Development of Collaborative Customer Service Officer Knowledge Sharing System (CCSOKSS)

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Abstract. In recent years, the banking industry across the nation have been undergoing swift economic revolution due to the surge created by the Central Bank of Nigeria's (CBN) restructuring and policies on Commercial Banks Capitalization. As a result of more competitive environments and struggling economies, these banks are trying to survive the economic recession and depression in the marketplace through mergers and acquisitions to improve capital bases. This mergers/acquisitions come with the challenge of streamlining technical information between/among staff members who have come together from different bank cultures and backgrounds. Thus, this paper aimed at the development of a Knowledge Sharing System for Customer Service Officers (CSOs) which exploits knowledge resident in them for competitive advantage after such mergers and acquisitions to ensure a seamless and quick integration process. Online SMS, chat rooms are collaboration techniques used in the system. Resolutions are stored for reuse in the Knowledge Repository.

Keywords: Knowledge sharing · Banking · Merger · Acquisition
Customer service officer

1 Introduction

In a highly demanding business world today, an organization's competitive edge depends almost entirely on how well it can manage and deploy its corporate assets. These assets can be categorized into tangible and intangible assets. Traditionally, tangible assets like plant, equipment, inventory and financial capital are considered the most fundamental corporate assets. Intangible assets play a very little or marginal role in an organization regardless from which industry it comes from [1]. Generally, many organizations till date still downplay the importance of their intangible assets. However, despite managing and giving prime focus to all their tangible assets, these organizations still find it very hard to gain the advantage to beat their competitors. Hence, it is getting greater attention of the managers that organizations require a much broader range of resources to be able to compete and succeed in the current competitive market. This is evident by an increasing number of organizations giving more emphasis to their intangible assets, previously left idle, unexplored and unmanaged [1].

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The purpose of this paper is to affirm the above claim and provide a knowledge sharing framework for customer service officers in the Nigerian Banking industry. The paper is organized as follows: Sect. 2 briefly discusses theoretical background to the study and also reviews existing knowledge management systems. Section 3 focuses on the methodology used in this work. Section 4 discusses result findings and practical implications of the developed knowledge sharing system. Section 5 concludes the paper and offers recommendations.

2 Knowledge

Knowledge is an intangible intellectual asset of invaluable potentials. It has been the subject of intensive research in almost every area of organizational inquiry [2]. It has been a fashionable subject in recent years, with significant attention focused on areas such as the key role of knowledge workers, the need to generate and share knowledge, the creation of knowledge and intensive organizations and societies [3].

However, there is no generally acceptable definition of knowledge. Different perspectives of knowledge ranges from philosophical (epistemology), data processing, artificial intelligence - knowledge representation, to theoretical point of views. This work asserts according to [4], that knowledge could be referred to as the cognizance of facts or events by individual(s) from an observation, learning, experience, and understanding of a reality in a particular context at a specific period of time as illustrated in Fig. 1.

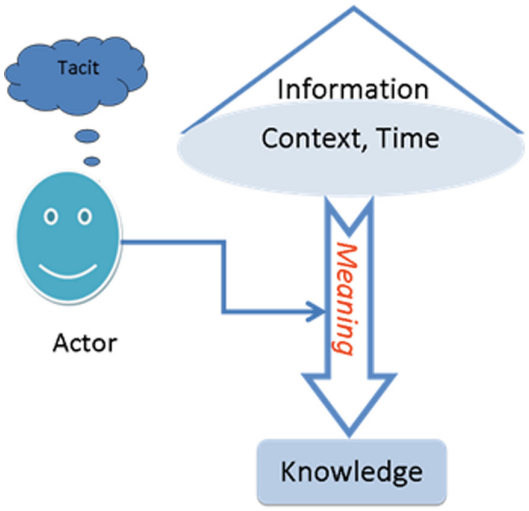

Fig. 1. Concept of knowledge [5]

Knowledge is attributed to individuals, that is, a stakeholder (Actor) who possesses experience, expertise, skill and competence. Albeit, two major type of knowledge exist, namely, Explicit (know) and Tacit (know-hows) knowledge. The features of each type is analyzed in Table 1.

Table 1. Types of knowledge [6].

Explicit	Tacit
Formal and systematic	Insights, intuitions, and hunches
Knowledge of rationality (mind)	Knowledge of experience (body)
Can be expressed in words and numbers	Not easily visible and expressible: it resides in people's heads
Easily communicated and shared in form of data, formula, graphs, manuals, books, documents, or theories etc.	Highly personal, hard to formalize, difficult to communicate or share with others
Can be expressed in computer code, databases, simulations, sets of general principles etc.	Rooted in individual's actions and experiences: in form of rules of thumb, ideals, values, or emotions

2.1 Knowledge Management

Knowledge Management (KM) is based on the premise that, just as human beings are unable to draw on the full potential of their brains, organizations are generally not able to fully utilize the knowledge that they possess. Through KM, organizations seek to acquire or create potentially useful knowledge and to make it available to those who can use it at a time and place that is appropriate for them to achieve maximum effective usage in order to positively influence organizational performance. It is generally believed that if an organization can increase its effective knowledge utilization by only a small percentage, great benefits will result [7]. Thus KM is pivotal to organizational success.

In [8] from [9], KM is described as "a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving and sharing all of an enterprise information assets". In other words, KM "is fundamentally about making the right knowledge or the right knowledge sources (including people) available to the right people at the right time" [10]. Also, KM is the process of conscious coordination of knowledge - skills, operation procedures, databases, etc.; in an organization, in order to organize, store and re-use the knowledge for achieving organizational goals and innovation [11].

Certain factors drive successful adoption of KM initiatives in organizations. Thus, KM initiatives to thrive, it should be aligned with KM spectrum which "entails people of common socio-cultural group who have common goals geared towards organizational productivity and application of technological tools for creation and use of knowledge" [12]. Therefore, KM processes span across identification and acquisition of people's experience and expertise (who knows what?) in a domain; evaluation and storage of knowledge (retain *knows and know-hows*); externalization and exploitation *(share to reuse*) through communication and collaboration; and evolution of knowledge (*discover know-hows*). Figure 2 depicts a set of KM processes in which *codification* of knowledge process is meant for knowledge representation and storage in a Repository (otherwise called *Corporate Memory*). In reality, each process does not link with subsequent process linearly, rather, it is an iterative process for validation purpose.

The outcome of technological impact on KM processes yields a KM system (KMS). A KMS should address four broad objectives namely, management of knowledge as an asset, enhancement of knowledge environment, improvement of the asset and creation of knowledge repository [13]. However, successful adoption of KM initiatives should not solely rely on technology, rather organizational goals and culture should be given preference for value or knowledge creation.

2.2 Knowledge Sharing

Organizations where knowledge transfer and/or sharing is a commonplace thrive and gain competitive advantage. Knowledge sharing (KS) allows exchange of information, skill or expertise among personnel throughout an organization to avoid redundancy, recurrent mistakes and loss of vital knowledge asset. KS may occur among people, friends, or members of a family, a community or an organization [14].

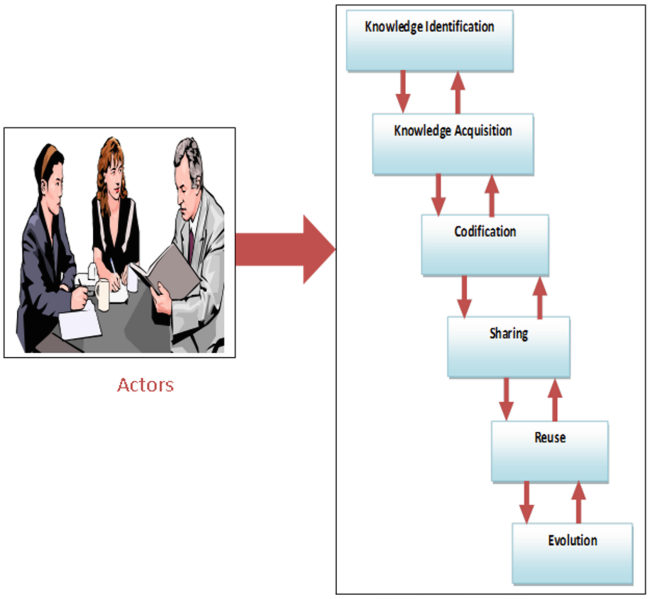

Fig. 2. Knowledge management processes [10]

Organizations need to consider the type of knowledge assets to be shared in order to determine the appropriate KM processes to be applied to sharing of such assets. Table 2 summarizes KM processes as well as the role of technology in the sharing of explicit and tacit knowledge respectively.

Knowledge sharing is significant as knowledge held by individuals cannot become organizational knowledge until it is shared throughout the organization. Figure 3 depicts the process of KS which starts with the involvement of individuals to create, locate and disseminate idea or information in an organization. KS is essential in the

Table 2. Features of knowledge sharing [15].

Characteristics of knowledge sharing	Explicit knowledge	Tacit knowledge
Characteristics	Codified knowledge found in documents, databases, etc. Easy to share, modify, and copy	Intuitive, knowledge rooted in context & practice. Difficult to articulate, share, modify, and copy
Management	Organize, categorize, refine, & share	Common practice, mentoring, apprenticeships, project teams, informal networks, chaos, etc.
Use of IT	Very useful for storage, transfer, and combination	Moderate – with careful implementation

implementation of any KM initiative. It should not be a one-directional transfer but rather between individuals (e.g. employees and their co-workers) and units within an organization [16]. The success of KS depends on willingness of individuals to encourage and share their organizational knowledge through internal organizational social exchanges applying the knowledge sharing model [14].

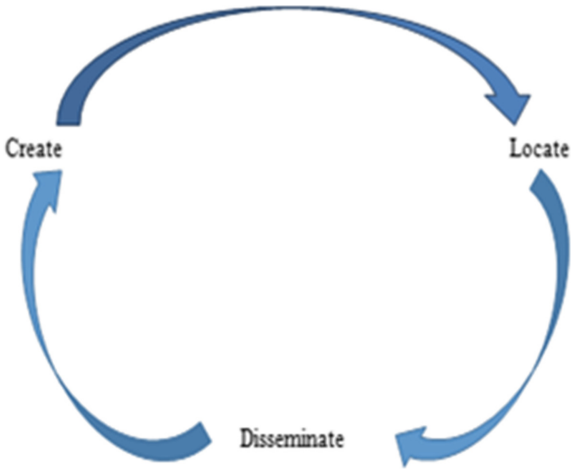

Fig. 3. Knowledge sharing model [14]

2.3 Review of Existing Knowledge Management in Organizations

An overview of a KM model and comparison of related works are subsequently considered in Sects. 2.3.1 and 2.3.2 respectively.

2.3.1 Banking Knowledge Management Model (BKMM)

A Knowledge Management Process in banking sector is depicted by Fig. 4. The environment forces such as, the importance for an organization to maintain its

competitive advantage by managing knowledge well, the requirement of the organization to distribute its knowledge among its geographically dispersed human resources, may compel the organization to initiate a KM programme. Through a combination of people and technology, information and energy are transformed into knowledge progress and structures that produce products and services [17]. There are mainly three components in the knowledge progress, namely, knowledge creation, knowledge retention and knowledge sharing.

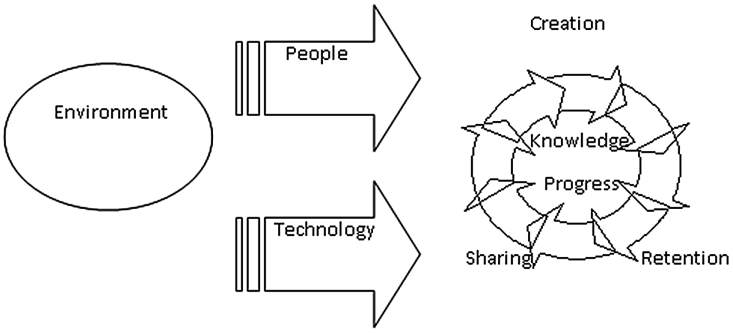

Fig. 4. Banking knowledge management model [17]

2.3.2 Comparison of Knowledge Sharing Systems in Organizations

Knowledge sharing among organization's personnel, especially in banking sectors were reviewed in the light of organizational goals, knowledge sharing approach according to Fig. 3, and techniques with the outcomes of KM implementation. The review deduced that collaborative and social interaction platforms including storytelling played significant role in sharing and transfer of personnel and organizational knowledge. Consequently, competitive advantage in terms of both economic (financial) and knowledge retention was gained by organizations. Table 3 presents the summary of the comparative evaluation of some related works.

2.3.3 Overview of Customer Service in the Nigerian Banking Industry

In Nigeria, the customer service unit is more effective in the banks than in all other organizations of the economy. Yet, the banks have a long way to go in achieving standardization.

In most banks, the knowledge platform is operated by their central IT department which keeps track of all record concerning customer complaint. The banking business today has gone beyond armchair banking era where the customers had to look for the banker to transact business. It is now the era of highly competitive business among banks. The financial institutions, including banks engage in aggressive search of customer to patronize their products and services. For effective customer service, the relationship between customer satisfaction and business performance should be taken into consideration.

Table 3. Comparative evaluation of some related works.

Authors	Methodology	Technique	Strength	Limitation
Hafizi and Hayati [17]	Data collection (environment and people), framework building, knowledge management	Electronic forum, online libraries and e-mails	Well designed and organized framework with emphasis on knowledge creation, retention and sharing	Small sample size i.e. case studies which makes the extent of KM integration little
Voelpel and Han [18]	Data Collection – in-depth case and direct observation of executives and line managers in Siemens. Internal documents, project manual, annual reports, etc.	Sharenet – knowledge library and forums e.g. live chat rooms, discussion groups	Online real time – had urgent request section for urgent resolution of time-bound challenges	Lack of attention on non-monetary incentives and cultural impact
Puterman [19]	Data collection – employee engagement survey called heartbeat	Blue connection – staff social networking site similar to the following platforms: Facebook, Twitter and Linkedin	Strictly business platform, all communications are made public to ensure strict official interaction	Communication on the networking site is not vetted before posting to the public
Rozwell [20]	Customer relationship management and knowledge management system	Knowledge base and story telling	Ability to capture, document and disseminate tacit and explicit knowledge. Decrease in their training costs all due to the implementation of the CRM/KM system	Little focus on individuals or team and the implementation of the customer self-service interface

Bad quality of service often has negative effects on the bank's image by limiting the number of prospective customers who patronize banking services. This is because a customer who has once been disappointed by a bank's services decides to tell others not to use that same service.

A company seeking to win through superior customer service constantly has to create new and different ways of enabling customers to realize value. Customers complain that banks do not handle their problems accurately or quickly. They are made

to feel at fault regardless of where the problem actually lies. A customer- focused bank that is customer service oriented recognizes these wants and needs of the customer and takes steps to accommodate them.

3 Methodology

The focus of this work is to provide a robust solution whereby customer service officers collaborate on customer complaints in order to meet individual customer's needs, hence, the need for the development of a Collaborative Customer Service Officer Knowledge Sharing System, (CCSOKSS). The following sections analyzes the approach, technique, and implementation of Knowledge sharing system for Bank CSO in this work.

3.1 Knowledge Acquisition from Existing Officers After Mergers/Acquisitions

The approach employed for information gathering of this work includes interview, observation, working document review and online survey to the intent of acquiring relevant knowledge. The target of the Interactive sessions focused on the following areas:

The use of Knowledge Management system with emphasis on knowledge sharing by the bank personnel during mergers and acquisitions and how it impacts on their throughput.

How could knowledge sharing and collaboration affect the overall business strategy of the banks considering the different organizational structures and ethical cultures of the corresponding banks?

Handling customers' queries and resolutions by categorizing knowledge in terms of importance and relevance of the query in question.

Customer service officers' learning curve and response time to customers' queries.

3.2 Architecture of Collaborative Customer Service Officer Knowledge Sharing System (CCSOKSS)

The KM processes that facilitate knowledge sharing formed the basic phases of CCSOKSS as depicted in the system architecture of Fig. 5. It illustrates the integration of database, data warehouse, and knowledge based system to support an information rich and knowledge sharing platform for resolving customers' complaints in an automated banking system.

CCSOKSS incorporates an innovative technology in the area of knowledge sharing and customer management directly related to the banking system. The CCSOKSS architecture is a framework which incorporates technologies like knowledge repository, OLAP, Intelligent miner and other reporting applications, integrated upon a web based bootstrapped interface. The system also combines specific methodologies needed to acquire the right information necessary for the business of knowledge sharing and decision making with the overall purpose of enhancing the Customer Service Officer

training curve at a very low cost. Tacit knowledge which has been externalized is shared during collaboration, rated and filtered based on user experience as well as comment's usefulness before storage in a repository. Stored knowledge is reused by the end user to achieve the goal of the system. The documentation of the architecture is discussed as follows.

3.2.1 User Access

Easy and comfortable information access is mandatory for any KM system. CCSOKSS presents CSO an access to knowledge capture and exploitation through usable interfaces.

3.2.2 Creation

The user interaction channel contains typical customer service information system which serves as a temporary area in the banking operational environment. This layer contains three different components which are designed to meet the CCSOKSS objectives of eliciting knowledge from customers to meet the customer care knowledge needs and the business process of the bank.

Create New Complaint: this component allows the user to create a new complaint if such complaint does not already exist in the database of the system. This ensures that the knowledge in the database of the system is always novel.

Edit Previous Complaint: this component provides a platform for the user to edit previous knowledge in the database, thereby creating room for error correction and management.

Complaint Resolution System: this component ensures that the knowledge in the repository is relevant and important to resolving customer complaint. It serves as a point for searching knowledge in the repository.

3.2.3 Filtering

All data stored in the operational database is being parsed to the filtering platform for ranking, categorization and mapping. Since the operational database is the source of knowledge for the repository, this layer ensures that the knowledge parsed to the repository is considered by the users of the system as relevant and useful to the needs of the bank. This is a very important stage because it represents the whole point of the system, which is to arm the bank personnel with the necessary information or knowledge to resolve customer query with little or no training at all.

3.2.4 Sharing

All business knowledge stored in the operational database needs to be managed and shared effectively for all users to utilize. New complaints posted on the forum are broadcasted to all users that are logged on for the business day; officers are alerted on the dashboard like a star network topology that routes data from a single to multiple nodes. A user posts to groups created in the forum: branch location-based e.g. market branches, university branches, to mention a few. Comments made on new complaints in the forum are sorted and rated in order of importance using the length of years of a user's experience on the job function as well as employee rating of comment's usefulness.

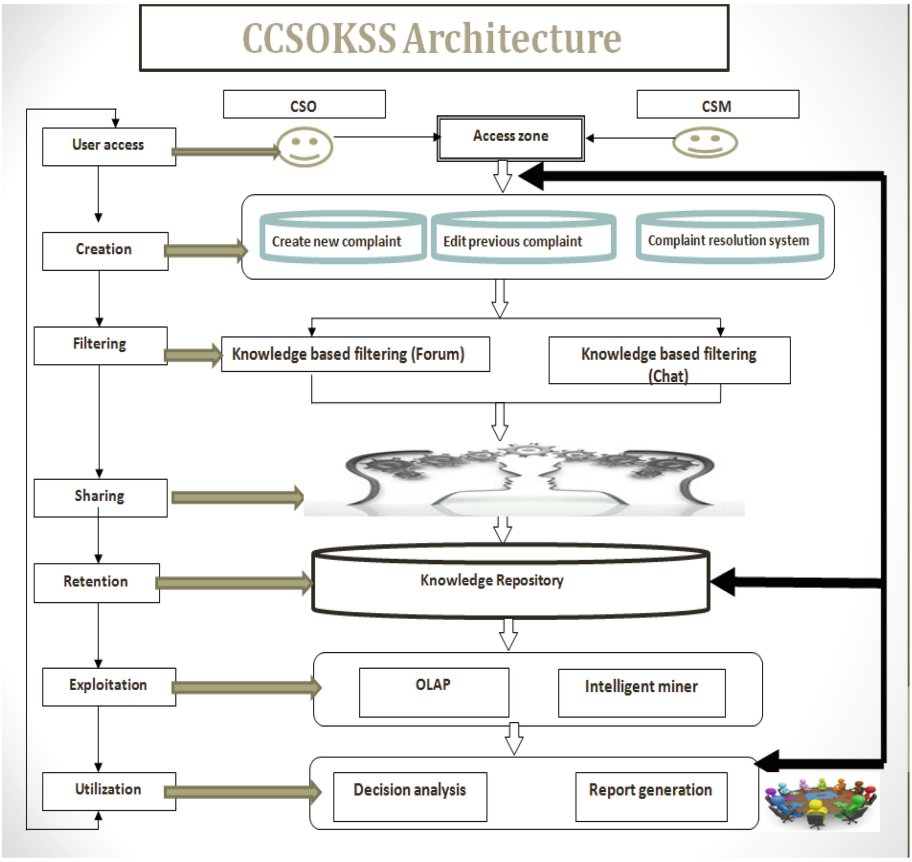

Fig. 5. Architecture of CCSOKSS

3.2.5 Retention

Knowledge Repository acts as a repository for current and historical operational data, where it is organized and validated so that it could serve decision-making objectives. The banking industry has a high volume of record in terms of information system, so data are widely used (and misused) in an ad hoc manner. The knowledge repository allows information to be presented in several formats and to be distributed in a more widely manner. The various stores of the business data are extracted, transformed and loaded from the transactional systems into the knowledge repository. It is also responsible for collecting, converting, cleaning, aggregating, and indexing customers' complaint resolution.

3.2.6 Exploitation

The Query layer contains collective intelligence components which includes intelligent miner, OLAP, and decision analysis. Each component is implemented through a series of operations.

The Intelligent Miner: The Intelligent miner is among the tools used by the bank employee to gain access to the Knowledge Repository. These tools provide the means for business intelligence through ad hoc and managed query environment and knowledge mining. These tools improve the decision-making process by providing new information that otherwise users would not have been able to access on a timely basis. The Intelligent Miner is a data mining tools for determining patterns, generalizations, regularities and rules in data resources as it relates to customer care complaints.

Online Analytic Processing: At the same time, OLAP functionality is used to gain a deeper understanding of specific customer service operational issues. The system takes advantage of OLAP flexible and timely manipulation of data. It enables the user to extract data quickly and easily and translate them into information in several ways.

3.2.7 Utilization

The system users need the utilization layer to access the system's various types of resource.

The customer service officers' key in to the platform to extract knowledge necessary for making decisions that resolves customers' complaints. The Officer accesses the suggested solutions in the complaint resolution system and makes a feedback to the system. The system also generates Reports. The reporting platform is generated with queries based on customer information and solutions recommended.

4 Discussion of Findings

Knowledge is retained in the repository for re-use after they are rated and filtered according to usefulness and CSO years of experience. It contains different topics as it relates to the experience of users of the system. It allows users to ask questions and comment on topics. Figure 6 illustrates a snap-shot of the knowledge acquisition to resolve customers' complaints through inline SMS in CCSOKSS.

The Collaborative Customer Service Officers' Knowledge Sharing System (CCSOKSS) was put to use by selected CSOs (two from each of ten branches of a selected Bank in Ibadan, Nigeria totaling twenty participants). A feedback form was designed for this purpose, and the outcome of filled forms was analyzed to determine the functionality (organizational goal), usability (culture), and socialization impact (organizational learning). Figure 7 presents the analysis of users' feedback.

With CCSOKSS, officers learn without physical barriers (online real time) and at the least cost possible, eliminating the need for classroom training sessions which could not go round all officers and are time consuming. Usually, most things learned in the classroom are usually not reviewed until the need for it arises. It also limits massive redeployment which is costly to the bank (redeployment allowances payment) and inconvenience for staff members who have to be away from their families as a result of mergers/acquisitions.

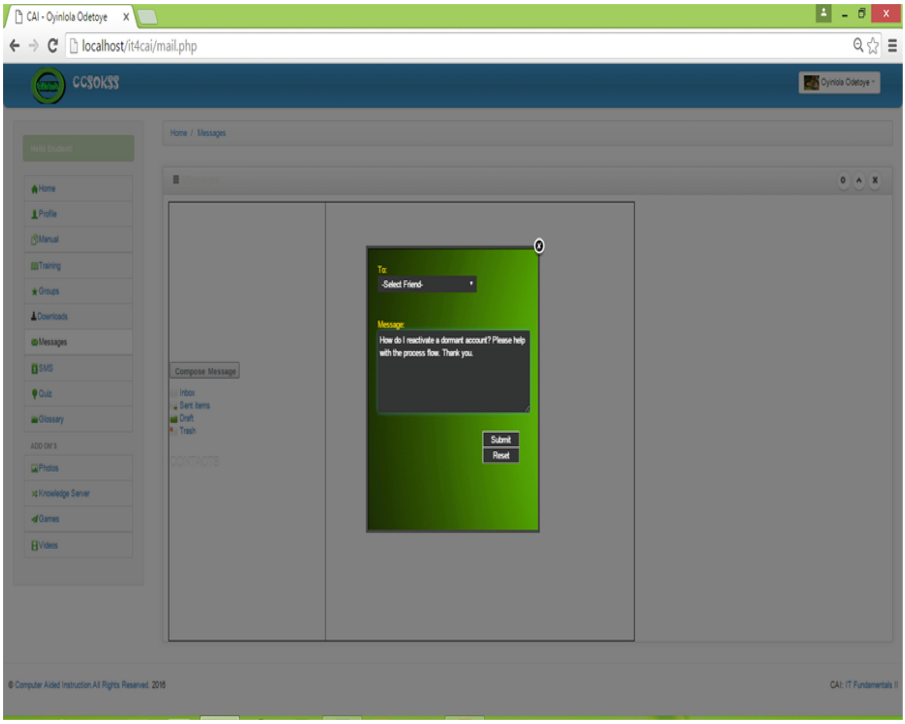

Fig. 6. CCSOKSS knowledge acquisition via online SMS

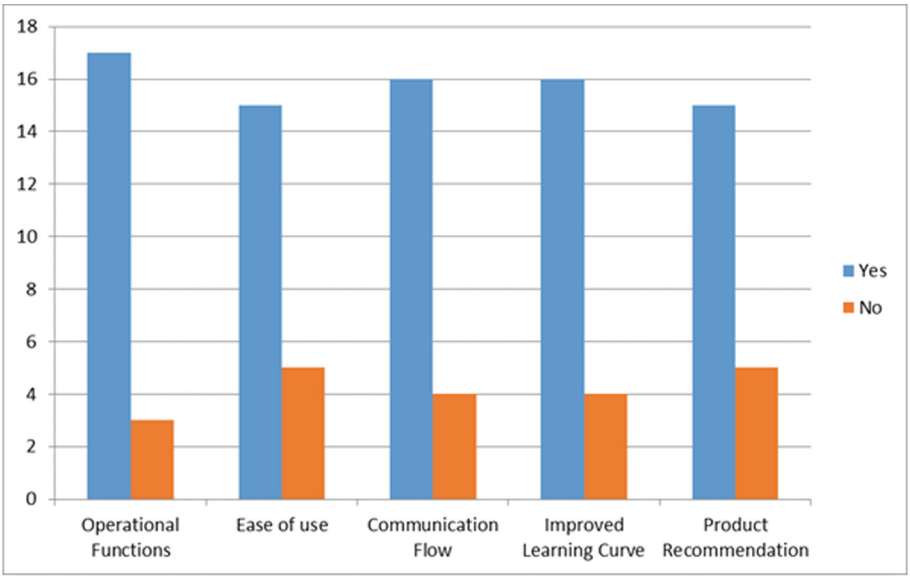

Fig. 7. Result presentation of CCSOKSS utilization

5 Conclusion and Recommendation

Mergers and acquisition are processes that continue through-out the life time of banks as new policies come into play which necessitates them. The process should be concluded in the least amount of time, cost and lay-off as can be managed. Customers expect every interaction with bank employees to be as enjoyable and stress free as there can be irrespective of mergers and acquisition. Employee knowledge should be incorporated in the corporate strategy of banks and should permeate the entire organization irrespective of branch location. The CCSOKSS delivers the ideal solution for ensuring a seamless merger process as regards the Customer Service desk which is the soul of a Bank.

When adopted, the CCSOKSS will create a customer-centric culture that encourages knowledge dissemination to flourish within the banking industry with the global aim of giving customers a uniform feel at each and every branch location they visit irrespective of bank mergers and acquisition. It also helps Customer Service Officers develop an in-depth understanding of the required job function with a view to rendering excellent service at all times and keeping a competitive edge in the industry.

Thus, Banks should deploy Knowledge Sharing System for tracking down undocumented knowledge embedded in employees that will help prevent loss that may arise from employee exit as well as mergers and acquisition.

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