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Determining the Implementation of Knowledge Management for Decision Making and Products Improvement: The Case of Arjo-Didessa Sugar Factory, Ethiopia

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Abstract:

Nowadays, knowledge is increasingly being considered as the main driver of the economy. The success of economies in the future shall thus be based on how organizations create, acquire, use, and leverage knowledge effectively and consequently improve their products by making an informed decision. The main aim of this research is to assess the knowledge management implementation for decision making and product improvement in Arjo-Didessa sugar factory, Ethiopia. As to the methodology, both quantitative and qualitative research designs were used to conduct the study. For the quantitative method questionnaire was employed and the questionnaire were close-ended whereas, for the qualitative method, semi-structured personal interview was done with the top managements of the sugar factory by focusing on knowledge management implementation for decision making and product improvement. Regarding the barriers in the factory, the finding of the study revealed that poor sharing of knowledge was found to be the top problem (37.6%) facing the factory in implementing knowledge management followed by lack of information (34.8%) and loss of critical information/knowledge (27.6). Of the study participants, 33.8% revealed that the significance of knowledge management are improving the quality of the product and

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better decision making while 23.8% of the respondents said that it can be significant to the competitive advantage of the sugar factory. The inferential statistics also revealed that the relationship between knowledge management and product improvement/decision making is statistically significant, p<0.001. The general manager of the sugar factory said that knowledge management is a new initiative and currently the sugar corporation has prepared the manual for open discussion with all stakeholders including every employee in the Factory. The manager also strengthens this by saying: "If knowledge management is fully implemented within the organization, it enhances the decision making at all level and improves competitive advantages of the organization". Based on the findings, it can be concluded that knowledge management is a paramount for improving competitive advantage, better decision making and improving quality of the products and thus it is highly recommended that the sugar factory considers implementing knowledge management as soon as possible.

Key words: Knowledge, Knowledge Management, product improvement, knowledge sharing, decision making, sugar factory

1. INTRODUCTION

Knowledge has been identified as one of the most important resources that contributes to the competitive advantage of an organization. (Applegate *et. al*, 1996). Since the beginning of 1990's, many organizations are moving towards the implementation of knowledge management to achieve the competitive advantage among their competitors. Alvin Toffler (1990) said, we are living in a knowledge-based society, where knowledge is the source of the highest power. In a world where markets, products, technology, competitors, regulations and even societies change rapidly, continuous innovation and the knowledge that enables such innovation have evidently become important sources of sustainable competitive advantage. Many scholars consider that the most important source of a given

organization's sustainable competitive advantage is the ability to create and utilize knowledge (Grant, 1996; Henderson and Cockburn, 1994; Nonaka, 1991 and 1994; Nonaka and Takeuchi, 1995; Sveiby, 1997; Winter, 1987, Omotayo, 2015).

It is commonly said that knowledge is power. In organizations, this expression has become even more relevant than other social settings. Knowledge is a major factor that differentiates successful organizations from the unsuccessful ones be it in businesses, not-for-profits or public enterprises. In today's organizational setting, the importance of knowledge management, as well as intellectual capital are strongly emerging themes (Chase, 1997). Many authors opined that the emerging patterns are that intellectual capital will replace natural resources, commodities, finance, technology and production processes as the key factor influencing competitive advantage (Quinn *et al.*, 1996; Martinez, 1998; Numri, 1998; Albert and Bradley, 1997). This is because, with the exception of intellectual capital, everything else, such as IT, materials, and technical information are available to everyone on similar terms. Yet other researchers argued that the management of knowledge is recognized as a strategic value of organizations' stocks of knowledge in different contexts (Sanchez and Heene, 1997). As its core, knowledge management is about recognizing the characteristics of the knowledge owned by the organization itself, recognizing the process through which knowledge is converted into goods and services, and adapting management practices. In other words, knowledge management focuses on an enterprise's ability to create, transfer and reuse the knowledge.

The key question is how can we generate knowledge, capture the raw materials of knowledge, like data, information, and experience from those who possess them. If we could get these ingredients, how can we transform them into knowledge to increase the quality of decision making? Nowadays, big

companies turned to knowledge management and they are using knowledge management systems of integrated databases. These systems enable different departments or units of the company to tap the wealth of knowledge assembled from different sources. Mostly, managers are eager to obtain more and more information, which can help for better decision making. Thus, knowledge management systems allow managers to navigate and make sense of the connections easily. At the present, many companies have to face high competition. Some struggle to implement corporate strategies to response to existing markets. To gain high benefit, these companies use knowledge management to compete with other companies. Knowledge management is very important for all kinds of business because it can help the companies improve their service, increase the quality of the products, reduce cost and faster response to their customers. However, the major challenge of managing knowledge in the companies is capturing and integrating knowledge to share among all organizational members (Grant, 1996). The successful company has to gain the ability to collect, store, and distribute specialized knowledge to create and sustain competitive advantage (Davenport and Prusak, 1998; Grant 1996).

As markets and organizations become more global, the traditional knowledge creation and transfer such as face-to-face contact, job rotation, and staff training program may prove to be too slow and less effective (Alavi and Leidner, 2001). Knowledge management has been used in most product-based companies and it has also extended to use in the service sector. However, there are not many studies looking closely to explain the situation in the service industry while service sector is continuously growing. Knowledge sharing, *i.e.,* the exchange of experience, events, thought or understanding on anything with an expectation to gain more insights and understanding about something is one of the components and very important aspect

of knowledge management. Knowledge sharing can be seen as communication of all types of knowledge, which includes explicit knowledge information, the "know-how' and "know-who' (Hawamdeh, 2003). Knowledge-sharing takes place between at least two parties called actors (Lee and Hawamdeh, 2002) and cannot exist outside of the human brain (Beveren, 2002).

Some organizations attain competitive advantages by encouraging and promoting knowledge sharing (Liebowitz, 2001). Thus, knowledge sharing is important to organizational success which should thus be implemented in profit making organizations such as sugar factories. Such organizations need to share knowledge held by employees if they are to gain the most from their intellectual capital and compete effectively in the global marketplace (Swart and Kinnie, 2003). A number of studies (Petrash, 1996; Gupta and Govindarajan, 2000) indicate that implementing knowledge sharing results in improved organizational effectiveness, such as product improvement. Therefore, it is vital to understand the situation and how the service sector develops knowledge management strategy. Knowledge management can play an important role to make companies compete productively. Arjo-Didessa sugar factory is a recently established sugar factory and obviously, there are a number of challenges to improve its products. The implementation of knowledge management for the purpose of informed decision making is a key in successful firms and thus the main objective of the present study is to determine knowledge management implementation for decision making and products improvement in Arjo-Didessa sugar factory, Ethiopia, which as a consequence can enhance competitive advantages.

2. METHODOLOGY

Study area

The study was conducted in East Wollega Zone, Jimma Arjo District, which is situated 18km away from Arjo town. Arjo-Dedessa Sugar Factory is located in the rift valley of Dedessa in the Oromia Regional State. It was established in 2009 and was previously owned by Al-Habesha Plc, a Pakistani company. It is located at 395 kilometers distance in the Addis Ababa – Nekemte-Bedelle -Jima route or at 540 kilometers distance in the Addis Ababa –Jimma –Bedelle-Nekemte route from the capital city. The total concession area of the factory is about 50 thousand hectares. The factory is situated at of 1350 meters above sea level and has a hot climate. The average annual rainfall is 1400 mill liters. The rain extends from May to October.

Currently, about 2729 hectares are planted and covered by sugar cane plantation. In addition to sugar, the factory can have the capacity to produce products like ethanol by using sugar by-products. After satisfying its self-electrical power need. The factory also exports electrical power for the national grid. Moreover, the factory has also the opportunity to carry out animal fattening by using by-products.

Research Design

To conduct this research, Cross-sectional research survey method was applied in the study because of a survey is normally conducted to determine the present status of a given phenomenon and we used both quantitative and qualitative methods.

Population of the study

The target population of the study was the employees in Arjo-Didessa Sugar Factory, in order to get detail and relevant

information about the current knowledge management implementation. Arjo-Didessa Sugar factory has a total of 800 employees with different educational status and thus considered as population of this study.

Sampling techniques and sample size determinations

Sampling techniques

There are two types of sampling techniques, namely probability sampling techniques and non-probability sampling techniques. From probability techniques simple random sampling technique method was used to determine sample size from the employees, whereas the top manager was taken purposively for the interview. Therefore, in order to select the representative respondents from the target population the researchers used simple random sampling as well as purposive sampling techniques. Even though there are many methods of simple random sampling, the researchers used lottery method.

Sample size determination formula

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \text{ Where } n_0 = \frac{Z^2_{\alpha/2} pq}{d^2}$$ ***(Kothar, 2004).***

n = sample size
d= margin of error
N = total number of employees
p= proportion of population
α= level of significance
q = 1-p
Where: d = 0.05
p = 0.5.
α=0.05

$$n_0 = \frac{(1.96)^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

Considering the population correction factor into account the sample size should be:

$$n = \frac{384}{1 + \frac{384}{800}} = 259 \text{ (sample size).}$$

Thus, the total of 258 questionnaires was distributed and one respondent, namely the general manager was purposively selected for the interview.

Methods of Data Collection

The data was collected from primary source by using structured questionnaire and semi-structure interview to fulfill the objectives of the study.

Method of Data Analysis

After the distributed questionnaires were collected, the data have been encoded to MS-Excel for data classification and organization and set to validate the data for further analysis. After data classification and organization, the data was transferred to the SPSS version 20 and statistical analysis was performed.

3. RESULTS

The researcher selected 258 employees by using simple random sampling technique. Among these respondents, 210 responded yielding a response rate of 81.4%. Besides acquiring responses through questionnaires, the interview was conducted with top management of the factory with regard to the knowledge

management implementation and its effect on decision making and product improvement.

3.1. Demographic Characteristics of Respondents

The table below presents the demographic characteristics of the study participants.

Table1: Demographic characteristics of respondents

No	Variable	Characteristics	Count	Percentage
1	Gender	Female	61	29.0
		Male	149	71.0
		Total	**210**	**100**
2	Age	18-30	128	61.0
		31-40	73	34.8
		41-50	4	1.8
		50 and above	5	2.4
		Total	**210**	**100**
3	Education	Certificate	3	1.4
		Diploma	52	24.7
		Degree	153	72.9
		Masters	2	1.0
		Total	**210**	**100**
4	Service year	Less than 2	66	31.4
		3-5	141	67.2
		More than 5	3	1.4
		Total	**210**	**100**

As shown in the above table, the majority of the respondents were male (71%) while the remaining (29%) were female respondents. Among the total respondents of this study, 128 (61%) were with the age range of 18-30 followed by respondents in the range of 31-40 with 34.8% while the remaining above 40 years of age collectively amounts to 9(4%).

Most of the respondents are BA/BSc degree holders (72.9%) followed by Diploma holder with 24.7% while only 1% of respondents are master holders. In addition, the above table revealed that 67.2% served the factory between 3 and 5 years while 31.4% of respondents indicated that they served the in the factory less than two years (Table 1).

3.2. The Current Status of knowledge management and Implementation in Arjo-Didessa Sugar Factory

The first objective of this study was to determine the current status of Knowledge Management implementation in Arjo-Dedeissa sugar factory. The finding is presented in table 2 below.

Table 2: The current status of knowledge management and implementation in the sugar factory

Item	Variable(s)	Count	Percentage
1. What do you think of knowledge management?	Never heard of it	16	7.6
	Doing in different name	30	14.3
	Management theory	25	11.9
	Strategic part	23	11.0
	Beneficial to factory	47	22.4
	Except for option one	69	32.8
	Other	-	-
	Total	**210**	**100**
2. What is the current stage of knowledge management in the factory?	Not at all exists	35	16.7
	Growing	128	61.0
	Introduction	38	18.1
	Growth	9	4.3
	Other	-	-
	Total	**210**	**100**
3. Does your organization recognize knowledge as part of their asset?	Yes	169	80.5
	No	21	10.0
	Can't Say	20	9.5
	Total	**210**	**100**
4. Which of the following best describes your organization?	R and D	52	24.8
	Every one's job	103	49.0
	Top mgmt.	55	26.2
	Total	**210**	**100**

To achieve the first objective of this study, respondents were asked four relevant questions. With regard to their knowledge of knowledge management, the majority of respondents (32.8%) indicated that they heard about knowledge management in general as management theory, a strategic partner of the

organization and something that benefits organizations. The remaining respondents said that they heard knowledge management as only management theory, a strategic partner of the organization, something being used but with different naming and something that benefits organizations with 11.9%, 11%, 14.3%, and 22.4% of response, respectively. In contrary to this response, only 7.6% of the respondents indicated that they never heard of knowledge management. As shown in item number two in table 2 above, the majority of the respondents (61%) revealed that the current status of knowledge management implementation is growing through time while 18.1% and 4.3% of the respondents said that it is at initial stage and growth stages, respectively. As opposed to this response, only 16.1% of them indicated that the practice of knowledge management never exists in the factory.

3.3. Implementation of knowledge management in Arjo-Didessa Sugar Factory for informed decision making and products improvement

The second objective of this study was to determine the contribution of implementing knowledge management in decision making for products improvement in the sugar factory. The tables below present the findings.

Table 3: The role of knowledge management in the sugar factory

Item	Variable(s)	Count	Percentage
5. How significant is the role of knowledge management?	Improving competitive advantage	50	23.8
	Better decision making	71	33.8
	Improving quality of products	71	33.8
	All	18	8.6
	Total	**210**	**100**

As shown in the above table, equal percentage of respondents, (33.8%) each revealed that the significance of knowledge management as improving the quality of product and better

decision making while 23.8% of the respondents said that it can be significant to the competitive advantage of the factory. But only 8.6% of the respondents indicated that knowledge management can be significant for all the three cases. Moreover, inferential statistics was used to examine the effect of knowledge management on product improvement and decision making in Arjo-Dedessa Sugar Factory. The table 4 below shows the result of the analysis.

Table 4: The relationship between knowledge management and product improvement/decision making

Variables	Mean	SD	Df	R^2	F	B	Sig.
KMI	3.11	.82	1,	.258	68.68	.51	.000
PI/DM	3.83	1.01	198				

Significance level: *p<0.05, 2 tailed
KMI-knowledge management implementation
PI/DM-Product improvement/Decision making

Regression analysis was conducted to see the relationship between knowledge management and product improvement/decision making in Arjo-Dedessa Sugar Factory. The Analysis of table above shows that the coefficient of determinant or the percentage variation in the dependent variable being explained by the change in the independent variable "R" square value is equal to 0.258 that is, 25.8% of the total variation in product improvement/decision making is explained predictor variable-knowledge management implementation. Beta value, in the above table, also revealed that the predictor variable (knowledge management implementation) has a statistically significant relationship with Product improvement/decision making.

Qualitative Results

As stated earlier, this study also used interview as a means of data collection. For this purpose, semi structured interview was

conducted with the general manager of the sugar factory. The summary of the result from the interview is presented as follows.

1. What is the current status of knowledge management implementation in Arjo-Dedessa Sugar Factory?

The general manager of the factory responded to the above question by saying: "Knowledge management is a new initiative and currently the sugar corporation has prepared the manual for open discussion with all stakeholders including every employee in the Factory". He also added that after the discussion and feedback the manual was forwarded to Consultant Company called DELOITTEE for better improvement. In addition, the respondent indicated that "the management team accepted the importance of knowledge management to be implemented in the factory on the meeting held at Adama city in November 2016 and reached an agreement with the stakeholders".

2. What is the role of knowledge management implementation in decision making for competitiveness advantage of improved product?

The general manager of the sugar factory reflected his idea towards the role of knowledge management in decision making for competitiveness advantage as follows: "First of all to be successful the structure of the organization matters as well trained and knowledgeable man power is needed. As a consequence, if knowledge management is fully implemented within the organization, it enhances the decision making at all level and as a consequence improves competitive advantages of the organization by improving the quality of our products. There will be change management across the organization, the company will have gained great impact on international market too".

3. What are the current key problems and barrier that affect the knowledge management implementation within Arjo-Didessa Sugar Factory?

According to the interview held with the manager of the Arjo-Didessa Sugar Factory on the assessment of knowledge management implementation for decision making and products improvement, forwarding his idea by suggesting some of the key challenges that affect knowledge management implementation as follows:

- Lack of awareness among staff about knowledge management (less attention to knowledge management implementation)
- Technical know-how of managing knowledge with the help of technology
- Staff turnover and dependency
- Unable to identify where there is knowledge
- Knowledge management department is not yet in place. Knowledge is not well organized and thus difficult to transfer and share among the staff
- Limited access to infrastructures and resistance to change

4. What is the importance of knowledge management implementation in sugar industries?

The top manager, when responding to this question said: "Knowledge management is the heart of any organization whether profitable or non-profitable as to bring the necessary output for decision making and quality production. Hence, our factory accepted the importance of knowledge management implementation for better organizational performance and for the improvement of our products.

5. Is there good trend of knowledge sharing and knowledge transfer in Arjo-Didessa Sugar Factory?

The general manager said: "There is a culture of knowledge sharing among Pakistanis and Ethiopian employees starting from machinery operation till sugar production process. However, it is poorly practiced when it comes to all levels mainly due to lack of a structured way of doing so. The factory transfers the highly qualified experts from other industry to fill the skill gap, conducting different experience sharing tours, requesting the universities to provide short term training.

DISCUSSION

The current status of knowledge management implementation in Arjo-Didessa Sugar Factory seems encouraging because the majority of the participants of the study (61%) revealed that the current status of knowledge management implementation is growing through time while 18.1% and 4.3% of the respondents said that it is at initial stage and growth stages, respectively. As to the implementation of knowledge management to make an informed decision, an equal percentage of respondents, 33.8% each revealed that the significance of knowledge management as improving the quality of the product and better decision making while 23.8% of the respondents said that it can be significant to the competitive advantage of the factory. Only 8.6% of the respondents said that knowledge management can be significant for all the three cases.

According to Litvaj, and Stancekova (2015), decision-making is a very important complex process consisting of specifically determined steps and activities. Decision-making process is one of the most important activities of managers in companies and thus considered to be the core of management. For decision-making based on knowledge, it is necessary to take into account matters related to the company management, i.e. employees, processes, equipment, regular identification and update of critical knowledge of the firm, continuous conduction

of critical knowledge areas analyses and most importantly monitoring and development of knowledge assets and their contents. Decision-making as the managing process, in the present situations full of uncertainty, put a lot of pressure on top management and their abilities. Therefore, the top management has to innovate the management, managerial systems in the company (Carnicky and Mesaross, (2006); Riplova, and Hrubizna, (2008); Litvaj, and Stancekova). Our finding also calls for the implementation of knowledge management in order to make an informed decision making, which as a consequence improves the products of the sugar factory. In general, the knowledge management needs to be positively and efficiently used in the decision-making process with the goal to improve product quality and take a competitive advantage.

Poor sharing of knowledge, lack of information and loss of critical information/knowledge are among the barriers that the sugar factory is currently facing due to the fact that knowledge management implementation is yet at an infant stage in Ethiopia. Similar findings were reported in another research in Ethiopia (Chala *et al.*, 2016) whereby knowledge sharing, one of the very vital component of knowledge management is a problem which needs to be tackled in order to benefit from implementing knowledge management.

CONCLUSION AND RECOMMENDATIONS

The drive towards the implementation of knowledge management in organizations has been increasing due to changes in business structures, increases in competition, changes in how customers choose to interact, and the reliability of technology in day-to-day processes. Generally, it can be concluded that there are various problems in the implementation knowledge management in Arjo-Dedessa Sugar

factory, among others, poor sharing of knowledge, lack of information and loss of critical information/knowledge. However, the initiative of knowledge management implementation is commended because the relationship between knowledge management and product improvement/decision making is significant and very importantly the top management is very positive and ready to implement knowledge management in the sugar factory.

To improve knowledge management implementation in the sugar factory, the following recommendations are forwarded.

- The factory should promote knowledge sharing by providing access to information technology infrastructures that are used for knowledge sharing.
- There should be formal ways of Knowledge transfer mechanism for knowledge sharing like preparing knowledge sharing opportunity as periodic meeting, training, and workshops at cross-department level and experience sharing with other sugar factories in Ethiopia.
- There should be a department/unit for knowledge management to enhance the decision making for the betterment of quality products.
- There should be a motivational scheme for the employees to improve their knowledge sharing behavior such as good working environment, acknowledgement of their contributions, and reward within the factory for best performer.
- The tools like Kaizen, the business re-engineering (BPR), and the project management cycle should be applied to support knowledge management implementation in the factory.

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