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Knowledge management as a facilitator for enhancing Innovation performance in Islamic Banking through total quality management: A comprehensive study between Bahrain and Sudan Islamic Banking services.

إدارة المعرفة كمعزز لاداء الخدمات المصرفية الإسلامية من خلال إدارة الجودة الشاملة: دراسة مقارنة بين القطاع المصرفي السوداني و البحرين

A THESIS SUBMITTED FOR THE FULLFILEMENT DEGREE OF PHD IN BUSINESS ADMINISTRATION

BY

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الاية

بسم الله الرحمن الرحيم

وَلِيَعْلَمَ الَّذِينَ أُوتُوا الْعِلْمَ أَنَّهُ الْحَقُّ مِنْ رَبِّكَ فَيُؤْمِنُوا بِهِ فَتُخْبِتَ لَهُ قُلُوبُهُمْ ۗ وَإِنَّ اللَّهَ لَهَادِ الَّذِينَ آمَنُوا إِلَىٰ صِرَاطٍ مُسْتَقِيمٍ

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سورة الحج اية 54

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DEDICATION

A special thanks to the most important people in my world whom I dedicate this thesis to them.

To the meaning of love, life and mystery of existence ***Mum*** *Words cannot express how grateful I am, your prayer for me was what sustained me thus far.*

To my ***Father****, who taught me to give without waiting for take, to whom I bear his name proudly, I had experienced your existence and guidance each and every day, Dad you are the one who let me finish my degree.*

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ABSTRACT

The purpose of this study was to investigate the relationship between Knowledge Management (KM), Total Quality Management (TQM) and innovation and its impact on Islamic banks in Bahrain & Sudan. Based on the theoretical framework, four main hypotheses were developed, and statistically tested. The study used both survey & interview **cross-sectional** methodology. **A convenient** sampling technique was adopted for senior managers, data was collected via self-administered close ended 250 questionnaires & open ended interview. The hypotheses were tested by applying **multivariate statistical data analyses.** Factor analyses and Structural Equation Model (SEM) were conducted to determine the validity, reliability and to investigate the relationships among the three variables in general and their relationships through mediation. Confirmatory Factor Analysis (CFA) was conducted to identify a variable factor structure of independent variables, dependent variables, and mediators. . Results indicate that **knowledge management** in the basic principles of **TQM** practices among the employees in Bahrain Islamic banks is higher in contrast to the relative knowledge of Sudan's Islamic Banks. The study suggests a future direction which needs to be implemented within Sudanese& Bahraini Islamic banks to improve the process quality and productivity.

المستخلص

الهدف من هذه الدراسة معرفة العلاقة بين ادارة المعرفة وإدارة الجودة الشاملة والابتكار ومدي تأثيرها علي البنوك الإسلامية عامة و السودان بصفة خاصة، اعتمدت **ادارة المعرفة** كمتغير مستقل **مع ثمانية** عناصر وا إدارة الجودة الشاملة كمتغير وسيط مع **سبعة** عناصر اساسية و تدابير الابتكار كمتغير تابع يشمل كل من تطوير المنتجات ونوعية الخدمة.

لتحديد الجوانب التي تؤثر في مدى العلاقة بين المتغيرات الثلاثة ادارة المعرفة ; إدارة الجودة الشاملة والابتكار في البنوك الإسلامية في السودان، والبحرين، تم جمع البيانات عن طريق استبيان وزع على العينة المختارة . مجموع الاستبيانات كان 300 تم توزيع (125 لكل بلد على حد سواء) 80% كانت صالحة التحليل. تم اختبار الفرضيات للدراسة عن طريق تطبيق تحليلات البيانات الإحصائية متعدد لمتغيرات وأظهرت أن ممارسات إدارة المعرفة بالمبادئ الأساسية و إدارة الجودة الشاملة بين العاملين في المصارف الإسلامية بالبحرين أعلى نسبيا من "البنوك الإسلامية" في السودان التي لا تزال تطبيقات و ممارسات ادارة المعرفة و ادارة الجودة الشاملة غير مألوفة .

واوصت الدراسة بضرورة الاتجاه المستقبلي أن يطبق في المصارف الإسلامية السودانية لتحسين جودة الخدمة والإنتاجية

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

List of Abbreviations

KM: Knowledge management

TQM: Total quality management

INNO: Innovation

IFKM: Islamic Finance Knowledge Management

IFSB : Islamic Financial Services Board

IIFM : International Islamic Financial Market.

IFIs: Islamic Financial Institutions

TS: (T-shaped) People

OC: Organization culture infrastructure

OS: organization structure infrastructure

IT: information technology

KAcq: knowledge acquisition and creation

Kcap: knowledge capturing and storage

Ksha: knowledge dissemination, sharing and transfer

Kapp: knowledge application.

Lsh: Leadership and Top management support

RR: Rewards and recognition

ET: Education and training

EI: Employee involvement

CI: Continuous improvement

CF: Customer focus

Dd: Database decisions

Product INNO: Product innovation

Process INNO: Process innovation

CHAPTER 1: INTRODUCTION

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1.1 Background

Since the late 1970s, Sudan started the process of converting its financial systems to Islamic ones, i.e., starting from a predetermined date, all banks and financial institutions were to use only Shari'ah-compliant methods of financing. Additionally, Sudan started a new obligatory state tax – zakat. However, the Islamic security sector (takaful) was left virtually untouched by the reforms. By 2000 Sudan was the only country that managed to successfully complete the project of Islamizing its entire financial sector.

At first Sudan's Islamic financial system has proved to be successful with the continuous development since the establishment of the country's first Shari'ah-compliant bank in 1977. But at present Sudan Islamic financial institutions in hold situation where no local or international growth.

The high competition from conventional banking systems negatively affects the process of introducing innovations to the marketplace as Sudanese banks drastically lack creativity and innovation. Bekkin,R (2009 April –June)

1.2 Problem statement and Background

Sudanese Islamic banks face huge competition in the global marketplace and ignoring the consideration of the relative importance of the implementation of KM, TQM and innovation, the banking sector in Sudan would not thrive, but rather halt in a rapidly changing world. A frozen financial system will have a negative impact on the competitive advantage and financial systems will stay behind the ever advancing world (Çizakça.M 2014).

There is a strong need for Islamic Finance institutions in Sudan to differentiate themselves through new and innovative products and processes. The financial products must be able to integrate Shariah, Islamic economics and modern day finance to truly represent what an Islamic financial product should be (*Thajude.K.S* 2012)

The Islamic Products and Processes should be governed by Islamic religious beliefs and covering consumer needs. It is not effective to take conventional products and just replace a few terms and conditions. The ultimate aim should be to come up with truly Shariah based products. In addition, the different demands of the various customer segments have to be considered (Noman.A.M 2002).

1.3 Development of Islamic Banking: Sudan against Bahrain

Sudan was a leader in the transformation of the entire internal financial system to an Islamic model. Through the years Bahrain chose

to embrace Islamic banking as a national policy concurrently with conventional banking and finance (dual track banking), and gained a better status including being classified as the second-strongest leader in the Islamic Banking sector.

- **Sudan status** (Pasha.O ,2012)
  - In 1977 (Sudan) Faisal Islamic Bank of Sudan was established
  - In 1984, the whole banking system in Sudan was made totally *Shari'ah*-based
  - The Sudanese Court of Appeal, in 1984, held that the charging of interest is subject to criminal prosecution
  - The Islamic banking sector in Sudan has witnessed encouraging growth
  - Most of the Islamic banks have been established in cooperation with foreign capital
  - Some Islamic financial institutions operating in Sudan include Tadamon Islamic Bank, Al Shamal Islamic Bank, Faysal Islamic Bank Sudan, Sudanese Islamic Bank, Al Baraka Bank Sudan and Al Salam Bank
  - To enhance corporate governance, Sudanese authorities have enforced Basel requirements, implemented AAOIFI

disclosure standards and revised the onsite inspection manual.

Bahrain status (Pasha.O ,2012)

- The Bahrain Monetary Agency (BMA) is the first central bank to develop and issue prudential regulations for Islamic banks
- Bahrain has highest concentration of Islamic financial institutions (28 Islamic banks, 16 *takaful* operators)
- Two-thirds of Islamic financial institutions operating in GCC countries are based in Bahrain
- Rapid growth from total assets of UDS 1.9 billion (2000) to 45% (in 2003) with total asset base reaching USD4.2 billion to USD 10.3 billion (2006) - an increase of 400 percent.
- Poised to become center for development of software tailored for Islamic banking, collaborations with Microsoft
- Appears oversupplied with Islamic banks, mergers are likely in the future
- Proposed setting up of an international Islamic stock exchange

– Proposed establishment of an Islamic rating agency

Time line of Islamic Banking and Finance in Bahrain (Pasha.O, 2012)

Year	Key Milestone
1973	Since its establishment, Bahrain Monetary Agency, has been promoting the country as an International Financial Centre and encouraging major international financial institutions as their regional base.
1979	Bahrain Islamic Bank was established to provide commercial banking services.
1981-1982	Dar- Almal, a holding company ,was established in Switzerland and owning a group of banks in some Muslim countries which they then established Shamil Bank of Bahrain in 1982 (former Faisal Islamic bank)
1983	Al- Baraka Islamic Bank followed suit. Established Islamic Banks in many countries.
1990s	Turning point in the development of Islamic Banking in Bahrain.

	The BMA, issued a total of 8 banking licenses to diverse group of Institutions to enable them to pursue Islamic Banking services.
Today	Bahrain has the highest concentration of IFIs. 2/3 of Islamic Financial Institutions operating in GCC countries are based in Bahrain Bahrain has maintained its global second position globally, according to the Islamic Finance Development Indicator (IFDI) 2015 report launched at the ongoing World Islamic Banking Conference in the kingdom

Table 1: Time line of Islamic Banking and Finance in Bahrain

1.4 Research Questions

This study addresses the following research questions:

1. What are the significant reasons influencing Islamic finance innovation performance in Sudan's?
2. **What** are the relationships between KM initiatives, TQM, and Islamic Banks' innovation performance?
3. **To what extent are** KM initiatives implemented through TQM improve Islamic Banks' innovation performance?

1.5 Research objective

The concept of KM is gaining more attention from researchers and practitioners as they have recognized the importance of the relationships between KM and innovation performance (Davenport & Prusak, 1997); (Hall & Andriani, 2003). While some researchers have suggested a relationship between KM and TQM (Hsu & Shen, 2005), few studies have examined the relationships among KM, TQM, and organization innovation performance and none was for the Islamic finance sectors.

The ultimate objective of this study is to

- **Identify** the factors influencing Islamic finance low innovation performance in Sudan's.
- **To examine the nature of** the relationships among **KM**, **TQM**, and **innovation** within Islamic banks
- **Determining** the role of **KM** implemented through **TQM** in Islamic banks sector innovation performance.

1.6 Significance of the Study

1.6.1 Theoretical practices

- The Islamic finance industry operates within a financial environment that demands it to adapt to the constant change. Within this framework survival requires

innovation and advancement that will both strengthen the very core of the industry as well as always keep it steps ahead of the curve. There are limited researches and papers investigating Relationships among Knowledge Management and Innovation Performance through Total Quality Management in which none was on Islamic Finance.

- **This study will highlight** the importance of knowledge management as it supports the concept of total quality management and the reality of its application in Sudan.

1.6.2 Practical practices

- **This study will Increase awareness** among the managers, decision makers and staff of the importance of the **application** methodology integrative to total quality management and knowledge management, especially in light of the growing rivalry, and a step to strengthen the effort to provide services to suit the needs and expectations of the Islamic Banking market.
- This study will **assist** Sudan's Islamic Banks to be more **competitive** and successful by being more innovative in both Islamic products and process.
- This study will **introduce** relevant **recommendations** and proposals in light of the results to the decision makers that are believed to contribute the enhancement, and correct

their application of integrative approach between the TQM and KM.

1.7 Definition of key terms

Knowledge:

Knowledge is a concept that cannot be seen, but can only observe its effects. Because knowledge is an invisible, intangible asset and cannot be directly observed, many organizations do not explicitly recognize the importance of knowledge, in contrast to their more visible financial and capital assets (Sveiby, 1997). There are two types of Knowledge: **explicit**, which can be written down and shared; and **tacit** which is learnt through experience and is communicated person to person.

Knowledge is the Capital owned by people and staff of a company such as: **know-how** and **expertise, competencies, market experiences, contextual information, and expert insight** that provides a framework for evaluating and incorporating new experiences and information. It originates and applied in **the minds of "knowers**." Knowledge becomes embedded not only in documents or repositories but also in **organizational routines, processes, practices, and norms**. (Davenport & Prusak, 1997, p.5), knowledge management can be defined as "the practice of selecting applying knowledge from pervious experiences of decision making to current and future decision-making

activities with the express purpose of improving the organization´s effectiveness" (Jennex, 2007,).

Knowledge management processes include organization-wide activities of knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application by individuals and groups to pursue the major organizational goals (Lawson, 2003)

Islamic Finance Knowledge Management

IFKM could be defined as 'a **practice** or systematic **and integrative process** that aims **to identify find, select, organize, distribute, transfer** important information and **build Sharia'a** and business knowledge resources within the institution to enable and empower capabilities and competencies to excel in conducting Sharia'a-compliant business and realize business objectives, problem solving, dynamic learning, strategic planning, and decision-making to achieve the organization goals (Gupta et al., 2000; Lawson, 2003).

According to Ackoff (1989),

- **Data** is raw, it is simply exists and **has no significance** beyond its existence (in and of itself). It can exist in any form, usable or not. It does not have meaning of itself. Moreover, collection of

data is not information, unless there is a relation between these pieces of data.

- **Information:** is data with context and relevance. , While information is necessary for good decision-making; alone it is insufficient. The reason is that information is simply a message; it has a sender and a receiver; and it is ultimately the receiver, not the sender, who decides whether the message is informative (and thus becomes information). Information allows us to answer the “who”, “what”, “where”, “when”, and “how many” questions.

- **Knowledge management** is the systematic management of an organization's **knowledge assets** for the purpose of **creating value and meeting** tactical & strategic requirements; it consists of the initiatives, processes, strategies, and systems that sustain and enhance the creation ,storage, assessment, sharing, refinement, and sharing of knowledge.

Total quality management can be summarized as a management system for **a customer-focused** organization that involves all **employees in continual improvement**. It uses strategy, data, and **effective communications** to integrate the quality discipline into the culture and activities of the organization. “**TQM** is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve

and exceed customer expectations" (Antony, Leung, Knowles, & Goshal, 2002, p. 551).

Innovation is a complete process that starts with the identification of opportunities or problems, followed by the discovery and development of solutions, taking the shape of products or services (or capabilities) which are then implemented or applied to the market (Jamil 2008). (Innovation does not necessarily rhyme with invention). (Devlin 1995) refers to the term innovation in the delivery system of financial services as 'an **opportunity to gain competitive advantage'** which would give, a retail banking service provider 'the basis for differentiation'.

Innovation can be defined as new or improved products, processes, services, and operations emerging from the implementation and adaptation of knowledge and practice that create added value to both customer and organization and distinguish the organization from others (Gloet & Terziovski, 2004).

The adoption of innovation is generally intended to contribute to organizational **performance** (Damanpour, 1991). Therefore, organization innovation performance is associated with the way organizations **adopt and adapt to changes** in markets, technology, and competition (Dougherty & Hardy, 1996).

CHAPTER 2 LITERATURE REVIEW

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2.1 Total Quality Management (TQM)

The recognition of **TQM** as a key to achieving sustained long-term competitive advantage has been widely promoted around the world, the lead article mapped out TQM theory (Dean & Bowen, 1994); there was a lot of research conducted on the positive effect of TQM on performance (Samson & Terziovski, 1999; Oakland & Porter, 2004). Choi and Valikangas (2001) argue that total quality management (TQM) is an important tool, but it cannot create sustainable value unless coupled with forward-looking strategies and innovation.

2.1.1 The Benefits of TQM

Now, TQM is known as the **key element in attaining achievement** and sustainability in both service and manufacturing companies (Claver-Cortes, Pereira-Moliner, Tari, & Molina-Azorin, 2008). Various studies showed that TQM is able to **improve** a company **performance** if it is effectively practiced (Flynn, Schroeder, & Sakakibara, 1994; Prajogo & Sohal, 2004; Samson & Terziovski, 1999). It will result in **lowering production cost** while **increasing the productivity** (Garvin, 1983), improving employee's job satisfaction (Ooi, Bakar, Arumugam, Vellapan, & Loke, 2007) while **minimizing their role conflict** (Teh, Yong, Arumugam, & Ooi, 2009). From this, it is evident that TQM is vital in achieving sustainable **competitive edge**.

2.1.2 TQM in Islamic banking sector

As a modern management approach, TQM can be used successfully in Islamic banking sectors that are mainly focused on **increasing the customer satisfaction** (Croker et al., 1996; Winn & Green, 1998). Recent research on TQM have helped develop a widely-updated plan for Islamic banking sector's **reforms and modernization** of Islamic banking. The TQM principles have broad applications in Islamic banking sectors and have produced desirable outcomes. With these applications, **service improvement** has become a **continual process** that has created an environment characterized by **unity, change and trust** (Terry, 1996). There is a considerable proximity between the principles of TQM and the principles of **effective banking system** (Lezotte, 1992; Balc, 2002).

Most bankers believe that banks are in financial sector, and not in the service industry, thus they tend to compete in terms of financial prowess rather than service quality (Al-Shobaki, SD, Fouad, RH & Al-Bashir, A 2010).

In order to apply TQM to a service sector it is important to decide on how to evaluate the **quality of service**. Service can be evaluated according to **cost**, **flexibility**, **acquirability**, **totality**, and **response time** (Evans,JR 1993). Setting the quality aspects for these services is an aspect that was discussed by (Tokan, K 1995). (Ramadan, Z 1995) considered the nature of services that the banks

provide. However, banks depend on **customer satisfaction** to sustain their business which classifies them as a service company.

2.1.3 The Core Elements of TQM

TQM is classified as a set of guiding principles for the foundation of **a continuously improving organization**. It incorporates fundamental basic **management techniques**, **improvement methods**, and **technical tools** in a disciplined approach (Besterfield, 2003). TQM implementation proposes not only to improve product quality and service, but also to reduce costs and improve customer satisfaction (Longest, Rakich, & Darr, 2000). Even though it appears to have produced mixed results, when properly implemented, TQM has been credited with providing benefits for organizations (Oakland & Porter, 2004).

TQM practices, as mentioned before are engaged in elements that considered so essential that many organizations define them, in some format, as a set of **core values and principles** on which the organization is to operate these elements are: **Top management** commitment (leadership), **Employee involvement**, **Continuous improvement**, **Customer focus**, **data base decision**, **Education & training** and **rewards & recognition**

Leadership and Top management support

Top management support is possibly the most important

principle in TQM. Top management support requires the top management to be committed to **lead employees** and provide an **inspiring vision**, **set strategic directions** that are understood by all, and **encourage values** that guide employees (Kubiak, 2005).

Top management's **leadership** and **encouragement** of the effort, based on an awareness of the benefits of TQM, is crucial. Top managers must clearly and publicly endorse TQM, be fully committed and have an understanding of each of the phases of implementing TQM. If necessary, they must undergo training of TQM principles.

In an environment where TQM is implemented and the goal is to become more **innovative**, **top managers should adopt a consultative style**. This style is an interactive type of leadership where the manager gets opinions before deciding on the plan presented (Flamholtz, 1990).

A consultative management approach, however, creates a work environment where **sharing knowledge** is truly valued. This can operate through the **quality facilitators** who are the links between management, staff and other employees, and who often represent cross-functional work teams.

Senior executives should consult with others in the organization. They should do this at various levels and in various functions, **Two-way communication** is crucial. Abdulmalik, A (2000) emphasizes the importance of participatory management approaches in

Islamic banks. **Communication** must be open **vertically**, between management and staff, and **horizontally**, between the different functions in an organization. Measurement of results in order to **monitor and improve performance** is another component of TQM, as are **rewards and recognition of employees** that do well.

The Shari'ah advisory board plays a unique role in the management of Islamic financial institutions. Within the context of TQM, it is important for Shari'ah boards to **play an integral role** in the banks which they advise; Close interaction between Shari'ah experts and the management team will mean that both groups will be more familiar with suitable **innovative strategies for the Islamic financial** marketplace. Innovative financial product solutions cannot be developed by staff that has inadequate knowledge of Islamic principles MEED (2001b). Collaboration and alliances among the Shari'ah boards of several Islamic banks can also be helpful in furthering the expansion of new products for the Islamic sector.

Employee Involvement

Since quality is a companywide process, it engages everyone in the organization with no exceptions in seeking out quality problems and corrects them (Watson, 2008). So the involvement of employees occurs **through a system of quality facilitators** who work with **cross-functional teams** to enhance work processes in order to

improve service to both the organization's internal and external customers.

Total employee involvement. All employees participate in working toward common goals. Total employee commitment can only be obtained after fear has been driven from the workplace, when **empowerment** has occurred, and management has provided the **proper environment**. High-performance work systems integrate continuous improvement efforts with normal business operations. Self-managed work teams are one form of empowerment.

Communications: During times of organizational change, as well as part of day-to-day operation, **effective communications** plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness

Continuous Improvement

Continuous improvement is a major driving force for TQM. Continuous improvement constrains an organization to be both **analytical and creative** in finding ways to become **more effective** at meeting **stakeholder expectations** and finding ways to become **more competitive**. Without improvement, the performance of all systems becomes **stagnant** (Feigenbaum, 2004).

Customer Focus

C**ustomer focus** ultimately determines the level of quality. No matter what an organization does to promote quality improvement such as training of employees, integrating quality into the design process, upgrading computers, or buying new measuring tools, the **customer determines whether the efforts** are worthwhile (Kubiak, 2005).The customers who ultimately determine the level of quality.

Quality construction process

Quality construction process helps organizations by **improve decision making accuracy**, **achieve consensus**, and **allow prediction** based on past history through **continually collecting and analyzing data**. **Data on performance measures** are necessary in order to know how well an organization is performing (Watson, 2008). In **Fact based decision making** data on performance measures are necessary.

Education & training

Training of employees is a fundamental principle of TQM (Ahire, Golhar, & Waller, M.A. (1996). Training can take many forms such as regular **seminars** or **workshops**, the quality facilitators should adopt leadership roles with respect to training activities. Particular attention should be paid to **cultural adaptation** to the workforce and to an **Islamic perspective**.

Employees should **learn about Islamic principles** and **ethics**. Other examples of training approaches include supporting, through financial incentives or time release, the **continuing education** of employees at colleges and universities. Senior managers should encourage employee initiative and develop programs where the **employees choose what to learn and when to learn**. **Mentoring programs** and **employee rotation** also expand skills and sharing of knowledge Von Krogh (1998). Indeed, training is a key part of the process and involves all employees.

Reward & recognition

An appropriate system of **reward and recognition** is critical to any bank's TQM, Reward and Recognition should be provided for **both suggestions** and **achievements** for **teams** as well as **individuals**. **Detecting** rewarding and recognizing contributors is the most **important job of a supervisor**. As people are recognized, there can be huge changes in self-esteem, productivity, quality and the amount of effort exhorted to the task at hand. Recognition comes in its best form when it is immediately following an action that an employee has performed (Nayantara, 2010). Recognition comes in different ways, places and time such as,

- Ways – It can be by way of personal letter from top management. Also by award banquets, plaques, trophies etc.
- Places – Good performers can be recognized in front of departments, on performance boards and also in front of top management.
- Time – Recognition can be given at any time like in staff meeting, annual award banquets, etc.

2.2 Knowledge Management (KM)

The world is now experiencing a radical transformation from a mass production system where the principal source of **value** was **human labor** and now to the epoch of 'innovation-mediated production' where the principal component of value creation, productivity and economic growth is **knowledge** (Andrew and Sirkin, 2006). As there are different dimensions of knowledge, it is difficult to identify precisely what knowledge is. Such understanding is now vitally important for the employees in any organization; especially for those interested in the services sector in general, and banking operations in particular (Pemberton et al, 2002).

In today's competitive business environment, an organization needs experience of how to deploy its **corporate assets efficiently and effectively**. Thus it is very hard for an organization to gain the advantage over its competitors. To achieve superiority, a firm needs a range of resources to be able to achieve success and competency in the marketplace (Borgonovo and Peccati, 2004)

2.2.1 Benefits of KM

From an organization point of view, the advantages of knowledge management can occur in 2 levels: individual and organization (Cong & Pandya, 2003).

At the **individual level** it gives an opportunity to individual to **discover, capture, share and apply** the knowledge in real environment.

At the **organization level**, it increases the **financial value** of the organization (U.S Department of Navy, 2001), besides it **improves the performance** through increased efficiency, productivity, quality and innovation (CIO Council, 2001).

2.2.2 Types of knowledge

As quoted by (Gamble and Blackwell 2001) knowledge differentiates into **two types**: "represented (**explicit**) and embodied (**tacit**) knowledge".

Tacit knowledge is hard to define because "it consists of mental models, beliefs, and perspectives" (Nonaka, 1998) and it is implicit in our patterns of action and in our head for the thing with which we are dealing (Schon 1978). This characteristic makes tacit knowledge **difficult to communicate** to other individuals. The owner of tacit knowledge will therefore always "**know more than they can say**" and for this reason taci knowledge can **never fully be in the possession of a firm** (Boisot 1998).

Tacit knowledge is not possible to integrate through manuals or documentation because it is embodied in individuals and it is **more personal**. Tacit knowledge is shared through deep socialization which

means that individual in the group not only **understand each other's** definition of certain situation but also agree on a common definition and justified true belief about how to act in certain situations (Von Krogh, Ichijo & Nonaka 2000). Therefore, one way to **integrate tacit knowledge** is through **organization routines** where individuals can meet and interact each other frequently (Grant 1996). Through the organizational routines individuals have chance to **share tacit knowledge** via **interpersonal and social relationship** (Zack 1999). The forms of organizational routines are regular formal education, formal and informal meetings, team working, discussion through e-mail and intranet (Hislop 2003).

Explicit knowledge is codified; it can easily communicated (Corno, Reinmoeller & Nonaka 1999). Because it is codified, explicit knowledge can be **transferred and shared** between individuals in an organization by using documentation or training programs (Von Krogh, Ichijo & Nonaka 2000). It is also **captured** artificially through manuals and standard operations, and then shared with others either through courses or books for self-reading (Lee and Yang 2000). If tacit knowledge is only stored in individuals, explicit knowledge can be **stored** in a variety of ways.

Organizations might prepare a numbers of **storage bins** to store their explicit knowledge such as **documentations** (electronic or paper), **procedures** (electronic or paper), **artifact, and audio-visual** (Von Krogh, Ichijo & Nonaka 2000), explicit knowledge can be

formalized and distributed through manuals, procedure, and instruction at the collective and individual's level (Nissen, Kamel & Sengupta 2000).

The variety of knowledge in an organization, then, should be **integrated with strategic mechanism** because the integration process is a complex process especially tacit knowledge. According to Grant (1996) there are **two mechanisms for integrating knowledge**; **direction and routines** (*figure 1*)

2.2.3 KM in Islamic banking sector

The success of Islamic banks depends very much on employees who understand the operations of the banks **based on sharia rules** or business principles. The banks need manpower who possess a **variety of knowledge, skills, and orientation** that is provided by training institutions and universities (Hassan 1999). Because manpower comes from different training institutions and universities, they have **different knowledge, norms and values** that require **adjustment to the need of Islamic banking** business. Even though, the people working in Islamic banks are **diverse in knowledge** and behavior they should have commitment for **common cause**. The diversity of knowledge creates problems to Islamic banks because some of the knowledge is **not Islamic economic-based** which needs to be **integrated into the Islamic economic** framework. In addition, **insufficient training** of the personnel to understand both

Islamic techniques of banking and its business processes **cause the little innovations** in terms of the banking services offered to their customers (Khan 1991) which also create the high level of customer dissatisfaction (Jones 2003).

Consumers' behavior in Islamic society is mostly affected by Islamic **moral, social**, and **cultural norms** (Khan 1991). Therefore, employees must understand this Moslems behavior when the employees are dealing with the consumers. One way to do this is **Islamization of knowledge** (Davies 1991) that means Islamic banks must **adjust this knowledge** to Islamic culture to support its business process.

Employees who understand sharia law feel uncomfortable knowing that their bank's operations do not really conform to the **prohibition of interest** (Kuran, 1996), Meanwhile employees who possess **commercial knowledge** might not take this issue serious that because they are familiar with the **charging of interest**. Therefore, both groups of employees have **different views of Islamic bank** business processes because they have different knowledge, practices, norms and values.

Islamic banks run their businesses within an Islamic economic framework without involving **riba** (i**nterest**) and **gharar (speculations**). This leads Islamic countries to **treat Islamic banks differently** from conventional banks based on **two factors** "a **religious** argument by considering that religious factors should be paramount and

an **economic** argument that Islamic operations are fundamentally different from conventional bank" (Warde 2000:97).

To make sure that Islamic banks are operating in the **framework of Islamic culture**, Islamic banks establish **Sharia Advisory Boards** that advice about the banks operations and **keep track of Islamic banks**. In addition, Islamic banks also build certain **governance structures** to ensure that the **day-to-day policies and activities are relevant to the sharia**. This type of structure keeps the Islamic banks operating within an Islamic culture.

The mission of Islamic banks is in accordance with **Quran** and **sharia** principles. Quran and sharia, as sources of Islamic law and the guidance of life, stress on the distribution of income, and the social responsibilities of wealth holders such as through **zakat** (tax) (Wilson 1990). Therefore, the banks not only focus on profit but also on **falah** in running their business as a form of obeying sharia. Therefore, providing **profit and loss sharing** products is more appropriate to Islamic banks rather than cost plus products because both Islamic banks and customers are responsible for both loss and profit in trading.

Individuals who possess **Islamic economic knowledge** also must establish their views based on business perspective because the missions of Islamic banks are not only concerned with **falah** but **also profit** because Islam recognizes capital as a factor of production but

it does not allow the factor to make a prior or predetermined claim on the productive surplus in the form of interest (Ariff 1988).

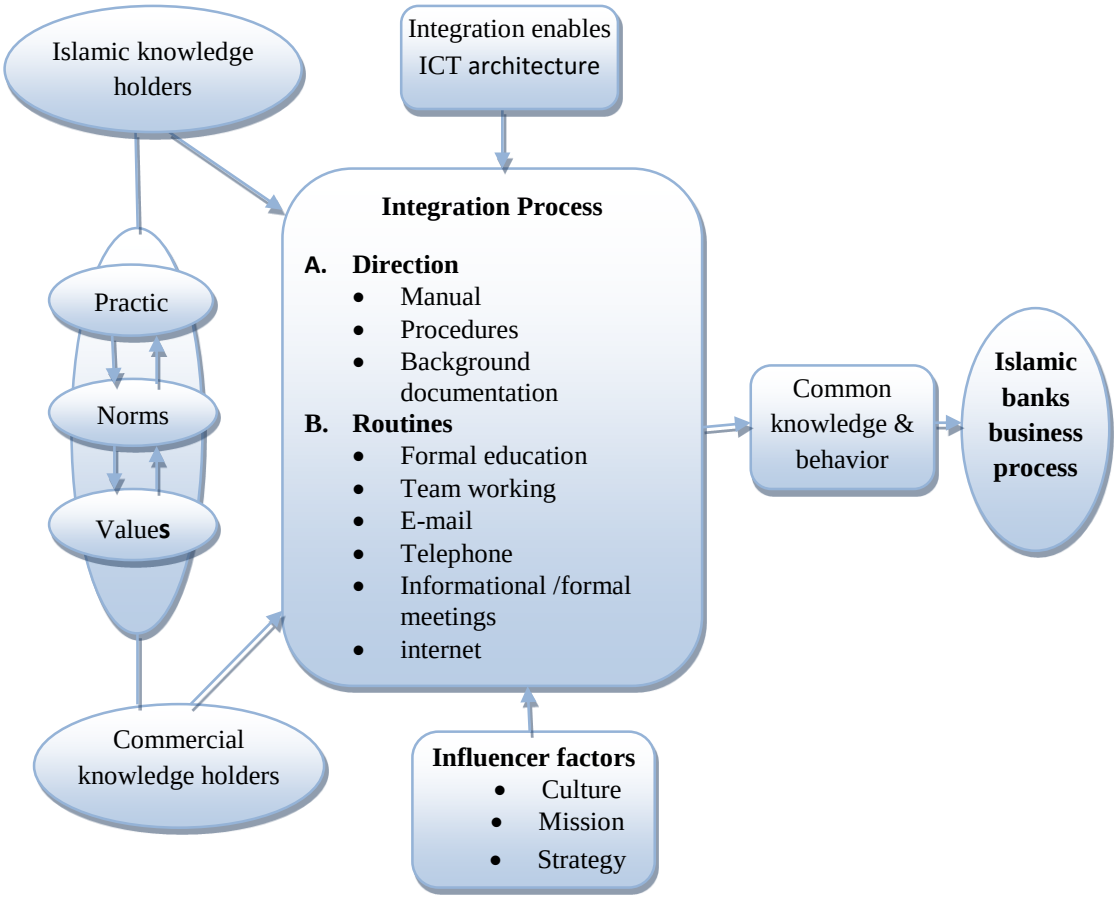


Figure 1 Theoretical Construct for Knowledge Integration Model

2.2.4 Knowledge Management and Learning Organizations:

"**Learning organization**" is a concept focused on process of **acquiring information**, **data interpretation**, and **knowledge development** and **obtaining of learning process**. It is crucial for the organization to achieve the success in managing the knowledge.

In order for the organization to be a learning organization it is required to establish:

1. **A climate** in which every employee is **encouraged to learn and develop**.
2. A human resource **development strategy** as a central policy
3. **Continuous** organizational transformation
4. **Commitment** of employees to learn and become better to enhance performance.

2.2.5 Critical Success Factors of KM

The main goal of KM is to **improve organizational achievement**; therefore, defining the critical success factors is useful, **the factors contributing to KM success** are what Davenport and Klahr (1998) identify as **eight KM success factors**: **Technology infrastructure**, **Organizational infrastructure**, **Balance of flexibility**, **Ease-of-accessibility to knowledge**, **Shared knowledge**, **Knowledge-friendly culture**, **Motivated workers** who develop, share, and use knowledge, and **Senior management support** and commitment. Any KM program needs to identify indicators of success to judge the extent of KM practices and management performance accordingly.

Moffett et al (2003), identify another two factors for successful KM: **Benchmarking** and **Performance measurements**. In general, no specific approach for successful KM applications in business

organization has been generalized by all researchers and considerable effort must be made to remove constraints to ensure successful KM implementation and interrelationships.

The success of KM implementation will not take place without the collective work of many **enablers**. These include the extent to which the **management believes** in KM effects, the **information technology** used, **human resource management**, and the **culture** of the organization. An organizational **structure** reflects the organization's policy toward engaging with its employees and in absorbing new ideas and experiences within and outside its capacity. The **hierarchical structure** may be used as an **enabler** in determining acceptable practices in the organization

Highlighting **the main factors** that **reduce** the chance of successful KM practices or the **barriers to sharing knowledge** is also important. Knowledge sharing often is regarded as a barrier for management. The following act as a barrier to knowledge sharing.

- Knowledge is intangible information in action; this makes it difficult to know **who knows what** (King and Marks, 2008).
- **Willingness** of departments to cooperate and contribute in knowledge sharing, either individually or collectively.
- **Underestimate knowledge** effects from both sides (employees and management), then knowledge becomes a second priority, (King and Lekse, 2006).

- People believe that knowledge is power and the **hoarding of knowledge** leads to **gaining control over power**.

This research will consider **Organizational infrastructure (**Information Technology**, Organization** Structure, Knowledge-friendly culture, and People), **Knowledge management process (**knowledge acquisition, knowledge Sharing, knowledge storing, knowledge application**)** as the main critical factors.

2.2.5.1 Organizational infrastructure

Information Technology infrastructure:

Many researchers have found that IT is a crucial element for knowledge creation. IT affects knowledge in a variety of ways:

First, IT facilitates rapid collection, storage, and exchange of knowledge on an unprecedented scale, thereby assisting the knowledge creation process.

Second, a well-developed technology integrates fragmented flows of knowledge. This integration can **eliminate barriers to communication** among departments in organization.

Third, **IT encourages all modes of knowledge creation** and is not limited to the transfer of explicit knowledge.

The implementation of knowledge management technologies without ensuring that the organization's employees are well informed about the organization's overall goals and objectives, and how this technology can facilitate the success of these goals, will lead to disappointing returns on the technology investment

Organizational Structure infrastructure

Organizational structure is important in leveraging technological architecture. Although intended to rationalize individual functions or units within an organization, structural elements have often had the unintended consequence of inhibiting collaboration and the sharing of knowledge across internal organizational boundaries. In essence it is important that organizational structures be designed for **flexibility**.

The organization structure should be **networked** to provide opportunities for employees to **interact and communicate** with others, and support knowledge-related actions. Because it is intangible, tacit knowledge is more difficult to manage than explicit knowledge. Organization structure should be able to **handle tacit** knowledge, and **change it into explicit knowledge** if necessary.

Organizational structure should **align with the strategies** and fit in a **transparent and open cultural environment**. It should be in line with the organization's strategies, **goals, mission and vision**, and **encourage employees to learn**. In the organizational structure, there

should be a connection between individual improvement and organization improvement. Moreover organizational structure should result in organization learning.

Organizational Culture infrastructure (Knowledge-friendly culture):

In general terms, culture can be understood as a set of **rules, values, and beliefs** that are **shared by a firm's members** and which conditions their behaviors, along with the configuration of the firm's image and identity in relation to its environment.

The presence of an appropriate organizational structure is one of the key aspects of successful knowledge management implementation so an understanding of all the aspects of an organization's culture is critical. The process of changing culture is particularly difficult due to the fact that it is history dependent and used as a socializing mechanism for new organizational members and it also repeats itself, so cultural misfits are less likely to be recruited in the organization or promoted to a higher position.

Organizational vision, mission and values embody the culture of the organization and determine the types of knowledge that are desired and the types of knowledge related activities that are encouraged. An appropriate culture within a firm can encourage people to create and share knowledge. Cultural management is an essential tool for successful implementation of knowledge management.

Organizational (T-shaped skills) People infrastructure:

Harvard Business Review (HBR) reported a need for a new type of individual skill. **T-shaped individuals** (the **vertical** part of the "T") knowledge in their own expertise and a broad and in-depth specialized knowledge in one or two fields. (The **horizontal** part of the "T") refers to the knowledge of general business issues and the complementary skills of communication with other departments and disciplines.

People with T-shaped skills are extremely valuable for creating knowledge because they can integrate diverse knowledge assets. They have the ability both to **combine theoretical and practical knowledge** and to see how their branch of knowledge interacts with other branches. Therefore, they can **expand their competence across several functional branch areas**, and thus create new knowledge (phil. 2007).

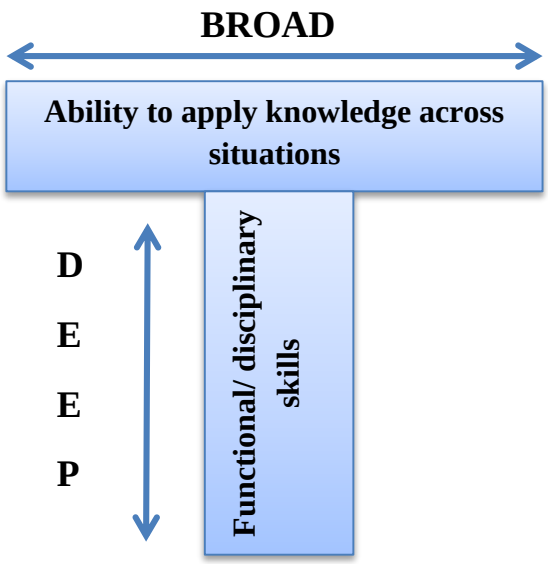


Figure 2: T-Shaped Skills

2.2.5.2 Knowledge Management Process

The KM process adopted in this study was grouped into the following core activities: **knowledge acquisition and creation**; **knowledge capturing and storage**; **knowledge dissemination and transfer**; and **knowledge application**. These processes lead to the success of KM in an organization.

Knowledge Acquisition and creation

Knowledge acquisition and creation need not only to be undertaken during the first step of a KM program, but also **continuously evolve and emerge**. Knowledge acquisition and creation are defined as the **improved** use of **existing knowledge** and effectively production of **new knowledge** through **active conversation** that is **externalized and distributed as new knowledge** (Hung et al., 2006; Lawson, 2003). The acquisition and creation of organizational knowledge involves not only organization knowledge related to the organization's **purposes, vision, mission, and principles** (Allee, 2003), but also the s**haring and circulating of personal experience (**Gold, Malhotra, & Segars, 2001). To maximize the impact of collected information and acquired knowledge, organization members are **encouraged to share their best practices**, new techniques, and lessons learned with their colleagues, wherever they are in the organization (Yodwisitsak, 2004). An organization cannot create knowledge by itself, it **learns** by the learning of its members and by incorporating new members who have knowledge the organization previously did not have (Simon, 1991).

Acquisition-oriented knowledge management processes are those oriented toward **obtaining knowledge**. **Innovation**, another aspect of acquisition, is the **creation of new knowledge** from the application of **existing knowledge** which was created by individuals only.

Issues in Acquiring and obtaining knowledge in Islamic finance:

A problem exists in Islamic banks because of **insufficient training** of their personnel (Kahf, 1999). The growth of Islamic banks have happened too rapidly to allow time for adequate personnel training. Also, many Islamic banks **recruit** their employees from **conventional banks**, and these employees have sometimes experienced problems in **understanding Shari'ah** rulings, **implementing** the new modes of financing, and in **advising** bank customers on the characteristics of different types of Islamic transactions and services. The lack of knowledge has also contributed to a **weak relationship**, in most instances, between **Islamic banks and their central banks**. This is partly due to the inability of the newly appointed personnel of Islamic banks to **explain adequately the special characteristics** of their transactions to central bank staff.

Knowledge capture and Storage

Knowledge capturing and storage are the processes of **identifying new** knowledge as relevant and important for current and future use and

storing that unit of knowledge in reasonable forms so that **others in the organization can access** it (Lawson, 2003; Zack, 1999). Knowledge capturing and storage become important when knowledge is created or acquired from other sources and adapted it **for internal use** (Hung et al., 2006). At this stage, organization members usually try to organize and **transform the acquired knowledge** into **written material** or other forms to store (Yodwisitsak, 2004).

In knowledge capturing **explicit knowledge** can be easily captured and put in the form of a manual, booklet, or document. On the other hand, **tacit knowledge** is imbedded in social structures, and therefore, it needs to be extracted, codified, and made explicit. Through this codification process, **tacit knowledge is transformed into explicit knowledge**.

Knowledge dissemination, Sharing and transfer

Knowledge dissemination and transfer are critical in KM processes, Knowledge transfer and knowledge sharing are often used **interchangeably** (Bock & Kim, 2002). Knowledge dissemination and transfer describe the business processes that **distribute and transmit knowledge** among individuals or groups participating in process activities within or across organizations via information systems or through personal interaction (Bock & Kim, 2002; Lawson, 2003; Lin & Lee, 2005). During the dissemination and transfer processes, knowledge should be **presented in useful and appropriate formats**,

making it understandable and directly interpretable by users (Ribiere, 2001).

When we communicate knowledge, both explicit and tacit knowledge can be shared. However, **explicit** knowledge can be shared more easily and carries **little risk** of creating **error** in the process. **Tacit** knowledge, which is hard to articulate, is the **challenging part** of knowledge sharing. In any case, sharing should be as direct as possible with **few intermediaries** (Buckman, 1998).

The knowledge communication processes involve **interaction** between the types of the knowledge as mentioned earlier. This **interaction**, between **tacit** and **explicit** knowledge **creates 4 modes of knowledge conversion**, which is called the **SECI** model developed by (Nonaka 1998), this model describes the conversion of tacit knowledge to tacit knowledge (**socialization**), tacit knowledge to explicit knowledge (**externalization**), explicit knowledge to tacit knowledge (**internalization**) and explicit knowledge to explicit knowledge (**combination**).

The conversion of tacit knowledge to tacit knowledge (**socialization**) is characterized by **joint activities, or face-to-face interactions** over time. **Externalization**, on the other hand, requires that one translate what is known intuitively into a form that can be understood by others.

Internalization is the conversion of explicit knowledge into tacit knowledge, this requires that one **learn the knowledge** to the point where it becomes **second nature**, or learning by continually doing. Finally, **combination** refers to Nonaka's theory (1998) on Organizational Knowledge Creation is widely known for addressing '**how**' knowledge is converted within organizations. Conversion of explicit knowledge to explicit knowledge, where **knowledge is coded** and classified for better retrieval and easier sharing in the future.

The researchers' belief that encouraging employees by their organization for knowledge sharing is the starting point in **building a strategy and achieving objectives**, although performance may be differ from one organization to another. In practice, the **hierarchical structure** may be used as an **enabler** in locating acceptable practices in the organization. Collective participation by employees will encourage and strengthen **relationships and trust** between employees and their organizations in problem solving, and such practices will serve in creating a set of **ongoing best organizational practices** for knowledge and the role of KM. Such participation reflects the **organizational culture and employees' motivation** (Cramton, 2001).

Knowledge dissemination, Sharing and transfer in Islamic finance

In order to grow and share knowledge, Islamic financial institutions also need to **develop trust-based** environments. When team or organizational members trust one another, this facilitates their working toward **team** or organizational goals rather than toward narrow, individual or functional goals or agendas (Madhavan and Grover, 1998).

Knowledge Protection Process

Without a knowledge protection process, knowledge would **lose the important qualities** of supporting progress. The methodology of knowledge protection include the concept of the protection of knowledge assets, the knowledge of how **outside illegal users** use inside knowledge assets, the rule of knowledge assets clear classification and control, and the measures of avoiding **inside illegal users steal** inside knowledge assets.

This would typically include the use of **copyright** and **patents** along with information technology systems that allow knowledge to be secured by **filename, user name, password and file-sharing protocols** that ascribe rights to authorized users. However, knowledge protection is often challenging in part because the copyright laws that are intended to protect knowledge are limited in their treatment of the knowledge environment.

Knowledge Application

Knowledge application is perceived as the **key element** of the knowledge based theory of the firm that is responsible for **gaining competitive advantage** rather than knowledge itself.

Knowledge application refers to processes of **making knowledge more active and relevant** for organizational application and applying knowledge to **new situations** in which users can **learn and generate new knowledge** and having effective storage and retrieval mechanisms that allow the organization to access that knowledge easily (Lawson, 2003; Lin & Lee, 2005).

The capability to utilize a related knowledge base in **decision making** and problem solving allows the firm to respond **more effectively** to environmental changes. Knowledge is used in a context in which users can not only learn but also produce new knowledge.

2.3 Innovation

In order for Islamic finance to be a viable alternative to conventional banking, it is necessary for Islamic Financial Institutions (IFIs) to offer innovative products and processes to address consumer demands. Innovation is the key to sustaining **growth and securing competitive advantage**. (Prajogo, Power, & Sohal, 2004; Prajogo & Sohal, 2003) find that Innovation plays a 'crucial role in maintaining **sustainable competitive advantage** in today's global competition. Innovation engages the application of **new ideas in products, processes, services, management, and marketing** (Singh & Smith, 2004). It varies from a major change to a million little **things that improve the operations** of the organization (Edenenius, Keller, & Lindbald, 2011; Singh & Smith, 2004). In its best form, innovation has the ability to **improve performance, solve problems, increase value**, and **enhance competitive advantage**, all of which are essential to the concept of differentiated strategy (Gloet & Terziovski, 2004).

2.3.1 Innovation in IFIs

First, innovation **enhances the overall efficiency** by which the **Islamic products and services** are being provided. This may be achieved via several channels such as the application of

technology that improves convenience for customers and reduces the cost of financial transactions by driving down operational costs.

Second, Innovation entails the introduction of **new structures** that may contribute to enhancing convenience for consumers and businesses.

Thirdly, innovation plays a role towards creating **new markets and expanding the markets** for Islamic products and services.

Fourthly, Innovation is crucial to maintain **competitiveness** in today's business environment

2.3.2 Issues in IFIs' product innovation

1) Standardization in Shariah Rulings for Product Innovation

(Jaroudi 2008)

Islamic Finance requires its financial products to be **Shariah compliant**, which needs to be approved by Shariah scholars before it can be marketed. **Unanimity** among the Shariah scholars on the Shariah compliance of the products is a valid **problem**. The absence of **universal standards** to govern the Islamic products compounds the **problem**. Due to these problems the **product development process becomes protracted**. There is a need for

standardization of Shariah rulings and hence Islamic financial products across the globe. The lack of uniformity among Islamic institutions as to the interpretation of Sharia on certain issues can hamper the structure of a project finance transaction (De Belder and Ruder, 1999; Martin, 2006; Yasseen, 2005).

2) Mature Management

Wise **governance** of the Islamic financial institution is of utmost importance, without it the performance of the industry will be affected in a **negative manner**. Good governance occupies the most important place in the Islamic finance industry (Rifaat, 2006).

3) Lack of expertise to develop new products

Developing products according to the Shariah is not an easy feat. The need for highly **skilled and experienced** shariah committee members therefore increases with the development of innovative Islamic financial products and services. To meet this human capital requirement, large financial institutions can act as **knowledge centers** to attract foreign talent from the existing international financial hubs, as well as retain local talent. (Grewal, 2011)

4) Conventionalization of Islamic banking

Most of the Islamic products are **based on the conventional** banking products. This process can be termed as conversion of conventional products into Islamic products. (Abdullah & Volker 2015) argued that this can be regarded as **conventionalization** of Islamic banking and finance because the process of conversion of products brings the economic profiles of conventional products into Islamic banking.

2.3.3 Innovation Measurer and Indictors

Innovation is the outcome of organizations' efforts to **produce new or improved products**, introduce more **efficient productive processes** and implement organizational or managerial changes or **new marketing and design processes** (Dhondt, 2003).

Service quality innovation results when a bank is able to **focus** its entire energies to think on behalf of **customer** for an outcome that surpasses customers' **expectation** of superior value. However such initiatives to innovate the service quality have often lead to increasing expectations among customers as well, and hence, constitutes a self-created challenge (Kandampully, 2002).

- To provide **products, services surpass** the customers' expectations.

- To provide **competitive products & services** in order to tempt and persuade the non-Muslim clientele to buy into our products.

Areas of Applications of Innovation

- **Products:**

Product innovation must be a continuous and deliberate part of the process of market development. Innovation in this Islamic context refers to the development of **new Islamic financial products and services** and **increasing the range of products and services** to meet the more sophisticated and complex requirements of today's consumers and businesses. Hence, innovation in Islamic finance must not only be **Shariah-compliant** but **credible as well as competitive**. Choi and Valikangas (2001) identified **ten innovation themes** that have proven useful over time and across industries. Some of these innovation themes are especially relevant to Islamic financial institutions. Examples are **consolidation**, **deep connections with customers,** and **mass marketing**.

Consolidation of various competitors into a bigger, **more powerful organization** could help purely Islamic institutions achieve the scale necessary to compete. According to (Ahmad Tajudin 2001) **cooperation** among Islamic banking

institutions worldwide should be closer so that the sector's operations and transaction systems would be **internationally recognized**.

Focus on niche segments is by developing **deep connections with customers**. When banks innovate to provide new products, these are easily and quickly copied by competitors.

- **Process :**

Quality of service is often the differentiating factor between competing banks, Islamic or otherwise (Tang and Zairi 1998). Innovations should also **focus on the customer experience** to search for ways to create **deep connections** between the institution and the customer. Process improvements are often part of **TQM initiatives**. Thus, the institution could gain a competitive advantage based on **superior customer relationships**. Such customer contact point innovations might occur in the areas of **employee-customer protocols**, **customization, methods of information delivery, speed of information delivery**, or the development of a breakthrough notion that revolutionizes a customer's **experience** with the organization.

Market Place:

The market place is another area where innovation might be needed. It is actually the catalyst in **bringing together the investors and the products**; **Digital delivery** which is online banking, is a good market place innovation which expected to grow apace for the Islamic financial sector. **Online banking** is a

tool to **distribute** Islamic financial services to the mass retail market. The move from an elite market to a **mass market** is another of (Choi and Valikangas 2001) innovation themes.

Regulatory Environment

This category in the Islamic Banking Industry encompasses both the **Sharia'a regulations** and the **civil regulations** (Jaroudi 2008).

On the Civil Side:

i. What would be required from some of the interested countries is to speed up the passing of laws/decrees that define the Islamic Banking and set the legal procedural framework.

ii. For those countries which already have special laws and codes, to revisit them if need be to be flexible, practical and tailored for the industry. Not to confine the Islamic Banking Industry to regulations of the conventional.

iii. Financial authorities to work hand in hand with the industry to develop a comprehensive and universal supervision systems to ensure the continued development and thus success of this Industry.

iv. Eventually to move into standardization of the regulations to as much as possible at least on global issues.

v. Adopt the AAIOFI standards and impose them to have a unified approach.

On the Sharia'a Side:

i. Uniformed guidelines rather than to leave the guidelines to the institutions to search and rely on the reputation of the scholar to ensure its being well received by the public.

ii. In the development and innovation of new products institutions need to search and rely upon the opinions and ruling of the respectful and well-versed scholars.

iii. Standardization in the industry, and a similar format (such as AAIOFI IFSB, and IIFM (International Islamic Financial Market) could be done towards Sharia'a rulings concerning applied modes of financing , which will speed up the processing of basic deals and allow the business personal to focus on sourcing, structuring and executing deals promptly.

iv. Developing a mechanism among scholars of continues review, announcement, feedback and adjustment for all new products and processes.

CHAPTER 3 RESEARCH METHODOLOGY

CHAPTER 3 RESEARCH METHODOLOGY

This chapter provides an overview of the **research methods** used and **questionnaire design** and how each element of the **knowledge management, total quality management and innovation variable** was **measured**, the **sample selection** and the methods used for administration of the questionnaire in the survey, statistical hypotheses **and** based on this this chapter, the next chapter will analyses the collected data.

3.1 Research Design

The purposes of this study were to explore the potential relationships among knowledge management (KM), total quality management (TQM), and Islamic banks innovation performance (INN) and to determine the role of KM implemented through TQM on INN. A correlation study design was used as it fit these purposes. As the constructs in this study (knowledge acquisition and creation, knowledge capturing and storage, knowledge dissemination and transfer, knowledge application, top management support, employee involvement, continuous improvement, customer focus, database decisions, product innovation performance, and process innovation performance) cannot be derived from direct measurement; **perceptual measurements** were used for this study.

A **positivistic research paradigm** was used. According to Bartlett (2005), a questionnaire survey research method is the most frequently used data collection method in organization research; therefore, a survey with paper-and-pencil format was utilized to collect data on participants' perceptions of their KM initiatives, TQM, and INN in their banks.

3.1.1 Model Development

The integrated model was used to test the relationships among TQM, KM and INNO (See Fig. 1). The causal relationships, indicated by arrows, were investigated by Linear Structural Relations software (LISREL) through SEM

3.1.2 The Structural Relationship Model between TQM, KM and INNO

The theoretical base of the study outlined the conceptual model to be composed of KM, TQM practices as the independent variable and the dependent variable is the two innovation types

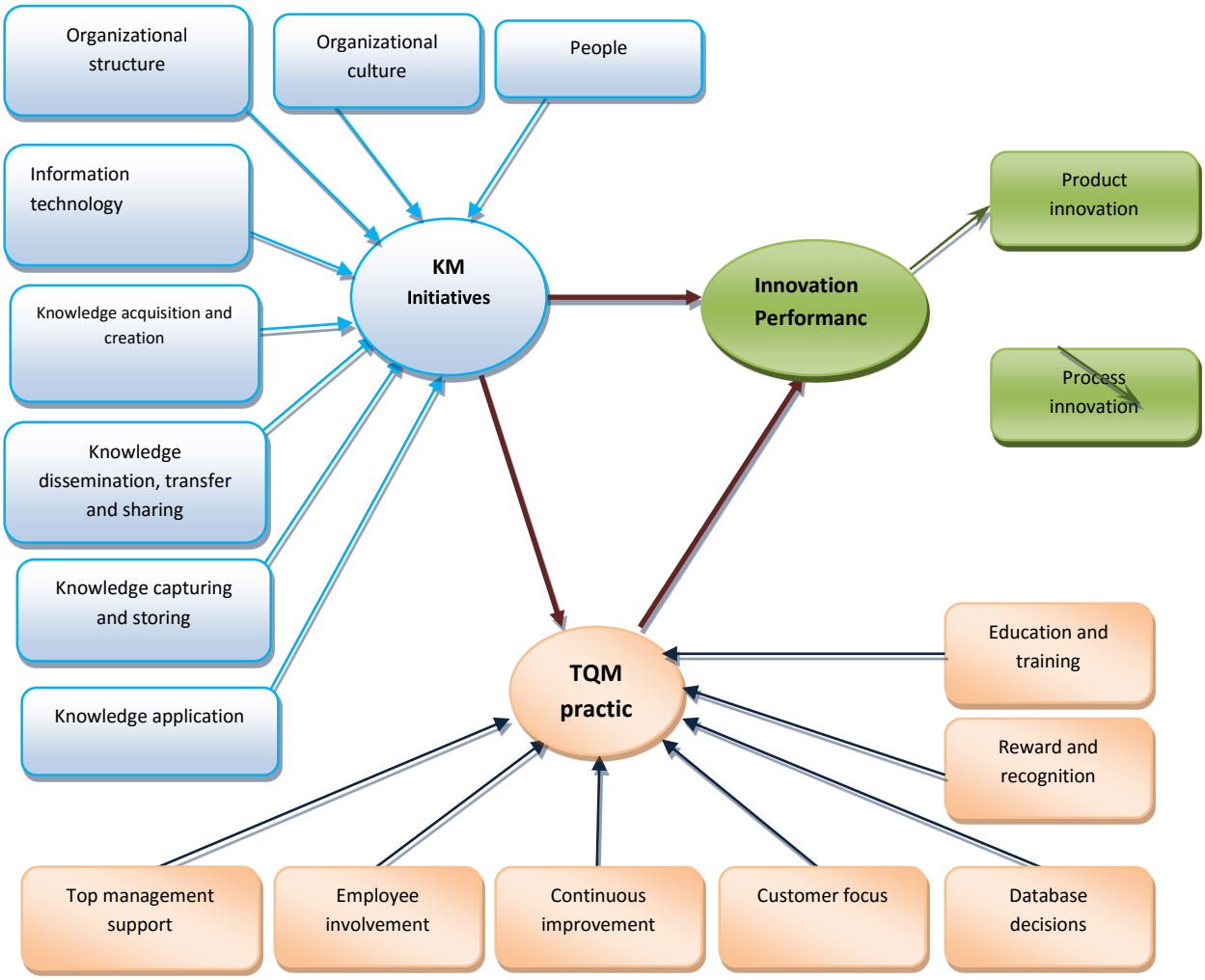


Figure 3. **The research framework model.**

3.2 Population and Sampling

Statistical population: Islamic financial institutes

Sampling Unit /Study area

Out of the 20 Islamic banks in Bahrain and 32 Islamic banks in Sudan**, in** this study the sampling unit was

- **Five Sudanese banks** Located in Khartoum State, Sudan.
- **Five Bahraini Banks** Located in Kingdom of Bahrain
    - This study area were chosen because of a **personal interest** of comparing my **home country Sudan** which is the only country that managed to successfully complete the project of **Islamizing its entire financial** sector yet **lacks the leading position** among the countries using the IFI, and Bahrain where I live, which ranked as a **top leader** within the IFIs.

Sample size:

A selection of **250 members** of the **target population** were covered by the survey.

Target Population:

The target population for this research was the **managerial positions of Islamic banks** in Sudan and Bahrain, due to the consideration that they are **better** equipped with the **relevant information of their bank's** own practices with regards to quality management. (Meredith & Roth 1998) mentioned that they are the **key personnel** that uncover a successful quality improvement process as they effectively utilize their **experience to enhance the bank's innovating processes**, product, and working environment, as well as improving the bank management systems. (Zhang, 2006) mentioned that

managers have good knowledge and a realistic view of the organization as a whole.

This research focuses on Sudan as the first country that managed to successfully complete the project of Islamizing its entire financial sector and Bahrain as a country that has gone through remarkable growth in the Islamic finance sector.

Targeted Number of Responses

The research framework studied is illustrated in Fig. 1 by applying the SEM. **SEM** is used for **two reasons**. Firstly, it is the most suitable way to build the **latent construct hierarchy** and it also effectively **removes any biasing effects of measurement** error made (Prajogo & Cooper, 2010). Secondly, this technique seems to be the **most applicable to study hypotheses** on the association between the observed variables and latent (Hoyle, 1995; Schaupp, Carter, & McBride, 2010),

(SEM) requires an **appropriate sample size** in order to produce reliable estimates (Hair, Anderson, Tatham, & Black 2010). Therefore, the target number of responses was determined based on the following logic. (Hair et.al 2010) **recommended the required sample size of 5-20** participants per parameter.

There were **18 parameters** from the model. Therefore, **100 to 150** managers for each country were set as the target number of responses (5 x 18 parameters). However not all managers responded

so anticipated an **80% response rate**. With a sample of 150 and a response rate of 80%, a **response group of 125 was anticipated**, which **fits** within SEM sample sizes limits

Survey methodology:

Based on the research objectives stated earlier and the structure of the target population this study was both quantitative & qualitative in order to get insight and appropriate information, for the quantitative data a **cross section** survey method been used which is the standard methodology used to investigate the integrative approach of TQM, KM and innovation, the time period for the collection of data vary from **1 week to 4 months**. The survey questionnaires were given out to the bank's **key person** identified to be submitted to those managers who were chosen. After some days/weeks, the questionnaires had been collected. A total of eighty questionnaires from each country were received with complete answers.

For the quantitative study a paper and pencil questionnaires were used to collect the data by interview the panel experts in the field to get in-depth information and use that information

Sampling method / technique

A convenient sampling approach was adopted for sample Islamic banks' seniors and top managers for both countries. The study is in Sudan and Bahrain and a sampling size of 200 is appropriate for

data collection from the said Islamic banks. The data was collected via **self-administered close-ended questionnaires** distributed to the respondents. A total of 300 questionnaires were distributed (150 in each country). Collectively, the two banks returned a total of 250 questionnaires, of which all 250 were found valid for further analysis.

3.3 Data collection procedures

Data for this case study was gathered from many sources such as **documents, and questionnaires** as suggested by (Creswell 1998). However, **questionnaires** were used as a dominant data collection method using the case study protocol because as it targeted and focuses directly on the **specific measurers** that for the case study topic and provides **perceived causal inferences** (Yin 1994, p.80).

Documents used included **publications, researches, memoranda, agendas, and announcements**. From those documents, some data was collected such as **Islamic banks history** and **current situation in Sudan and Bahrain**, the **concept and measurers of TQM**, **KM and Innovation** in general and banking sector in particular, and Islamic bank's polices, regulations and the work process.

While, **questionnaires** were distributed for **key respondents of Banks in Sudan and Bahrain**, it took between **20 to 30 minutes** to be

answered. In some cases, **telephone and e-mail** were used to complete the data collection.

The **questionnaire** was **designed two times** as the first draft **lacked important measurers for the KM and TQM** the **seconded /final questionnaire** has **an introductory page** showing what our research title is and what the study focuses on.

Secondly, we express our appreciation for those participating in answering the questionnaire.

Finally, we started each of the four sections by a brief definition and understanding of the section.

The four sections were

Section I: Demographic Profile

Section II: Knowledge Management Assessment

Section III: Total Quality Management

Section IV: Innovation Performance

3.4 Instrumentation

A self-administered **questionnaire** was used to **examine the hypothesized** relationships among KM, TQM, and Innovation within

the Islamic banks. **A seven-point** Likert-type scale was used where the Level of Agreement was as follow

1 – Strongly disagree

2 – Disagree

3 – Somewhat disagree

4 – Neither agree nor disagree

5 – Somewhat agree

6 – Agree

7 – Strongly agree

The questionnaire instrument contained items representing the three important constructs in this study: **KM initiatives**, **TQM**, and **Innovation**. **Cronbach's alpha (α) analysis was used to test the Reliability coefficient**, the overall result of Cronbach's alphas ranged from **.72 to .81**, which suggests the **reliability is acceptable**.

3.5 The measurement of the Variables

3.5.1 Knowledge management.

There were **nine types of KM constructs** selected based on the research objective from the adaptation of KM measurement using **37 items** that Were measured from **different researchers**, to measured (T-shaped) People items from (Jaroudi 2008) adopted ,friendly culture infrastructure items from (Chase 1997) ,**knowledge acquisition** and **creation**, items from (Gold, Malhotra, & Segars, 2001) and (Lawson

2003) adopted, **knowledge capturing** and **storage**, items from (Al-Busaidi and Olfman 2005) and (Lawson 2003) adapted, **knowledge dissemination, sharing** and **transfer** items from (Lawson 2003) & (Nonaka and Takeuchi 1995) adapted **and knowledge application**, items from (Lawson 2003) and (Lin & Lee 2005) adapted.

3.5.2. Total quality management.

Many researchers, (Ahire, Golhar, and Waller 1996), (Samson and Terziovski 1999) , (Dean and Bowen 1994) and (Al-Khalifa & Aspinwall, 2000), have presented in the past that TQM is a **multidimensional factor**. In this study seven dimensions of TQM were adopted and analyzed. These TQM dimensions are: **leadership and top management**, **reward and recognition, education and training, employee involvement, continuous improvement, customer focus and database decision**. There were **44 statements** established to further breakdown the characteristics of the seven dimensions of TQM. These items were selected as they were widely accepted and referred to in many TQM and operations management journals.

Leadership and top management support was measured using items from (Singh and Smith 2004) and (Zeitz, Johannesson, and Ritchie 1997).

Reward and recognition

Were measured using items from (Antony et al. 2002) & (Zeitz et al. 1997).

Education and training

Were measured by using items from (Singh and Smith 2004) and (Zeitz, Johannesson, and Ritchie 1997)

Employee involvement

Were measured using items based on (Antony, Leung, Knowles, and Gosh 2002) and (Powell 1995).

Continuous improvement

Were measured using items from (Antony et al. 2002) and (Zeitz et al. 1997).

Customer focus

Were measured using items from (Antony et al.2002) and (Zeitz et al. 1997).

Database decision

Were measured using items based on (Antony, Leung, Knowles, and Gosh 2002) and (Powell 1995),

3.5.3. Innovation

Finally, INNO was measured using 12 items adapted from (Singh and Smith 2004) and (Prajogo and Sohal 2003) with 5 items for product innovation and 7 items for process innovation. The criteria for measuring innovation performance were the number of innovations, the speed of innovation, the level of innovativeness, and being the first in the market. The respondents were asked to evaluate the bank's innovation performance against the key competitor in the industry to minimize industry effect based on their perceptions.

3.5.4 Control variables:

Initial real GDP per capita, exchange rate, Inflation, Government consumption, Trade Openness and Terms of Trade was the control variable, the industry type was Islamic banks in both Sudan and Bahrain.

3.6 Hypotheses development

To answer the research questions above, four testable propositions were derived from the literature and existing studies.

3.6.1 Knowledge Management initiatives and Its Contributions on Total Quality Management

As (Grover and Davenport 2001) noted, **KM** is rapidly becoming a critical business function and solution for many organizations in **effectively managing intellectual resources**. (McAdam and Leonard 2001) suggested that, during everyday business processes and operations, **TQM and KM constitute an interactive relationship**. (Zhao and Bryar 2001) considered **KM and TQM as strongly linked**, particularly in the areas of **continuous improvement and workforce empowerment**. (Snyder and Cummings 1998) stated that organizations must be able to learn from experience, effectively use knowledge, correct errors, and apply this knowledge within the organization if they are to change and adapt to continuously changing markets. That is, through KM initiatives, TQM as a philosophy or management practice can assist organizations in cultivating their ability to change and continuously improve. During organizational change, the roles of **TQM and KM are usually very similar**.

(Barber, Munive and Keane 2006) addressed the role of **knowledge management** systems in **supporting continuous improvement**. They showed that a knowledge management system enables continuous improvement by “utilization of available data already held within the company’s management databases”.

Knowledge transfer ensures continuous **improvement** in **total quality** management. There are procedures and standards showing

how the operations conducted at the enterprises implementing Total Quality Management. **Knowledge sharing** allows the **employees** question the procedures of the company. The procedures developed **ensure coordination of the solutions** implemented for various operations within the company. Thus, the company can carry out its operations more effectively and productively.

(Hsu and Shen 2005) mentioned that **KM coexists with TQM** as both share similarities, including results orientation, people-based management, teamwork, leadership, and delighting the customer. (Hung et al. 2006) confirmed that **KM initiatives significantly and positively contribute to TQM**. It is, therefore, hypothesized in this study that knowledge management initiatives positively influences total quality management. **Thus, the first hypothesis (H1) is**

H1:	KM initiatives will have a direct positive effect on TQM.

3.6.2 Contributions of Total Quality Management to Organization Innovation Performance

In the last two decades, **TQM** is considered as a **management practice** that provides an organization with **better performance** (Feng, Prajogo, Tan, Sohal 2006). Concurrently, a wide range of studies have examined the relationship between TQM and innovation (Hoang et. al., 2006; Perdomo-Ortiz, Gonzalez-Benito, et. al., 2009; Prajogo and

Sohal, 2003) stated that TQM and its **cultural factors** foster **innovative** activities in the organization.

Based on (Perdomo-Ortiz et al. 2009) the positive effects of TQM on innovation can be **conceptualized in three aspects**. **First**, **market orientation** and **customer focus** related practices which provide organizations with the new customer needs information consequently; to full these requirements leads to new ideas to meet these demands (Fuentes et. al., 2006; Hoang, et. al., 2006; Hung, et. al., 2011). The **next** contribution of TQM to innovation is related to **continuous improvement**. This practice aids **to improve know-how** within the organization by recognizing the necessary changes in processes (Prajogo and Sohal, 2004a, Perdomo-Ortiz, et. al., 2009;) By implementing **continuous improvement**, employees learn to think **more creatively** regarding the way that work is being done, **education and training** will increase the staff's **skills** which would eventually provide **better chances for innovations**. **Finally, Teamwork, employee empowerment, and people management** which encourage autonomy and sharing ideas among employees that consequently **leads to innovation** (Fuentes, et. al., 2006; Hoang, et.al. 2006; Perdomo-Ortiz, et. al., 2009; Prajogo and Sohal, 2004a). **Thus, a second hypothesis was proposed.**

H2:	**TQM will positively enhance organization innovation performance**

3.6.3 Contributions of Knowledge Management Initiatives to Innovation Performance:

(Gloet and Terziovski 2004) explored the relationship between knowledge management practices and innovation performance and found **both positive and negative relationships** where the **humanist** approach to KM and innovation performance are **significantly and positively related**, while **IT-focused KM** and innovation performance **are not significantly** and positively related. Meanwhile, a large number of academic studies have found a positive association between knowledge management and innovation. (Carneiro, 2000; Darroch & McNaughton, 2002; Nonaka & Takeuchi, 1995; Prajogo, Power & Sohal 2004). **KM** appears to be an **important** concept and is often cited as an antecedent of **innovation.**

Acquiring knowledge from inside and outside of the organization advances the **knowledge assets** within the organization that leads to **knowledge modification** (Chang and Lee, 2008 ; Chen and Huang, 2009; Hung et. al., 2010) which **increases the innovative** outcomes (Chen and Huang, 2009) . (Capon, Farley, Lehmann, and Hulbart 1992) argued that **knowledge acquisition** and **creation facilitates innovation**. Organizations that spend money on **research and development** to create **new ideas** and knowledge lead innovation (Barsh, 2007; (Capon et al., 1992) .

Knowledge dissemination, transferring and sharing are enhanced by a culture where the use of knowledge, KM, innovation and creative thinking is encouraged. Some studies, however, have confirmed that knowledge **transfer** is important and has a significant positive relationship to both product innovation and process innovation (Hall & Andriani, 2003 , Prajogo, Power, & Sohal, 2004)

Likewise, **applying new knowledge** by **solving problems** and inculcating knowledge into **new products** is directly related to **innovation** (Lin & Lee 2005) & (Chen and Huang, 2009).

Moreover, the results from (Prajogo et al & sohal 2004a) confirmed that **KM has a significant positive relationship with both product and process innovation**. They further emphasized that KM play an **important role** in determining organization innovation performance. Organizations that desire to become innovative product and process developers will need to focus on their KM and creativity capability as their first step (Prajogo, power and sohal, 2004). Based on these and other studies, it was hypothesized in this study that knowledge management initiatives enhance organization innovation performance.

H3:	***KM initiatives will enhance the innovation performance*** *(product innovation and process innovation)* ***within the Islamic institutes.***

3.6.4 Knowledge Management Initiatives and Its Indirect Impact on Organization Innovation Performance via Total Quality Management

(Hung et al. 2010) empirically examined the relationship between **KM, TQM, and innovation;** he demonstrated that **TQM plays an important role** in transforming the contributions of KM processes into organization innovation performance.

The results of this study revealed that there is a significant association between KM and TQM. In addition, KM contributes to innovation through TQM. In other words KM is an antecedent for TQM and innovation (Amir, Ahmad and Khalil 2012).

So a fourth hypothesis been proposed

H4:	**KM initiatives** will be indirectly associated with **organization innovation** performance **via the mediator, TQM**

3.7 Reliability and Construct Validity

3.7.1 Reliability of Instrument Based on Collected Data

Cronbach's alpha was used to measure the **internal consistency** of the measurement scale. The data collected from the questionnaire showed moderately **high reliability**, with over all Cronbach's alphas ranging from **.72 to .81**.

- The 33 items measuring **KM** found Cronbach's alphas ranged from **.72 to .79**.
- The 40 items measuring **TQM** had Cronbach's alphas ranging from .**77 to .81**.
- The 17 items measuring **INNO** showed Cronbach's alphas ranging from .**80 to .81.**

An adequate alpha is one that is higher than 0.50, though (Nunnally 1978) a value of **0.6** is considered as **average**, **0.7 and above** considered as **good reliability** value (Hair et al., 2010; Tabachnick & Fidell, 2014).

Measure	**Scale**	**Number of** Items	**Cronbach's Alpha** (α)
KM Initiatives	My organization	2	.78
	Compared with competitor	3	.72
	Organization Structure	5	.77
	Organization culture	7	.78
	T-shaped skills (people)	2	.75
	Information technology	3	.78

	Knowledge acquisition and creation	6	.79
	Knowledge capture and storage	3	.79
	Knowledge dissemination and transfer	4	.78
	Knowledge protection	2	.79
	Knowledge application	5	.73
TQM Practices	My organization	3	.78
	Leadership and Top management support	7	.79
	Rewards and recognition	6	.78
	Education and training	5	.79
	Employee involvement	5	.79
	Continuous improvement	7	.78
	Customer focus	7	.81
	Database decisions	7	.77
INNO	Product innovation	5	.80

Process innovation	7	.81

Table2: Reliability Coefficient of Knowledge Management Initiatives, TQM Practices, and Organizational Innovation Performance (n=125)

3.7.2 Validity

The **content validity** and **construct validity** of this survey instrument were examined using **confirmatory factor analysis (CFA)** and expert reviews.

3.7.2.1 Content Validity

Content validity was conducted to ensure that the **data** collected were **valid**. According to(Badri, Davis, and Davis 1995), content **validity** depends on **how well the measurement items are** created in order to cover the content domain of the variables being measured. However, the content validity of this questionnaire was **based on previous studies**. According to (Nunnally 1987), an instrument has **content validity if it has a representative collection of items and if rational methods of test construction were used previously.** Therefore, it could be assumed that the **questionnaire has content validity** based on the results of earlier studies.

The content of the final version of the survey instrument is summarized in Table3.

Section	Contents	Level of Measurement	Number of Items
Demographic			
Information	- Bank Name /Location (item 1)	Nominal	1
	- Type of bank (item 2)	Nominal	1
	- Number of employees in the bank (item 3)	Nominal	1
	- Current position in organization (item 4)	Nominal	1
	- Years of service in current position (item 5)	Nominal	1
	-Gender (item 6)	Nominal	1
	- Age (item 7)	Nominal	1
	- Level of education (item 8)	Nominal	1
KM	- My organization (item:9.1,9.2)	Interval	2
	- Compared with competitor (item:10.1-10.3)	Interval	3
	-Organization Structure (item: 11.1 – 11.5)	Interval	5
	- Organization culture (item: 12.1 – 12.5)	Interval	7
	-T-shaped skills (item: 13.1 – 13.5)	Interval	2

	-Information technology (item: 14.1 – 14.3)	Interval	3
	- Knowledge acquisition and creation (item:15.1-16.6)	Interval	6
	- Knowledge capture and storage (item:16.1-16.3)	Interval	3
	- Knowledge dissemination and transfer (item:17.1-17.4)	Interval	4
	- Knowledge protection (item:18.1-18.2)	Interval	2
	- Knowledge application (item:19.1-19.5)	Interval	5
TQM	- My organization (item:20.1-20.3)	interval	3
	- Top management support (item:21.1-21.7)	Interval	7
	- Rewards and recognition (item:22.1-22.6)	Interval	6
	- Education and training (item:23.1-23.5)	Interval	5
	- Employee(item:24.1-24.5)	Interval	5
	- Continuous improvement (item:25.1-25.7)	Interval	7
	- Customer focus (item:26.1-26.7)	Interval	7
	- Database decisions (item:27.1-27.7)	Interval	7

INNO	- Compared with key competitor (item:28.1-28.3)	Interval	3
	- Product innovation (item:29.1-29.5)	Interval	5
	- Process innovation (item:30.1-30.7)	Interval	7

Table3 Content of the Final Survey

3.7.2.2 Construct Validity of the Instrument Based on Collected Data

After collecting the data for the study**, a confirmatory factor analysis (CFA**) using the **LISREL** program was conducted to **examine the factor structure**. According to (Yuan 2005), one of the most important steps in structural equation modeling is to **confirm that the model fits the data**. Model fit is the issue of how the model that best represents the data reflects underlying theory (Hooper, Coughlan, & Mullen, 2008). Therefore, a good-fitting model is one that is **reasonably consistent with the data and so does not require re-specification** (Kenny, 2011).

The criteria that researchers often use to conclude that the **model**

is a good fit or is **acceptable** are as followed: (a) the Non-Normed Fit Index (NNFI) exceeds 0.95 (Sharma, Mukherjee, Kumar, & Dillon, 2005); (b) the Comparative Fit Index (CFI) exceeds 0.93 (Byrne, 1998); (c) the Goodness of Fit Index (GFI) exceeds 0.90 (Byrne, 1998); (d) the Adjusted Goodness of Fit Index (AGFI) exceeds 0.9 (Tabachnick & Fidell, 2007); and (e) the Root Mean Square Residual (RMR) is less than 0.08 (Hu & Bentler, 1999). Good models have small RMR (Tabachnick & Fidell, 2007).

Measuring knowledge management initiatives.
Results of CFA revealed evidence for the construct validity of the KM initiatives scales. The factor structure moderately fit the data (1) NNFI = 0.99; (2) CFI = 1.000; (3) GFI = 0.925; (4) AGFI = 0.91; and (5) RMR = 0.076.
The Overall fit indices for the model were a good fit.

Table 4: KM fit indices for the model

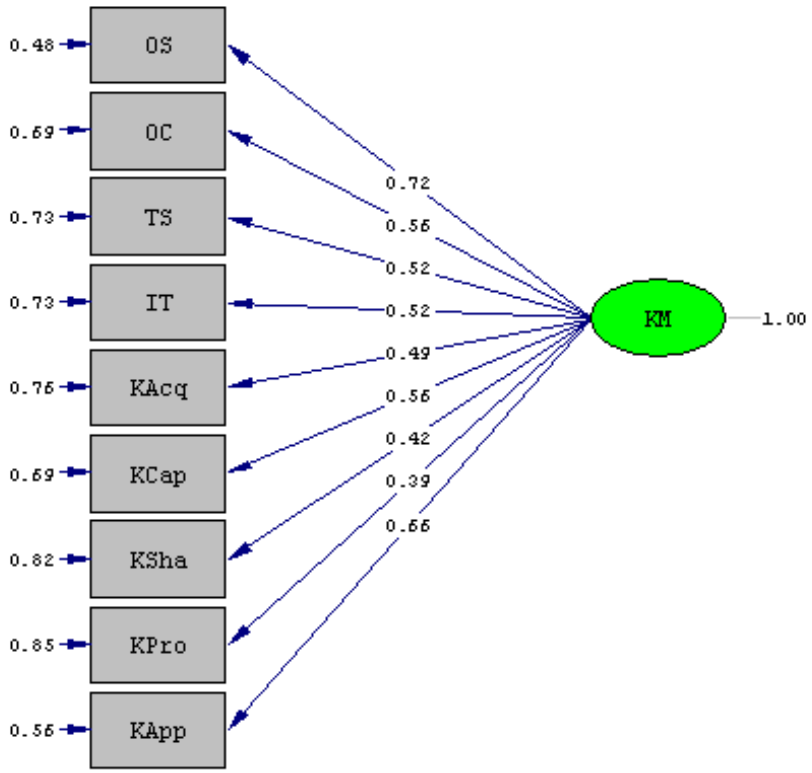


Figure 4 Measurement model of knowledge management initiatives

Measuring total quality management.
The results of the CFA for the TQM scales revealed their construct validity. The factor structure moderately fit the data: (1) NNFI = 0.988; (2) CFI = 0.992; (3) GFI = 0.91; (4) AGFI = 0.9; and (5) RMR = 0.074.
The overall fit indices for the model were a good fit

Table 5: TQM fit indices for the model

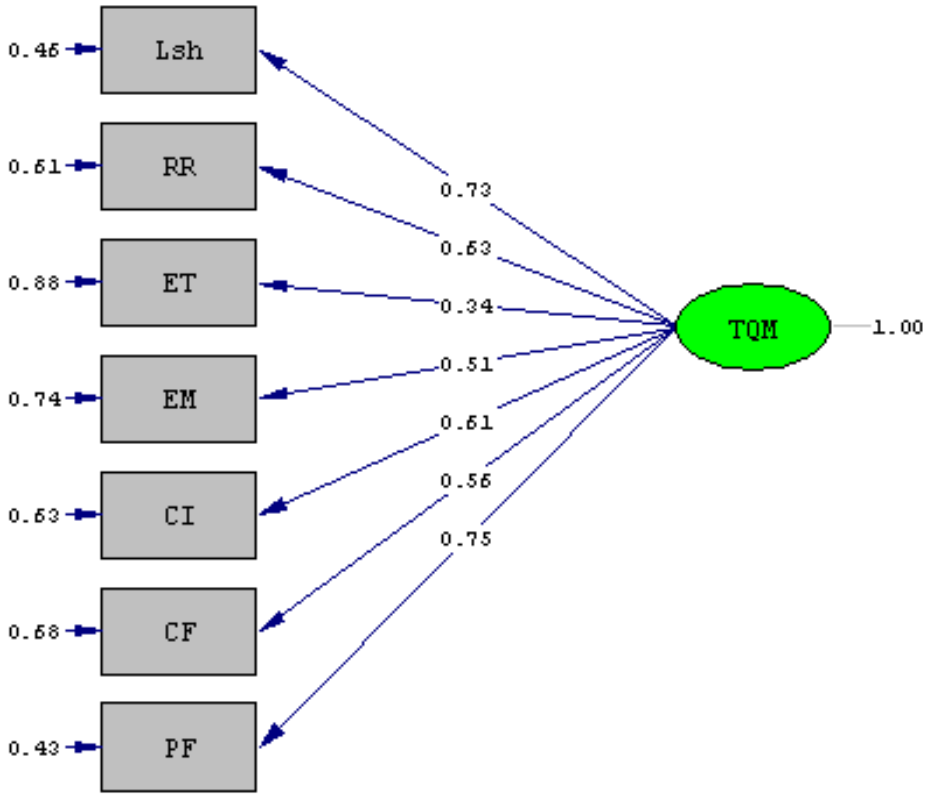


Figure 5 Measurement model of TQM practices.

Measuring bank innovation performance. It was not possible to calculate a CFA for INNO as there were only two items in each of the two scales. As a result, only content validity could be determined for INNO.

3.8 Statistical techniques

Data analysis procedures were matching up with the research purposes. Where both descriptive and exploratory research

technique were used

Descriptive statistics were used on the questionnaire data to provide the basic information about the instrument, test the hypotheses and to validate if a relationship existed between knowledge management, Total quality management and Innovation in Islamic Banks.

For additional data analysis, I used structural equation modeling (SEM) with the LISREL program. Structural equation modeling, (SEM) is a statistical technique for testing and estimating causal relations using a combination of statistical data. SEM is appropriate for theory testing, allows confirmatory modeling technique, and to determine whether a certain model is valid. I used SEM for theory testing, in SEM, interest usually focuses on latent variables, being KM, TQM, and INNO in this research. SEM allows multiple measures to be associated with a single latent construct.

My study was designed to provide a better understanding of Bahrain and Sudan Islamic finance mechanism. A qualitative interview questions elicited data focusing on the aspects of knowledge management, total quality, and innovation which strengthened the knowledge base on which recommendations been made by focusing on some important conclusions to shape future implementations to meet Islamic market needs.

CHAPTER 4 DATA ANALYSIS AND RESULTS

CHAPTER 4 DATA ANALYSIS AND RESULTS

The purpose of this study was to identify the factors influencing Islamic finance low innovation performance in Sudan's through exploring the potential relationships among knowledge management initiatives (KM), total quality management practices (TQM), and Islamic Banks innovation performance (INNO) and determining the role of KM implemented through TQM in Islamic banks sector innovation performance.

A combination of several instruments was used to collect data from 250 manager respondents from both Sudan and Bahrain in the Islamic banks. This chapter provides a description of the results related to the dependent (INNO) and independent variables (KM and TQM). The results of the survey are reported through the examination of descriptive statistics then, the hypothesized model will be tested.

4.1 Exploratory data

4.1.1 Knowledge Management interview

Knowledge management is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities, such as problem solving, dynamic learning, strategic planning, and decision-making. Several questions have been discussed through extended interviews to understand and come to a conclusion about the knowledge management

processes for both countries

Table 6: Knowledge Management interview

Organizational structure	
Sudan	**Bahrain**
Most of the Sudanese banks facilitate to some extend both (top down and down up) communication across functional boundaries and highly utilize informal communication in the daily process, and some banks provide technology that allows employees to collaborate with others inside and outside the organization, employees are encouraged to work in team To some extend accountability for results bound with giving away authority and delegation of powers.	Most of the Bahraini Islamic banks enhance communication quality and design processes with effective channels of communications to facilitate knowledge sharing / transferring across functional boundaries, provide the most advance technology that allows employees to collaborate with others inside and outside the organization and encourage employee to work in team only when it's needed To some extend the accountability for results bound with giving away authority and delegation of powers
Conclusion: Sudanese banks strongly adopt informal communication that is unhealthy as a practice for it may spread wrong or distorted news which may	

sometimes prove harmful. Information released from such communication network is usually incomplete and subject to errors and mistakes. Some banks lack good technological system that allows the employees to collaborate.	
Organizational Culture	
Sudan	**Bahrain**
By nature all Sudanese banks have a **trust-based environment** as has been confirmed by all banks interviewee with a consultative management style where sharing knowledge is truly valued, most of the employees may know what the overall mission of the banks but the top management has a minor role to insure that everyone is aware of it, the employees have not been involved in design and planning as the top management believe banks is a sensitive and can't accept risks. Sudanese banks adopt different methods for employees to further develop their knowledge and apply them to new situations but in some cases these methods are ineffective. The	banks have a **trust-based environment** with a **consultative** management style, top management somewhat try to insure that everyone is aware of its overall mission and encourage participation of all stakeholders, the employees sometimes have been involve in design and planning but not in the strategic plans, the employees regularly analyze their work products to look for ways of doing a better job with an intensive encouragement to try new and better ways of doing their job/ promoting creative thinking and creativity

employees do not have standard checklist or framework to analyze their work products to look for ways of doing a better job. Top management encourage the employees to try new and better ways of doing their job and promote creative thinking and creativity but most of the employees are dependent and do not possess initiative way of thinking.	
Conclusion: Sudanese banks build trust without basis. Trust on the job means doing what you say you're going to do, being willing to take responsibility for your mistakes, lets managers know about problems before they develop into major failures, ask for help, or even saying "no" to an assignment when you do not think you can realistically complete it. From this definition it is clear that the trust that given is a Sudanese cultural base that why the employees do not participate in setting the plans while the management is trust based style. Sudan's banks employees do not know and work toward the bank's mission statement.	
T-shaped skills (people)	
Sudan	**Bahrain**
Corporate governance, management style, and business guidelines and	Corporate governance, management style, and business guidelines and

procedures try to ensure finding and retain **human talent** as possible but rarely foreigners have been the case so it was bounded within few Sudanese cases.	procedures ensure finding and retain **human talent** with a high competition between the candidates that allow the bank to recruit from a bigger pool of diversified knowledge, background and experiences.
Conclusion: Sudanese banks lack the diversification on their staff where more than 90% are Sudanese with one type of experience and it can extend to be only from the bank that they are currently working at. So Sudanese banks' employees do not really have T-shapes skills which is one of the biggest competitive advantage, having T-shaped skills means having the depth of related skills and expertise in a single field, the ability to collaborate across disciplines with experts in other areas and to apply knowledge in areas of expertise other than one's own. It allows people to imagine the problem from another perspective and be very enthusiastic about other people's disciplines.	

Information Technology (IT)	
Sudan	**Bahrain**
All Banks have computer servers with a regular backup that allow employees to search and retrieve stored knowledge but the question is what type of knowledge has been stored and in which format.	All banks utilizing databases, repositories and information technology applications that allow the employees to search and retrieve stored knowledge which has been stored in a form that is

Some banks have knowledge in the form that is readily accessible to employees who need it like providing an intranet for all employees, electronic libraries and archive system but some do not.	readily accessible to employees who need (e.g. intranet, internet, libraries, resource center, and other forum)
Conclusion: The application of IT on Sudanese banks is three-directional - to the customer, to the bank and to the employee. Customers are satisfied by the updated range of IT services, banks applied IT to a wide range of back and front office tasks in addition to a great number of new products, and for the employees IT has increased their productivity. There are some places of enhancement such as providing libraries and archive system in addition to give access to all the employees to at least an intranet.	
Islamic Knowledge acquisition and creation	
Sudan	**Bahrain**
In the recruitment process it is very difficult to find candidates with Islamic finance background/ certificated as Sudan's institutes and universities do not provide Islamic finance certificate so must of the banks tried to overcome it by provide 2 weeks introductory training that allow them to have some basic training	Banks have a big pool of Islamic finance background candidates to choose from the most appropriate will be selected and given some introductory training, then the bank continues to develop and maximize the employees knowledge through internal and external training and continuing education Islamic financing colleges

believing that they will develop their knowledge from their mats. For the existing staff regularly most of the banks provide internal and external training as well as send some selected employees to attend seminars and in some cases study for a Master degree to acquire new knowledge, some banks' Shari'ah board plays an integral role of educating the employees and exchange of ideas Banks' top management encourage, support and award employees to present new ideas without fear and creating new knowledge from existing knowledge but the employees somewhat lack the initiative, creativity and thinking out of the box mentality. Sudanese banks accept feedback and suggestions from customers but rarely could it be a valuable and added knowledge or idea.	and universities. Shari'ah board plays an integral role of educating the employees and exchange of ideas. Banks encourage, support and award employees to present new ideas and develop new knowledge from the existing one, in addition to the employees, banks absorb knowledge from business partners into the Bank
Conclusion: Sudanese banks knowledge strongly affected by the lack of universities that provide Islamic finance, trainees had not been followed up with to	

insure the new knowledge that has been acquired, trainee do not filter the knowledge provided on the training.	
Knowledge capture and storage	
Sudan	**Bahrain**
Few banks and mainly the international ones utilize various written devices such as newsletter, manuals to store the knowledge they captured from employees that will be converted into action plans that lead to the design of new products and services .Banks appreciate valuable employees' ideas and documents them for further development.	**Bahraini banks u**tilizing various written devices such as newsletter, manuals to store the knowledge they captured from employees they respond to employees' ideas and documents them for further development where they have a mechanisms for converting knowledge into action plans to design new products and services.
Conclusion: Sudanese banks do not have effective knowledge storage system.	
Knowledge dissemination, sharing and transfer	
Sudan	**Bahrain**
Stakeholders such as employees, customers and business can share and transfer their knowledge into the bank and from the bank to individuals, the	Bahrain Banks have **mechanisms** in place to transfer knowledge from stakeholders such as employees, customers and business into the bank

bank have regular seminars, conferences, and training session to share knowledge the employees are encouraged to share their knowledge with some type of a reward, but still there is no reward system that push and motivate the employee.	and from the bank to individuals Banks adopt a regular mentoring programs, lectures, seminars, conferences, and training session to share knowledge and encourage the employees through a standardized reward system for sharing and transferring knowledge.
Conclusion: Most of Sudanese banks staff do not fully understand knowledge sharing, they belief it exclusive in to emails, regular meetings take place but mostly to evaluate the work process. Most of the employees do not have the welling to learn and to apply the new knowledge gained from training.	
Knowledge protection	
Sudan	**Bahrain**
There is no **patent** and **copyright** new knowledge only **law and disclosure of security** protect knowledge from inappropriate or illegal use inside and outside of the organization.	Bahrain banks do not have a mechanisms to patent and copyright new knowledge but there is a mechanisms to protect knowledge from inappropriate or illegal use inside and outside of the organization.
Conclusion: Sudanese banks depend on law and disclosure of security to protect	

their knowledge.	
Knowledge application	
Sudan	**Bahrain**
There is no measurement for the new knowledge acquired and filtering it so it is very difficult to generate new patterns for future use, banks possess processes for applying knowledge to critical competitive needs and quickly links sources of knowledge to solve new problems and try to apply knowledge learned from mistakes only when it's has been identified.	**Banks in Bahrain** have a processes filtering, applying experiential knowledge and somewhat applying knowledge to critical competitive needs and quickly links sources of knowledge and knowledge learned from mistakes to solve new problems. They have good methods to analyze and critically evaluate knowledge to generate new patterns and knowledge for future use.
Conclusion: On the application side of new knowledge the problem relay on the employees. They do not present/suggest the new knowledge possessed but when there is a new knowledge processed top management, especially quality control managers, they possess process for applying knowledge.	

4.1.2 Total Quality Management interview

TQM is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve and exceed customer expectations.

Table 7: Total quality management interview

Leadership and top management support	
Sudan	**Bahrain**
Top managers adopt a consultative style, show concern for the need for quality, try to set clear goals for quality improvement, and commit to quality that regard as top competitive priority and there is a strong commitment to quality only at the top levels. Top Management regularly collaborate with Shari'ah boards for Shari'ah purposes only in some individual cases with some banks it goes further to assign sufficient people to do quality-related activities. Shari'ah boards of several Islamic banks regularly collaborate and alliance. top management encourage long-term	Top managers adopt a consultative style where sharing knowledge is truly valued and accept responsibility for quality, show concern for the need for quality, set clear goals for quality improvement, and commit to quality that regard as top competitive priority and there is a strong commitment to quality at all levels. Top Management regularly collaborate with Shari'ah boards to assign sufficient people to do quality-related activities. Shari'ah boards of several Islamic banks regularly collaborate and alliance. Top management to some extend encourage long-term strategic thinking.

strategic thinking.	
Conclusion: Top management and Shari'ah board play a good role of continues quality development	
Reward & recognition	
Sudan	**Bahrain**
Top management encourages, supports and rewards employees to present, share and transfer new ideas and present quality performance without a standardized reward system. The quality lack some understanding and measuring tools it is just let the work goes, whenever there is innovative idea for a product or process (while this is very few) they do reward the innovators International banks set a better standard for the packages while still it is not as required some employees do other work or even go to training and save from to allowance given to fill this gap.	Top management encourages, supports and rewards employees to present new ideas without fear, banks have standardized reward systems for sharing or transferring knowledge they recognizing employee for superior quality performance and provide incentive rewards to innovators that can be bonus schemes of profit sharing. They provide good, adequate and competitive packages.
Conclusion: Sudanese banks do not have standardized reward systems. Packages are somewhat competitive in the market but still the employees are unsatisfied.	

Education & training	
Sudan	**Bahrain**
Acquiring and enhancing the knowledge of Islamic Banking through different types of training both at the entry ranks and senior ones, having some minor mentoring programs, lectures, seminars, conferences, and training session emphasize knowledge sharing.	Acquiring knowledge through intensified levels of training both at the entry ranks and senior ones. Sponsoring students to enroll into universities /continuing education of employees at Islamic financing colleges, having regular mentoring programs, lectures, seminars, conferences, and training session to emphasize sharing knowledge are ways to accomplish it.
Conclusion: Employees attend good number of training, seminars & conferences but most of the banks do not provide post-graduate ones.	
Employee	
Sudan	**Bahrain**
Employees fully trained for the work they perform and are encouraged to work in team there is a basic suggestion system for them and they are uninvolved	Employees fully trained for the work they perform and to some extend to work in team with a more active suggestion system, they with some limits involved

in the decision- making designing and strategic planning but may participate in setting their unit objectives and employees interact with customers and suppliers	in design, planning and decision-making .Employee interaction with customers and suppliers.
Conclusion: Sudanese banks employees well trained and have good interaction with the customers but they do not participate in the decision making and even their suggestion where there is a basic suggestion system.	
Continuous improvement	
Sudan	**Bahrain**
Continuous quality improvement is an important goal for the top management specially the quality control managers they play an active role as facilitators of continuous improvement, coaches of new methods, mentors, and leaders of empowered employees but the employees do not have sense of quality, managers try to encourage them to improve the quality of their product but most of the employees do not believe that quality improvement is their responsibility, and even if they do they	continuous quality improvement is an important goal for the managers that play an active roles as facilitators, coaches of new methods, mentors, and leaders of empowered employees they encourage the employees to improve the quality of their product, and develop a believe that quality improvement is the employees responsibility. Managers and employees periodically reviews quality issues in meetings where managers provide feedback to the employees on their quality So they can analyze their

can't analyze their work products to look for ways of doing a better job, as feedbacks and periodic meetings are not quality-based ones.	work products to look for ways of doing a better job.
Conclusion: Quality control managers play an active role in the continues quality improvement but still the problem within the lower staff that do not believe that quality improvement is their responsibility.	
Customer focus	
Sudan	**Bahrain**
Employees in work unit know who their customers are, they think of them when doing their work to increase customer satisfaction Top managers often measure their external and internal customers' needs. Customers are encouraged to provide feedback but most of the time it has no value in designing new process, product or service.	Employees in work unit know who their customers are but they do not think of them when doing their work, employees to some extend measure their external and internal customers' needs and increase customer satisfaction. Customers are encouraged to provide feedback but they do not participate in design new processes, products, or services.
Conclusion: Sudanese in general adopt a casual behavior mixed with personal feelings with the customers where it can affect the bank negatively.	

Process focus /Database decisions	
Sudan	**Bahrain**
Sudanese banks' employees do not have any statistical tool or charts to check on the quality of their work or services only normal appraisal type of data that lack the true quality data where they can't trace their work improvement.	**E**mployees use statistical charts to check on the quality of their work or services and collect data on the amount of time it takes to get the job done, they keep these charts displayed at their work station to trace work improvements where quality data (cost of quality, defects, errors, scraps, etc.) are used as tools to manage quality.
Conclusion: Employees do not have understanding of how to measure quality data of their work and do not have any statistical tool or charts to check on the quality of their work so they can develop it.	

4.1.3 Innovation Performance

Innovation is a complete process that starts with the identification of opportunities or problems, followed by the discovery and development of solutions, taking the shape of process, products or services which are then implemented or applied to the market.

Table 8: Innovation performance interview

Product innovation	
Sudan	**Bahrain**
The newness of new products that are relevant to Islamic financial institutions comes from market and consumer needs Sudanese banks somewhat up-to-date with the latest technological innovations in new product development.	Increasing the level of newness of new products that relevant to Islamic financial institutions using somewhat the latest technological innovations Bahraini banks suffer from low number of new products that is first-to-market (early market entrants.
Conclusion: The push factor for developing new products is present where a market oriented method rather than a product oriented is the norm and where innovative competing products are expected	
Process innovation / the Regulatory Environment	
Sudan	**Bahrain**

Still Sudanese banks needs to participate in the technological competitiveness and revise the updated technology used in processes. All Sudanese banks adopted the AAIOFI standards with standardize Sharia'a rules that have been set by the government The government laws and codes are inflexible, practical but all tailored for the Islamic Banking industry.	As well Bahraini banks need to participate more in the technological competitiveness and revise the updated or novelty of technology used in processes Bahrain Islamic banks adopt the AAIOFI standards with somewhat standardization in the industry concerning Sharia'a rulings The government laws and codes are somewhat flexible, practical and tailored for the Islamic Banking industry. Not the conventional banking. Passing the laws is somewhat speedy relative to the conventional banking ones.
Conclusion: Sudanese banks needs to participate in the technological competitiveness and revise the updated technology, banks follow the AAIOFI standards with standardize governmental Sharia'a rules that in some cases inflexible. Conventional banks are prohibited.	

4.2 Descriptive Statistics

4.2.1 Data screening

All three designated variables, KM, TQM, and INNO were screened as parametric variables using missing data, outliers, means, histogram, standard deviations, skewness, and kurtosis as discussed below.

4.2.1.1 Missing Data:

Lisrel been used to find out if there is randomly missing data or if there is some pattern (reason) to why the data points are missing.

Number of missing values per variable after imputation were

KM	TQM	INNO
0	0	0

4.2.1.2 Outliers

These are case scores that are extreme and therefore have a much higher impact on the outcome of any statistical analysis. In order to avoid biased results the data set must be checked for univariate (outliers on one variable alone) and multivariate (outliers on a combination of variables) outliers. The univariate test examine each variable individually for departures from normality through the z- score coefficient, Univariate outliers are those with very large standardized scores (z scores greater than 2.68) and that are disconnected from the distribution. Excel software was used to calculate z scores for every

case were none of the data found greater than the z-score, as shown on the Appendix

4.2.1.3 Normality: The data needs to follow a normal distribution in order for most analyses to work properly. There are two aspects to normality of a distribution, skewness and kurtosis, and both must be tested before normality can be established.

a. Skewness – this describes how unevenly the data is distributed with a majority of scores piled up on one side of the distribution and a few stragglers off in one tail of the distribution. Skewness is often but not always caused by outliers. For normality the absolute of z score for skewness should be less than 3.3

b. Kurtosis – this describes how "peaked" or "flat" a distribution is. If too many or all of the scores are piled up on the or around the mean then the distribution is too peaked and it is not normal, vice versa for when a distribution is too flat. For normality z-score for kurtosis should also be less than 3.3.

   As shown on the tables below the data found to be normally distributed

Table 9: Univariate Summary Statistics for Continuous Variables *of KM Initiatives, TQM Practices, and INNO Performance (n =125)*

Variable	**Mean**	**St. Dev**	**T-Value**	**Skewness**	**Kurtosis**	**Min**	**Freq**	**Max**	**Freq**
KM	5.750	0.21	302.73	-0.160	-0.613	5.300	4	6.20	2
TQM	5.72	0.21	299.97	0.261	-0.517	5.30	3	6.2	3
INNO	5.35	0.26	234.3	-0.183	-0.505	4.70	1	5.9	1

Table 10: Test of Univariate Normality for Continuous Variables

	Skewness		**Kurtosis**		**Skewness and Kurtosis**	
Variable	**Z-Score**	**P-Value**	**Z-Score**	**P-Value**	**Chi-Square**	**P-Value**
KM	-0.754	0.451	-1.878	0.060	4.095	0.129
TQM	1.220	0.222	-1.457	0.145	3.612	0.164
INNO	-0.861	0.389	-1.409	0.159	2.726	0.256

Table 11: Univariate Summary Statistics for Continuous Variables (Total Sample Size = 125)

Variable	**Mean**	**St. Dev**	**T-Value**	**Skewness**	**Kurtosis**	**Mini**	**Fq.**	**Max**	**Fq.**
OS	5.812	0.327	198.620	-0.042	-0.196	5.066	4	6.504	6
OC	5.666	0.324	195.819	-0.039	-0.117	4.771	1	6.400	4
Ts	5.664	0.542	116.899	0.038	-0.032	4.529	7	6.990	3
IT	6.170	0.493	140.021	-0.049	-0.318	4.992	3	7.079	11
Kacq	5.710	0.295	216.618	-0.010	-0.127	5.008	3	6.379	4
Kap	6.238	0.375	185.885	-0.020	-0.284	5.383	4	6.983	8
Ksha	6.158	0.448	153.676	-0.002	-0.260	5.211	6	7.104	6
kpro	4.388	0.644	76.176	0.107	0.104	2.814	3	6.061	2
Kapp	5.922	0.454	145.961	0.014	-0.110	4.847	3	7.065	2
Lish	6.163	0.392	175.707	0.027	-0.228	5.364	7	7.096	3

RR	5.901	0.334	197.260	0.042	-0.174	5.171	5	6.698	3
ET	5.798	0.383	169.216	-0.019	-0.063	4.829	2	6.710	3
EM	5.242	0.392	149.460	0.054	-0.384	4.548	13	6.182	3
CI	5.914	0.369	178.949	0.041	-0.164	5.140	6	6.933	1
CF	5.307	0.295	201.211	0.010	-0.123	4.639	4	6.052	2
PF	5.713	0.381	167.550	0.068	-0.259	4.997	10	6.676	2
prouct	5.566	0.428	145.266	0.014	-0.371	4.739	9	6.441	7
process	5.069	0.248	228.185	-0.001	-0.339	4.574	8	5.563	8

Table 12: Test of Univariate Normality for Continuous Variables

	Skewness		**Kurtosis**		**Skewness and Kurtosis**	
Variable	**Z-Score**	**P-Value**	**Z-Score**	**P-Value**	**Chi-Square**	**P-Value**
OS	-0.198	0.843	-0.345	0.730	0.159	0.924
OC	-0.184	0.854	-0.125	0.900	0.050	0.976
Ts	0.181	0.857	0.096	0.923	0.042	0.979
IT	-0.230	0.818	-0.725	0.468	0.579	0.749
Kacq	-0.047	0.962	-0.152	0.880	0.025	0.987
Kap	-0.096	0.924	-0.614	0.539	0.386	0.825
Ksha	-0.009	0.993	-0.539	0.590	0.291	0.865
kpro	0.505	0.613	0.418	0.676	0.430	0.807
Kapp	0.067	0.947	-0.107	0.915	0.016	0.992
Lish	0.129	0.897	-0.443	0.658	0.213	0.899
RR	0.198	0.843	-0.282	0.778	0.119	0.942
ET	-0.092	0.927	0.017	0.987	0.009	0.996
EM	0.256	0.798	-0.948	0.343	0.965	0.617
CI	0.196	0.844	-0.256	0.798	0.104	0.949
CF	0.047	0.962	-0.141	0.888	0.022	0.989
PF	0.324	0.746	-0.535	0.593	0.391	0.823
prouct	0.065	0.948	-0.903	0.366	0.820	0.664
process	-0.007	0.995	-0.795	0.427	0.631	0.729

c. Histograms for Continuous Variables

Knowledge Management Initiatives

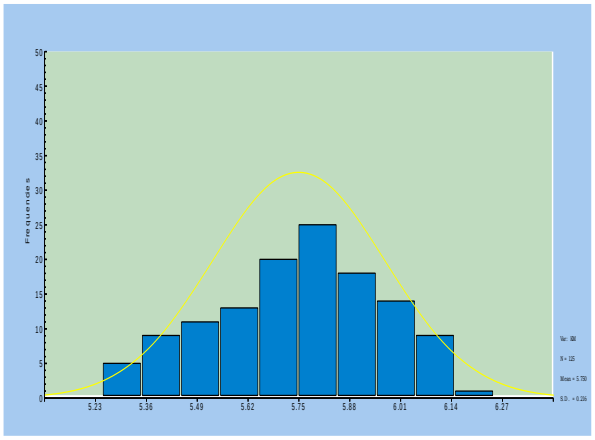


Figure 6 . Histogram of knowledge management.

Frequency	Percentage	Lower Class Limit	
4	3.2	5.300	• • • •
8	6.4	5.390	• • • • • • • •
12	9.6	5.480	• • • • • • • • • • • •
16	12.8	5.570	• • • • • • • • • • • • • • • •
19	15.2	5.660	• • • • • • • • • • • • • • • • • • •
23	18.4	5.750	• •
20	16.0	5.840	• • • • • • • • • • • • • • • • • • • •
14	11.2	5.930	• • • • • • • • • • • • • •
7	5.6	6.020	• • • • • • •
2	1.6	6.110	• •

Histograms for Continuous Variables

OS

Frequency	Percentage	Lower Class Limit	
4	3.2	5.066	• • • •
5	4.0	5.209	• • • • •
13	10.4	5.353	• • • • • • • • • • • • •
19	15.2	5.497	• • • • • • • • • • • • • • • • • • •
28	22.4	5.641	• •
34	27.2	5.929	• •
16	12.8	6.216	• • • • • • • • • • • • • • • •
6	4.8	6.360	• • • • • •

OC

Frequency	Percentage	Lower Class Limit	
1	0.8	4.771	•
6	4.8	4.934	• • • • • •
5	4.0	5.097	• • • • •
10	8.0	5.259	• • • • • • • • • •
30	24.0	5.422	• •
22	17.6	5.585	• •
29	23.2	5.748	• •
16	12.8	5.911	• • • • • • • • • • • • • • • •
6	4.8	6.237	• • • • • •

Ts

Frequency	Percentage	Lower Class Limit	
7	5.6	4.529	• • • • •
15	12.0	4.775	• • • • • • • • • •
53	42.4	5.267	• •
33	26.4	6.005	• •
14	11.2	6.252	• • • • • • • • • •
3	2.4	6.744	• •

IT

Frequency	Percentage	Lower Class Limit	
3	2.4	4.992	• • •
11	8.8	5.201	• • • • • • • • • • •
16	12.8	5.618	• • • • • • • • • • • • • • • •
26	20.8	5.827	• •
28	22.4	6.244	• •
18	14.4	6.453	• • • • • • • • • • • • • • • • • •
12	9.6	6.662	• • • • • • • • • • • •
11	8.8	6.870	• • • • • • • • • • •

Kacq

Frequency	Percentage	Lower Class Limit	
3	2.4	5.008	• • •
5	4.0	5.145	• • • • •
11	8.8	5.282	• • • • • • • • • • •
21	16.8	5.419	• •
31	24.8	5.556	• •
24	19.2	5.830	• •
17	13.6	5.967	• • • • • • • • • • • • • • • • •
9	7.2	6.104	• • • • • • • • •
4	3.2	6.242	• • • •

Kap

Frequency	Percentage	Lower Class Limit	
4	3.2	5.383	• • • •
14	11.2	5.703	• • • • • • • • • • • • • •
18	14.4	5.863	• • • • • • • • • • • • • • • • • •
20	16.0	6.023	• • • • • • • • • • • • • • • • • • • •
30	24.0	6.183	• •
20	16.0	6.503	• • • • • • • • • • • • • • • • • • • •
11	8.8	6.663	• • • • • • • • • • •
8	6.4	6.823	• • • • • • • •

Ksha

Frequency	Percentage	Lower Class Limit	
6	4.8	5.211	• • • • • •
15	12.0	5.400	• • • • • • • • • • • • • • •
1	0.8	5.590	•
13	10.4	5.779	• • • • • • • • • • • • •
20	16.0	5.968	• • • • • • • • • • • • • • • • • • • •
35	28.0	6.158	• •
18	14.4	6.347	• • • • • • • • • • • • • • • • • •
11	8.8	6.726	• • • • • • • • • • •
6	4.8	6.915	• • • • • •

Kpro

Frequency	Percentage	Lower Class Limit	
3	2.4	2.814	• •
8	6.4	3.139	• • • • •
52	41.6	3.788	• •
31	24.8	4.438	• •
19	15.2	4.762	• • • • • • • • • • • • •
10	8.0	5.412	• • • • • • •
2	1.6	5.737	•

Kapp

Frequency	Percentage	Lower Class Limit	
3	2.4	4.847	• • •
10	8.0	5.068	• • • • • • • • • •
12	9.6	5.290	• • • • • • • • • • • •
14	11.2	5.512	• • • • • • • • • • • • • •
17	13.6	5.734	• • • • • • • • • • • • • • • • •
28	22.4	5.956	• •

28	22.4	6.177	• •
7	5.6	6.399	• • • • • • •
4	3.2	6.621	• • • •
2	1.6	6.843	• •

Total Quality Management

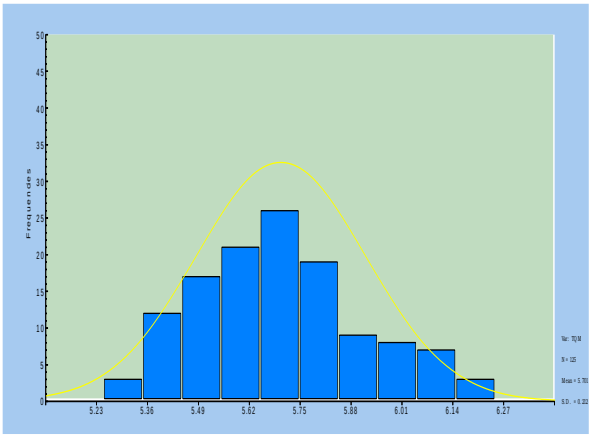


Figure7. Histogram of total quality management

Frequency Percentage Lower Class Limit

3	2.4	5.300	• • •
10	8.0	5.390	• • • • • • • • • •
17	13.6	5.480	• • • • • • • • • • • • • • • • •
19	15.2	5.570	• • • • • • • • • • • • • • • • • • •
26	20.8	5.660	• •
17	13.6	5.750	• • • • • • • • • • • • • • • • •
14	11.2	5.840	• • • • • • • • • • • • • •
9	7.2	5.930	• • • • • • • • •
7	5.6	6.020	• • • • • • •
3	2.4	6.110	• • •

Lish

Frequency Percentage Lower Class Limit

7	5.6	5.364	• • • • • • •
10	8.0	5.537	• • • • • • • • • •
19	15.2	5.711	• • • • • • • • • • • • • • • • • • •
21	16.8	5.884	• • • • • • • • • • • • • • • • • • • •
23	18.4	6.057	• •
22	17.6	6.403	• • • • • • • • • • • • • • • • • • • •

13	10.4	6.577	• • • • • • • • • • • •
7	5.6	6.750	• • • • • • •
3	2.4	6.923	• • •

RR

Frequency Percentage Lower Class Limit

5	4.0	5.171	• • • • •
19	15.2	5.476	• • • • • • • • • • • • • • • • • • •
20	16.0	5.629	• • • • • • • • • • • • • • • • • • • •
21	16.8	5.782	• • • • • • • • • • • • • • • • • • • •
31	24.8	5.934	• •
12	9.6	6.087	• • • • • • • • • • • •
7	5.6	6.240	• • • • • • •
7	5.6	6.393	• • • • • • •
3	2.4	6.546	• • •

ET

Frequency Percentage Lower Class Limit

2	1.6	4.829	• •
4	3.2	5.017	• • • •
19	15.2	5.205	• • • • • • • • • • • • • • • • • • •
20	16.0	5.394	• • • • • • • • • • • • • • • • • • • •
29	23.2	5.770	• •
29	23.2	5.958	• •
12	9.6	6.146	• • • • • • • • • • • •
7	5.6	6.334	• • • • • • •
3	2.4	6.522	• • •

EM

Frequency Percentage Lower Class Limit

13	10.4	4.548	• • • • • • • • • • • •
17	13.6	4.711	• • • • • • • • • • • • • • • • •
35	28.0	5.038	• •
18	14.4	5.201	• •
28	22.4	5.528	• •
11	8.8	5.692	• • • • • • • • • • •
3	2.4	6.018	• • •

CI

Frequency	Percentage	Lower Class Limit	
6	4.8	5.140	• • • • • •
11	8.8	5.319	• • • • • • • • • • •
14	11.2	5.499	• • • • • • • • • • • • • •
21	16.8	5.678	• •
21	16.8	5.857	• •
24	19.2	6.036	• •
19	15.2	6.216	• • • • • • • • • • • • • • • • • •
6	4.8	6.395	• • • • • •
2	1.6	6.574	• •
1	0.8	6.754	•

CF

Frequency	Percentage	Lower Class Limit	
4	3.2	4.639	• • • •
10	8.0	4.780	• • • • • • • • • •
12	9.6	4.922	• • • • • • • • • • • •
19	15.2	5.063	• • • • • • • • • • • • • • • • • • •
23	18.4	5.204	• •
30	24.0	5.346	• •
11	8.8	5.487	• • • • • • • • • • •
7	5.6	5.628	• • • • • • •
7	5.6	5.770	• • • • • • •
2	1.6	5.911	• •

PF

Frequency	Percentage	Lower Class Limit	
10	8.0	4.997	• • • • • • • • • •
13	10.4	5.165	• • • • • • • • • • • • •
15	12.0	5.333	• • • • • • • • • • • • • • •
15	12.0	5.501	• • • • • • • • • • • • • • •
27	21.6	5.669	• •
17	13.6	5.837	• • • • • • • • • • • • • • • • •
14	11.2	6.005	• • • • • • • • • • • • • •
8	6.4	6.172	• • • • • • • •
4	3.2	6.340	• • • •
2	1.6	6.508	• •

Innovation Performance

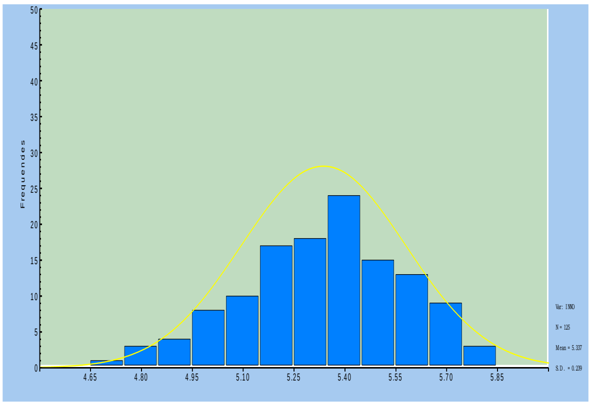


Figure 8. Histogram of innovation.

Frequency	Percentage	Lower Class Limit	
3	2.4	4.700	• • •
6	4.8	4.820	• • • • • •
9	7.2	4.940	• • • • • • • • •
10	8.0	5.060	• • • • • • • • • •
16	12.8	5.180	• • • • • • • • • • • • • • • •
37	29.6	5.300	• •
16	12.8	5.420	• • • • • • • • • • • • • • • •
12	9.6	5.540	• • • • • • • • • • • •
10	8.0	5.660	• • • • • • • • • •
6	4.8	5.780	• • • • • •

Product

Frequency	Percentage	Lower Class Limit	
9	7.2	4.739	• • • • • • • • •
9	7.2	4.909	• • • • • • • • •
19	15.2	5.080	• • • • • • • • • • • • • • • • • • •
16	12.8	5.250	• • • • • • • • • • • • • • • •
24	19.2	5.420	• •
19	15.2	5.760	• • • • • • • • • • • • • • • • • • •
16	12.8	5.930	• • • • • • • • • • • • • • • •
6	4.8	6.101	• • • • • •
7	5.6	6.271	• • • • • • •

Process

Frequency	Percentage	Lower Class Limit	
8	6.4	4.574	• • • • • • • •

9	7.2	4.673	• • • • • • • • •
16	12.8	4.772	• • • • • • • • • • • • • • • •
30	24.0	4.970	• •
28	22.4	5.069	• •
19	15.2	5.267	• • • • • • • • • • • • • • • • • • •
7	5.6	5.366	• • • • • • •
8	6.4	5.464	• • • • • • • •

4.2.1.4 Correlational Statistics

The correlation coefficients among KM, TQM, and INNO were examined as shown in Table13 the correlation matrix between the variables.

Table13: Correlation Matrix

	KM	TQM	INNO
KM	1.000		
TQM	0.699	1.000	
INNO	0.550	0.724	1.000

The correlation matrix reveals a significant relationship among KM, TQM, and

INNO. The two independents variable (KM and TQM) have a significant correlation with the dependent variable (INNO). KM was positively correlated with INNO (0.55). TQM was positively correlated with INNO (0.724) and TQM was positively correlated with KM (0.699).

Table 14: *Inter-correlation matrix between the Variable*

	OS	**OC**	**Ts**	**IT**	**Kacq**	**Kap**	**Ksha**	**kpro**	**Kapp**
OS	1.000								
OC	0.507	1.000							
Ts	0.018	0.133	1.000						
IT	0.462	0.620	0.082	1.000					
Kacq	0.174	0.238	0.030	0.199	1.000				
Kap	0.607	0.361	0.027	0.399	0.323	1.000			
Ksha	0.505	0.202	0.031	0.297	0.010	0.373	1.000		
Kpro	0.031	0.016	0.354	0.014	0.140	0.012	0.023	1.000	
Kapp	0.311	0.381	0.022	0.441	0.204	0.349	0.507	0.014	1.000
Lish	0.257	0.166	0.074	0.251	0.108	0.171	0.225	0.053	0.183
RR	0.335	0.403	0.208	0.346	0.194	0.110	0.223	0.103	0.232
ET	0.267	0.307	0.184	0.339	0.203	0.174	0.076	0.101	0.163
EM	0.243	0.282	0.146	0.355	0.168	0.097	0.103	0.268	0.124
CI	0.355	0.334	0.170	0.439	0.218	0.252	0.231	0.079	0.216
CF	0.023	0.015	0.076	0.064	0.199	0.172	0.050	0.096	0.143
PF	0.281	0.290	0.193	0.291	0.282	0.272	0.236	0.139	0.308
Product	0.396	0.292	0.128	0.312	0.257	0.182	0.242	0.065	0.218
Process	0.163	0.153	0.185	0.111	0.204	0.181	0.120	0.157	0.17

Lish	**RR**	**ET**	**EM**	**CI**	**CF**	**PF**	**prouct**	**process**	
Lish	1.000								
RR	0.287	1.000							
ET	0.108	0.306	1.000						
EM	0.014	0.317	0.385	1.000					

CI	0.069	0.407	0.329	0.525	1.000				
CF	0.117	0.065	-0.064	0.084	0.120	1.000			
PF	0.118	0.436	0.348	0.403	0.459	0.261	1.000		
Product	0.133	0.461	0.282	0.359	0.541	0.227	0.507	1.000	
Process	0.205	0.286	0.184	0.227	0.294	0.158	0.238	0.067	1.00

Covariance Matrix

	KM	TQM	INNO
KM	0.045		
TQM	0.031	0.045	
INNO	0.030	0.039	0.065

4.2.2 Participant Background Information

The descriptive statistics of the sample relating to the respondents were classified according to gender, age group, level of education, job function and position and finally the experience.

The dominant gender from the 80 respondents of the sample chosen from Bahrain banks were of graduate males (66.7%) and a higher percentage for Sudan (80%), and were classified by age group as shown in figure 6.

Table 15: Age of Respondents

	Bahrain		Sudan	
Age Group	**Frequency**	**Percent**	**Frequency**	**Percent**
Under 30	12	10%	7	6%
30-40	50	40%	25	20%
41-50	39	31%	55	44%
51-60	24	19%	38	30%
Total	125	100%	125	100%

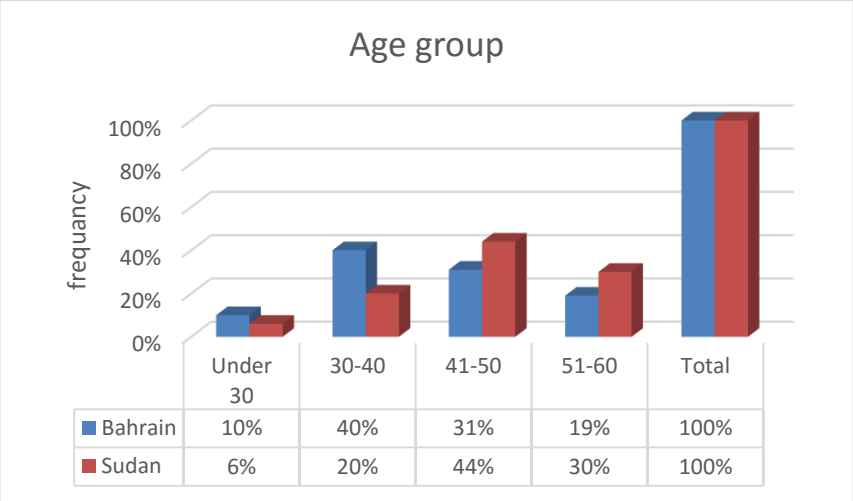


Figure 9: Age of Respondents

As shown in figure 9 the least age group for both Bahrain and Sudan respondents was under 30 years old, the dominant with (40 %)

of the Bahrain's respondents were between 30-40 years old while for Sudan respondents were only 200% for this age group and the dominant was between 41-50 years old (44 %) which was the second highest for Bahrain by (31 %) in the selected sample and a good number of respondents for those older than 50 years (19 %) for Bahrain and (30%) for Sudan. This indicates that Bahrain Islamic banks have a greater number of younger employees that have new knowledge and have a better capabilities of absorbing new additional knowledge.

Education Level of Respondents

Table 16: Education level

	Bahrain		Sudan	
Level of Education	Frequency	Percent	Frequency	Percent
Bachelor	36	29%	6	15%
Masters	84	67%	26	65%
Doctorate	5	4%	8	20%

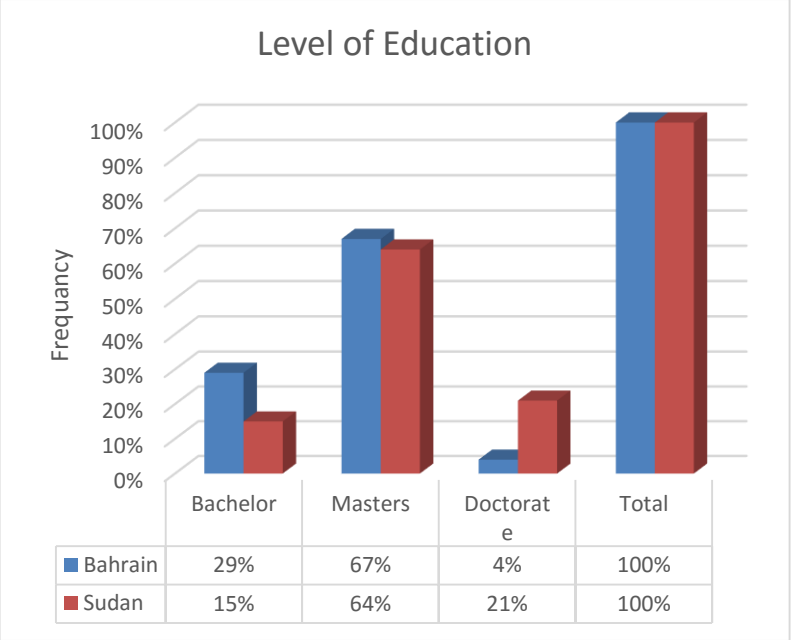


Figure 10: Education Level of Respondents

As figure 10 shows that the highest level of education achieved by most respondents for Bahrain and Sudan was a Master's degree, accounting for (67%) and (64%) of the samples, followed by bachelor's degree (30%) for Bahrain where there were only (15%) for Sudan respondents as the second highest for Sudan with (21%) were holding a doctorate and only (4%) for Bahrain.

Respondents' job function

	Bahrain		Sudan	
Job functions	**Frequency**	**Percent**	**Frequency**	**Percent**
Sharia compliant manager	5	4%	4	3%

Strategic planning	18	14%	21	17%
Corporate banking	17	14%	18	14%
Human Resource	9	6%	16	13%
Dev manager	30	24%	12	10%
Risk manager	12	10%	12	10%
Quality assurance	10	8%	9	7%
Retail manager	12	10%	18	14%
Administration	12	10%	15	12%
Total	125	100%	125	100%

Table 17: Respondents' job function

As shown in table 17 the highest group of job group for Bahrain respondents was Development manager with (24%) of the sample while for Sudan it was the fourth with only (10%), and the dominant for Sudan respondents was Strategic planning with (17%) and it's the second high for Bahrain respondents with (14%) same as the Corporate banking which was the second high for Sudan respondents with (14%) as well of the respondents same as Retail managers for Sudan respondents with (14%) while for Bahrain it was (10 %), Risk manager and administration was (12%) for both Bahrain where they were (14%)

&(12%) for Sudan respondents, and human resources (6%) for Bahrain and (13%) for Sudan respondents and (12%) of respondents in Shari'a compliant manager and Quality Assurance while for Sudan they were represented with (10%).

Respondents' Years of Experience

Table 18: Respondents' Years of Experience

	Bahrain		Sudan	
Years	**Frequency**	**Percent**	**Frequency**	**Percent**
0-2 years	3	2%	15	12%
3-5 years	12	10%	53	42%
6-8 years	84	67%	15	12%
8+ years	26	21%	42	34%
Total	125	100%	125	100%

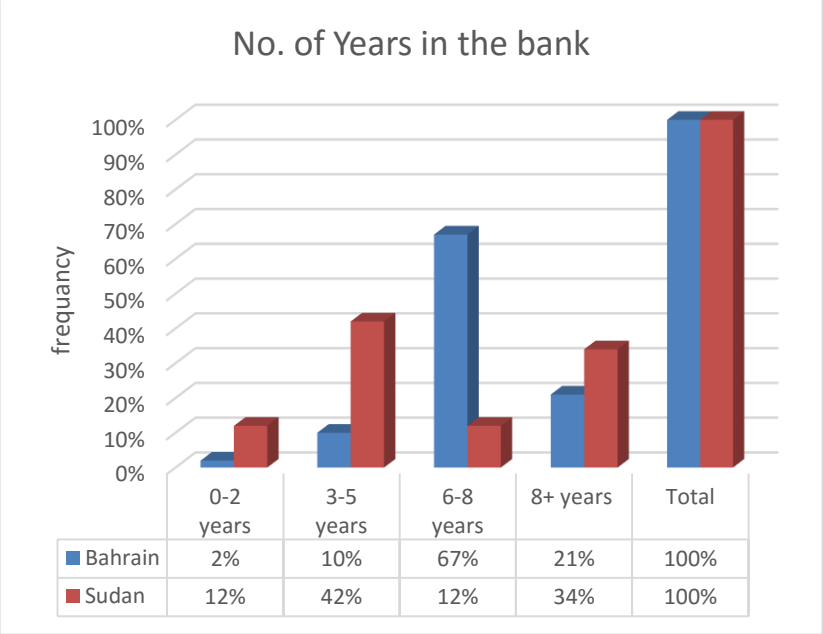


Figure 11: Respondents' Years of Experience

The respondents' years of experience are summarized in figure 8 which shows that the highest number of respondents for Bahrain were working with the bank for 6-8 years with (67%) while only (12%) of Sudan respondent did. The highest number of respondents for Sudan were 3-5 years working with the bank with (42%) where a very low number of (10%) of Bahrain respondents did. few of Bahrain respondents had less than 2 years of experience with (2%) while (12)% did for Sudan respondents. A high percentage of 34% of Sudan respondents were working with the bank for more than 8 years on the other hand a decant number of 21% did for Bahrain.

4.2.3: Knowledge Management as a Competitive Advantage

The knowledge management capability of a firm is hypothesized to be a multi-dimensional construct composed of structure capability, technical knowledge management infrastructure capability, and knowledge management process capability.

Social Knowledge Management Infrastructure Capability

- **Organizational Structure**

The structural variable was measured using five aspects. The statements were as follows:

1st Statement: My organization acquires knowledge by incorporating new members who have Islamic financial knowledge (not conventional background).

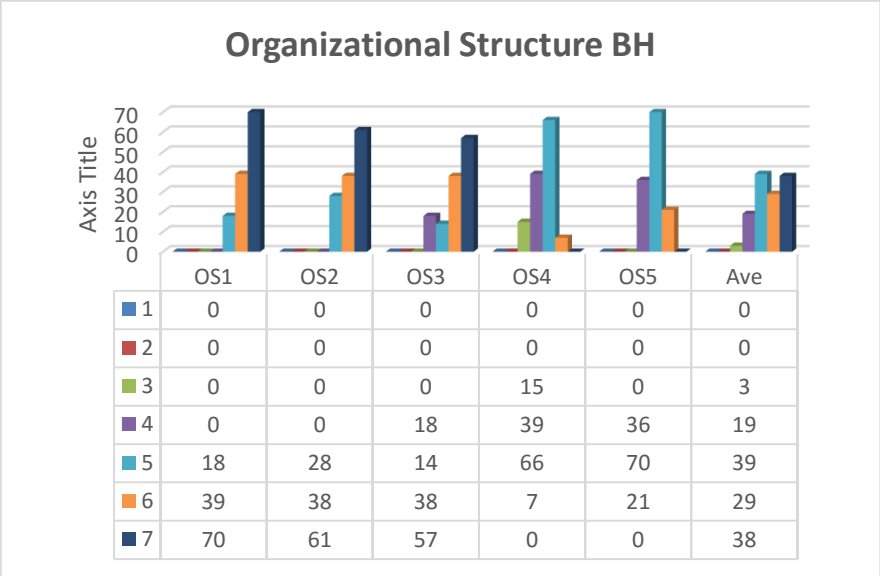
2nd Statement: My organization's providing technology that allows employees to collaborate with others inside and outside the organization.

3rd Statement: My organization's designing processes to facilitate knowledge sharing or transferring across functional boundaries with enhanced communication quality.

4th Statement: My organization has accountability for results bound with giving away authority and delegation of powers.

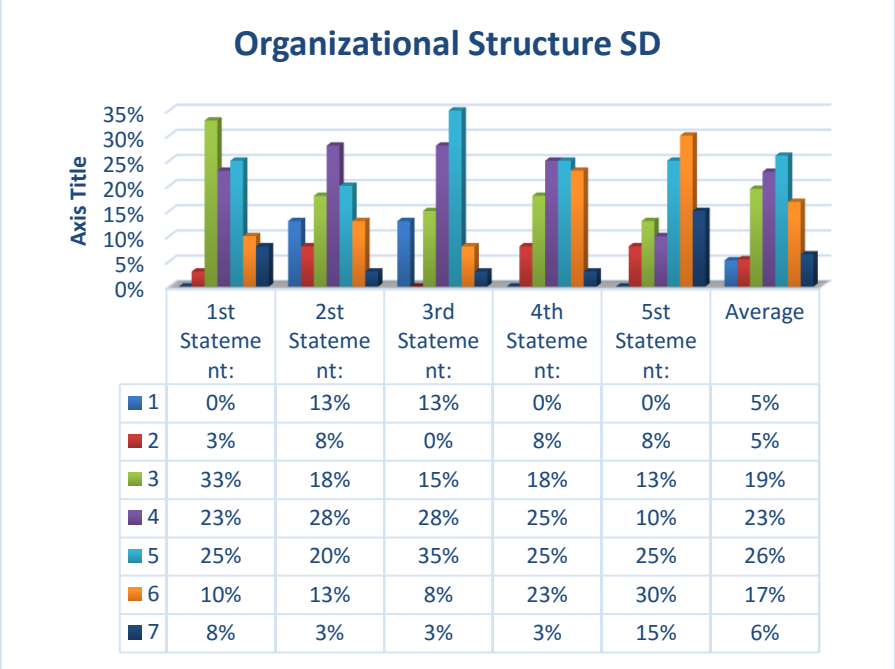
5th Statement: My organization encourages employees to work in team.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	OS1	OS2	OS3	OS4	OS5	Ave
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	15	0	3
4	0	0	18	39	36	19
5	18	28	14	66	70	39
6	39	38	38	7	21	29
7	70	61	57	0	0	38

μ	6.4	6.3	6.1	4.5	4.9	5.8



μ	4.3	3.8	4.1	4.5	5	4.3

OS	Bahrain	Sudan
μ	5.8	4.3

Figure 12: Organizational Structure for Bahrain and sudan

As shown from the figure above, It is clear that most of the **Bahrain respondents agree** with all the statements, which indicates that Bahrain Islamic banks have a well-constructed structure which provides the ability to discover, create and transfer knowledge on the other hand for **Sudan respondents** their feedback indicate that Sudan Islamic banks have constructed Organization structure that hardly provides the ability to discover, create and transfer knowledge.

- **Organizational Culture**

The cultural variable was measured using seven aspects. The statements were as follows:

1st Statement: The nature of the bank is a trust-based environment;

2nd Statement: Having different methods for employees to further develop their knowledge and apply them to new situations;

3rd Statement: Top managers adopt a consultative style where sharing knowledge is truly valued;

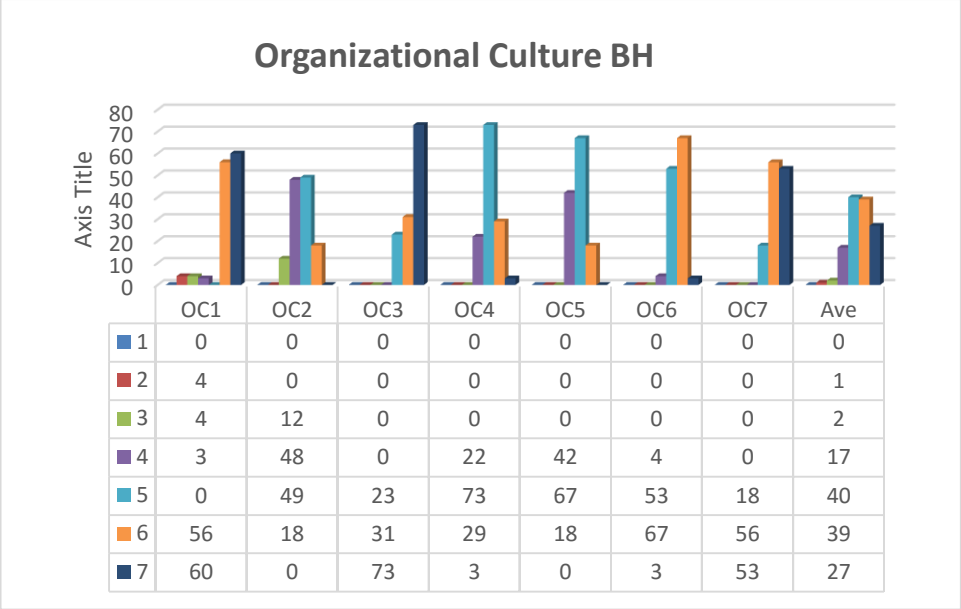
4th Statement: Top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders;

5th Statement: Increasing employee involvement in design and planning;

6th Statement: Employees analyze their work products to look for ways of doing a better job;

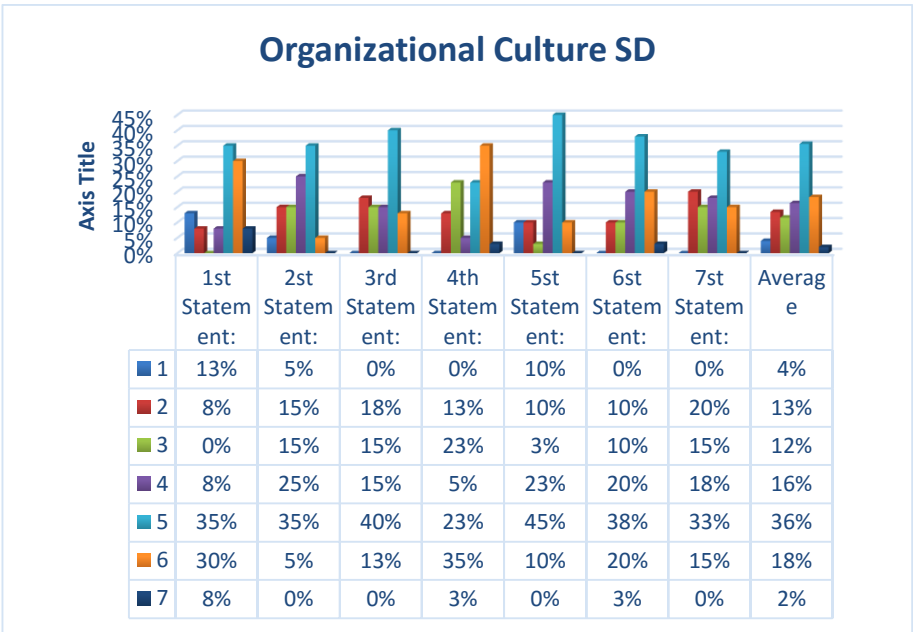
7th Statement: Encouraging employee to try new and better ways of doing their job/ promoting creative thinking and creativity.

These aspects are represented in the following figure along with the respondents' results in percentages, and also show the average of all responses.



	OC1	OC2	OC3	OC4	OC5	OC6	OC7	Ave
1	0	0	0	0	0	0	0	0
2	4	0	0	0	0	0	0	1
3	4	12	0	0	0	0	0	2
4	3	48	0	22	42	4	0	17
5	0	49	23	73	67	53	18	40
6	56	18	31	29	18	67	56	39
7	60	0	73	3	0	3	53	27

μ	6.2	4.6	6.4	5.1	4.8	5.5	6.3	**5.7**



	1st Statement:	2st Statement:	3rd Statement:	4th Statement:	5st Statement:	6st Statement:	7st Statement:	Average
1	13%	5%	0%	0%	10%	0%	0%	4%
2	8%	15%	18%	13%	10%	10%	20%	13%
3	0%	15%	15%	23%	3%	10%	15%	12%
4	8%	25%	15%	5%	23%	20%	18%	16%
5	35%	35%	40%	23%	45%	38%	33%	36%
6	30%	5%	13%	35%	10%	20%	15%	18%
7	8%	0%	0%	3%	0%	3%	0%	2%

μ	4.7	3.9	4.2	4.5	4.1	4.6	4	4.3

OC	**Bahrain**	**Sudan**
μ	**5.7**	**4.3**

Figure 13: Cultural Knowledge Management Infrastructure

As shown from figure 13, the common Bahrain response for the aspects was agreeing on most of the statements 97% of the respondents were positively agree, while for Sudan there were negative feedbacks a cumulative of only 56% agreeing for the aspects .

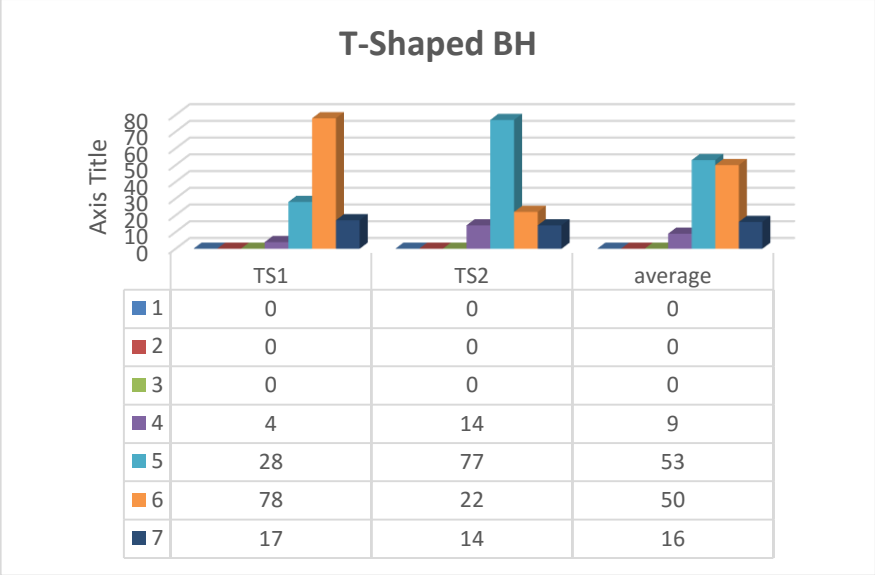
Looking at the average of all aspects the results implies Sudan with an average of 4.3 is not as Bahrain Islamic banks 5.7 where the respondents stated that it has a good workplace culture, there are shared values that knowledge is important for success, and there is sharing of knowledge as well as the support of key personnel to the practices of knowledge management.

- **People (T-shaped Skills)**

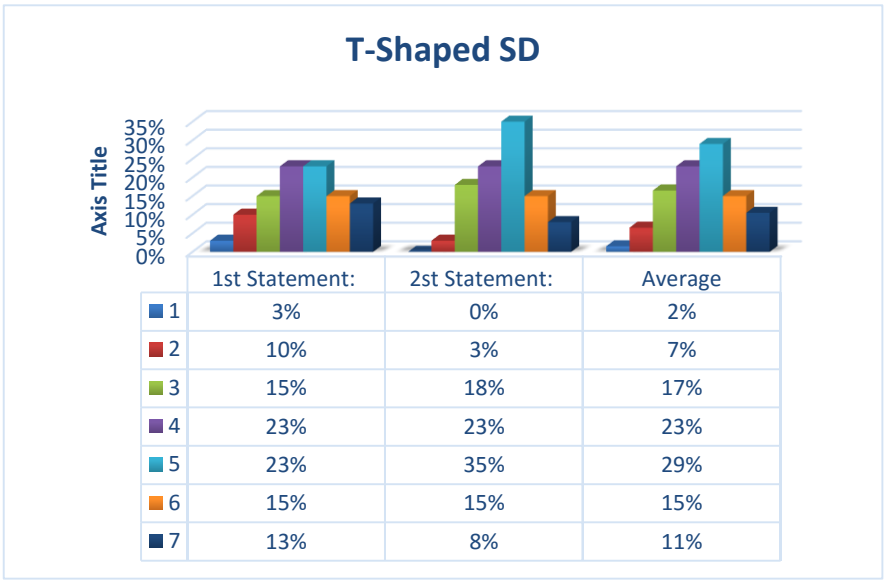
The people variable was measured using two aspects, which are represented in the following figure along with the respondents' results in percentages, and also shows the average of all responses. The statements are as follows:

1st Statement: Corporate governance, management style, and business guidelines and procedures ensure finding and retain human talent;

2nd Statement: Top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders.



μ	5.9	5.3	5.7



μ	4.5	4.7	4.6

T-Shape	**Bahrain**	**Sudan**
μ	**5.7**	**4.6**

Figure 14: People Knowledge Management Infrastructure

As figure 14 shows, there is a high proportion of Bahrain respondents in agreement (5.7) for the two aspects and for Sudan they somewhat agree, which implies that Bahrain Islamic banks better than Sudan where they hire only skillful T-shaped employees who are not only expert in their field, but can apply that knowledge of expertise in other areas of the organization and give opinions in other tasks, as well as the ability to communicate with other departments.

Technical Knowledge Management Infrastructure Capability

- **Information Technology**

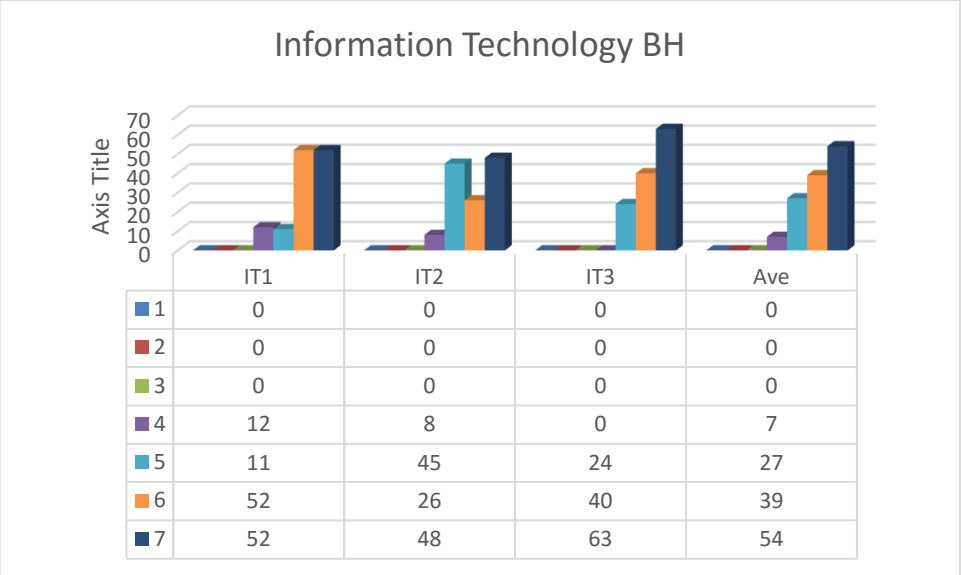
The information technology variable was measured using three aspects, the statements are as follows:

1st Statement: My organization providing technology that allows employees to search and retrieve stored knowledge;

2nd Statement: My organization has knowledge in the form that is readily accessible to employees who need it (e.g. intranet, internet, libraries, resource center, and other forum;

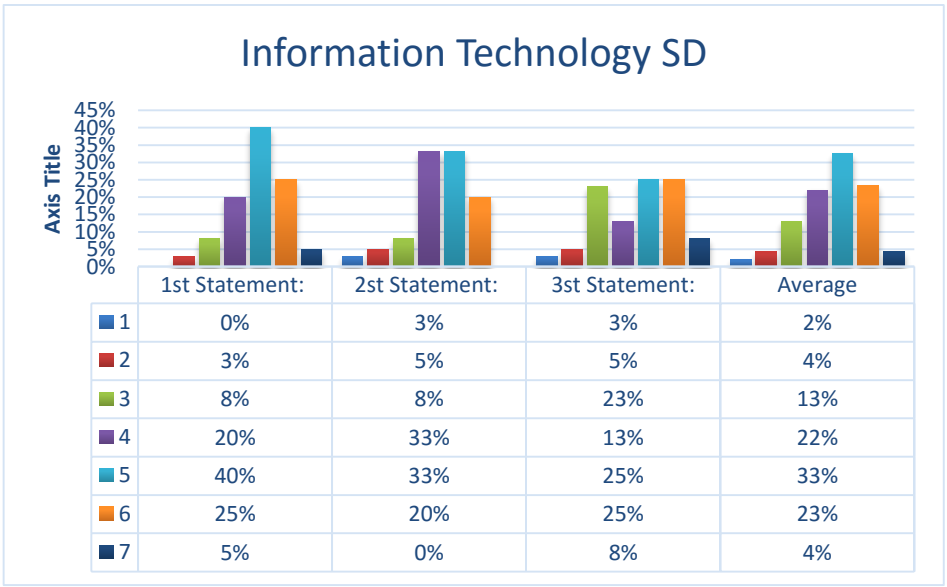
3rd Statement: My organization utilizing databases, repositories and information technology applications to store knowledge for easy access by all employees.

These aspects are represented in the following figure along with the respondents' results in percentages, and also show the average of all responses.



	IT1	IT2	IT3	Ave
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	12	8	0	7
5	11	45	24	27
6	52	26	40	39
7	52	48	63	54

μ	6.1	5.9	6.3	6.2



	1st Statement:	2st Statement:	3st Statement:	Average
1	0%	3%	3%	2%
2	3%	5%	5%	4%
3	8%	8%	23%	13%
4	20%	33%	13%	22%
5	40%	33%	25%	33%
6	25%	20%	25%	23%
7	5%	0%	8%	4%

μ	4.9	4.5	4.6

IT	**Bahrain**	**Sudan**
μ	**6.2**	**4.6**

Figure 15: information Technology

As shown in the figure 15, due to the quantitative measurement of (a mean 6.2) for Bahrain respondents and (a mean 4.6) for Sudan respondents for all aspects it may imply that Bahrain Islamic banks have well-established technical infrastructure, and uses the information technologies that enable them to collaborate internally and externally, as well as enabling employees in different locations gain new knowledge and whether from single or multiple sources or point of time.

Knowledge acquisition and creation

The acquisition **and creation** variable was measured using six aspects. The statements are as follows:

1st Statement: My organization absorb knowledge from business partners into the bank;

2nd Statement: My organization encourage, support and award employees to present new ideas without fear;

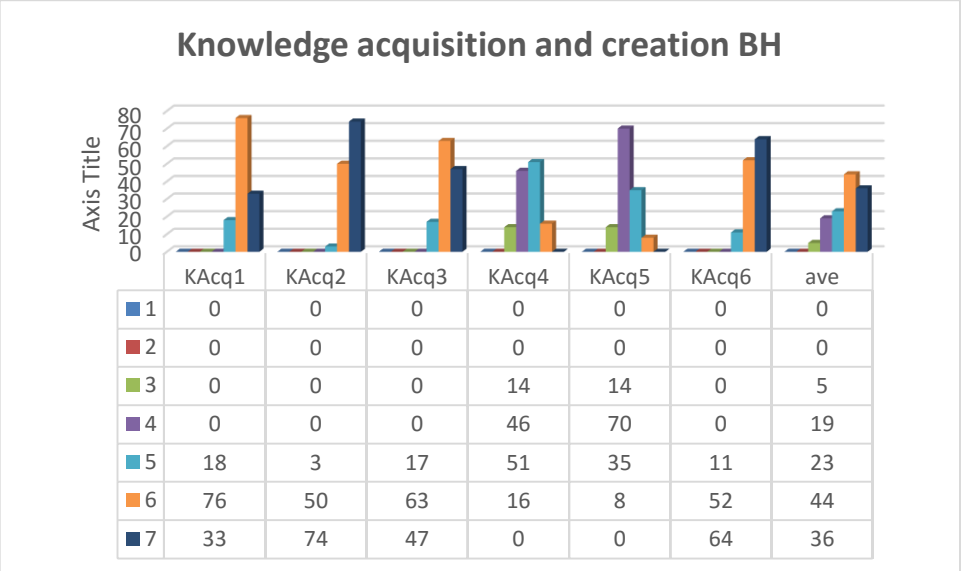
3rd Statement: My organization Shari'ah board plays an integral role of educating the employees and exchange of ideas;

4th Statement: My organization having a mechanism for acquiring knowledge from different sources such as employees, customers, business partners, and competitors;

5th Statement: My organization having a mechanism for creating new knowledge from existing knowledge;

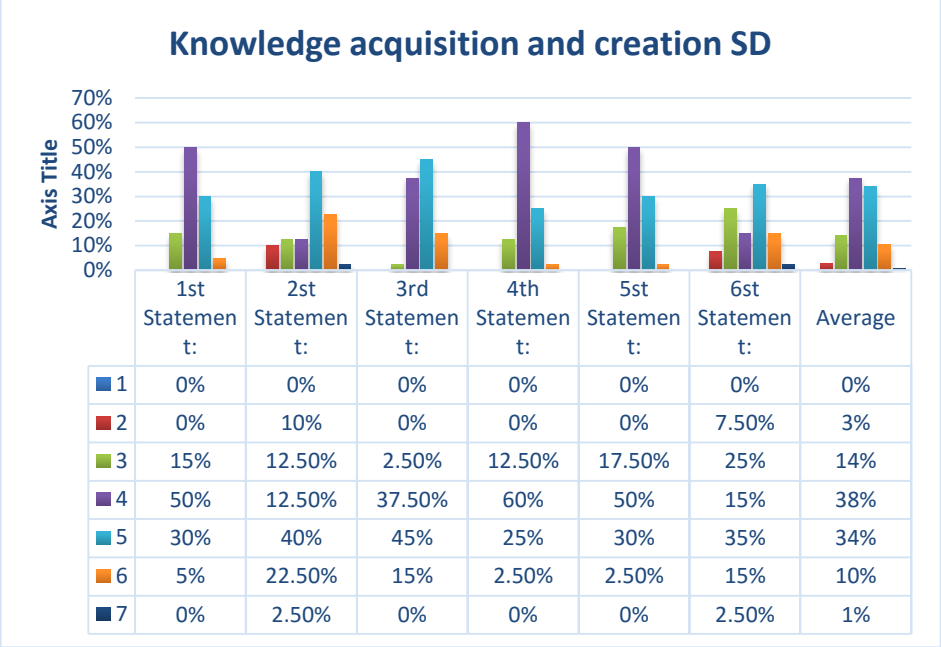
6th Statement: My organization acquiring knowledge through training /continuing education of employees at Islamic financing colleges and universities;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses



	KAcq1	KAcq2	KAcq3	KAcq4	KAcq5	KAcq6	ave
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	14	14	0	5
4	0	0	0	46	70	0	19
5	18	3	17	51	35	11	23
6	76	50	63	16	8	52	44
7	33	74	47	0	0	64	36

μ	6.1	6.6	6.2	4.5	4.3	6.4	5.7



	1st Statement:	2st Statement:	3rd Statement:	4th Statement:	5st Statement:	6st Statement:	Average
1	0%	0%	0%	0%	0%	0%	0%
2	0%	10%	0%	0%	0%	7.50%	3%
3	15%	12.50%	2.50%	12.50%	17.50%	25%	14%
4	50%	12.50%	37.50%	60%	50%	15%	38%
5	30%	40%	45%	25%	30%	35%	34%
6	5%	22.50%	15%	2.50%	2.50%	15%	10%
7	0%	2.50%	0%	0%	0%	2.50%	1%

μ	4.3	4.6	4.7	4.1	4.1	4.3	4.4

Kacq	**Bahrain**	**Sudan**
μ	**5.7**	**4.4**

Figure 16: Knowledge Acquisition and creation Process

As seen in the above figure, Bahrain respondents lead Sudan respondents where they agree that their banks improved use of existing knowledge and effectively produce new knowledge through active conversation that is externalized and distributed as new knowledge where they absorb knowledge from business partners into the bank that encourages, supports and awards employees to present new ideas and that Shari'ah board plays an integral role of educating the employees and exchange of ideas

Which indicate that Bahrain Islamic banks have to some extent established acquisition processes, since the respondents mostly agree (5.7) with the six aspects while for Sudan it is somewhat less with average of 4.4. This implies that Bahrain Islamic banks have a better process that enable its employees to create, share, and disseminate knowledge throughout the bank than Sudan Islamic banks.

- **Knowledge capture and storage**

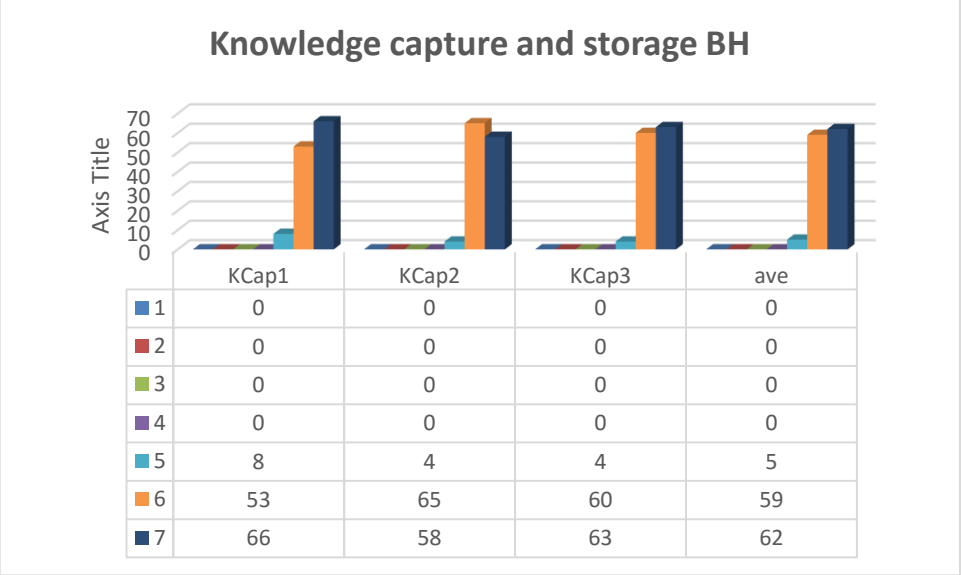
The capture and storage variable was measured using three aspects. The statements are as follows:

1st Statement: My organization utilizing various written devices such as newsletter, manuals to store the knowledge they captured from employees;

2nd Statement: My organization responding to employees ideas and documents them for further development;

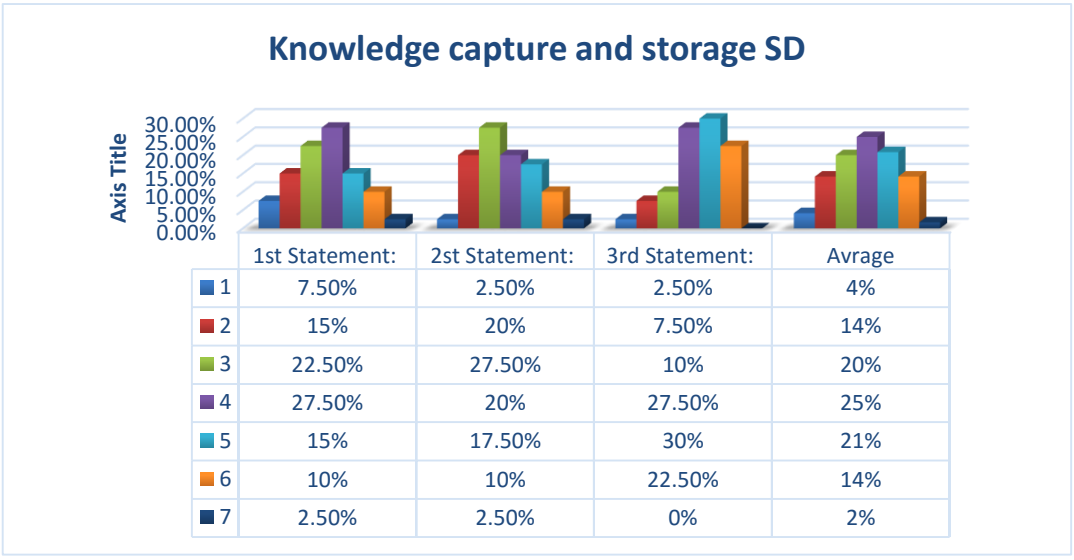
3rd Statement: My organization having mechanisms for converting knowledge into action plans and the design of new products and services;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses;



	KCap1	KCap2	KCap3	ave
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	8	4	4	5
6	53	65	60	59
7	66	58	63	62

μ	6.3	6.2	6.3	6.2



	1st Statement:	2st Statement:	3rd Statement:	Avrage
1	7.50%	2.50%	2.50%	4%
2	15%	20%	7.50%	14%
3	22.50%	27.50%	10%	20%
4	27.50%	20%	27.50%	25%
5	15%	17.50%	30%	21%
6	10%	10%	22.50%	14%
7	2.50%	2.50%	0%	2%

μ	3.7	3.7	4.4	3.9

Kc&s	**Bahrain**	**Sudan**
μ	**6.2**	**3.9**

Figure 17: Knowledge capture and storage

As the above figure shows the largest proportion of Bahrain respondents agree (6.2) on all aspects while the majority of Sudan has doubt on the process of the knowledge capture and storage within their banks (3.9). So it is concluded from the results above that half or more of the respondents agree that their Banks have to some extent knowledge management capture and storage processes. This may imply that Bahrain Islamic banks have processes that provide the ability to its employees to identifying new knowledge as relevant, transfer and absorb it from individuals into the bank and vice-versa, as well as organizing and updating data. Then, they store that unit of knowledge in reasonable forms so that others in the bank can access it.

- **Knowledge dissemination, sharing and transfer**

The variable was measured using four aspects. The statements were as follows:

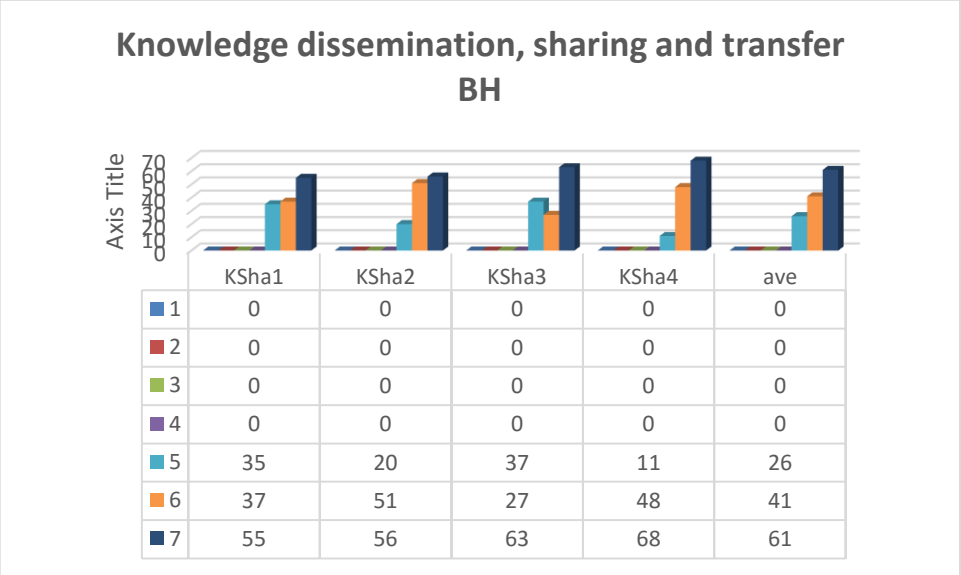
1st Statement: In my organization fairness practices are adopted;

2nd Statement: My organization has mechanisms in place to transfer knowledge from employees, customers and business into the bank and from the bank to individuals;

3rd Statement: My organization has a standardized reward system for sharing or transferring knowledge;

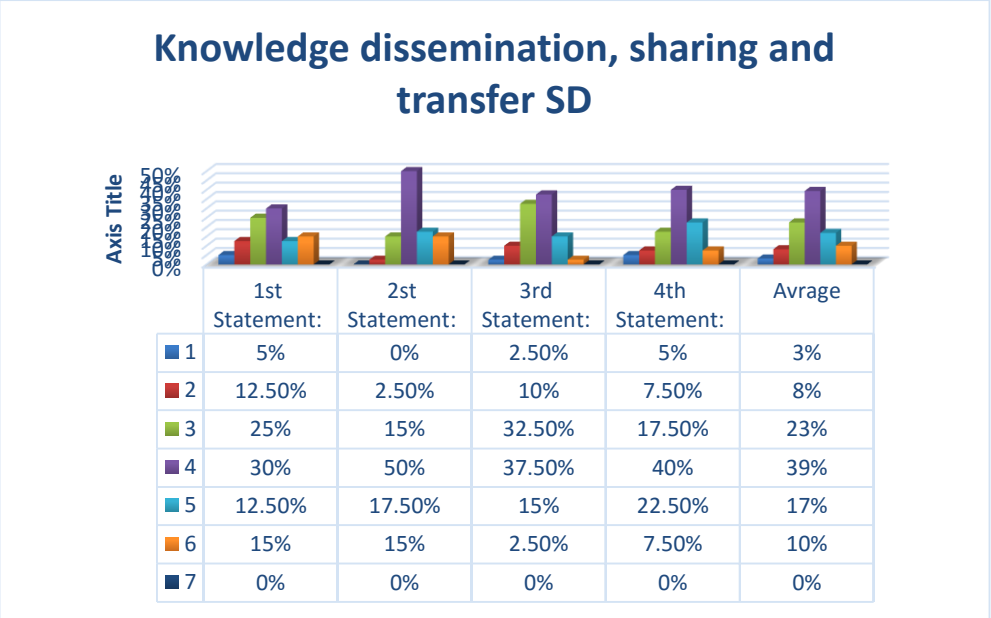
4th Statement: My organization has regular mentoring programs, lectures, seminars, conferences, and training session to share knowledge;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	KSha1	KSha2	KSha3	KSha4	ave
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	35	20	37	11	26
6	37	51	27	48	41
7	55	56	63	68	61

μ	6.2	6.3	6.2	6.4	6.2



	1st Statement:	2st Statement:	3rd Statement:	4th Statement:	Avrage
1	5%	0%	2.50%	5%	3%
2	12.50%	2.50%	10%	7.50%	8%
3	25%	15%	32.50%	17.50%	23%
4	30%	50%	37.50%	40%	39%
5	12.50%	17.50%	15%	22.50%	17%
6	15%	15%	2.50%	7.50%	10%
7	0%	0%	0%	0%	0%

μ	3.8	4.3	3.6	3.9	3.9

Kdst	**Bahrain**	**Sudan**
μ	**6.2**	**3.9**

Figure 18: Knowledge dissemination, sharing and transfer

As the above figure shows the largest proportion of respondents agree (6.2) on all the aspects while for Sudan the respondents do not really agree with the first aspect that in their bank fairness practices are adopted, the second aspect that their bank has mechanisms in place to transfer knowledge from employees, customers and business into the bank and from the bank to individuals, third aspect, ratio that their bank has a standardized reward system for sharing or transferring knowledge, accounting for and the last aspect that their bank regular adopt

mentoring programs, lectures, seminars, conferences, and training session to share knowledge.

From the results above, it can be said that Bahrain Islamic banks have good knowledge dissemination, sharing and transfer, since the majority of respondents agree with all aspects, not like in Sudan that where there is a real doubt. Therefore, Bahrain Islamic banks have a good degree of dissemination, sharing and transfer knowledge that enable it to create good awareness.

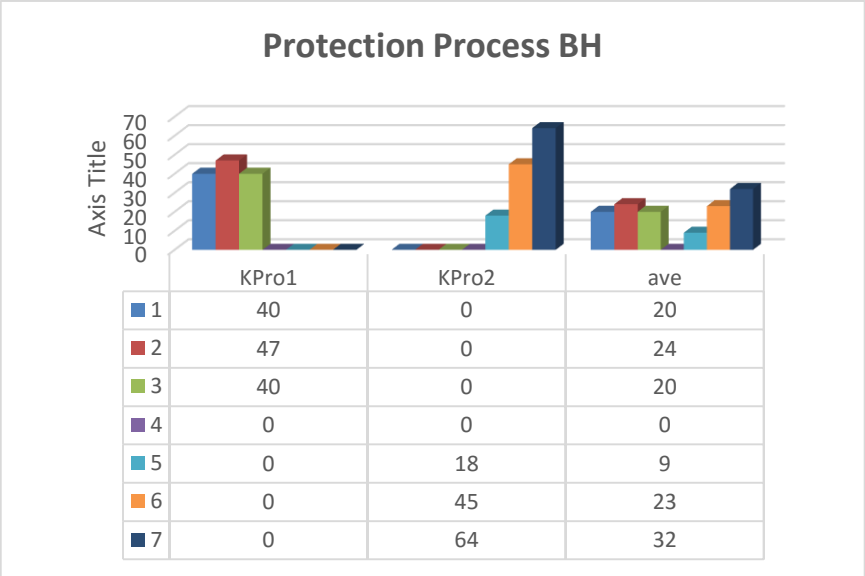
- **Knowledge Protection Process**

The protection variable was measured using two aspects. The statements are as follows:

1st Statement: My organization has mechanisms to patent and copyright new knowledge;

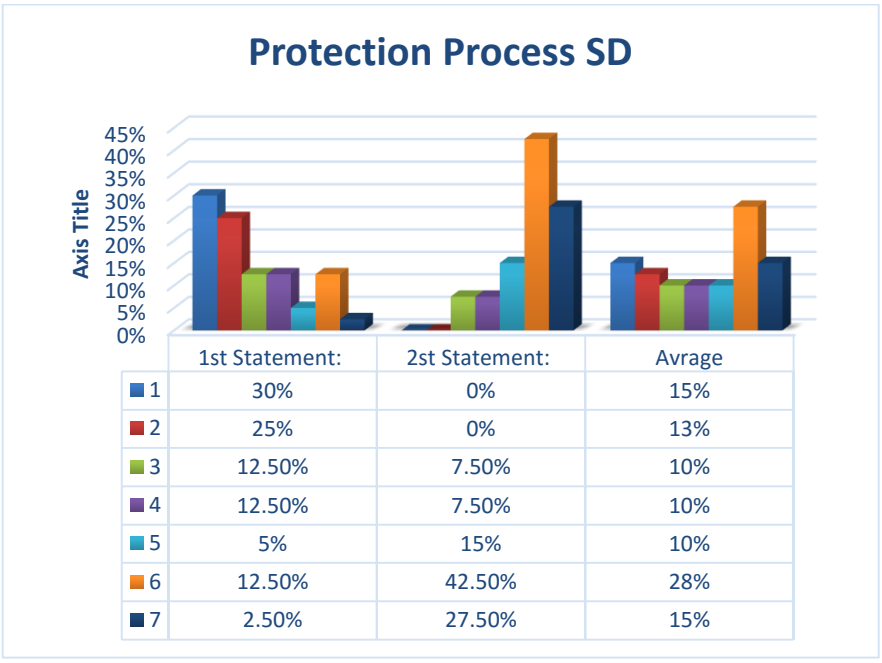
2nd Statement: My organization has mechanisms to protect knowledge from inappropriate or illegal use inside and outside of the organization.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	KPro1	KPro2	ave
1	40	0	20
2	47	0	24
3	40	0	20
4	0	0	0
5	0	18	9
6	0	45	23
7	0	64	32

μ	2	6.4	4.3



	1st Statement:	2st Statement:	Avrage
1	30%	0%	15%
2	25%	0%	13%
3	12.50%	7.50%	10%
4	12.50%	7.50%	10%
5	5%	15%	10%
6	12.50%	42.50%	28%
7	2.50%	27.50%	15%

μ	2.9	5.8	4.3

Kpp	**Bahrain**	**Sudan**
μ	**4.3**	**4.3**

Figure 19: Knowledge Protection Process

As the above figure shows the largest proportion of Bahrain respondents strongly disagree agree that their banks have mechanisms to patent and copyright new knowledge while it was a little better for Sudan where the respondents somewhat disagree. For the second aspect, both Bahrain and Sudan respondents agree that their bank has mechanisms to protect knowledge from inappropriate or illegal use inside and outside of the bank.

From the results above, it can be said that both Bahrain and Sudan Islamic banks lack mechanisms to patent and copyright knowledge protection capability.

- **Knowledge Application Process**

The application **Process** variable was measured using three aspects. The statements are as follows:

1st Statement: My organization has processes filtering knowledge;

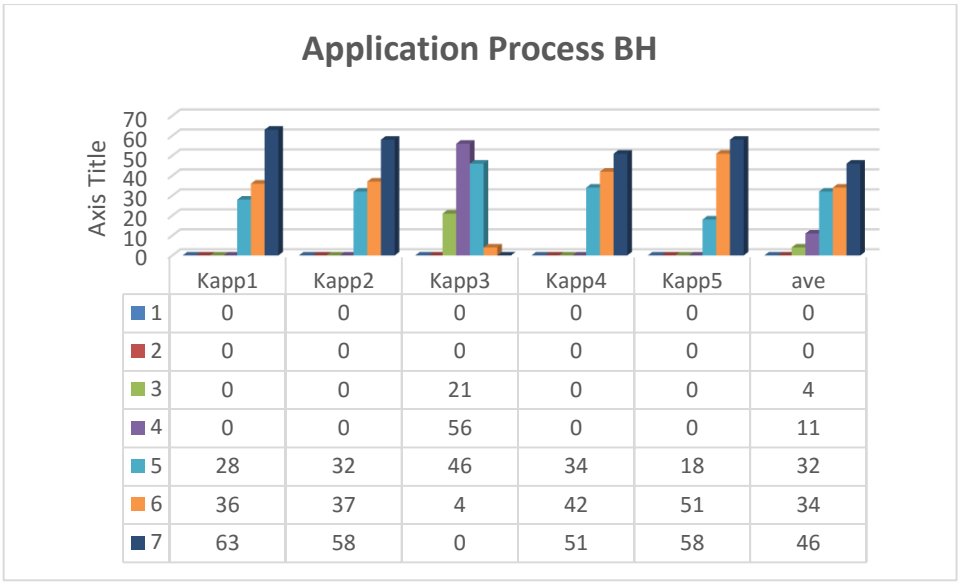
2nd Statement: My organization has processes for applying experiential knowledge;

3rd Statement: My organization has processes for applying knowledge to critical competitive needs and quickly links sources of knowledge to solve new problems;

4th Statement: My organization has methods to analyze and critically evaluate knowledge to generate new patterns and knowledge for future use;

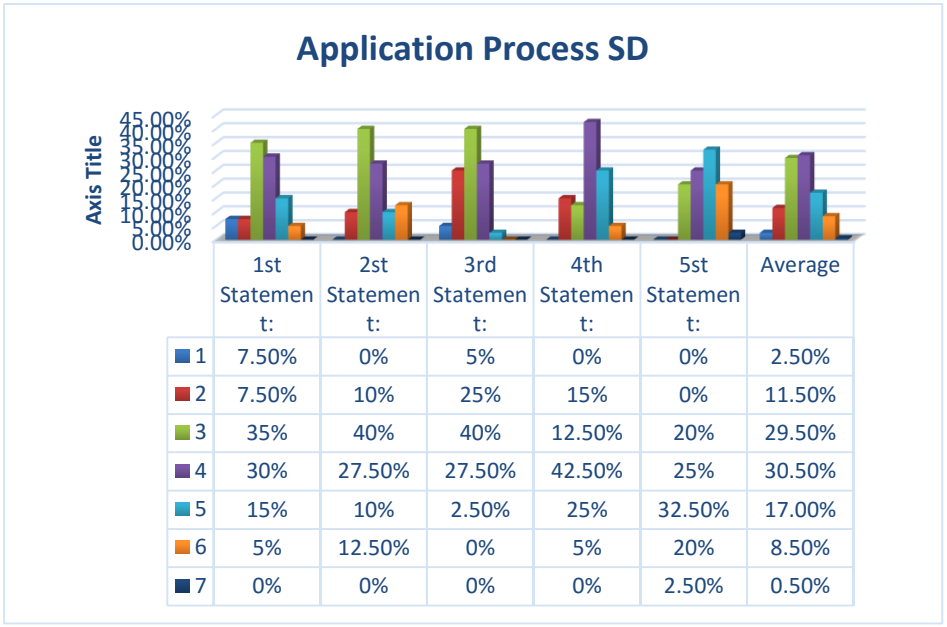
5th Statement: My organization applying knowledge learned from mistakes.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	Kapp1	Kapp2	Kapp3	Kapp4	Kapp5	ave
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	21	0	0	4
4	0	0	56	0	0	11
5	28	32	46	34	18	32
6	36	37	4	42	51	34
7	63	58	0	51	58	46

μ	6.3	6.2	4.3	6.1	6.3	5.9



	1st Statement:	2st Statement:	3rd Statement:	4th Statement:	5st Statement:	Average
1	7.50%	0%	5%	0%	0%	2.50%
2	7.50%	10%	25%	15%	0%	11.50%
3	35%	40%	40%	12.50%	20%	29.50%
4	30%	27.50%	27.50%	42.50%	25%	30.50%
5	15%	10%	2.50%	25%	32.50%	17.00%
6	5%	12.50%	0%	5%	20%	8.50%
7	0%	0%	0%	0%	2.50%	0.50%

μ	3.5	3.8	3	3.9	3.8

Kapp	**Bahrain**	**Sudan**
μ	**5.9**	**3.8**

Figure 20: Knowledge Application Process

As seen in the above figure, a surprising ratio of Bahrain respondents strongly agree with three aspects that their bank has processes filtering knowledge, has processes for applying experiential knowledge and learns from mistakes. And the respondents also agree that their banks have methods to analyze and critically evaluate knowledge to generate new patterns and knowledge for future use. on the other hand, an outstanding result for the third aspect, in which (45%) of the surveyed employees were neutral that their bank has processes for applying knowledge to critical competitive needs and quickly links sources of knowledge to solve new problems. From Sudan respondents a clear doubt on all aspects were seen on their responses.

It is clear from the results above that Bahrain Islamic banks have an outstanding knowledge management application processes capability, since the majority answers for the five aspects are more or almost (80%), and this implies that Bahrain Islamic banks have the processes that enable it to use knowledge in developing new products/services, and in solving problems as well as contingency application of knowledge. This is not true for Sudan Islamic banks.

4.2.4 Total Quality Management

TQM is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve and exceed customer expectations.

- **Leadership and top management support**

The **Leadership and top management support** variable was measured using seven aspects. The statements are as follows:

1st Statement: In my organization Top managers adopt a consultative style where sharing knowledge is truly valued;

2nd Statement: In my organization top management collaborate with Shari'ah boards to assign sufficient people to do quality-related activities;

3rd Statement: In my organization top management accept responsibility for quality, show concern for the need for quality, set clear goals for quality improvement, and commit to quality;

4th Statement: In my organization there is collaboration and alliances among the Shari'ah boards of several Islamic banks;

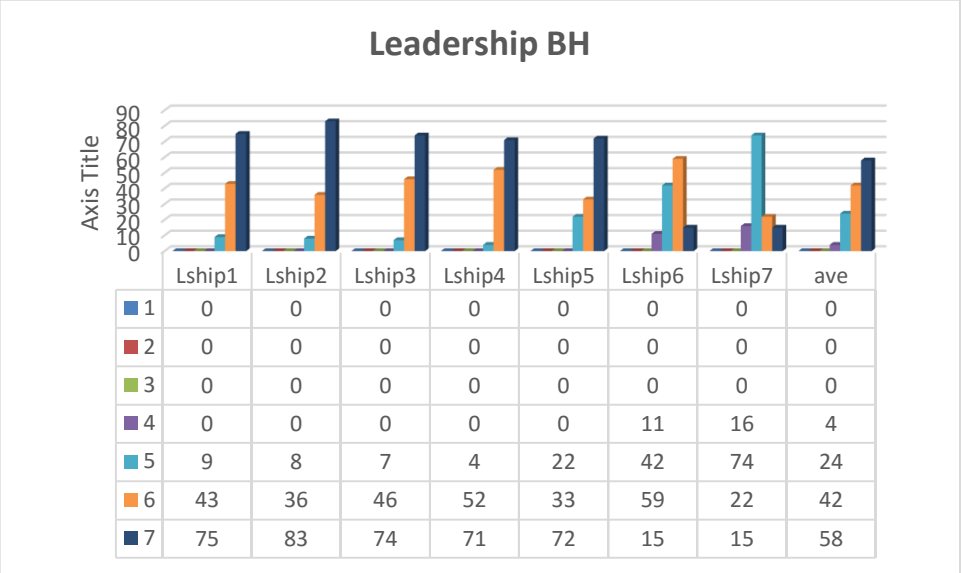
5th Statement: In my organization quality regard as top competitive priority and there is a strong commitment to quality at all

levels;

6th Statement: In my organization top management encourage long-term strategic thinking;

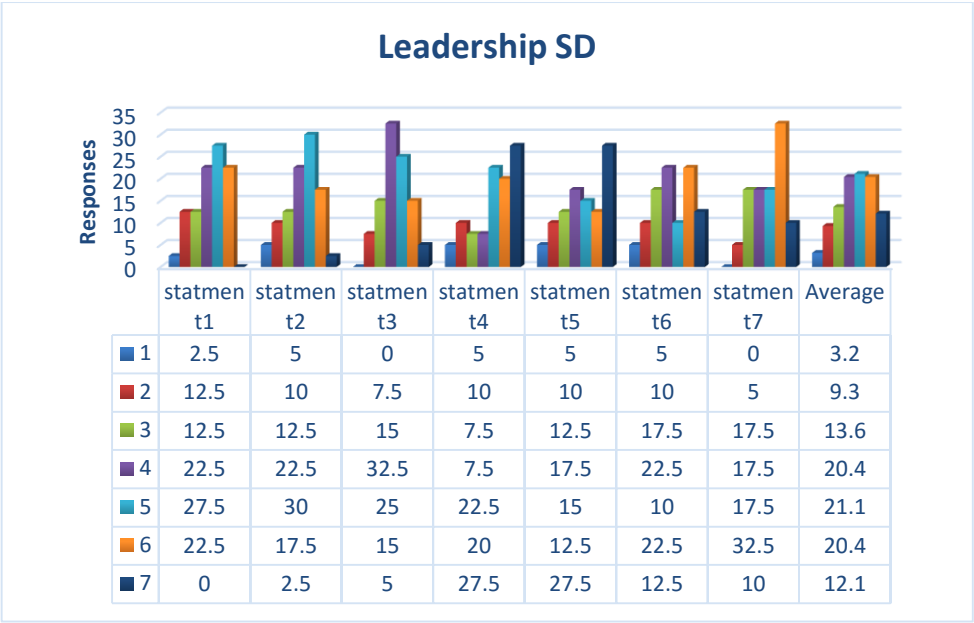
7th Statement: In my organization top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	Lship1	Lship2	Lship3	Lship4	Lship5	Lship6	Lship7	ave
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	11	16	4
5	9	8	7	4	22	42	74	24
6	43	36	46	52	33	59	22	42
7	75	83	74	71	72	15	15	58

μ	6.5	6.6	6.5	6.5	6.4	5.6	5.3	6.2



	statment t1	statment t2	statment t3	statment t4	statment t5	statment t6	statment t7	Average
1	2.5	5	0	5	5	5	0	3.2
2	12.5	10	7.5	10	10	10	5	9.3
3	12.5	12.5	15	7.5	12.5	17.5	17.5	13.6
4	22.5	22.5	32.5	7.5	17.5	22.5	17.5	20.4
5	27.5	30	25	22.5	15	10	17.5	21.1
6	22.5	17.5	15	20	12.5	22.5	32.5	20.4
7	0	2.5	5	27.5	27.5	12.5	10	12.1

μ	4.3	4.3	4.4	5	4.8	4.4	4.9	4.6

Lship	**Bahrain**	**Sudan**
μ	**6.2**	**4.6**

Figure 21: Leadership and top management support

As seen in the above figure, a surprising ratio 100% of Bahrain respondents somewhat agree, agree or strongly agree with all the seven while for Sudan respondents they were more neutral ,the overall average for Bahrain respondents was 6.2 against 4.6 for Sudan for the Leadership and top management support which means that Bahrain Islamic banks have an outstanding managerial support that adopt consultative leadership style and encourage values that guide, direct and inspire employees, this implies that Bahrain Islamic banks have a better managerial involvement and support than Sudan Islamic Banks that enable it to insure total quality.

- **Reward & recognition**

The **Reward & recognition** variable was measured using seven aspects. The statements are as follows:

1st Statement: My organization encourage, support and award employees to present new ideas without fear;

2nd Statement: My organization has a standardized reward system for sharing or transferring knowledge;

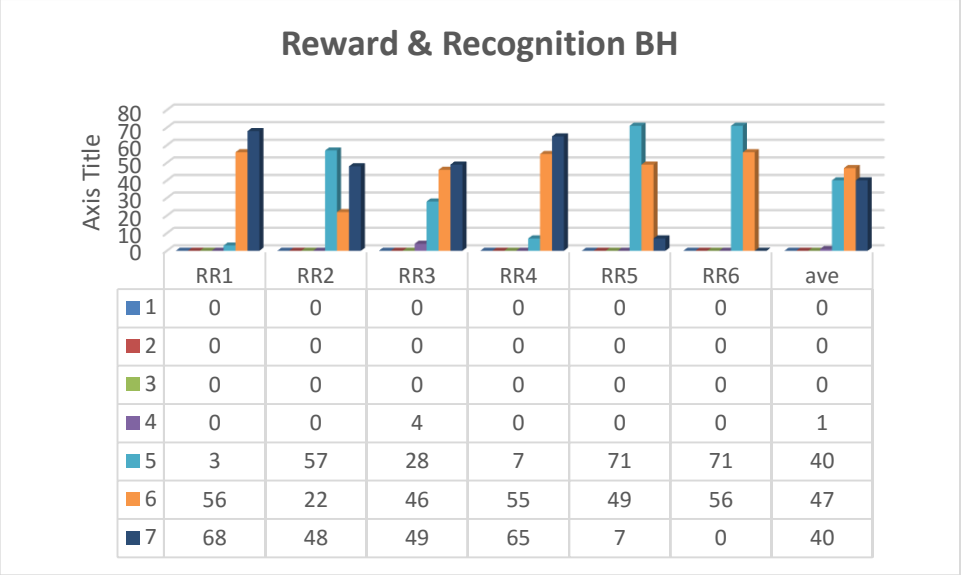
3rd Statement: My organization has a process of recognizing employee for superior quality performance;

4th Statement: My organization has a process of encouraging /rewarding innovators (those who come up with new products or services);

5th Statement: My organization has adequate and competitive packages;

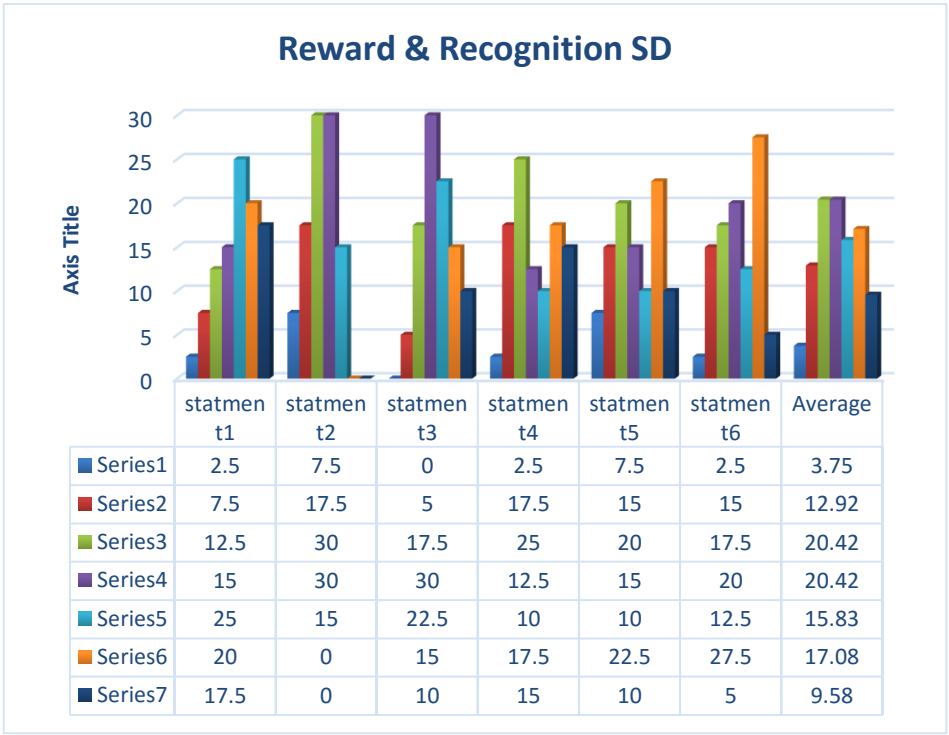
6th Statement: My organization has incentives rewarding system for innovators through bonus schemes of profit sharing;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	RR1	RR2	RR3	RR4	RR5	RR6	ave
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	4	0	0	0	1
5	3	57	28	7	71	71	40
6	56	22	46	55	49	56	47
7	68	48	49	65	7	0	40

μ	6.5	5.9	6.1	6.5	5.5	5.4	5.9



	statment1	statment2	statment3	statment4	statment5	statment6	Average
Series1	2.5	7.5	0	2.5	7.5	2.5	3.75
Series2	7.5	17.5	5	17.5	15	15	12.92
Series3	12.5	30	17.5	25	20	17.5	20.42
Series4	15	30	30	12.5	15	20	20.42
Series5	25	15	22.5	10	10	12.5	15.83
Series6	20	0	15	17.5	22.5	27.5	17.08
Series7	17.5	0	10	15	10	5	9.58

μ	4.8	3.3	4.6	4.2	4.1	4.3	4.2

RR	Bahrain	Sudan
μ	5.9	4.2

➢ **Figure 22: Reward & recognition**

As seen in the figure 22, All Bahrain respondents either somewhat agree, agree or strongly agree in all 6 aspects with an average of agree (5.9) while Sudan respondents vary from strongly disagree to strongly agree for all aspects with an average of neutral (4.2). The result means that Bahrain Islamic banks have an outstanding reward and recognition system for suggestions and achievements for teams as well as individuals, with good packages and incentives which have a positive impact on the employees self-esteem, productivity, quality and the amount of effort exhorted to the task at hand that enable them to insure total quality.

➢ **Education & training**

The **Education & training** variable was measured using five aspects. The statements are as follows:

1st Statement: My organization acquires knowledge through training /continuing education of employees at Islamic financing colleges and universities;

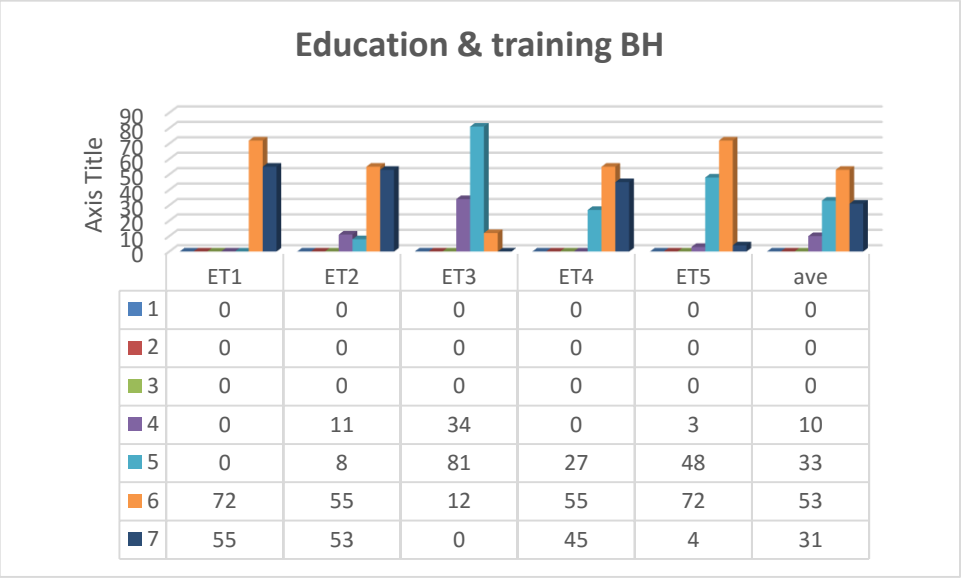
2nd Statement: My organization has regular mentoring programs, lectures, seminars, conferences, and training session to share knowledge;

3rd Statement: My organization increases employee involvement in design and planning;

4th Statement: My organization Sponsors students to enroll into universities to enhance the knowledge of Islamic Banking;

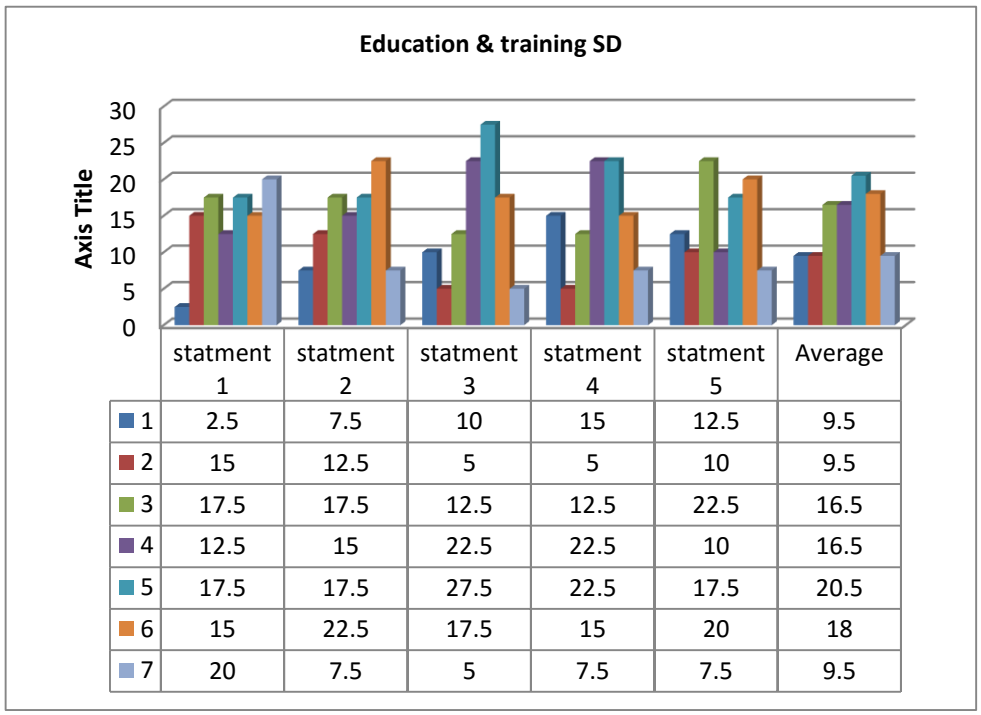
5th Statement: My organization Intensifies levels of training both at the entry ranks and senior ones;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	ET1	ET2	ET3	ET4	ET5	ave
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	11	34	0	3	10
5	0	8	81	27	48	33
6	72	55	12	55	72	53
7	55	53	0	45	4	31

μ	6.4	6.2	4.8	6.1	5.6	5.8



	statment 1	statment 2	statment 3	statment 4	statment 5	Average
1	2.5	7.5	10	15	12.5	9.5
2	15	12.5	5	5	10	9.5
3	17.5	17.5	12.5	12.5	22.5	16.5
4	12.5	15	22.5	22.5	10	16.5
5	17.5	17.5	27.5	22.5	17.5	20.5
6	15	22.5	17.5	15	20	18
7	20	7.5	5	7.5	7.5	9.5

μ	4.5	4.2	4.3	4	4	4.2

ET	**Bahrain**	**Sudan**
μ	**5.8**	**4.2**

➢ **Figure 23: Education & training**

As figure 23 shows that All Bahrain's respondents agreed with all the aspects of education and training with an average of agree (5.8), on the other hand Sudan respondents were varied with an average of a neutral (4.2), which indicate that Bahrain Islamic banks have a good

education and training system for their employees, where the employees **learn about Islamic principles** and **ethics** and **continuing education** at colleges and universities. They have **mentoring** and **rotation programs** that expand the employee's skills and sharing of knowledge.

- **Employee Involvement**

  The **employee** variable was measured using five aspects. The statements are as follows:

1st Statement: My organization has an active employee suggestion system;

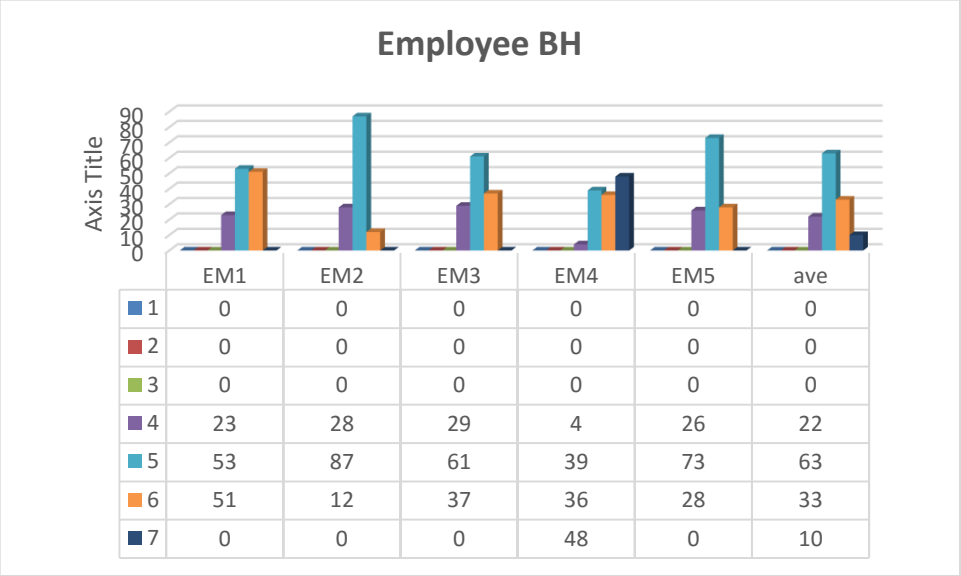
2nd Statement: My organization increases employee autonomy in decision- making;

3rd Statement: My organization increases employee interaction with customers and suppliers;

4th Statement: My organization fully trains employee for the work they perform;

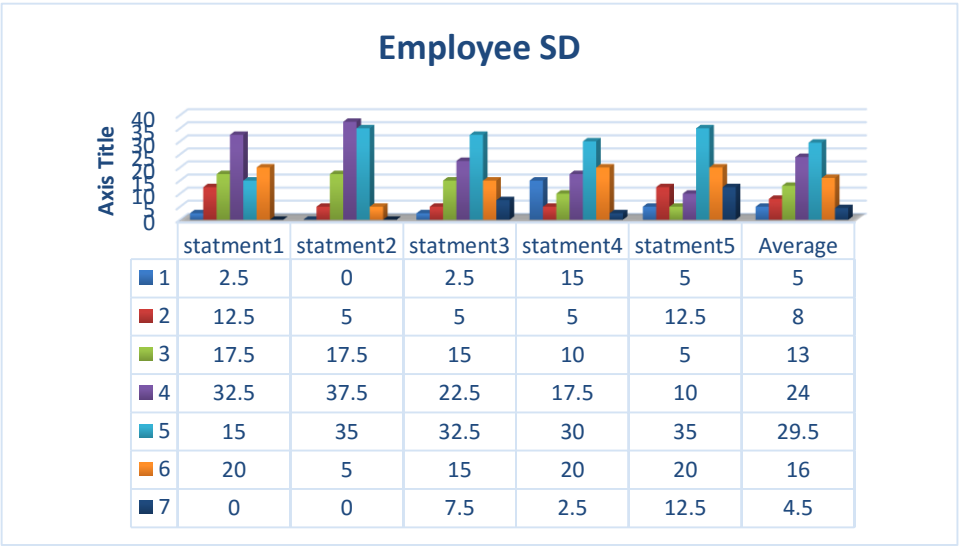
5th Statement: My organization encourages employee to work in team.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	EM1	EM2	EM3	EM4	EM5	ave
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	23	28	29	4	26	22
5	53	87	61	39	73	63
6	51	12	37	36	28	33
7	0	0	0	48	0	10

μ	5.2	4.9	5.1	6	5	5.2



	statment1	statment2	statment3	statment4	statment5	Average
1	2.5	0	2.5	15	5	5
2	12.5	5	5	5	12.5	8
3	17.5	17.5	15	10	5	13
4	32.5	37.5	22.5	17.5	10	24
5	15	35	32.5	30	35	29.5
6	20	5	15	20	20	16
7	0	0	7.5	2.5	12.5	4.5

μ	4	4.1	4.5	4.1	4.7	4.3

Em	**Bahrain**	**Sudan**
μ	**5.2**	**4.3**

➢ **Figure 24: Employee involvement**

As seen in figure 24 the largest proportion of Bahrain respondents somewhat agreed (5.2) with the aspects of employees involvement on the other hand while for Sudan it was also neutral feedback with an average of (4.3), so it can be said that Bahrain Islamic banks have a somewhat **proper environment** of **empowerment** and a good **employee involvement system through qualified facilitators** that work in **cross-functional teams** to involve all the employees to participate and enhance work processes toward common goals in order to improve the service and insure total quality.

- **Continuous improvement**

  The **continuous improvement** variable was measured using seven aspects. The statements are as follows:

1st Statement: In my organization continuous quality improvement is an important goal;

2nd Statement: In my organization employees are encouraged to improve the quality of their product;

3rd Statement: In my organization employees believe that quality improvement is their responsibility;

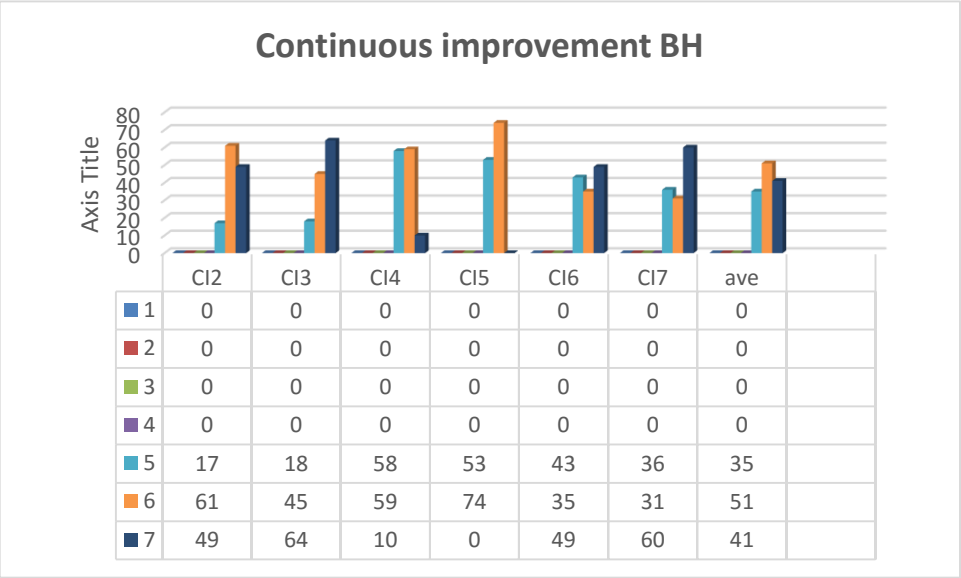
4th Statement: In my organization employees analyze their work products to look for ways of doing a better job;

5th Statement: My organization provides feedback to employees on their quality;

6th Statement: In my organization managers have active roles as facilitators of continuous improvement, coaches of new methods, mentors, and leaders of empowered employees;

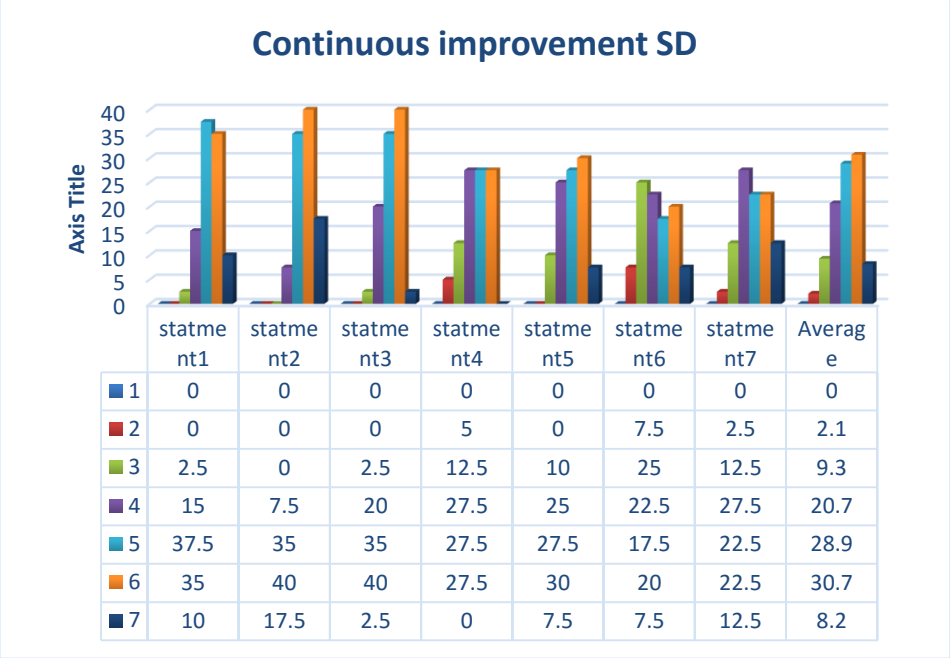
7th Statement: In my organization managers and employee periodically reviews quality issues in meetings.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	CI2	CI3	CI4	CI5	CI6	CI7	ave
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	17	18	58	53	43	36	35
6	61	45	59	74	35	31	51
7	49	64	10	0	49	60	41

μ	6.3	6.3	6.4	5.6	5.6	6	6.2	5.9



	statment1	statment2	statment3	statment4	statment5	statment6	statment7	Average
1	0	0	0	0	0	0	0	0
2	0	0	0	5	0	7.5	2.5	2.1
3	2.5	0	2.5	12.5	10	25	12.5	9.3
4	15	7.5	20	27.5	25	22.5	27.5	20.7
5	37.5	35	35	27.5	27.5	17.5	22.5	28.9
6	35	40	40	27.5	30	20	22.5	30.7
7	10	17.5	2.5	0	7.5	7.5	12.5	8.2

μ	5.4	5.7	5.2	4.6	5	4.4	4.9	5

CI	**Bahrain**	**Sudan**
μ	**5.9**	**5**

➢ **Figure 25: Continuous improvement**

As seen in the figure 25, a very high ratio of Bahrain respondents strongly agree with the continuous improvement aspect with an overall average of (5.9) against Sudan Islamic banks that the respondents somewhat agreed with it with an average of (5).

This implies that Bahrain Islamic banks have outstanding **analytical and creative** methods in finding ways to become more effective at meeting stakeholder expectations and finding ways to become more competitive and more effective the processes that enable it to use

knowledge in developing new products/services, and in solving problems as well as contingency application of knowledge.

As a comparison Bahrain Islamic banks have a leading status in continues improvement application processes.

- **Customer focus**

  The **customer focus** variable was measured using seven aspects. The statements are as follows:

1st Statement: In my organization employees in work unit know who their customers are;

2nd Statement: In my organization employees think of their customers when doing their work;

3rd Statement: In my organization employees often measure their external customers' needs (customers outside the organization);

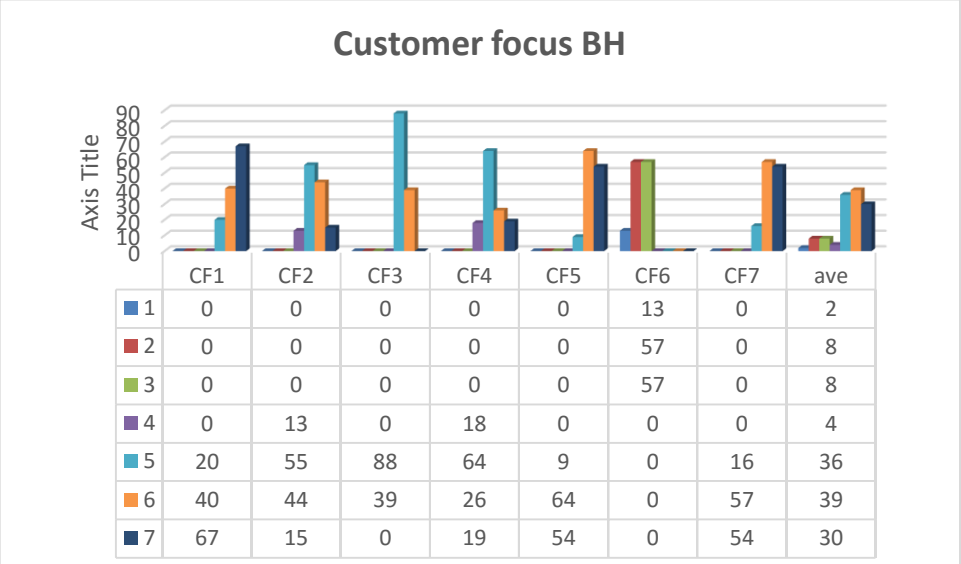
4th Statement: In my organization employees often measure their internal customers' needs (customers inside the organization);

5th Statement: In my organization customers are encouraged to provide feedback;

6th Statement: In my organization customers help design new processes, products, or services;

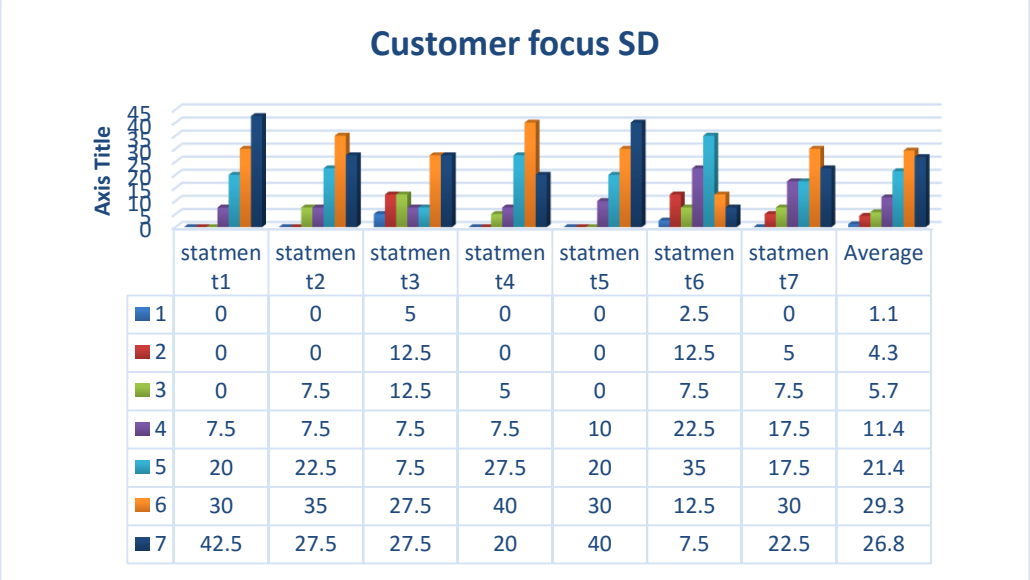
7th Statement: In my organization processes or activities increase customer satisfaction;

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	CF1	CF2	CF3	CF4	CF5	CF6	CF7	ave
1	0	0	0	0	0	13	0	2
2	0	0	0	0	0	57	0	8
3	0	0	0	0	0	57	0	8
4	0	13	0	18	0	0	0	4
5	20	55	88	64	9	0	16	36
6	40	44	39	26	64	0	57	39
7	67	15	0	19	54	0	54	30

μ	6.4	5.5	5.3	5.4	6.4	2.3	6.3	5.3



	statment1	statment2	statment3	statment4	statment5	statment6	statment7	Average
1	0	0	5	0	0	2.5	0	1.1
2	0	0	12.5	0	0	12.5	5	4.3
3	0	7.5	12.5	5	0	7.5	7.5	5.7
4	7.5	7.5	7.5	7.5	10	22.5	17.5	11.4
5	20	22.5	7.5	27.5	20	35	17.5	21.4
6	30	35	27.5	40	30	12.5	30	29.3
7	42.5	27.5	27.5	20	40	7.5	22.5	26.8

μ	6.1	5.7	4.9	5.6	6	4.4	5.3	5.43

CF	**Bahrain**	**Sudan**
μ	**5.3**	**5.4**

➢ **Figure 26: Customer focus**

As seen in the above figure, a surprising ratio of Bahrain respondents strongly agree that the employees in work unit know who their customers are, customers been encouraged to provide feedback and that the overall processes/activities increase customer satisfaction, and they agree that in their Banks employees think of their customers when doing their work and they often measure their external and internal customers' needs, the only concept that they disagree with was the customers help design new processes, products, or services. The overall average for Bahrain and Sudan Islamic banks indicate that Bahrain and Sudan

Islamic banks both have a somewhat good customer focus application which insures a total quality performance.

- **Process focus /Database decisions**

The **Process focus /Database decisions** variable was measured using seven aspects. The statements are as follows:

1st Statement: In my organization employees use statistical charts to check on the quality of their work or services;

2nd Statement: In my organization employees collect data on the quality of their work or services;

3rd Statement: In my organization employees keep data to trace work improvements;

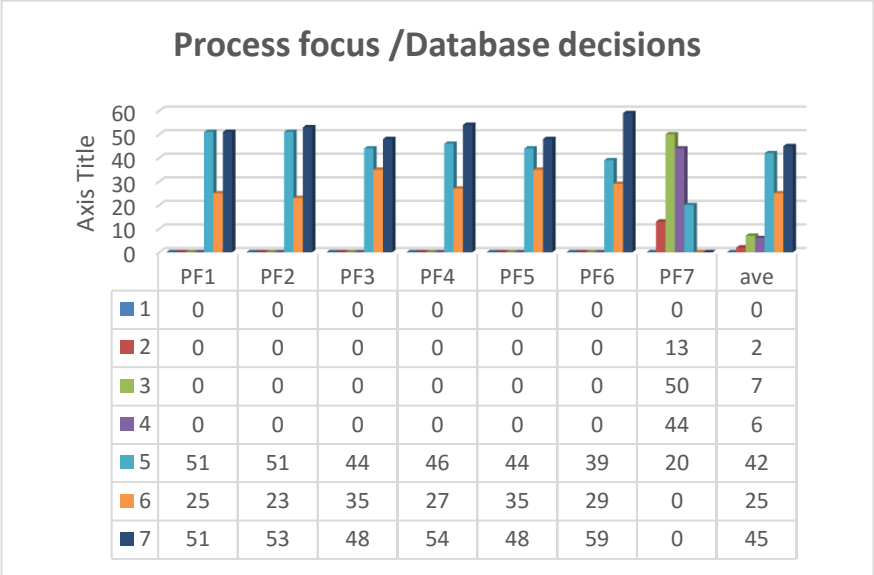
4th Statement: In my organization employees collect data on the amount of time it takes to get the job done;

5th Statement: In my organization employees keep records or charts measuring the quality of their work displayed at their work station;

6th Statement: In my organization quality data (cost of quality, defects, errors, scraps, etc.) are used as tools to manage quality;

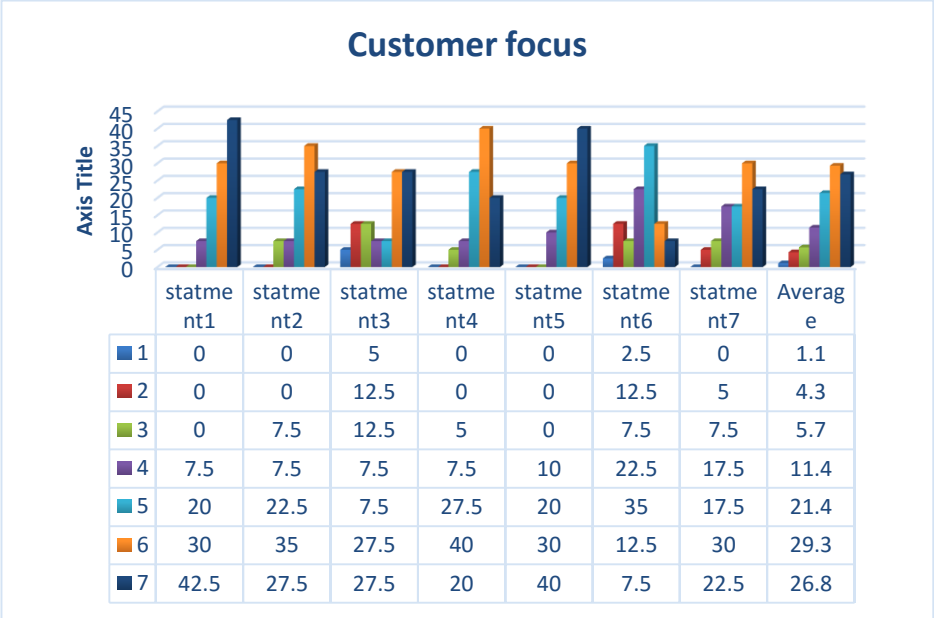
7th Statement: In my organization quality data are available to manager, supervisors, and employees.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	PF1	PF2	PF3	PF4	PF5	PF6	PF7	ave
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	13	2
3	0	0	0	0	0	0	50	7
4	0	0	0	0	0	0	44	6
5	51	51	44	46	44	39	20	42
6	25	23	35	27	35	29	0	25
7	51	53	48	54	48	59	0	45

μ	6	6	6	6.1	6	6.2	3.6	**5.7**



	statment1	statment2	statment3	statment4	statment5	statment6	statment7	Average
1	0	0	5	0	0	2.5	0	1.1
2	0	0	12.5	0	0	12.5	5	4.3
3	0	7.5	12.5	5	0	7.5	7.5	5.7
4	7.5	7.5	7.5	7.5	10	22.5	17.5	11.4
5	20	22.5	7.5	27.5	20	35	17.5	21.4
6	30	35	27.5	40	30	12.5	30	29.3
7	42.5	27.5	27.5	20	40	7.5	22.5	26.8

µ	3.5	3.6	3.8	3.9	3.8	3.8	4.4	3.8

PF	**Bahrain**	**Sudan**
µ	**5.7**	**3.8**

➢ **Figure 27: Process focus /Database decisions**

As seen in the above figure, an outstanding ratios of Bahrain respondents strongly agree that in their bank the employees use statistical charts to check on the quality of their work, collect data on the quality of their work, keep data to trace work improvements, collect data on the amount of time it take to get the job done, keep records or charts measuring the quality of their work displayed at their work station and that their bank quality data (cost of quality, defects, errors, scraps, etc.) are used as tools to manage quality But there was a higher range of different responses on the last aspect in which the respondents somewhat disagree (3.6) that the quality data are available to manager, supervisors, and employees while this statement has a link and harmony with the previous statement that the respondents strongly agree to it I may assume that the respondent didn't understand the statement .

On the other hand, Sudan respondents were having a doubt on all the statement giving an overall count of (3.8).

Referring to the overall average of Bahrain (5.7) agreement result, it indicates that Bahrain Islamic banks **improve decision making accuracy**, **achieve consensus**, and **allow prediction** based on past

history through **continually collecting and analyzing data** to know how well the Bank is performing to insure a total quality performance. However for Sudan's Islamic Banks, it is still needs to be improved.

4.2.5 Innovation Performance

Innovation is a complete process that starts with the identification of opportunities or problems, followed by the discovery and development of solutions, taking the shape of products, process or services improvement (or capabilities) which are then implemented or applied to the market. The Innovation performance in a firm is hypothesized to be a multi-dimensional construct composed of product innovation and process innovation

- **Product innovation**

  The **Product innovation** variable was measured using five aspects. The statements are as follows:

1st Statement: My organization increases the level of newness of new products that relevant to Islamic financial institutions;

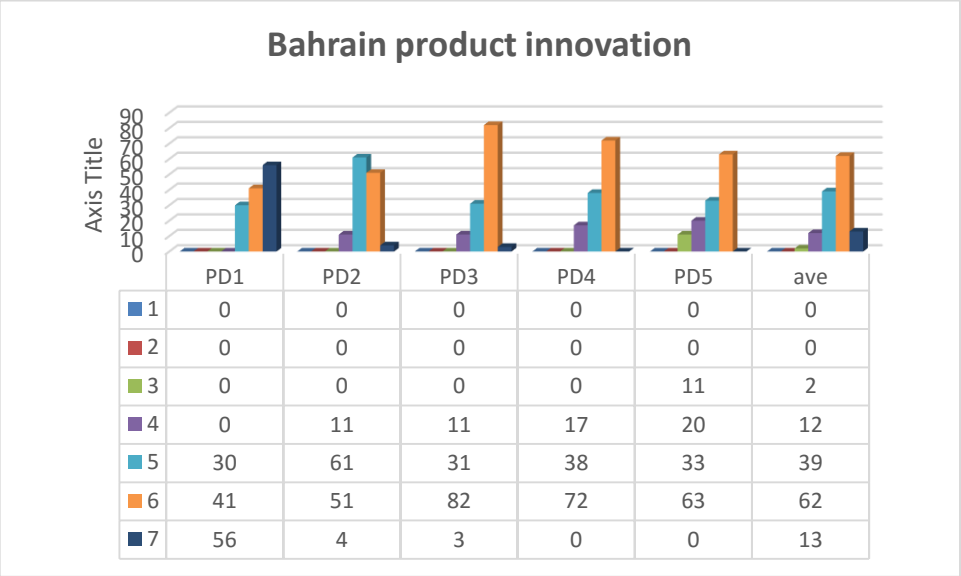
2nd Statement: My organization uses the latest technological innovations in new product development;

3rd Statement: My organization enhances the speed of new product development;

4th Statement: My organization increases the rate and the number of new products introduced to the market;

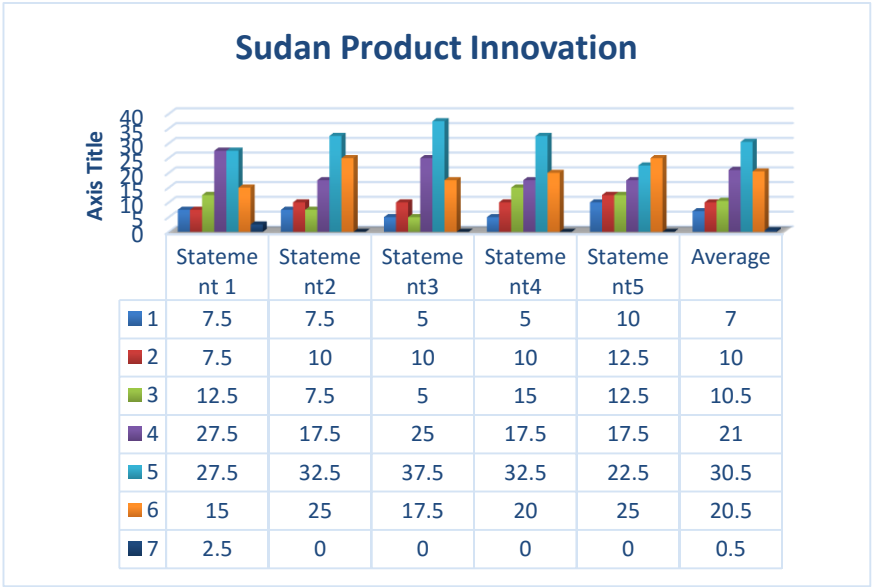
5th Statement: My organization boosting up the number of new products that is first-to-market (early market entrants).

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	PD1	PD2	PD3	PD4	PD5	ave
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	11	2
4	0	11	11	17	20	12
5	30	61	31	38	33	39
6	41	51	82	72	63	62
7	56	4	3	0	0	13

μ	6.2	5.4	5.6	5.4	5.2	**5.6**



	Statement 1	Statement2	Statement3	Statement4	Statement5	Average
1	7.5	7.5	5	5	10	7
2	7.5	10	10	10	12.5	10
3	12.5	7.5	5	15	12.5	10.5
4	27.5	17.5	25	17.5	17.5	21
5	27.5	32.5	37.5	32.5	22.5	30.5
6	15	25	17.5	20	25	20.5
7	2.5	0	0	0	0	0.5

μ	4.2	4.3	4.3	4.2	4.1	**4.2**

Product INNO	**Bahrain**	**Sudan**
μ	**5.6**	**4.2**

➢ **Figure 28 Product innovation**

As shown in the figure above, Bahrain respondents somewhat agreed while for Sudan it neutrally agreed, that their bank uses the latest technological innovations in developing, innovating and increasing the level of newness and new Islamic products, and that **their banks** enhance the speed of new product development, **increases** the rate and the number of new products introduced to the market and boosts up the number of new products that is first-to-market (early market entrants).

From the results above (5.6) as an average for Bahrain put it higher than Sudan, so it can be concluded that Bahrain Islamic banks have some innovative Islamic products developments for both the existing and new ones while Sudan does not.

➢ **Process innovation**

The **Process innovation** variable was measured using seven aspects. The statements are as follows:

1st Statement: My organization participates in the technological competitiveness;

2nd Statement: My organization revising the updated or novelty of technology used in processes;

3rd Statement: My organization enhances the speed of adoption of the latest technological innovations in processes;

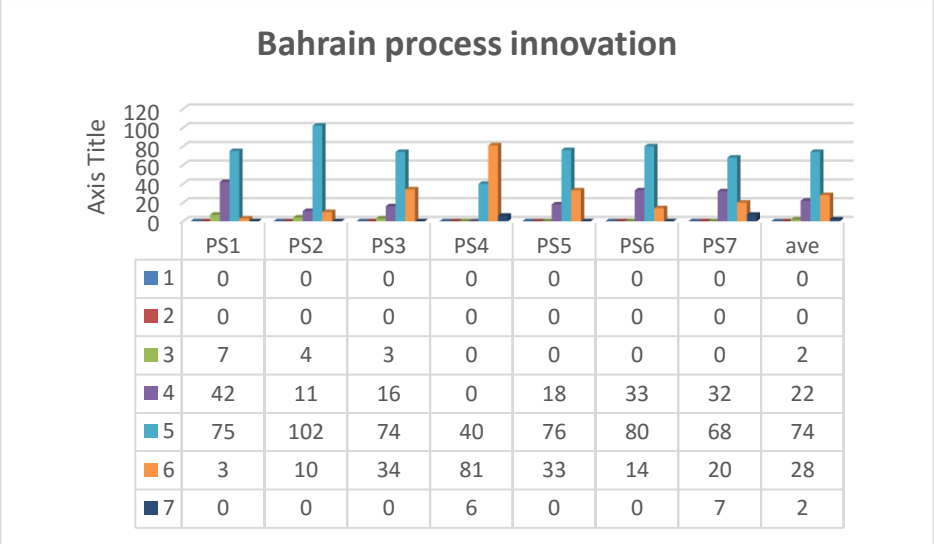
4th Statement: My organization adopts the AAIOFI standards

5th Statement: there is standardization in the industry concerning Sharia'a rulings;

6th Statement: The government laws and codes are flexible, practical and tailored for the Islamic Banking industry, while conventional banking is not;

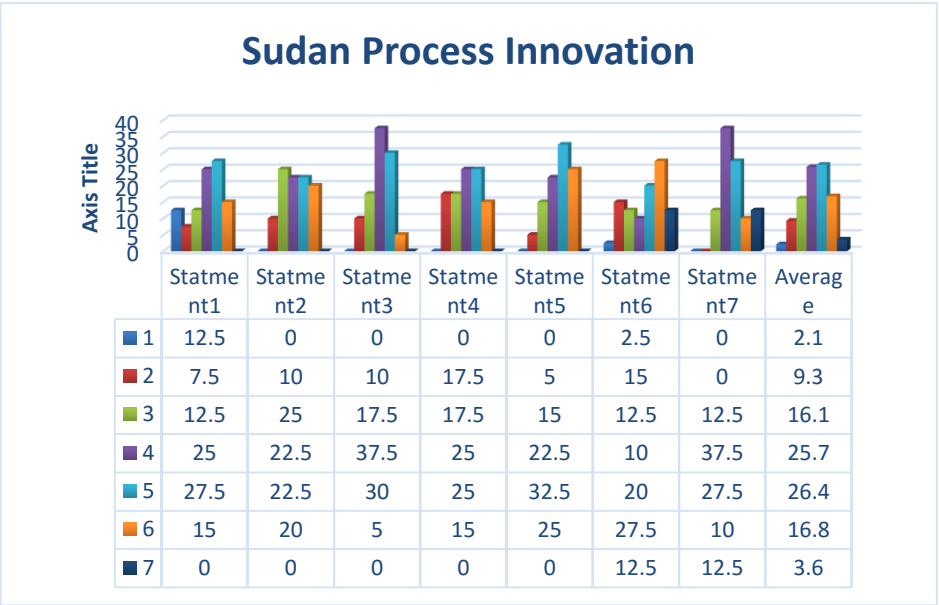
7th Statement: Passing the laws/decrees that define the Islamic Banking and set the legal procedural framework is speedy relative to the conventional banking ones.

These aspects are represented in the following figure along with the respondents' results in percentages, and it also shows the average of all responses.



	PS1	PS2	PS3	PS4	PS5	PS6	PS7	ave
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	7	4	3	0	0	0	0	2
4	42	11	16	0	18	33	32	22
5	75	102	74	40	76	80	68	74
6	3	10	34	81	33	14	20	28
7	0	0	0	6	0	0	7	2

μ	4.6	4.9	5.1	5.7	5.1	4.9	5	5.1



	Statment1	Statment2	Statment3	Statment4	Statment5	Statment6	Statment7	Average
1	12.5	0	0	0	0	2.5	0	2.1
2	7.5	10	10	17.5	5	15	0	9.3
3	12.5	25	17.5	17.5	15	12.5	12.5	16.1
4	25	22.5	37.5	25	22.5	10	37.5	25.7
5	27.5	22.5	30	25	32.5	20	27.5	26.4
6	15	20	5	15	25	27.5	10	16.8
7	0	0	0	0	0	12.5	12.5	3.6

μ	3.9	4.2	4	4	4.6	4.6	4.7	4.3

Process INNO	**Bahrain**	**Sudan**
μ	**5.1**	**4.3**

➢ **Figure 29: Process innovation**

As shown in the figure Bahrain respondents somewhat agreed against Sudan who again were neutral that their Banks participates in the technological competitiveness, they often revise the updated or novelty of technology used in processes and that the bank enhances the speed of adoption of the latest technological innovations in processes.

For the standardization and rules they also somewhat agreed that there is standardization in the industry concerning Sharia'a rulings, that both the government laws and codes are flexible, practical and tailored for the Islamic Banking industry and passing the laws/decrees that define the Islamic Banking and set the legal procedural framework is speedy relative to the conventional banking ones. The forth aspect that the bank adopts the AAIOFI standards counted a high agree evaluation of (67.5).

From the results above it can be concluded that Bahrain Islamic banks have a somewhat good technological competitiveness, standardization and rules that has a positive impact on the p**rocess innovation and while Sudan is relatively behind**

4.3 Confirmation of Hypothesized Model

The full model of the structured equation model of KM, TQM, and INNO (Figure 5) shows the influence of the variables. The criteria for fit are described previously under Construct Validity. The factor structure moderately fits the data: (1) NNFI = 0.999; (2) CFI = 0.999; (3) GFI = 0.986; (4) AGFI = 0.974; and (5) RMR = 0.0098. The overall fit indices for the model are a good fit as NNFI, CFI, and GFI >0.90, AGFI > 0.80, and RMR< 0.02. Figure 5 shows the model.

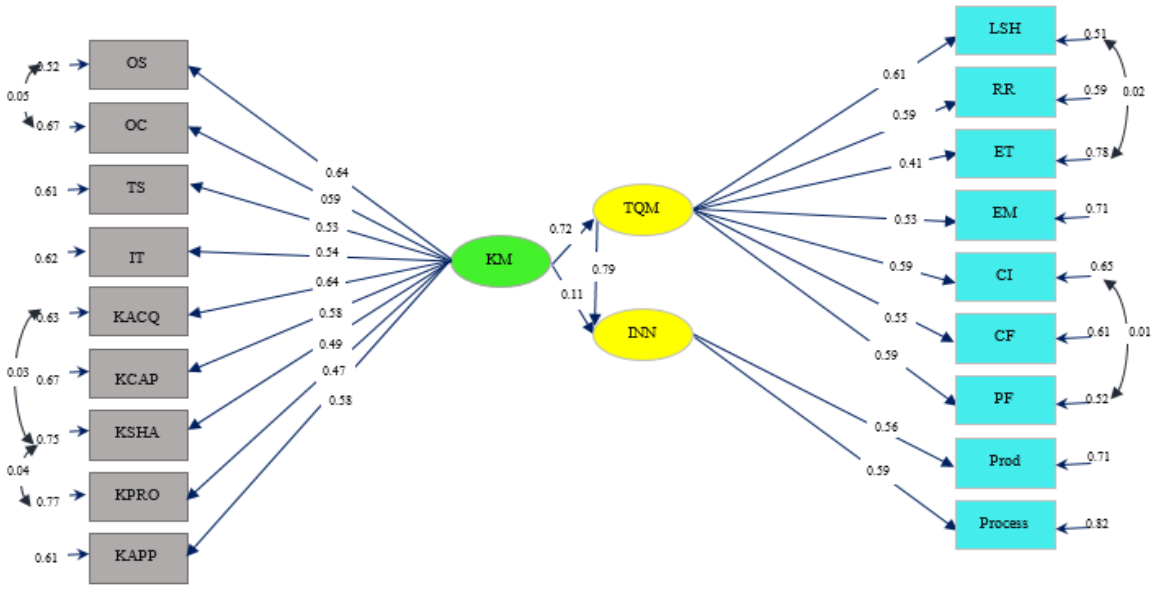


***Figure 30 Structural* equation model for Bahrain Islamic banks innovation performance.**

Figure 30, show the relationships among the three main variables (the arrow pointing from KM to TQM shows a positive relationship), the relationships between a subset and the main variable (For example, the arrows from KM point to OS-KAPP to show the relationships between

KM and its indicators), and last the double-headed arrows show correlations within the subsets (e.g. There is a correlation between OS and OC).

4.4 Proving the hypotheses

- **Relationships among Knowledge Management Initiatives (KM), Total Quality Management (TQM), and Islamic Banks' Innovation Performance (INNO)**

. Four hypotheses were proposed in this study, these hypotheses were examined through the path coefficients and total effect sizes of the constructs in the hypothesized model as shown below.

Relationship between knowledge management initiatives and total quality management. Which is H1.

H1:	*KM initiatives will have a direct positive effect on TQM*

H1 is supported as well, as there is a significant path from KM to TQM with a coefficient of 0.72.

Relationship between total quality management practices and innovation performance. TQM enhances INNO.

H2:	*TQM will positively enhance organization innovation performance*

H2 is supported. As shown in figure 5 there is a significant path from TQM to INNO with a coefficient of 0.79

Relationship between knowledge management initiatives and innovation performance. For this study it was considered as H3.

H3:	*KM initiatives will enhance the innovation performance (product innovation and process innovation)*

H3 is supported as there is a path from KM to INNO with a coefficient of 0.11.

- **For the second research question "KM initiatives implemented through TQM improve Islamic Banks' innovation performance a fourth hypotheses need to be proved H4.**

H4:	***KM initiatives*** *will be indirectly associated with* ***organization innovation*** *performance* ***via the mediator, TQM***

H4: According to (Baron and Kenny's 1986 p.1176) recommendations for examining mediating effects, three conditions should be fulfilled: the first condition is that the independent variable and proposed mediator must each be significantly related to the dependent variable when considered separately. **H2 & H3** demonstrated that the independent variable (KM) was independent of the proposed mediator (TQM), and both were significantly related to the dependent variable (innovation performance) separately. The second condition requires the independent variable to be significantly related to the proposed mediator. **H1** demonstrated that the independent variable (KM) was significantly related to the proposed mediator (TQM). The last condition specifies that the relationship between the independent variable and the dependent variable should be diminished or non-significant when the proposed mediator is controlled. , coefficient *c′* must be smaller than coefficient *c* in Figure 28. (Baron and Kenny 1986) explicitly point out that "the strongest mediation demonstration is when *c′* is zero".

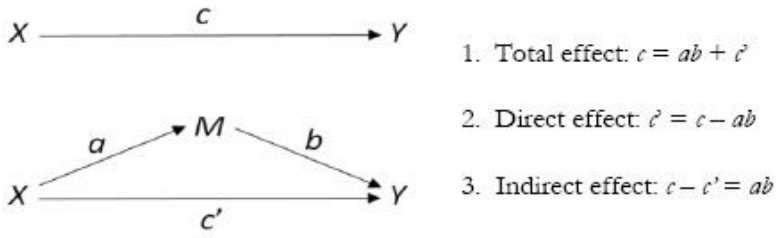


Figure 31. Baron & Kenny's mediation model

In this study, KM is positively associated with innovation performance as indicated by Hypothesis 3 with a direct effect *c'* of 0.11, calculating the indirect effect on INNO through TQM c (=a*b) will be 0.72*0.79=0.57. Table 4 demonstrates that the relationship between KM and innovation performance is direct and statistically significant, though the correlation is low (r = 0. 11); the indirect effect of KM on innovation performance through TQM is significant and considerably stronger (r = 0.57).

		TQM	**INNO**
KM	Direct effect	0.72	0.11
	Indirect effect	-	0.57
	Total effect	0.72	0.68
TQM	Direct effect		0.79
	Indirect effect		-
	Total effect		0.79

Table 19. Total effects of knowledge management initiatives on total quality management and innovation performance.

The results support the **H4** that TQM mediates the relationship between KM and innovation performance.

For the above results, it is concluded that KM exhibited an indirect influence on INNO with TQM as the mediator, but it had almost no direct influence.

CHAPTER 5: DISCUSSION, LIMITATION, RECOMMENDATIONS & CONCLLUSION

CHAPTER 5: DISCUSSION, LIMITATION, RECOMMENDATIONS &CONCLLUSION

The study results are discussed in the following sections. The section is organized in order of the research questions where the four hypotheses will be proved for the benchmark country Bahrain, then a comparative analysis between Bahrain and Sudan will be conducted to come out with the final conclusion.

5.1 Implication of the study

5.1.1 KM initiatives and INNO performance:

While a large number of academic studies have found a positive association between knowledge management and innovation. (Carneiro, 2000; Darroch & McNaughton, 2002; Nonaka & Takeuchi, 1995; Prajogo, Power & Sohal 2004), in addition to (Gloet and Terziovski 2004) who explored the relationship between knowledge management practices and innovation performance and found **both positive and negative relationships** where the **humanist** approach to KM and innovation performance are **significantly and positively related this study found that** Knowledge management initiatives by its self-had no statistically significant direct influence on organization innovation performance.

5.1.2 KM initiatives and TQM:

KM is positively associated with TQM. This finding is consistent with the body of research that has found a positive contribution of KM to TQM As (McAdam and Leonard 2001) suggested that, during everyday business processes and operations, **TQM and KM constitute an interactive relationship**. (Zhao and Bryar 2001) considered **KM and TQM as strongly linked**, particularly in the areas of **continuous improvement and workforce empowerment**. (Snyder and Cummings 1998) stated that organizations must be able to learn from experience, effectively use knowledge, correct errors, and apply this knowledge within the organization if they are to change and adapt to continuously changing markets. That is, through KM initiatives, TQM as a philosophy or management practice can assist organizations in cultivating their ability to change and continuously improve. During organizational change, the roles of **TQM and KM are usually very similar** also (Hsu and Shen 2005) mentioned that **KM coexists with TQM** as both share similarities, including results orientation, people-based management, teamwork, leadership, and delighting the customer. (Hung et al. 2006) confirmed that **KM initiatives significantly and positively contribute to TQM**, there for Islamic Banks could learn from their experiences and apply these experiences and knowledge. As TQM is a management practice that can assist organizations in nurturing their knowledge and ability to change (Hung et.al, 2010).

5.1.3 TQM practices and INNO performance:

This study found that TQM enhances INNO which support many authors such as (Feng, Prajogo, Tan, Sohal 2006) who argued organizations employing total quality management will provide a productive environment for innovation as TQM supports principles that match well with innovation, **TQM** is considered as a **management practice** that provides an organization with **better performance** (Hoang et. al., 2006; Perdomo-Ortiz, Gonzalez-Benito, et. al., 2009; Prajogo and Sohal, 2003) stated that TQM and its **cultural factors** foster **innovative** activities in the organization.

5.1.4 Knowledge Management Initiatives and Its Indirect Impact on Organization Innovation Performance via Total Quality Management

The results of this study revealed that there is a significant association between KM and TQM. In addition, KM contributes to innovation through TQM. In other words KM is an antecedent for TQM and innovation which corresponds with (Hung et al. 2010) empirically examined the relationship between **KM, TQM, and innovation;** he demonstrated that **TQM plays an important role** in transforming the contributions of KM processes into organization innovation performance.

5.2 Limits of the study:

The limitations of this study include:

1. The original measurement instrument was designed mainly according to a western context and in the English language.

2. The study comprised only five banks from each country, and the respondents were limited to managers that were reached through known personal connections.

3. The results from the survey were limited to the respondents' perceptions only and thus are subject to sole source error.

4. Factor analyses and Structural Equation Model (SEM) were conducted on Bahrain only in order to prove determine whether the constructed model is valid and to investigate the relationships among the three variables in general and their relationships through mediation.

5. The analysis done throughout two years during which the current rank for both countries changed

5.3 Recommendation

The following recommendations are presented in three parts: recommendations for Islamic banks professionals, especially Sudan professionals; recommendations for future research; and recommendations for theory.

Recommendations for Islamic banks professionals

The results of this research provide valuable information for Islamic banks professionals to understand the relationships existing among **knowledge management** initiatives, **total quality management**, and **innovation performance**.

The study results can help managers and professional decision makers' support, direct and maximize knowledge management efforts in their banks.

An important conclusion of this research that KM alone does not generate superior performance, Total Quality Management has a greater impact on INNO so managers and decision makers need to use total quality management tools as mediators to increase INNO performance.

Sudanese Islamic Banks have to use and implement total quality management and knowledge management practices in the appropriate way, to insure an effective an innovative performance.

Recommendation for Future Research

First, future studies are needed to extend the current research. Such studies might use multiple Islamic Banks and more countries could be included so that different perspectives are incorporated in viewing Islamic banking sector reality.

Second, Factor analyses and Structural Equation Model (SEM) could be conducted to all countries involved in the research.

Further, as mentioned, this study employed measurements from different existing instruments, it would be better for future researchers to develop their own measurement related to the literature and the interview script.

5.4 Conclusion

This study is the first of which investigate how Islamic Banks' KM initiatives influence innovation performance through TQM in Sudan to answer this argument Bahrain was set as a benchmark.

After the data been collected and analyzed we concluded that the indirect effect of KM on innovation performance through TQM as a mediator was significant and considerably stronger than the direct effect of Knowledge management initiatives by its self- where there were no significant direct influence on organization innovation performance.

Further for the current Islamic banks INNO performance we concluded that Bahrain Islamic banks somewhat maintain competitiveness within IFS by collaborating the best of their capabilities in both Islamic product and process innovation that increased their efficiency with a new structure within the existing and new markets which increased the customers' satisfaction. Comparing both independent variables it was clear a superior status for Bahrain Banks against Sudan for the following reasons:

Bahrain Islamic banks have a good understanding and application of the knowledge management and total quality management concepts which implies that the Bahrain Islamic banks utilizes its knowledge efficiently and has the ability to apply it in different situations. A possible explanation for this result is that Bahrain Islamic banks focus on increasing the customer satisfaction to sustain their business. Where employees in work unit know who are their customers and think of them and their needs, customers been encouraged to provide feedback on the overall products, processes & activities to increase customer satisfaction with these applications, service improvement has become a continual process that has created an environment characterized by unity. Bahrain Islamic Banks have young employees that possess a variety of knowledge, skills, and orientation they understand the operations of the banks based on sharia rules. Bahrain Banks hire skillful T-shaped employees who are not only expert in their field, but

can apply that knowledge of expertise in other areas of the bank and give opinions in other tasks, as well as the ability to communicate with other departments, pushed by a well-constructed workplace culture and structure with outstanding managerial support that adopt consultative leadership style and encourage values that guide, direct, inspire and encourage the employees to discover, create, transfer and share knowledge. They have a good education and training system for their employees, where the employees learn about Islamic principles and ethics and continuing education at colleges and universities. As well as a mentoring and rotation programs that expand the employee's skills and sharing of knowledge under a direct supervision of Shari'ah board who plays an integral role of educating the employees. Managers adopt an outstanding reward and recognition system for suggestions and achievements for teams as well as individuals, and good packages and incentives which have a positive impact on the employees self-esteem, productivity, quality and the amount of effort exhorted to the task at hand that enable them to insure total quality. they provide somewhat proper environment of empowerment and a good employee involvement system through qualified facilitators that work in cross-functional teams to involve all the employees to participate and enhance work processes toward common goals in order to improve the service and insure total quality, Bahrain Islamic banks have an outstanding analytical and creative methods in finding ways to become more effective at meeting stakeholder expectations and finding ways to become more competitive and more effective the processes that enable

it to use knowledge in developing new products/processes, and in solving problems as well as contingency application of knowledge. Bahrain Islamic banks improve decision making accuracy, achieve consensus, and allow prediction based on past history through continually collecting and analyzing data to know how well the Bank is performing to insure a total quality performance by the use of statistical charts and uses the information technologies that enable them to collaborate internally and externally.

So the factors that led to the current situation of the Sudanese Islamic banks concluded to be

1. Sudanese banks strongly adopt informal communication that is unhealthy as a practice, as it may spread wrong or distorted news which may sometimes prove harmful. Information released from such communication network is usually incomplete and subject to errors and mistakes.

2. Sudanese in general adopt a casual behavior mixed with personal feelings with the customers where it can affect the bank negatively

3. Sudanese banks build trust without basis. Trust on the job means doing what you say you're going to do, being willing to take responsibility for your mistakes, lets managers know about problems before they develop into major failures, ask for help, or even saying "no" to an assignment when you do not think you can’t realistically complete it. From this definition it is clear that the trust that given is a

Sudanese cultural base that why the employees do not participate in setting the plans while the management is trust based style.

4. Sudan's banks employees do not know and work toward the bank's mission statement.

5. Sudanese banks lack the diversification on their staff where more than 90% are Sudanese, with one type of experience and it can extend to be only from the bank that they are currently working at. So Sudanese banks' employees do not really have T-shapes skills which is one of the biggest competitive advantage, having T-shaped skills means having the depth of related skills and expertise in a single field, the ability to collaborate across disciplines with experts in other areas and to apply knowledge in areas of expertise other than one's own. It allows people to imagine the problem from another perspective and be very enthusiastic about other people's disciplines.

6. Employees attend good number of training, seminars & conferences but most of the banks do not provide post-graduate ones.

7. Sudanese banks knowledge strongly affected by the lack of universities that provide Islamic finance, trainees had not been followed up with to insure the new knowledge that has been acquired, trainee do not filter the knowledge provided on the training.

8. Sudanese banks do not have standardized reward systems. Packages are somewhat competitive in the market but still the employees are unsatisfied.

9. Most of Sudanese banks staff do not fully understand knowledge sharing, they belief it exclusive in to emails, regular meetings take place but mostly to evaluate the work process. Most of the employees do not have the welling to learn and to apply the new knowledge gained from training.

10. Employees do not have understanding of how to measure quality data of their work and do not have any statistical tool or charts to check on the quality of their work so they can develop it.

11. Sudanese banks do not have effective knowledge storage system.

12. Sudanese banks depend on law and disclosure of security to protect their knowledge.

13. On the application side of new knowledge the problem relay on the employees. They do not present/suggest the new knowledge possessed but when there is a new knowledge processed top management, especially quality control managers, they possess process for applying knowledge.

14. Top management and Shari’ah board play a good role of continues quality development

15. Banks follow the AAIOFI standards with standardize governmental Sharia'a rules that in some cases inflexible. Conventional banks are prohibited.

16. Sudanese banks employees well trained and have good interaction

with the customers but they do not participate in the decision making and even their suggestion where there is a basic suggestion system

17. Quality control managers play an active role in the continues quality improvement but still the problem within the lower staff that do not believe that quality improvement is their responsibility.

18. The push factor for developing new products is present where a market oriented method rather than a product oriented is the norm and where innovative competing products are expected

19. The application of IT on Sudanese banks is three-directional - to the customer, to the bank and to the employee. Customers are satisfied by the updated range of IT services, banks applied IT to a wide range of back and front office tasks in addition to a great number of new products, and for the employees IT has increased their productivity but still some banks lack good technological system that allows the employees to collaborate. In general there are some places of enhancement such as providing libraries and archive system in addition to give access to all the employees to at least an intranet. So Sudanese banks needs to participate in the technological competitiveness and revise the updated technology

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APPENDIXIS

Appendix A: Comments and recommendations of the seminars:

On both **seminars**, good attendance was accomplished with positive and constructive feedback that added to the thesis the arguments below:

First seminar

- **What is the gap that this thesis going to fulfill?**

  It's been clarified that there is a great lack of study about the relationship between knowledge management, total quality management and innovation in the banking sector and nothing about the Islamic banking sector. This thesis went further to investigate the factors of the deteriorating rank of Sudan within the Islamic banking countries.

- Unclear purpose of study?

  On the seminar three overlapped purpose of study were presented which led to an argument from three of the attendees this led to revised purpose of the study which was accepted from the attendees on the second seminar.

- Unclear variables identification?

  On the seminar the variables identification was discussed briefly which led to confusion on the deduction of the hypotheses, a recommendation was raised to read "Research Methods for Business, by Uma Sakran". The book helped in

  - Variable clearly identified.

- Deduction and development of the hypotheses.
- Building the conceptual model.

Second seminar

- Why was Bahrain selected as a benchmark and not any other county?

  It is justified that two factors led to select Bahrain as the first on is its leading status in the Islamic banking sector and the second was the connivance factor to collect the samples.

- A notice been mentioned that was not seriously handled concerning the age and years of experience of the respondents that shows that Sudanese employees seem to travel out of Sudan which is one of the factors that affects knowledge management within the employees .

Appendix B: Final Questionnaire

1

Knowledge Management Assessment, Total Quality Management, and Islamic banking Innovation Performance Instrument

Thank you very much for participating in this survey. Your input is very valuable. Please answer the following questions regarding your Bank **(Islamic banking businesses**) based on your current perceptions.

Section I: Demographic Profile

1. Bank Name /Location _____

2. Which type of the bank below best describes your bank?

_____ Multinational Corporation, Headquarter is in _____

_____ Joint Venture

_____ Bahraini _____ Sudanese

_____ Other _____

2. The total number of employees in the bank

_____ 1-100 _____ 101-1,000

_____ 1,001-10,000 _____ More than 10,001

3. What is your current position in your bank?

_____ Human Resource Development Manager

_____ Development Manager

_____ Others, please specify _____

4. Length of time in my current position is

_____ 0-2 years _____ 3-5 years

_____ 6-8 years _____ 8 + years

5. Your gender

_____ Male _____ Female

6. I am in the age group

_____ 21 to 30 _____ 41 to 50 _____ Others

_____ 31 to 40 _____ 51 to 60

7. Which of the following best describes your highest level of formal education?

_____ Bachelor's degree or equivalent _____ Master's degree,

_____ Doctoral degree, _____ Others, please specify _____

8. certify ISO quality standard, please specify _____

Section II: Knowledge Management Assessment

Knowledge management is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities, such as problem solving, dynamic learning, strategic planning, and decision-making. Knowledge management processes include knowledge acquiring and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application.

My organization (item:9.1,9.2)							
Strongly Disagree Strongly agree							
9.1 has a knowledge management program	1	2	3	4	5	6	7
9.2 has a knowledge management training in place	1	2	3	4	5	6	7

Compared with competitor (item:10.1-10.3)							
Strongly Disagree Strongly agree							
10.1 is more successful	1	2	3	4	5	6	7
10.2 is growing faster	1	2	3	4	5	6	7
10.3 is more innovative	1	2	3	4	5	6	7

Organizational structure (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
11.1 Acquire knowledge by ingesting new members who have Islamic financial knowledge (not conventional background)	1	2	3	4	5	6	7
12.7 providing technology that allows employees to collaborate with others inside and outside the organization	1	2	3	4	5	6	7
13.4 designing processes to facilitate knowledge sharing or transferring across functional boundaries with enhanced communication quality	1	2	3	4	5	6	7
23.7 Accountability for results bound with giving away authority and delegation of powers.	1	2	3	4	5	6	7
17.7 encouraging employee to work in team							

Organizational Culture (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
13.6 The nurture of the bank is a **trust-based environment**	1	2	3	4	5	6	7
14.4 having different methods for employees to further develop their knowledge and apply them to new situations	1	2	3	4	5	6	7

16.1 Top managers adopt a consultative style where sharing knowledge is truly valued	1	2	3	4	5	6	7
16.7 top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders	1	2	3	4	5	6	7
17.1 increasing employee involvement in design and planning	1	2	3	4	5	6	7
18.4 employees analyze their work products to look for ways of doing a better job.	1	2	3	4	5	6	7
23.4 encouraging employee to try new and better ways of doing their job/ promoting creative thinking and creativity	1	2	3	4	5	6	7

T-shaped skills (people) (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
23.6 corporate governance, management style, and business guidelines and procedures ensure finding and retain human talent.	1	2	3	4	5	6	7
16.7 top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders	1	2	3	4	5	6	7

Information Technology (IT) (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
12.1 providing technology that allows employees to search and retrieve stored knowledge	1	2	3	4	5	6	7
13.5 having knowledge in the form that is readily accessible to employees who need it (e.g. intranet, internet, libraries, resource center, and other forum)	1	2	3	4	5	6	7
12.2 Utilizing databases, repositories and information technology applications to store knowledge for easy access by all employees	1	2	3	4	5	6	7

Islamic Knowledge acquisition and creation (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
11.2 absorb knowledge from business partners into the Bank	1	2	3	4	5	6	7
11.3 encourage , support and award employees to present new ideas without fear	1	2	3	4	5	6	7
11.4 Shari'ah board plays an integral role of educating the employees and exchange of ideas	1	2	3	4	5	6	7
11.5 having a mechanisms for acquiring knowledge from	1	2	3	4	5	6	7

different sources such as employees, customers, business partners, and competitors							
11.6 having a mechanisms for creating new knowledge from existing knowledge	1	2	3	4	5	6	7
11.7 acquiring knowledge through training /continuing education of employees at Islamic financing colleges and universities	1	2	3	4	5	6	7

Knowledge capture and storage (item:12.1-12.7)							
Strongly Disagree Strongly agree							
12.3 Utilizing various written devices such as newsletter, manuals to store the knowledge they captured from employees	1	2	3	4	5	6	7
12.5 responding to employees ideas and documents them for further development	1	2	3	4	5	6	7
12.6 having mechanisms for converting knowledge into action plans and the design of new products and services	1	2	3	4	5	6	7

Knowledge dissemination, sharing and transfer (item:13.1 -13.7)							
Strongly Disagree Strongly agree							
13.1 fairness practices are adopted	1	2	3	4	5	6	7
13.2 having mechanisms in place to transfer knowledge from employees, customers and business into the bank and from the bank to individuals	1	2	3	4	5	6	7
13.3 having a standardized reward system for sharing or transferring knowledge	1	2	3	4	5	6	7
13.7 having regular mentoring programs , lectures, seminars, conferences, and training session to share knowledge	1	2	3	4	5	6	7

Knowledge protection (item:12.1-12.7)							
Strongly Disagree Strongly agree							
12.4 having mechanisms to patent and copyright new knowledge	1	2	3	4	5	6	7
14.5 having mechanisms to protect knowledge from inappropriate or illegal use inside and outside of the organization	1	2	3	4	5	6	7

Knowledge application (item:14.1-14.7)							
Strongly Disagree Strongly agree							
14.1 having processes filtering knowledge	1	2	3	4	5	6	7
14.2 having processes for applying experiential knowledge	1	2	3	4	5	6	7
14.3 having processes for applying knowledge to critical competitive needs and quickly links sources of knowledge to solve new problems	1	2	3	4	5	6	7
14.6 having methods to analyze and critically evaluate knowledge to generate new patterns and knowledge for future use	1	2	3	4	5	6	7
14.7 applying knowledge learned from mistakes	1	2	3	4	5	6	7

Section III: Total Quality Management

TQM is an integrative management philosophy aimed at continuously improving the performance of products, processes and services to achieve and exceed customer expectations.

My organization (item:15.1-15.5)							
Strongly Disagree Strongly agree							
15.1 has quality management or quality assurance program in place	1	2	3	4	5	6	7
15.2 initiate total quality management program	1	2	3	4	5	6	7
15.3 has quality management training and update ISO standard	1	2	3	4	5	6	7

Leadership and top management support (item:16.1-16.7)							
Strongly Disagree Strongly agree							
16.1 Top managers adopt a consultative style where sharing knowledge is truly valued	1	2	3	4	5	6	7
16.2 top management collaborate with Shari'ah boards to assign sufficient people to do quality-related activities	1	2	3	4	5	6	7

16.3 top management accept responsibility for quality, show concern for the need for quality, set clear goals for quality improvement, and commit to quality	1	2	3	4	5	6	7
16.4 There is collaboration and alliances among the Shari'ah boards of several Islamic banks	1	2	3	4	5	6	7
16.5 quality regard as top competitive priority and there is a strong commitment to quality at all levels	1	2	3	4	5	6	7
16.6 top management encourage long-term strategic thinking	1	2	3	4	5	6	7
16.7 top management insure that everyone is aware of its overall mission and encourage participation of all stakeholders	1	2	3	4	5	6	7

Reward & recognition (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
11.3 encourage , support and award employees to present new ideas without fear	1	2	3	4	5	6	7
13.3 having a standardized reward system for sharing or transferring knowledge	1	2	3	4	5	6	7

17.5 recognizing employee for superior quality performance	1	2	3	4	5	6	7
22.6 encouraging /rewarding innovators (those who come up with new products or services)	1	2	3	4	5	6	7
23.1Adequate and competitive packages							
23.2 Incentives rewarding system for innovators through bonus schemes of profit sharing	1	2	3	4	5	6	7

Education & training (item:11.1- 11.7)							
Strongly Disagree Strongly agree							
11.7 acquiring knowledge through training /continuing education of employees at Islamic financing colleges and universities	1	2	3	4	5	6	7
13.7 having regular mentoring programs , lectures, seminars, conferences, and training session to share knowledge	1	2	3	4	5	6	7
17.1 increasing employee involvement in design and planning	1	2	3	4	5	6	7
23.5 Sponsoring students to enroll into universities to enhance the knowledge of Islamic Banking.	1	2	3	4	5	6	7

23.3 Intensified levels of training both at the entry ranks and senior ones	1	2	3	4	5	6	7
Employee(item:17.1-17.7)							
Strongly Disagree Strongly agree							
17.2 having a more active employee suggestion system	1	2	3	4	5	6	7
17.3 increasing employee autonomy in decision- making	1	2	3	4	5	6	7
17.4 increasing employee interaction with customers and suppliers	1	2	3	4	5	6	7
17.6 fully training employee for the work they perform	1	2	3	4	5	6	7
17.7 encouraging employee to work in team	1	2	3	4	5	6	7

Continuous improvement (item:18.1-18.7)							
Strongly Disagree Strongly agree							
18.1 continuous quality improvement is an important goal	1	2	3	4	5	6	7
18.2 employees are encouraged to improve the quality of their product	1	2	3	4	5	6	7
18.3 employees believe that quality improvement is their responsibility	1	2	3	4	5	6	7

18.4 employees analyze their work products to look for ways of doing a better job.	1	2	3	4	5	6	7
18.5 feedback provides to employees on their quality	1	2	3	4	5	6	7
18.6 managers assume active roles as facilitators of continuous improvement, coaches of new methods, mentors, and leaders of empowered employees	1	2	3	4	5	6	7
18.7 managers and employee periodically reviews quality issues in meetings	1	2	3	4	5	6	7

Customer focus (item:19.1-19.7)							
Strongly Disagree Strongly agree							
19.1 employees in work unit know who their customers are	1	2	3	4	5	6	7
19.2 employees think of their customers when doing their work	1	2	3	4	5	6	7
19.3 employees often measure their external customers' needs (customers outside the organization)	1	2	3	4	5	6	7
19.4 employees often measure their internal customers' needs (customers inside the organization)	1	2	3	4	5	6	7
19.5 customers are encouraged to provide feedback	1	2	3	4	5	6	7

19.6 customers help design new processes, products, or services	1	2	3	4	5	6	7
19.7 processes or activities increase customer satisfaction	1	2	3	4	5	6	7

Process focus /Database decisions (item:20.1-20.7)							
Strongly Disagree Strongly agree							
20.1 employees use statistical charts to check on the quality of their work or services	1	2	3	4	5	6	7
20.2 employees collect data on the quality of their work or services	1	2	3	4	5	6	7
20.3 employees keep data to trace work improvements	1	2	3	4	5	6	7
20.4 employees collect data on the amount of time it take to get the job done	1	2	3	4	5	6	7
20.5 employees keep records or charts measuring the quality of their work displayed at their work station	1	2	3	4	5	6	7
20.6 quality data (cost of quality, defects, errors, scraps, etc.) are used as tools to manage quality	1	2	3	4	5	6	7
20.7 quality data are available to manager, supervisors, and employees	1	2	3	4	5	6	7

Section IV: Innovation Performance

Innovation is a complete process that starts with the identification of opportunities or problems, followed by the discovery and development of solutions, taking the shape of products or services (or capabilities) which are then implemented or applied to the market.

Compared with key competitor (item:21.1-21.3)							
Strongly Disagree Strongly agree							
21.1 is more successful	1	2	3	4	5	6	7
21.2 is growing faster	1	2	3	4	5	6	7
21.3 is more innovative	1	2	3	4	5	6	7

Product innovation (item:22.1-22.7)							
Strongly Disagree Strongly agree							
22.1 increasing the level of newness of new products that relevant to Islamic financial institutions	1	2	3	4	5	6	7
22.2 using the latest technological innovations in new product development	1	2	3	4	5	6	7
22.3 enhancing the speed of new product development	1	2	3	4	5	6	7

22.4 increasing the rate and the number of new products introduced to the market	1	2	3	4	5	6	7
22.5 boosting up the number of new products that is first-to-market (early market entrants	1	2	3	4	5	6	7

Process innovation / the Regulatory Environment (item:24.1-24.7)							
Strongly Disagree Strongly agree							
24.1 participating in the technological competitiveness	1	2	3	4	5	6	7
24.2 revising the updated or novelty of technology used in processes	1	2	3	4	5	6	7
24.3 enhancing the speed of adoption of the latest technological innovations in processes	1	2	3	4	5	6	7
24.4Adopt the AAIOFI standards.	1	2	3	4	5	6	7
standardization in the industry concerning Sharia'a rulings	1	2	3	4	5	6	7
24.5 The government laws and codes are flexible, practical and tailored for the Islamic Banking industry. Not the conventional banking.	1	2	3	4	5	6	7
24.6 passing the laws/decrees that define the Islamic	1	2	3	4	5	6	7

Banking and set the legal procedural framework is speedy relative to the conventional banking ones							