676	0.099
<u>KM13</u> Investment in KM technology, people and processes	Equal variances assumed	3.549	0.062	3.812	0.000
	Equal variances not assumed			4.028	0.0000
<u>KM32</u> Implementation of different KM Information Technologies	Equal variances assumed	1.151	0.286	2.498	0.014
	Equal variances not assumed			2.685	0.009
<u>LO11</u> Constant conversations with customers	Equal variances assumed	0.075	0.785	0.63	0.530
	Equal variances not assumed			0.637	0.527
<u>LO14</u> Shared vision	Equal variances assumed	.132	.717	-.623	0.535
	Equal variances not assumed			-	0.538
<u>LO15</u> Systematic problem solving	Equal variances assumed	.108	.743	-.423	0.673
	Equal variances not assumed			-	0.671
<u>LO16</u> Learning from history, experiences and mistakes	Equal variances assumed	5.02	0.027	1.318	0.191
	Equal variances not assumed			1.409	0.163
<u>LO17</u> Continuous learning	Equal variances assumed	15.768	0.000	2.012	0.047
	Equal variances not assumed			2.354	0.021
<u>LO18</u> Employee empowerment	Equal variances assumed	0.511	0.476	0.26	0.795
	Equal variances not assumed			0.249	0.805
<u>LO19</u> Leaders sharing up to date information with employees	Equal variances assumed	0.428	0.514	-	0.946
	Equal variances not assumed			0.069	0.943
<u>LO20</u> Leaders as designers, teachers and stewards	Equal variances assumed	0.324	0.570	1.601	0.112
	Equal variances not assumed			1.661	0.101
<u>LO21</u> Culture which nurtures learning through multi-way communications	Equal variances assumed	0.325	0.570	2.479	0.015
	Equal variances not assumed			2.539	0.014
<u>LO22</u> Easy identification of expertise availability	Equal variances assumed	14.644	0.000	2.503	0.014
	Equal variances not assumed			2.767	0.007
<u>LO23</u> Diversity recognized as strength	Equal variances assumed	0.05	0.823	0.979	0.33
	Equal variances not assumed			0.959	0.341

Based on the Levene's Test for Equality of Variances and hence the t-test for the Equality of the means, we conclude the following:

- Processes to capture, codify, store, retrieve, use, and reuse knowledge are different in higher-rated and lower-rated organizations.
- Teamwork, cooperation, and collaboration being part of work processes are different in higher-rated and lower-rated organizations.
- Leadership facilitating and rewarding teamwork and team decision making is different in higher-rated and lower-rated organizations.
- Individual responsibility for communications is different in higher-rated and lower-rated organizations.
- Free access to company information is different in higher-rated and lower-rated organizations.
- User friendly IT software is different in higher-rated and lower-rated organizations.
- Benchmarking industry best practices is different in higher-rated and lower-rated organizations.
- Investment in KM technology, people, and processes is different in higher-rated and lower-rated organizations.
- Implementation of different KM information technologies is different in higher-rated and lower-rated organizations.
- Continuous learning is different in higher-rated and lower-rated organizations.
- Culture which nurtures learning through multi-way communications is different in higher-rated and lower-rated organizations.

- Easy identification of expertise availability is different in higher-rated and lower rated organizations.

On the other hand:

- Consideration of knowledge as a strategic asset is not different in higher-rated and lower-rated organizations.
- Leadership with strong passion for knowledge management is not different in higher-rated and lower-rated organizations.
- Extensive use of After Action Review is not different in higher-rated and lower-rated organizations.
- Efficient knowledge transfer is not different in higher-rated and lower-rated organizations.
- Constant conversations with customers are not different in higher-rated and lower-rated organizations.
- Shared vision is not different in higher-rated and lower-rated organizations.
- Systematic problem solving is not different in higher-rated and lower-rated organizations.
- Learning from history, experiences, and mistakes is not different in higher-rated and lower-rated organizations.
- Employee empowerment is not different in higher-rated and lower-rated organizations.
- Leaders sharing up to date information with employees is not different in higher-rated and lower-rated organizations.
- Leaders as designers, teachers, and stewards are not different in higher-rated and lower-rated organizations.

- Diversity recognized as strength is not different in higher-rated and lower-rated organizations.

The table below shows that half of the knowledge management and organizational learning practices differ among the higher-rated and lower-rated organizations.

Knowledge Management and Organizational Learning Practices	Different in higher-rated and lower-rated organizations
Consideration of knowledge as a strategic asset	X
Processes to capture, codify, store, retrieve, use, and reuse knowledge	✓
Leadership with strong passion for KM	X
Teamwork, cooperation, and collaboration being part of work processes	✓
Leadership facilitating and rewarding teamwork and team decision making	✓
Individual responsibility for communications	✓
Free access to company information	✓
Extensive Use of After Action Review	X
User friendly IT software	✓
Benchmarking industry best practices	✓
Efficient knowledge transfer	X
Investment in KM technology, people, and processes	✓
Implementation of different Information Technologies	✓
Constant conversations with customers	X
Shared vision	X
Systematic problem solving	X
Learning from history, experiences, and mistakes	X
Continuous Learning	✓
Employee empowerment	X
Leaders sharing up to date information with employees	X
Leaders as designers, teachers, and stewards	X
Culture which nurtures learning through multi-way communications	✓
Easy identification of expertise availability	✓
Diversity recognized as strength	X

Then the independent t-test was performed on the average of the dependent variables (six dependent variables) to see whether organizational performance differs in higher-rated and lower-rated organizations.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	Sig. (2-tailed)
AvOP6	Equal variances assumed	5.571	.020	3.792	.000
	Equal variances not assumed			4.293	.000

The Levene's Test is 0.02 which is less than 0.05 hence "Equal variances not assumed" is used. The t statistics is 0.00 which is less than 0.05 hence we accept the alternative hypothesis that the average organizational performance differs in higher-rated and lower-rated organizations.

Lastly, the independent t-test was performed on each dependent variable to see whether it differs in higher-rated and lower-rated organizations.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	Sig. (2-tailed)
OP2 Organizational effectiveness and efficiency	Equal variances assumed	.204	.653	2.410	.018
	Equal variances not assumed			2.606	.011
OP3 Innovation	Equal variances assumed	.238	.627	3.336	.001
	Equal variances not assumed			3.303	.002
OP4 Customer satisfaction	Equal variances assumed	1.742	.190	1.726	.087
	Equal variances not assumed			1.951	.054
OP6 Employee motivation and satisfaction	Equal variances assumed	.674	.414	1.330	.187
	Equal variances not assumed			1.444	.153
OP7 Workforce flexibility	Equal variances assumed	5.527	.021	3.550	.001
	Equal variances not assumed			3.932	.000
OP8 Breakdown of communication barriers	Equal variances assumed	9.172	.003	2.415	.018
	Equal variances not assumed			2.682	.009

Based on the Levene's Test for Equality of Variances and the hence the t-test for the Equality of the means, we conclude the following:

- Organizational effectiveness and efficiency is different in higher –rated and lower-rated organizations.
- Innovation is different in higher –rated and lower-rated organizations.
- Workforce flexibility is different in higher –rated and lower-rated organizations.
- Breakdown of communication barriers is different in higher –rated and lower-rated organizations.

On the other hand:

- Customer satisfaction is not different in higher-rated and lower-rated organizations.
- Employee motivation and satisfaction is not different in higher-rated and lower-rated organization.

4.6. ONE-WAY ANOVA

The One-Way Analysis of Variance (ANOVA) is used to determine whether there are any significant differences between the means of at least three independent groups.

In this study, One-Way ANOVA was performed to test whether there are statistically significant differences in the average knowledge management and organizational learning practices among the five industries.

Test of Homogeneity of Variances

AvLOKM

Levene Statistic	df1	df2	Sig.
1.828	4	97	.130

The Levene's statistics is 0.130 which is greater than 0.05 hence there is no violation of the assumption of homogeneity of variances and ANOVA test is used.

ANOVA

AvLOKM

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.903	4	.476	1.886	.119
Within Groups	24.473	97	.252		
Total	26.376	101			

The ratio of F statistics (1.886) is 0.119 which is greater than 0.05 hence there is insufficient evidence that there are statistically significant differences among the five industries.

One-Way ANOVA was performed to test whether there is statistically significant difference in the average organizational performance among the five industries.

Test of Homogeneity of Variances

AvOP6

Levene Statistic	df1	df2	Sig.
.865	4	97	.488

The significance of Leven's statistics is 0.488 which is greater than 0.05 hence the assumption of homogeneity of variances is not violated and the ANOVA test is used.

ANOVA

AvOP6

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.567	4	.142	.444	.776
Within Groups	30.960	97	.319		
Total	31.528	101			

The significance of the ratio of F statistics (0.444) is 0.776 which is greater than 0.05 hence there is insufficient evidence that there is statistically significant difference in the average performance of the five industries.

CHAPTER FIVE

SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1. FINDINGS

As stated through the research questions, this study mainly aimed to test whether knowledge management (KM) and organizational learning (OL) practices impact organizational performance (OP). In addition, it tested whether KM and OL practices and OP differ in higher-rated and lower-rated organizations and among the five selected knowledge and learning intensive industries.

Findings from Regression Analyses

The first set of hypotheses tested to know whether KM and OL practices are positively related to each of the eight dependent variables, namely: decision making process, organizational effectiveness and efficiency, innovation, customer satisfaction, employee personal competencies and skills, employee motivation and satisfaction, workforce flexibility and breakdown of communication barriers.

Finding 1

Based on the factor and regression analyses, two of the dependent variables: decision making process (OP1) and employee personal competencies and skills (OP5) were removed from the study due to low communality (amount of variance shared with all other variables) resulting from factor analysis and due to the violation of assumption of normality of the error term distribution in multiple regression. Hence, we failed to test

the relationship between KM and OL practices and decision making process and between KM and OL practices and employee personal competencies and skills.

The interpretation here may be that the impact of KM and OL practices on the decision making process and employee competencies and skills is not understood by the respondents as a salient one.

Therefore, based on the regression analyses of the remaining six dependent variables we provide the following findings:

Finding 2:

Learning from history, experiences, and mistakes (LO16), processes to capture, codify, store, retrieve, use, and reuse knowledge (KM2) and implementation of different KM Information Technologies (KM32) are statistically significant in predicting an increase in organizational effectiveness and efficiency.

As literature shows, labor efficiency increases due to the experience curve effect since employees achieve improvements through learning, experimenting and making mistakes. In turn, an increase in labor efficiency leads to an increase in organizational efficiency. Moreover, learning from history and mistakes allows the organization to avoid the same mistakes and prepares employees to do the right thing in upcoming tasks. This of course, increases their proficiencies hence increases organizational effectiveness and at the same time leads to lower costs from fewer mistakes hence increases organizational efficiency. Furthermore, the processes of KM allow the organization to be more effective and efficient at the same time since, as stated by Gorelick et al. (2004) there will be lack of “reinvention of the

wheel” hence less waste of time and money. In addition, the wise use of different KM IT reduces operational expenses and redundancy hence increases efficiency. This, at the same time, enhances the process of problem solving, hence increases effectiveness.

Finding 3:

Investment in KM technology, people and processes (KM13), diversity recognized as a strength (LO23), efficient knowledge transfer (KM12), processes to capture, codify, store, retrieve, use and reuse knowledge (KM2) and free access to company information (KM7) are statistically significant in predicting fueling innovation.

A holistic approach to investment in KM (technology, people and processes) is necessary to create new knowledge and fuel innovation. Investment in KM technology without investment in people who can effectively use that technology is not sufficient. Moreover, investment in people is not sufficient if the organization does not have in place the processes to carry out the knowledge management. Furthermore, as Leonard and Straus (1997) discussed, innovation requires divergent thinking and diverse cognitive perspectives. Diversity unlocks the creative potential of the organization that is why differing perspectives and viewpoints are powerful factors in stimulating innovation. Again, when knowledge is easily spread throughout the organization through reports, strategic reviews, rotation programs, etc., new dimensions and new ideas can emerge from the use and review of the knowledge transferred. Knowledge is known to enhance the innovation capability of an organization .And if limited information access hinders innovation due to the lack of information and knowledge as base for generating new ideas free information access triggers innovative ideas.

Finding 4:

Constant conversations with customers (LO11), leadership facilitating and rewarding teamwork and team decision-making (KM5), employee empowerment (LO18) and investment in KM technology, people, and processes (KM13) are statistically significant in predicting enhancement of customer satisfaction.

On-going and meaningful conversations with customers increase the organization's abilities in understanding customer needs and identifying changes in their needs; they enhance the customers' engagement, therefore they increase customer satisfaction and loyalty. Furthermore, teamwork and team decision-making, as Senge (1990) asserts, provide extraordinary capacities for coordinated action in developing the best alternative solution to satisfy the customer. In addition, empowering employees enhances employee self-motivation leading to greater employee satisfaction, which is a key for customer satisfaction too. Finally, a holistic approach to investment in KM technology, people, and processes maximizes the overall organizational effectiveness and efficiency because of which customers are necessarily more satisfied.

Finding 5:

Efficient knowledge transfer (KM12) and benchmarking industry best practices (KM10) are statistically significant in predicting an increase in employee motivation and satisfaction.

Efficient knowledge transfer maximizes the utilization of existing knowledge by providing employees with the knowledge they need to complete and improve their tasks and this increases employee motivation and satisfaction. Also, benchmarking industry best practices enhances employee motivation and satisfaction in two ways. First, employees are motivated to adapt the best practices identified to improve their performance. Second, when employees take part in the benchmarking processes their motivation increases.

Finding 6:

Continuous learning (LO17), leadership facilitating and rewarding teamwork and team decision making (KM5) and culture which nurtures learning through multi-way communications (LO21) are statistically significant in predicting an increase in workforce flexibility. On the other hand, learning from history, experiences, and mistakes (LO16) negatively affects workforce flexibility.

Operating in competitive and uncertain environments organizations have to empower a flexible workforce, which is able to respond and adapt to both external and internal changes. Continuous learning and keeping pace with the change enhance workforce flexibility.

When leaders design work around teams, team members are engaged in determining the best way to complete the team tasks, and collective decision making takes place regarding all the details of the tasks at hand (when, where, how). Through improved team collaboration, teams work together to integrate workforce flexibility into the culture, and address inefficiencies in work design avoiding duplications and increasing productivity and job satisfaction. Also, culture which nurtures learning through upward, downward and horizontal communications and open meetings and conferences enhances the organization's awareness of the constant changes and the necessity of having a flexible workforce. And finally, although learning from experience and mistakes provides constructive learning opportunities and leads to the development of employee competencies and skills, however, this enhancement is in individual employee proficiency and has little to do with enhancement of overall workforce flexibility.

Finding 7:

Teamwork, collaboration and cooperation being part of work processes (KM4), leaders sharing up to date information with employees (LO19), benchmarking industry best practices (KM10), individual responsibility for communications (KM6) and leadership facilitating and rewarding team work and team decision making (KM4) are statistically significant in predicting breakdown of communication barriers. Shared vision (LO14) negatively affects the breakdown of communication barriers

Dialogues and discussions during teamwork allow the team members to suspend assumptions and enter into a genuine “thinking together” mode as described by Senge (1990). These stimulate breakdown of the communication barriers among team members.

And leaders who are encouraged to share information with employees inspire transparency and trust within corporate culture and this enhances the breakdown of communication barriers. When leaders share information with employees on a regular basis they enhance the employees' engagement and involvement in the day-to-day business functions and promote the morale of employees. Also benchmarking creates the necessary processes for sharing and discussing knowledge and developing new initiatives hence it revives communications. Moreover, when each member in the organization displays individual responsibility for communications (knows well that other members depend on him/her for information and at the same time knows from whom to get the required information) communication among the organizations' members is enhanced greatly and communication obstacles are reduced.

Additionally, when leaders act as coaches and mentors who encourage teamwork and team decision-making, the traditional authoritarian relationship between bosses and employees turns into a facilitative relationship and breakdown of communications barriers is a commonly explained impact of facilitative leadership.

Shared vision negatively affects the breakdown of communication barriers. Perhaps this is so because leaders and employees take it for granted that shared and once and for all understood vision is part of the organization's basic structure and constitution. This is confirmed by the result of the Independent Samples T-Test, which shows that employees in both higher-rated and lower-rated organizations hold a shared vision.

The table below summarizes the findings of the regression analyses.

The Relationship between Knowledge Management and Organizational Learning Practices And Organizational Performance		R²	Statistically Significant Relationship
Learning from history, experiences, and mistakes	Organizational effectiveness and efficiency	50.8%	+
Processes to capture, codify, store, retrieve, use, and reuse knowledge			+
Implementation of different KM Information Technologies			+
Diversity recognized as strength	Innovation	55.4%	+
Efficient knowledge transfer			+
Processes to capture, codify, store, retrieve, use, and reuse knowledge			+
Free access to company information			+
Investment in KM technology, people, and processes			+
Constant conversations with customers	Customer satisfaction	41.9%	+
Leadership facilitating and rewarding team work and team decision making			+
Employee empowerment			+
Investment in KM technology, people, and processes			+
Efficient knowledge transfer	Employee motivation and satisfaction	22.3%	+
Benchmarking industry best practices			+
Continuous Learning	Workforce flexibility	39.2%	+
Leadership facilitating and rewarding team work and team decision making			+
Culture which nurtures learning through multi-way communications			+
<i>Learning from history, experiences, and mistakes</i>			-
Teamwork, collaboration, and cooperation being part of work processes	Breakdown of communication barriers	53.3%	+
Leaders sharing up to date information with employees			+
Benchmarking industry best practices			+
Individual responsibility for communications			+
<i>Shared vision</i>			-
Leadership facilitating and rewarding teamwork and team decision making			+

Findings from Independent Samples T-Tests

Finding 8: Higher-rated organizations are different from lower-rated organizations in:

Higher-rated organizations have better KM processes (processes to capture, codify, store, retrieve, use and reuse knowledge) compared to lower-rated organizations. Moreover, teamwork, cooperation, and collaboration constitute a larger part of work processes in higher-rated organizations that is why leaders facilitate and reward teamwork and team decision-making more in higher-rated than in lower-rated organizations.

Compared to lower-rated organizations, higher-rated organizations provide employees with easier and freer access to company information that is why these organizations have more user-friendly IT software, which enable employees to access and use the needed information and knowledge. For these reasons, individuals in higher-rated organizations are more responsible for communications and are encouraged to find, use and share information and knowledge.

In contrast to lower-rated organizations, higher-rated organizations implement wider range of different KM Information Technologies that is why it is easier to identify expertise available in these organizations.

Higher-rated organizations are better able to gain outside perspectives through benchmarking and uncovering, identifying and adapting best practices.

Higher-rated organizations place more emphasis on continuous learning through using knowledge and actionable advice to routinely help individuals and teams learn what they need to learn and apply this learning to meet the organization's strategic goals. That is why higher-rated organizations engage in more communications to nurture learning.

Higher-rated organizations have combined investments in KM technology, people and processes since these firms are motivated by competitiveness as discussed by Crossan and Pabuji (2003). Lower-rated organizations have lower investments since they are motivated by legitimacy acquisition and knowledge protection only.

Because of all these differences, higher-rated organizations have better organizational effectiveness and efficiency, enhanced innovation, increased workforce flexibility and less communication barriers than lower-rated organizations.

Finding 9: Higher-rated organizations are not different from lower-rated organizations in:

Both higher-rated and lower-rated organizations understand the importance of knowledge as a strategic asset that needs to be managed continuously. Moreover, leaders in higher-rated and lower rated organizations have strong passion for managing knowledge.

Employees in both types of organizations hold a shared picture of the firm's vision, mission and objectives; hence both types of organizations understand the importance of shared vision for an organization.

Both higher-rated and lower rated organizations capture learning from After Action Review, i.e., looking at the activities completed to see what happened against what was expected to happen and to see why it happened. Furthermore, they make sure to absorb learning from history, experiences, and mistakes.

Higher-rated and lower-rated organizations do not differ in the extent of constant conversations with customers, knowledge transfer processes and problem solving processes.

Both understand the importance of ongoing conversations with customers, efficient knowledge transfer and systematic problem solving. For this reason, the levels of customer satisfaction do not differ between higher-rated and lower-rated organizations.

Both types of organizations consider diversity as a strength and value individuals who speak out, develop ideas and challenge actions.

It is interesting to note that both higher-rated and lower-rated organizations have low levels of employee empowerment. These organizations give employees little choice in their work assignments and do little to provide them with the resources and the training they need.

For this reason, the levels of employee motivation and satisfaction are not different in higher-rated and lower-rated organizations.

Although leaders in both higher-rated and lower-rated organizations consider themselves as designers of learning infrastructures, teachers and coaches for people, they share information with employees to an average extent. Even in higher-rated organizations, leaders are reluctant to share a great extent of information with their employees. Most leaders probably see the information as power to retain their influence or they do not find their employees trustworthy.

Finding 10:

Findings from One-Way ANOVA

There is insufficient evidence that there are statistically significant differences in the average knowledge management and organizational learning practices among the five selected industries (Architecture, Engineering & Construction (AEC), Advertising Services, Pharmaceutical, Consulting Services and Real Estate Services). Moreover, there is insufficient

evidence that there are statistically significant differences in the average performance among the five selected industries.

We can assume that the five selected industries practice the same extent of knowledge management and organizational learning.

5.2. LIMITATIONS

We have to be aware of some limitations to our research. As this study was based on the managers' responses obtained from survey questionnaire, we should note that managers might bias either to display positive or neutral results or to guard company information however, managers are the ones who have a strategic and interdisciplinary perspective of the business.

Moreover, a more in-depth study could have been conducted by administering interviews with top management to examine further the relationships between knowledge management and learning organization with organizational performance since the interviews could include open-ended questions and address different perspectives beyond the ones specified in the questionnaire. Nevertheless, considering the busy schedules of general managers/CEOs, the administration of the survey questionnaire through email was the most appropriate and feasible procedure.

Previous theses from other universities in Lebanon have examined the topic of organizational learning practices of Lebanese organizations and the topic of knowledge management practices in specific departments of Lebanese organizations. However, the topics of knowledge management & learning organizations linked together have not been addressed previously. Besides, examining the impact of knowledge management and learning organization on organizational performance of Lebanese organizations has not been addressed. This thesis highlights the importance of intellectual capital, intangible assets, and knowledge as a strategic resource for maintaining competitive advantage.

5.3. RECOMMENDATIONS

Managers of Lebanese organizations seem to be aware of the theoretical aspects of knowledge management and learning organization, however their knowledge management and organizational learning practices reflect some ambiguity. Although managers understand the strategic importance of knowledge and are passionate about managing knowledge and at the same time they consider themselves designers of learning organizations and coaches who create space for learning, the implementation of knowledge management and organizational learning practices in their organizations do not exactly reflect their understanding of the importance of KM and LO. As such, there is insufficient access to company information, low levels of employee empowerment prevail, and leaders share only moderate level of information with employees. Moreover, communication being one of the key factors of employee empowerment and information sharing, culture which nurtures learning through multi-way communications and individual responsibility for communications should not score low relative to other practice, however here it's the opposite . There is a low score and this is most probably due to the low levels of employee empowerment and information sharing. Hence, it is important for managers to empower employees and provide them with the information they need for decision making to enhance employee morale, strengthen management-employee relationships, increase employee responsibility, and accountability, promote a culture of trust, openness, and transparency, all of which will positively affect the bottom-line results.

Finally, managers should encourage the implementation of the knowledge management and organizational learning practices, which are shown to improve organizational performance.

APPENDIX

**Questionnaire Exploring
Knowledge Management and Organizational Learning Practices
In Lebanese Organizations**

Dear Participants,

As part of the fulfillment of the requirements of the MBA degree from Haigazian University, I am conducting a survey about organizations in Lebanon to explore their knowledge management and organizational learning practices.

I would really appreciate and be grateful if you would take time to fill out the attached questionnaire.

Your frank responses will remain strictly confidential and the data from this survey will be reported in the thesis anonymously. To ensure anonymity, you are not required to disclose any personal information, identify yourself or your organization.

Your active participation will be an expression of your valuable sense of social responsibility that I definitely need.

The questionnaire consists of 32 statements, which describe knowledge management and learning organization practices.

Please read through each of the following statements and fill in the check box that indicates your level of agreement with the implementation of these practices in Your Organization according to the following scale: Strongly Disagree – Disagree – Neutral – Agree – Strongly Agree

For any clarification, please do not hesitate to contact me at mkhederlarian@students.haigazian.edu.lb

Thank you again for your valuable time and support,
Looking forward to hearing from you soon,

Sincerely,
Maria Khederlarian

No.	<i>Please read through each of the following statements and fill in the check box that indicates your level of agreement with the implementation of below practices in Your Organization:</i>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Knowledge is considered a key resource and a strategic asset that needs to be managed continuously.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	There are processes to systematically generate, capture, acquire, codify, store, retrieve and transfer knowledge for application and reuse (instead of reinventing it over) at all levels of the organization.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Leaders have a strong passion for knowledge management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Team work, collaboration, and cooperation are part of work routines and processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Leaders facilitate and reward team work and team decision making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	There is great emphasis on individual responsibility for communications where everyone asks: "Who in this organization depends on me for what information? And on whom, in turn, do I depend?" and employees are visibly encouraged to find, use and share information and knowledge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	There is free access to company information with no discrimination among employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	There is extensive use of After Action Review (AAR) which enables group members to look at the completed activity, analyze What actually happened against what was planned, Why it happened, and How it can be done better next time to improve performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	IT software are user friendly for employees and include sufficient help-instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	There is a formal process of gaining outside perspectives through benchmarking to ensure that best industry practices are uncovered, analyzed, adopted, and implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Constant conversations with customers take place and employees are encouraged to bring the customers' views into the decision making process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Knowledge is spread quickly and efficiently through reports, strategic reviews, system audits, personnel rotation programs, education and training, regular meetings and conferences.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Investments are made not only in knowledge management technology but also in people and processes to facilitate the utilization of knowledge in the stored technologies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	All employees hold a shared picture of the firm's vision, mission and objectives and are well aware of how they contribute to the achievement of the firm's objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	There are systematic procedures for problem solving through scientific method for diagnosing problems, using data and statistical tools to organize data, draw inferences and make decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	<i>Please read through each of the following statements and fill in the check box that indicates your level of agreement with the implementation of below practices in Your Organization:</i>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
15	There are systematic procedures for problem solving through scientific method for diagnosing problems, using data and statistical tools to organize data, draw inferences and make decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	There are processes to store and use knowledge from past history and experiences. Successes and failures are reviewed, assessed and learning from mistakes takes place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Knowledge and actionable advice are used to routinely help individuals and teams learn what they need to learn and apply this learning to meet the organization's strategic goals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Employees are given choice in their work assignments and provided with the resources and training they need.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Leaders share up to date information with employees about competitors, industry trends, and organizational directions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Leaders effectively integrate working and learning: they are "designers" of learning infrastructures, they create space for learning and invite people into that space: they are great teachers, they coach employees: they are growers of people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Culture nurtures learning through regular upward, downward and horizontal communications through suggestion systems, electronic bulletin boards, or town hall/open meetings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Processes encourage interaction across boundaries and facilitate free exchange and flow of information to ensure that expertise is available where it is needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Diversity is recognized as strength; all individuals are encouraged to develop ideas, to speak out and to challenge actions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Increased information and knowledge availability enhanced the decision making process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Application of learned knowledge and better knowledge reuse resulted in improved business processes, fewer mistakes, less redundancy and reduced costs and led to increased organizational effectiveness and efficiency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Integrating new knowledge learned with existing knowledge led to innovation and rapid development of new and improved products & services.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Improved knowledge of customer needs resulted in enhanced customer satisfaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Learning from experience and learning from others resulted in the development of employee personal competencies and skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	<i>Please read through each of the following statements and fill in the check box that indicates your level of agreement with the implementation of below practices in Your Organization:</i>	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
29	Valuing and appreciating people for their work led to increased employee motivation and satisfaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Learning skills beyond job requirements prepared employees to easily perform other jobs and led to increased workforce flexibility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Facilitative leadership resulted in the breakdown of traditional communication barriers which means that communication between and across all layers of the organization provided a sense of coherence making each individual a vital part of the system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Please check which of the following technologies does your organization implement. (Choose all the technologies that apply)					
	<input type="checkbox"/> Electronic library for key business processes, work systems					
	<input type="checkbox"/> Database about customers					
	<input type="checkbox"/> Database about competitors					
	<input type="checkbox"/> Database about industry best practices					
	<input type="checkbox"/> Electronic bulletin board for sharing information and knowledge					
	<input type="checkbox"/> Database about employee information (skills, competencies, expertise level)					
	<input type="checkbox"/> Social networks and groups					
<input type="checkbox"/> Decision Support System						
<input type="checkbox"/> Knowledge Management Software						

Please specify your position in the organization: _____

Thank you for your participation

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