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KNOWLEDGE MANAGEMENT BEST PRACTICE IN HIGHER LEARNING INSTITUTION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

This systematic literature review (SLR) aims to identify the Knowledge Management (KM) Best Practice components in the KM Model proposal for Higher Learning Institutions (HLI) environment. The KM Best Practice components identified from this paper will be referring in the future study to verify the effectiveness of the components to be the best practice for KM. A SLR of KM Best Practice to identify and define the components of Best Practice from the KM models was conducted recently. 179 articles included in the literature review were extracted based on the exclusion criteria and only retained 71 related reviews. The review of published papers of conference and journals' articles shows the components of Best Practice in KM are basically divided into two aspects which is the soft aspect and the hard aspect. The literature evidence the lacks of combination of these two aspects into an integrated model decelerate KM Best Practice to fully throttle in the organization. The scenario leads to the immaturity of the HLI towards the implementation of KM System. The first steps of identifying the attributes to measure the components from the models in the literature will led to the definition of the KM Best Practice component for the higher learning environment as concluded in this Systematic Literature Review.

Keywords: *Knowledge Management, Knowledge Management System, Knowledge Management Best Practice, Higher Learning Institutions.*

1. INTRODUCTION

KM and HLI are two terms that synchrony, this is due to the nature of HLI as the center of knowledge process. However, the previous research works on KM Best Practice model evidence the KM model works alone as silo and not clearly verified to be recognized as KM Best Practice.

This SLR provide included literature on KM Best Practice in HLI based on the research method converse later in this paper. The search results for related literature were explained in the search result section and each components found were discussed in the discussion section, the conclusion section wrapped the SLR as the first steps of verifying the KM Best Practice components in the literature and work as the millstone for the beginning of KM Best Practice model development in the future study.

2. LITERATURE REVIEW

KM composed of tacit experience, idea, insights, values and judgments of individuals as well as for the analysis of information and data[1]. KM process involved creating, acquiring, capturing, sharing, and using knowledge, wherever it resides, to enhance learning and performance in organizations [2], and helps to enhance the organizational performance [3]. Consequence, made KM process to be the core process particularly in the Higher Learning Institution (HLI), the hub for knowledge creation and dissemination and knowledge sharing due to its nature of functionality [4].

KM System (KMS) may be included with any type of information, including both qualitative and quantitative. [5] [6] Proved the need for knowledge sharing portal embedded to the social media as the knowledge codifier and the networking as the support technology. [7] Technical perspective defined as a tri-component include; Technologies, Functions and Knowledge. [8]The need for a model

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assessing knowledge transfer in order to leverage the knowledge sharing culture among the organizational staff with the support from the best technology for KM [9].

2.1. KM in HLI

The current state of KM implementation at (HLI) in Malaysia shows the resource of knowledge and data are not yet being fully utilized, managed and shared among the organizational members [10], with the additional issue of cultural and soul added [11] these scenario leads to the deliberation of knowledge sharing free flow in the HLI despites of the investment made on the Information and Communications Technology (ICT) facilities [12]. The lack of understanding of the core idea of KM in HLI which is not simply the issue of managing technology, but it also requires managing the social relations and interactions in the organization [13], [14]. However the need to identify the attributes for measuring the model for KM is a must before defining the component and element for KM Best Practice in HLI environment [15].

2.2. KM Best Practice

KM Best Practice means getting the right information, to the right person, at the right time and cost effective. Which also means organizing, distilling and presenting information in a timely, relevant, accurate and simple manner. The Best Practice helps to leverage both tacit and explicit knowledge in a systematic way, to enable effective decision making [16]. A well designed and implemented KM initiative can result in higher agent productivity [17]. Therefore, organization must use the right method and tools towards KM Best Practice[18]. Meanwhile Leary & Selfridge [19] suggest KM for Best Practice as a manufacturing process of re-Engineering supported by Joslin [20]. KANA [21] suggested the guidelines for KM Best Practice.

2.3. KM Best Practice in HLI

This literature will serve as the guidelines to identify and develop a new model consist of the KM Best Practice for HLI environment with the correct measurement for component effectiveness validation. In order to do so, the organization must therefore take important issue in managing KM Best Practice [22]. While [23], HLI needs good practice so that HLI can determine the growth of KM in the organization. The online learning or technology made better result better than only face to face learning [24].

3. METHODS

This Systematic Literature Review (SLR) the KM Best Practice from the existing models for HLI environment. A search strategy was used to identify published literature relevant to the potential KM Best Practice [25]. The systematic literature was organized and developed in order to filter the relevance literatures [26]. The models for KM Best Practice was listed in order to identify the Best Practice component [14]. The articles review papers from year 2006 to present day. It is acknowledge that there are other KM models which are not included in this papers due to the limitation which is stated in the limitation part.

3.1. Research Questions

The study is to answer the research questions ; 1)What are the components for KM Best Practice? and 2) How the KM Best Practice components consider as KM Best Practice?

3.2. Research Objectives

The objectives of this paper are to: 1) Identify the components of KM Best Practice for HLI environment and 2) List the KM Best Practices components from the existing models intended for possible definition in future study.

3.3. Literature Search Significance

Prerequisite to identify KM Best Practice components to be model as sole to accelerate KM growth and to ensure the fully optimization and efficiencies of KM in the organization according to a the structured compliance due to the existing KM models that claims to be the best yet doesn't integrate the full of KM component in a single model.

3.4. Search Methods

Using the key words 'Knowledge Management', 'Knowledge Management System', 'Knowledge Management Model', 'Knowledge Management Best Practice', 'Knowledge Management Best Practice Model' the KMICE database conferences was searched to trace the articles related to the study of KM for year 2008, 2010 and 2012. The Online Journal; Scopus and ScienceDi-rect, information.gate.net and Google scholar were also referred and articles were downloaded where applicable. References from the key paper were searched and filtered to distinguish model preferred regardless the KM Best Practices for HLI environment.

3.5. Sampling

The literature search gives attention to KM model for HLI, Educational Organization (EO) and Universities. However some of the literature may

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include the business organization which is relevant to the focus and sampling. The intention for the sampling are converse in the discussion.

3.6. Inclusion And Exclusion Criteria For Papers

The inclusion criteria includes: (1) Published papers on KM (education institution) focus on Knowledge (tacit and explicit), KM (Process) and KMS (Technology, functional, architecture and application), and (2) Papers tittles related to KM Models. (3) Papers on articles, social science, and information technology.

The Exclusion Criteria for papers: (1) Papers without full details reference. (2) Articles for business knowledge management.

4. SEARCH RESULTS

The inclusion criteria are summarized in Figure-1. Overview of the Systematic Literature Review for KM Best Practice.

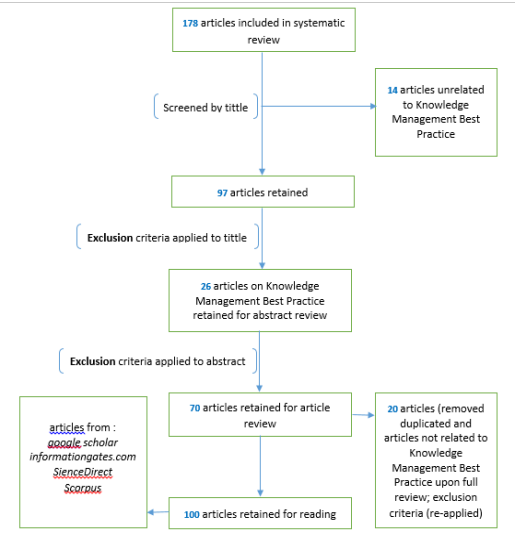

Figure-1: *Overview of the Systematic Literature Review for KM Best Practice.*

4.1. Scopus Online Journal

Search result Are summarized in *Table-1. Search result for Scopus Online Journal*

Table-1 : Search Result For Scopus Online Journal

Year Search category	KM	KM System	KM Model	KM Best Practice	KM Best Practice Model
2014	360	3	1	37	1
2013	289	26	16	209	3
2012	260	20	18	172	10
2011	290	31	15	181	4
2010	267	30	15	204	9
Total	**1466**	**110**	**65**	**803**	**27**

4.2. Science Direct Online Journal

Search result are summarized in *Table-2. ScienceDirect Online Search Result.*

Table-2. ScienceDirect Online Search Result.

Search category Year	Knowledge Management	Knowledge Management System	Knowledge Management Model	Best Practice	Best Practice Model
2014	66	90	44	3	3
2013	30	51	23	7	3
2012	38	84	52	1	7
2011	29	55	15	2	1
Total	163	280	134	13	14

The Systematic Literature found that the inclusion criteria and the exclusion criteria for the articles are essential in order to achieve the relevant information.

5. DISCUSSION

Human, [24] does have positive relationship with KM which contribute to innovation while technology and human interact through and interface to leverage knowledge transfer. Organizational culture and communication gives positive impact for KM to flourish in the organization [27], [28] according to the evolution of technology [29].

5.1. The KM Best Practice Components

The result from the SLR are being tabulated in *Table-3. KM Best Practice Components Summary Table*. Each components are being details and converse as followed.

i. Organizational Culture

Tasmin and Woods [30]defined knowledge culture in the organizations as the combination of common expectations, tacit rules, shared experience and social norms that later shape the attitude and behavior of the members in the organization to support and encourage the knowledge-sharing activities through the interaction and relationship building to overcome CKM barriers [31]. Ramachandran & Chong [32] suggested the culture in the organization must include; clan culture, hierarchy culture and market culture. Based from the SLR, KM Best Practice for Organizational Culture may consists of:

a. **Kiasu-ism** -Guan Gan [3] introduced Kiasu-sm which refer to situation when the knowledge workers in the organization feel insecure to share knowledge due to afraid of losing the exclusiveness of the ownership of the knowledge. This situation occur mostly in Asian

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b. **Truth** - Truth means knowing what really works and what doesn't [33][34].Truth is the element related to human factor that measure knowledge to be shared is truth and not to hide it can be determine from believe and morality guanine advantage. Truth is one of the cultural element that drives the cultural of the organization.

c. **Learning** - The learning culture in the organization considered critical to guarantee the core competence enhancement and sustained competitive advantage for the organization and also develop creativity and innovation, efficiency, competencies and quality performance among the team member in HLI [35]. The e-learning implementation [36] will replace the traditional learning method in the organization. Meanwhile Nasir [37] suggested the need to cater the member of the organization behavior especially for those who suffer from social interaction to gain knowledge face to face.

d. **Collaboration** – Means the degree to which people in a certain group actively assist one another in their task [38]. Collaboration involved knowledge transfer [7]. Computer-mediated collaboration uses collaboration technologies with its platform helps to create synchronous collaboration as what was said by [39].

e. **Mutual Trust** - The existence of mutual trust facilitates open, substantive and influential knowledge exchange. Guan Gan [3] suggested, mutual trust only exist in an organization when its members believe in the integrity, character and ability of each other. Aulawi & Panahi [40], [41] supported, trust and team working spirit exist among the team member of the organization will enhance respect and flourish the positive influence on the members attitudes towards Knowledge Sharing [9], [42], [43] As argued by Tasmin & Woods [30] managing knowledge are based on sharing culture that fully depend on trust and good relationships among people within an organization.

f. **Believe** - Theory of Reason Action (TRA); categorized believe into two forms that determined human intentions which is believe in the possible outcome of the behavior and in the evaluation of the outcome and believe in the normative expectation of others and the motivation to comply with those expectations [40].

Value- People with different value see different things in the same situation and organize their knowledge by their value [33].

Experience - Organization with KM strategy enable integration of the organization and manage the KM issue more effectively, therefore the need for experience member might be functional [44]. Experience also provides historical perspective

Table-3. KM Best Practice Components Summary Table

i.	ii	iii	iv	v	vi	vii
Organizational culture	**Organizational structure**	**Human Psychology**	**Infrastructure**	**Technology**	**Knowledge Process**	**Knowledge Audit**
a. Kiasu-ism b. Truth c. Learning d. Collaboration e. Mutual Trust f. Believe g. Value h. Experience i. Altruism j. Mutual-Reciprocity k. Self-Efficiency l. Complexity m. Judgement n. Enjoyment	a. Strategy b. Leadership c. Organizational Hierarchy	a. Motivation b. Incentives c. Rewards d. Awareness	a. Architecture b. Application c. Repositories d. Functionality	a. Database b. Decision Support System c. Groupware d. Intranet Webs	a. Generation b. Acquisition c. Capture d. Storage e. Dissemination f. Used/Share g. Records h. Preserve	a. Measurement b. Audit (Technical & Procedural)

from which to view and understand new situation and events [34].

i. **Altruism** - Okyere-kwakye [43], defined altruism as the psychological condition of an individual donating their knowledge within the society without seeking any returns.

j. **Mutual Reciprocity** - Okyere-kwakye [9] referred mutual reciprocity as the state of pursuing and exchange in the flair of fairness or pursuing the process of exchange in an expectance of positive outcomes.

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k. **Self-Efficiency** - Okyere-kwakye [9] defined self-efficiecy as the judgment of capability to organize certain behaviors, these can be summarized by the environment, personal, goals and the social network.

l. **Complexity** - Davernport & Prusak [33], [34] agreed, experience and ground truth are the component to deal with complexity due to the nature of knowledge rigid structure that exclude what doesn't fit. The idea of complexity are crucial for sense making in KM.

m. **Judgment** - Knowledge contain judgment that need to be analyst by human none other like data and information, the need for judgment for new situation can refine the judgment made for new information [34].

n. **Enjoyment** – The enjoyment of positive outcome is the pleasure of every member of the organization to support the altruism this component was introduced by Okyere-kwakye [9].

ii. Organizational Structure

A welled defined Organizational Structure defines how the activities in the organization will help towards the achievement of organizational aim. The structure are based on;

a. **Strategy** - Consider the fitness of organizational strategy and the KM strategy and its corporate intent [44].

b. **Leadership** -Leadership supposed to mean by the knowledge champion in that provide the sense of who is in charge, vision, purpose, ownership and motivation [45]. This critical component acted as a driver for effective KM in the organization [3][46]. Highly significant components for learning organization that drive the strategic planning of the organization added [47]. The belief of empowering employees with certain autonomy in task achievement and learning, can provide agility to the organizations knowledge culture thus support the learning organization. Meanwhile, Jahani [48] suggested leadership and rewards system as the key to knowledge sharing among the member of the organization.

c. **Organizational Hierarchy** –Managing KM Best Practice for HLI must ensure the structure of the organization beginning from the leadership to the lowest member of the organization is flexible and like a chain and must be able to react against environment sudden changes, this issue occur in the Public HLI in Malaysia [49].

iii. Human Psychology

The psychology of human also related to emotional intelligence which powering the tacit knowledge sharing through team affiliation in the organization [50] with positive attitude knowledge sharing among the member in the organization can be a success [51].

a. **Motivation** - Motivational practice in the organization means improvement of work place, work environment and the job itself [52]. This element must be link and work together with the other organizational culture's element.

b. **Incentives** - Incentives and Rewards are two distinguish component [3]. Incentives defined as the things that have the ability to incite determination or action by employees in the organization.

c. **Rewards** - Abdullah [7] suggested the rewards must be clearly define by the top management as an encouragement, motivation and to tighten the commitment of the organizational members. This element act as the strongest factors in creation of Knowledge Sharing environment in the organization because the rewards gives direct impact on the motivation of the organizational members [40]. Rewards are being categorized into two namely Extrinsic rewards are positively valued work outcomes that are given to the employee in the work setting, while the Intrinsic Rewards are positively valued work outcomes that are received by the employee directly as result of task performance [3].

d. **Awareness** - All the team members must have adequate knowledge and awareness to practice the existing technology in their education environment despites of the provided infrastructure by the HLI does support the mobile technology as the latest technology [53],[7]. But in HLI case not all members are involved or aware, no awareness on the benefit to derive from it and lack of expertise or know- how to use and handle it [54].

iv. Infrastructure

Aulawi & Govindaraju [40] defined infrastructure as the asset of the organization and act as the apparatus aiming to facilitate the creation of an environment which enables members of the organization to share their knowledge with one another intensively, infrastructure also directly link to the technology, structure and organizational culture [55].

a. **Architecture** - The architecture layers component includes; the application, technology, infrastructure and repositories to suite the collaborative HLI environment [56] [57]. A model to assist KM in Higher education is required [58] he also supported the idea of KM architecture as the component to support the KMS. The consideration for cloud might be consider the latest technology for the KM architecture in HLI environment [59].

b. **Application** - The application component refer to the functionality of Information Retrieval Engine

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that serve as an interface to diverse set of knowledge silos, and plays a central role when setting up a KM [38].The Application layer must include; Portal, EDMS, workflow and Online Analytical Processing (OLAP) Technique. The present technology that support mobile applications have to ensure the members awareness about the individual information use individually through mobile technologies [53].

c. **Repositories** – Considered as a crucial component [60], this components must be in line with the latest technology. The latest study of KM in Malaysia focus on the mobile database for future repositories and should be able to cater the present records. For future placement and technologies for repositories, Intranet can be replace with Private Cloud, Internet, can be replace with Public Cloud and Extranet can be replaced with Hybrid Cloud [59]. Knowledge codification acts as a bridge for representing information and tacit knowledge of organizational routines explicitly allows the building of repositories [61].

d. **Functionality** – Abdullah [56] suggested functionality as the backbone for KMS the functionality referring to the technology with more than one features which implies as a better functionality.

v. Technology

IT has become a link that connects people together but now IT not only connecting people, technology must also have a positive relationship with KM process directly [62] [63]. Technology in the organization means the used of IT-Based KMS such as e-mail [64]. The introduction to mobile technology at present in HLI must be fully alert by the team members, the staff and the top management of HLI to ensure the facilities are up to date [65]. The IT literacy that is; knowing how to use the appropriate technology to deal with KM process and turn it into digestible and shareable knowledge among the team member does require some updated skills and competencies among the team members [60]. Abdullah [56] grouped the CKM technology channel into four types namely;

a.**Database** –Include the Data were-house component contain; data source, extract transform load (ETL) process, Data Ware house structure and Data Were-house Application [66]. The possible data mining technology for Knowledge Discovery in Database (KDD) must be position well in the data were house that relate to human mind and also the data mining search which is crucial in retrieving the data from the were-house [67].

b.**Decision Support System** –Helps the management for better judgment and data analysis by computer in the organization. The system acts as KM enablers in the organization.

c.**Groupware** – The groupware such as Lotus Notes was used to helps members in the organization to share their knowledge and this collaborative software must be able to tackle the collaboration environment in HLI.

d.**Intranet Webs** – Mingles the internal organizational webs, this networks helps the internal collaborative environment in the organization.

vi. Knowledge Process

Knowledge Process practices three main process known as the creation, storage and distribution of knowledge which is the core activity of HLI. The Knowledge process does impact the knowledge performance [68]. The SLR returns more than three KM process as converse in this part.

a. **Generation** - Che Rusuli [2] reported, HLI have excelled at creating scholarly information and intelligence from the data, yet they have tended not to create knowledge from intelligence, in addition HLI have done little to use organizational information to create knowledge which can be used to improve the functionality of HLI process which is not only making knowledge as the collection in the house but the information itself must be able to produce the right amount of information at the right time. He added, the process of dynamic knowledge creation occurs during socialization when internal (tacit) knowledge is made external (explicit).

b. **Acquisition** - Che Rusuli [2] documented, HLI have a restricted limited funding, technology, staff and space towards presenting the corporate acquisition in order to provide continuous education and staff training to all staff members even though it is acknowledged the HLI is the starting point of knowledge acquisition [60]. While Abdullah [7] defined knowledge codification or coordination as the steps required to place in the organizational knowledge into a form that makes it accessible to others who may need it.

c. **Capture** - Che Rusuli [2]recorded HLI could play a major part in the knowledge capture processes, because the member of the organization have the capabilities to organize and manage the knowledge and making it as the central of the knowledge and provide a storage from lost.

d. **Storage** - Storage can be refer to the organizational memory of skills and experience [69] and the storage doesn't only mean the computerized technology equipped component. Storage also represent the learned way of thinking and behavior of the members in the organization.

e. **Dissemination** - Rajalakshmi & Wahidabanu [6] defined codification as the process to convert tacit

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knowledge to explicit knowledge in a useable form for the organizational members. The converted explicit knowledge is organized, categorized, indexed and access by the network community later on, this process help the organization to build the base of the repositories.

f. **Used/Sharing** - Che Rusuli [2]stressed on the impotency of knowledge sharing which provide a link between the individual and the organization by moving knowledge resides in the individuals to the organizational level, where it is converted into economic and competitive value for the organization. Based on social exchange theory the factors that impel individual to share knowledge among them in the organization are crucial [9]

g. **Records** - Che Rusuli [14]suggested the importance of being able to develop and design the knowledge of how to records, due to the lack of recording skill among the member of an organization. In addition the process of recording will help the organization to learn by their past process which was good and need for improvement. However, not all knowledge can be recorded and codified as information, therefore the unrecorded knowledge are still unknown. Recorded HLI doesn't only dealing with records and action but it also involved the knowledge processes and information. Dhillon [70] argued the nature of records are merely in the mind of individual member of the organization and it needed a platform to convey the information internally and externally.

h. **Preserve** - Che Rusuli [1] introduced the knowledge preservation acted as the key material of the organization. This process should be considered as organizational innovation and evolving process in HLI to avoid brain drain in the organization stated [67]. Meanwhile, Ismail [62] suggested, for HLI preservation programs the management must take into consideration.

vii. Knowledge Audit

The audit components from the SLR consist of the measurement and the audit itself. This component acts as the key indicator of the effectiveness of KM practices in the organization. The components measure the compliance of both hard and soft aspects to meet certain requirement as pre-determined by the organization

a. **Measurement** - Tasmin & Woods [31] reported, measurement is the critical aspect of any KM effort to strike the right balance between organizational and technological changes in the organization. KM contribution measurement model was suggested by [15]. Therefore HLI must be competent enough to serve KM Best Practice [60].

b. **Audit** - Audit was suggested as the KM Best Practice to ensure and maintain KM performance according to the organizational specification.

As part of the result for the SLR, it can be concluded, KM is a popular management tools that integrate fragmented knowledge reside in the organization. Through such integration, the benefits of the organization can be distributed among the members or even the society. The need to respond to the mutable environment in order to better serve the needs of entire HLI. KM Best Practice means the compliant of KM to be competence.The results for KM Process Best Practice components returns the lowest number for Store and Dissemination, and the highest was Capture, it shows the unbalanced process in the organization. The lack of intention given to the Storage component might end up with a big surplus to fill in.

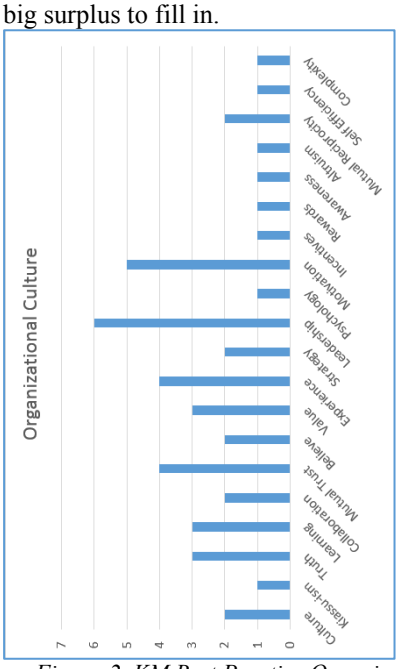

Figure-2. KM Best Practice Organizational Culture Component

The analysis graph above concluded from the SLR shows the highest number for leadership as a must have for KM Best Practice component. While the components such as Kiasu-ism, Psychology, Rewards, Awareness, Altruism, Self-Efficiency and Complexity returned the lowest number, this is due to the nature of newly introduced components. The results however still need for a clear definition and measurement for future works. The verification for component effectiveness will be done in the future works.

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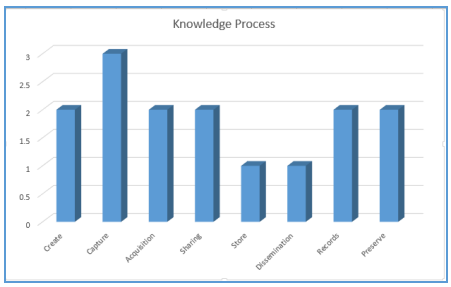

Figure-3. KM Best Practice Process Components

Because knowledge is growing and the past data and information must be store and being able to access at any time, there are more and more. This part of SLR result will be used in the future study to clearly define KM Best Practice.

6. CONCLUSION

The literature evidenced the lack of focused on the overall components of KM practices, 100% of the previous studies shows the lack of associating the KM component into an integrated model and not fully determined to be the best model to serve as the Best Practice. Therefore the need for component effectiveness verification to make the KM Best Practice component to be recognize as the Best Practice is a must. This SLR answered both research questions and the KM Best Practice components will be referring in the future study to verify the effectiveness of the components to be the best practice for KM.

7. LIMITATION

The literature serves KM Best Practice in the HLI environment, some of the business oriented KM literature are literary used as the additional source of references. The literature care on KM Best Practice in Eastern Country due to the distinguish culture presented compare to the West culture that reflects the organizational culture [71].

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