

Development of Digital Repository system for Knowledge Management by Using Collective Intelligence and Big data for SMEs

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Abstract: The purposes of the research were 1) to design a framework for a Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs. And 2) to evaluate the appropriateness of the framework by experts. The 10 individuals chosen were experts in the field of Information Technology by purposive sampling. The data collection tools were the system and the assessment of an appropriate model using a 5-level rating scale. The statistics used in the data analysis were means and standard deviation. The results showed that 1) The framework for a Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs consisted of 3 components as followed: a) Knowledge Management, b) Cloud Knowledge Management System, and c) User Interface 2) the expert opinions were that it was absolutely appropriate in overall.

Key words: Digital repository, knowledge management, collective intelligence, big data, SMEs.

1. Introduction

The present world into economic and social system that the digital era, digital technology will not only support tools to work like in the past [1], but is integrated into the lifestyle of our daily and will change the structure, format, all economic activity in the code[2]. Processes in production, trade, service, and other social processes, including interactions between individuals. Country Thailand must accelerate the digital technology is used as an important tool in driving the country's development context Thailand country then [3]. Digital technology can respond to the problems facing the country, challenges or opportunities, economic and social development. [4]

The SMEs are crucial to the economic development of the country especially. It is a business that creates value for the economy [5]. Both in terms of job creation. Value added And revenue generation In various roles both as a producer. Distributors and service providers is the SMEs that do well in the creation and facilitate economic transactions [6]. During the past decade, the lack of development of SMEs in the competition, whether it is in terms of turnover, the market capitalization of product development management systems [7]. And developing personnel skills Especially during the economic crisis facing the country, resulting in many SMEs have shut down [8] and the current environment of business has changed dramatically. If adaptation is not to make a competitive disadvantage. It is impossible to survive until

government's policy and stimulus measures. To salvage the economic crisis, several measures. One of the measures, and it is. Promoting SMEs has been so important as entrepreneurs, small and medium-sized enterprises [9]. And is the largest power of the business sector's role in the reconstruction and development of the national economy stronger again.

Knowledge management is important for the business sector need the insights and new approaches to the survival of the sector [10]. Research to develop ideas about the role of knowledge as a key driver for the operation and growth in this perspective [11], the interesting development is the concept of "knowledge" and "entrepreneur", which combines the two. this is a significant driver in the race for today's enterprises the ability to create and exploit knowledge resources. The ability to implement an effective and entrepreneurship by seeking new ways of doing things and create new opportunities for evaluation and use in context [12].

The goal of knowledge management in recent years is the ability to integrate data from multiple views to provide the insight needed to make the right decision. The organization has not decided just by considering factors such as income, salary or interest rates for commercial loans. An overview is what will drive the decision. As to investment in R & D much or to expand to new markets, however, [13].

Thus, analyzing the data into knowledge, the organization can be leverage business decisions and strategies in the right direction, effectively and timely. It is a new challenge in the world of knowledge management today. And a challenge for knowledge management. Organizations in our country as.

In this paper, we propose a framework for a Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs and To serve as a tool to support learning for those of SMEs or Startup to engage in successful businesses effectively.

2. Purpose or the Research

The purposes of the research are:

- 1) To design a Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs
- 2) To evaluate a Digital Repository system for Knowledge management by Using Collective Intelligence and Big data for SMEs

3. Scope of the research

- 1) Population

Population is the experts in the field of digital repository, knowledge management, collective intelligence, and big data.

- 2) Sample Groups

Samples are 10 experts in the field of digital repository, knowledge management, collective intelligence, and big data chosen by purposive sampling. They are highly-experienced experts in these fields for at least 5 years.

- 3) Variables of the research

Independent variable is the digital repository for knowledge management By using collective intelligence and big data for SMEs

Dependent variable is the appropriateness of the digital repository for knowledge management by using collective intelligence and big data for SMEs.

4. Research Framework



Fig. 1. The research framework of digital repository system for knowledge management by using collective intelligence and big data for SMEs (DRS-KMSMEs).

5. Methodology

The framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs can be divided into two phases:

- 1) Design the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs.
 - a) Design the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs.
 - b) Propose the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs to the advisor for further examination and revision and
 - c) Create an instrument for assessing the appropriateness of the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs.
- 2) Assessment of the appropriateness of the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs as the following:-
 - a) Propose the designed the framework for a digital repository system for knowledge management by using collective intelligence and big data for SMEs. to the 5 experts for assessing the appropriateness and
 - b) Analyze the output data by using appropriateness measurement scale based on 5-point Likert Scale as well as means statistics
 - 1.00-1.49 means the assessment topic is absolutely inappropriate
 - 1.50-2.49 means the assessment topic is inappropriate
 - 2.50-3.49 means the assessment topic is neutral
 - 3.50-4.49 means the assessment topic is appropriate
 - 4.50-5.00 means the assessment topic is absolutely appropriate

6. Result

Stage 1 The Framework of Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs (DRS-KMSMEs) is composed of 3 key components which are [5], [13]–[18]:

The architecture of the data warehouse system digital for knowledge management using wisdom and total big data for entrepreneurs SMEs a framework consists of 3 including parts of the 1 knowledge

management (Knowledge Management) Part 2 knowledge management system on the cloud (Cloud Knowledge Management System) and the 3 user interface (User Interface) can explain the details are as follows.

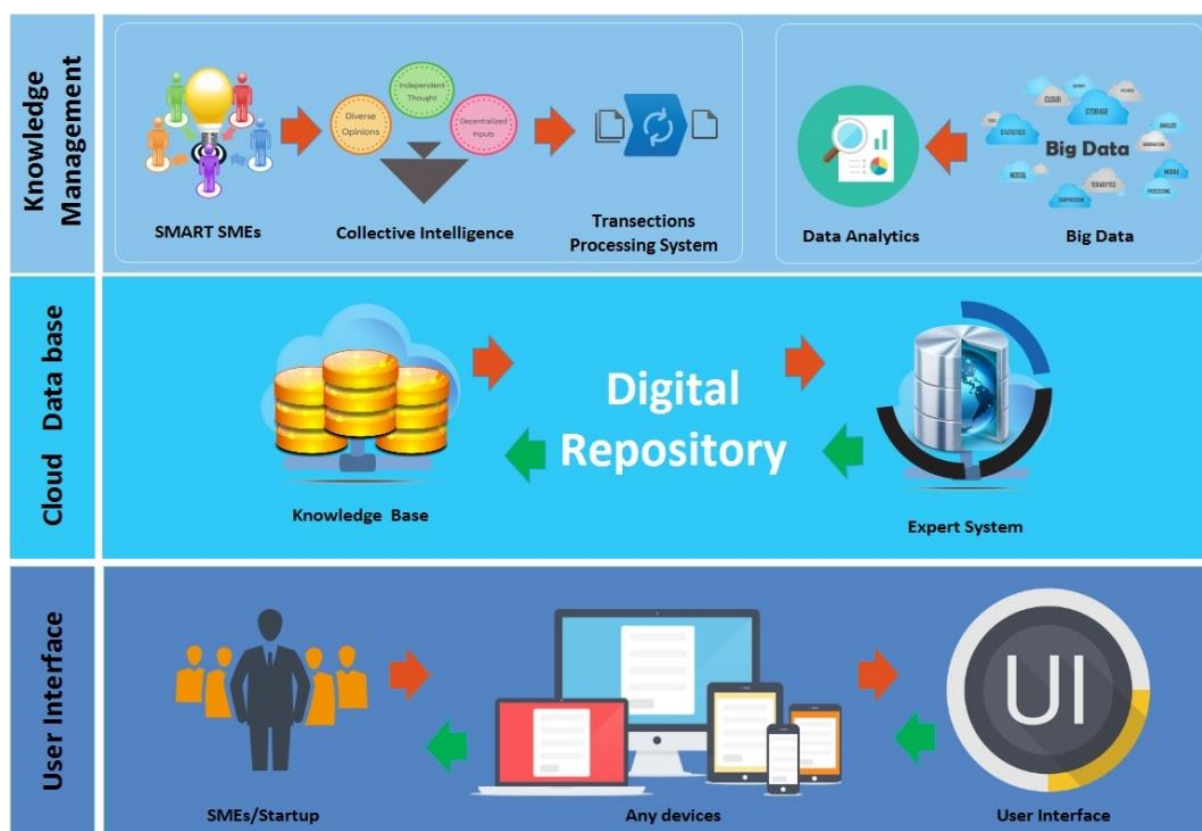


Fig. 2. The framework of digital repository system for knowledge management by using collective intelligence and big data for SMEs (DRS-KMSMEs).

Part 1 Knowledge Management

The extracted knowledge in the field of business, such as finance, marketing and manufacturing. Technical or business knowledge extraction, which is sourced from two different sources.

- 1) Knowledge Management The collective intelligence (Collective intelligence) is selected SMEs to master to be successful. Taken a lesson from the experience. Through the process of collective intelligence And data processing systems, Electronic Data Processing is used to manage the basic information.
- 2) Knowledge Management Using Big Data is a data analytics that relate to the business. From various sources on the Internet.

When the two sources of knowledge processing (Processing) already. Knowledge will not go. Keep a database of knowledge (knowledge Base).

Part 2 Cloud Knowledge Management System

Consists of 2 parts: Expert system and knowledge Base, which processed on Cloud Computing.

- 1) Expert system, users get the convenience. In the question and answer. What to ask a virtual one, talk to the experts really.
- 2) knowledge Base serves as a Center for collecting information and knowledge which will allow search and access facilities.

Cloud Computing is to share resources through access to the Internet. Open permissions Users from

around the world can gain access to resources such as software, hardware,

Part 3 User Interface

Consists of three parts: the SME owner or operator new (Startup) electronics (Any Device) and user interface (User Interface)

- 1) SME or Startup to make entries or keywords to search through the system (a Web for application)
- 2) Electronic equipment (Any device) whether it is a smart phone, PC or portable computer. You can access the system (Web Application)
- 3) User Interface is the interface between the user and the system (Web Application) to provide information.

Stage 2 The result of appropriateness measurement of the framework of Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs

Table 1. The Assessment Result of Framework of Digital Repository System

Assessment Topics	\bar{X}	S.D.	Assessment Result
1. The framework of digital repository system	4.63	.31	absolutely appropriate
1.1 Knowledge Management	4.60	.30	absolutely appropriate
1.1.1 Knowledge Management by using collective intelligence	4.40	.49	appropriate
1.1.2 Knowledge Management by using big data	4.80	.40	absolutely appropriate
1.2 Cloud Knowledge Management System	4.75	.34	absolutely appropriate
1.2.1 Expert system	4.90	.30	absolutely appropriate
1.2.2 knowledge Base	4.60	.59	absolutely appropriate
1.3 User Interface	4.53	.42	absolutely appropriate
1.3.1 SME/ Startup	4.50	.67	absolutely appropriate
1.3.2 Device Tools (smart phone, tablet, PC, etc.)	4.90	.30	absolutely appropriate
1.3.3 User Interface	4.20	.87	appropriate
2. Workflow of digital repository system for knowledge management.	4.70	.46	absolutely appropriate
3. Technologies used in the development of the system (Web Application/Expert system/Big data/KMS)	4.90	.30	absolutely appropriate
4. Appropriate use a framework of digital repository system for knowledge management.	4.70	.46	absolutely appropriate
Total	4.66	.28	absolutely appropriate

Following Table 1, the framework of Digital Repository system for Knowledge management By Using Collective Intelligence and Big data for SMEs is rated as absolutely appropriate in overall (\bar{X} =4.66, S.D.=0.28) When considering each component, it found out that technologies used in the development of the system (Web Application/Expert system/Big data/KMS) is rate as the most absolutely appropriate (\bar{X} =4.90, S.D.=0.30), followed by :1) Workflow of digital repository system for knowledge management and Appropriate use a framework of digital repository system for knowledge management.

These are rate as absolutely appropriate (\bar{X} =4.70, S.D.=0.28).These are followed by the framework of digital repository system which is consisted of 3 components (1.1 Knowledge Management, 1.2 cloud Knowledge management system, and user Interface. These are rate as absolutely appropriate (\bar{X} =4.63, S.D.=0.31)

7. Conclusion

According to evaluation by the experts, it is found that the development of the framework of digital repository system for knowledge management by using collective Intelligence and big data for SMEs. This is in complaint with Rene Lopez Flores [19] who found that framework proposes the implementation of techniques from the collective intelligence research field in combination with the systematic methods provided by TRIZ theory. Both approaches are centered in the human aspect of the innovation process, and

are complementary while collective intelligence focuses on the intelligence or behavior that emerges in collaborative work, the TRIZ theory is centered in the individual's capacity to solve problems.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Thanapol Namnual studied literature review, designed system, collected data and wrote paper. Panita Wannapiroon analyzed the data and had approved the final version.

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