INTELLIGENT SUPPLIER SELECTION FOR CORPORATE USING KNOWLEDGE MANAGEMENT FRAMEWORK

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Abstract-World has shrunk due to globalization of manufacturing trade and financing of such industrial activities. Thus this has increased tremendous competition across the nation. Obviously, the supply chain mechanism of quality products has to keep pace with the competition both qualitatively and quantitatively. Thus this has also catapulted knowledge based economy to new heights. In order to identify quality suppliers, many companies across the globe have invested huge sum in knowledge management systems (KMS) and Corporate Intelligence (CI) activities to manage information and Knowledge resources in their organization to be more competitive. This paper examines the supplier selection process through the resource based theoretical approach to Organizations/enterprises further highlight importance of integrating KMS and CI process to generate and fine tune synergy in order to sustain competitive advantage which will lead the organization to compete strategically in the Knowledge economy.

Keywords- Corporate Intelligence; Knowledge Management; Knowledge Codification; Case-Based Reasoning;

I. INTRODUCTION

In today's fast paced economy, vast improvement in technology, qualitative improvement in products, deep penetration in the marketing of products, fine tuning of supply chain mechanism, cost cutting measures, the present day managers have to keep pace with in depth knowledge of how of selecting qualitative suppliers. The key to any successful strategy is the ability to identify, develop and sustain a competitive advantage with reference to their competitors.

Knowledge management (KM) is the process through which corporate knowledge is used to improve organizational performance. KM has also had a technological focus but its adherents also place strong emphasis on the need for human and cultural interventions in order to make knowledge sharing work.

Corporate intelligence (CI) is a process for gathering usable knowledge about the external business environment. CI focuses on turning external information into the intelligence required for tactical or strategic decisions. Any organization needs to know its own organization, the competition, and the battlefield, and then be able to analyze and use this information in the decision-making process.

Knowledge is certainly the best resource and the only sustainable competitive advantage to individuals and organizations. There are numerous benefits of the KM programs to organizations from various industries like accelerating the process of research and development, to offer professional services, companies use KM, industries employ KM to develop creative skills and networks and to enhance customer service.

The most significant impacts of CI practices are: Increased quality of information, Accelerated decision-making, Improved organizational processes, Decreased costs ,Increased organizational awareness, Improved threats and opportunity identification Time savings.

To understand the KM process, the discovery of existing knowledge involves locating internal knowledge within the organization. First, internal knowledge may be combined with other internal knowledge to create new knowledge. Secondly, information may be analyzed to create new knowledge. Knowledge sharing is often a major preoccupation with knowledge management and is frequently addressed in the literature.

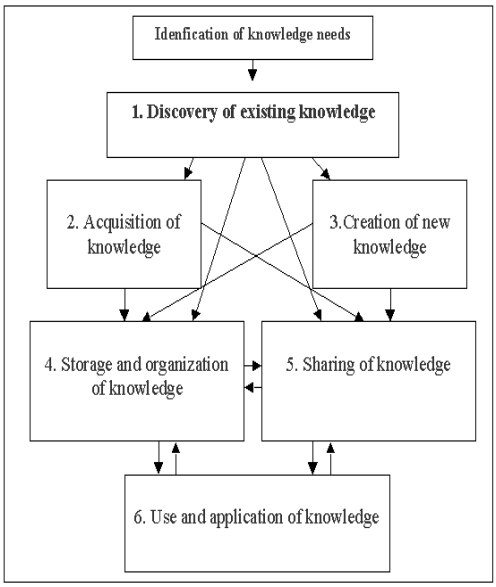

Fig.1 Conceptual framework: knowledge management Processes

The KM and CI (KMCI) strategy combines effective (KM) and appropriate (CI) to provide the right mix of the right information to the right decision maker at the right time. The firm identifies the CI priorities through its KM efforts.

The six key factors that have impact on effective CI:

- lag between the decision and its implementation
- data overload;
- outsourcing the "thinking";
- teams that do not understand the critical thinking process;
- lack of context (organizational values); and
- lack of creativity and innovation.

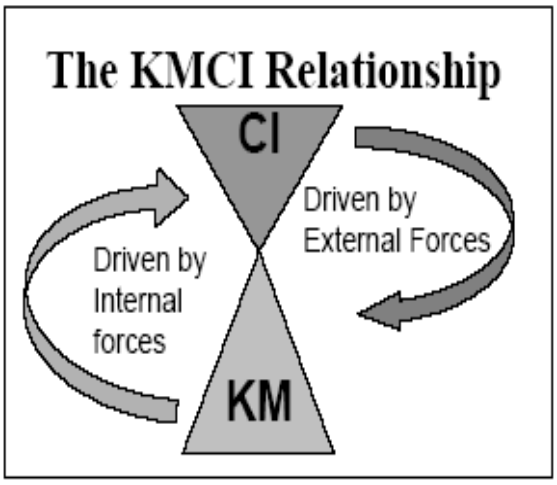

Fig. 2KMCI Relationship.

II. RELATED WORKS

Integration of Knowledge Management and Corporate Intelligence helps making better decisions in corporate. Knowledge codification means converting tacit knowledge to explicit knowledge in a usable form for the organizational members. The resulting knowledge base supports training and decision making. Literature Survey has been made on knowledge management and CBR systems.

In [4] Business intelligence converts the raw data into

information for decision making. It bridges connection between enterprise system and industrial informatics. The business intelligence mainly encompasses OLAP and data mining.

Companies can do additionally opinion mining and can do decision making using knowledge management.

In [1] It analyzes the decision-making needs inenterprise business activities and establishes a three dimensional enterprise decision analysis model: decision makers, decision making information, and decision-making process. The enterprise decision needs new requirements for the corporate intelligence system such as Network, Personalization or Codification and Intelligence.

In [5] Analysis shows it has rapid growth of data and technologies trigger the transformation of data to useful information known as _Knowledge'. Knowledge codification for sharing and capturing explicit and tacit knowledge will be an effective resource sharing platform of knowledge between people.

In [2] categorization of knowledge is done to provide

right knowledge to the right user. The Categorization of knowledge is done using Lesson Learned System (LLS) framework. This work helps us to improve the better knowledge sharing and also provides the data security for the stored information.

In [6] A CBR model with semantic intelligence is used for deciding a fine tuned solution. Currently most CBR systems use traditional indexing method which takes longer time to retrieve the cases from the case base. The efficiency in searching the cases in Case base need to be improved. A scalable approach for CBR has been proposed in this paper in order to improve the search efficiency.

III. OVERVIEW OF PROPOSED WORK

Knowledge Management Technique is used for supplier selection process. The identified suppliers are passed through a screening process in which all the suppliers are filtered based on a lot of checks. The filtered suppliers list forms a supply base from which various requests are sent to suppliers and a contract term is derived. After several rounds of negotiations, the

supplier is finally selected and the contract is awarded to him.

A. Importance of new suppliers

First, there may exist new suppliers that are superior in some way to a firm's existing suppliers. Second, existing suppliers may go out of business, or their costs may be increasing. Third, the buyer may need additional suppliers simply to drive competition.

B. Supplier qualification Screening process

Reference checks--The buyer may contact previous customers and ask about the supplier's

Delivery performance, adherence to contract terms

Financial status checks-- if the supplier has recently assumed significant debt, this may raise red flags about the possibility the supplier will declare bankruptcy.

Indications of supplier quality--The buyer might require that suppliers have ISO 9000certification indicating that the supplier has policies, procedures, documentation, and training.

Ability to meet specifications--Request samples of supplier products and test them to ensure conformance to the Buyer's requirements.

Visit the supplier's production facility and interview line workers to ensure that all members of the supplier team understand the critical features of the product.

C. Creating a supply base

If the buyer utilizes short-term contracts and frequently re-procures the same item, it typically makes sense to establish a cohort of pre-qualified suppliers who will compete for these contracts. Even if the buyer uses long term contracts for individual items, it might still make sense to use a pre-qualified supply base. Information requests to suppliers Request For Information (RFI) is issued when the buyer seeks to gain market intelligence regarding what alternatives and possibilities are available to meet the buyer's needs. Request For Proposal (RFP) is issued when the buyer has a sense of the market place and has a statement of work .Request For Quote (RFQ) is issued when the buyer can develop a statement of work that states the exact specifications of the good or service needed.

D. Contract terms

The supplier selection process culminates in a contract between the buyer and one or more suppliers. At the highest possible level, contract terms relate to either monetary transfers or how the contract will be executed

D. Negotiation process

In a negotiation the buyer attempts induce favourable terms from suppliers, and vice-versa. Negotiations often are viewed as zero-sum games where the buyer gains what the supplier gives up. Competitive tendering is an alternative way to extract concessions from suppliers Whereby suppliers are played of one another. Competitive tendering approaches differ in the amount of visibility that suppliers have regarding competitors' bids. At one extreme is the dynamic open-descending-bid format. At the other extreme is the sealed-bid format in which each bid is known only to the buyer and the supplier who submitted it.

E. Supplier evaluation and contract award

The buyer begins the supplier evaluation process by identifying the "dimensions" it wishes to Use when evaluating suppliers. Once suitable dimensions are identified, they are ranked. During this phase the buyer determines which supplier or suppliers to award a contract to. Sole award contracting may be favourable if the scope of work is best accomplished by a single supplier. The overall process of knowledge creation for supplier selection is shown in Fig.3.

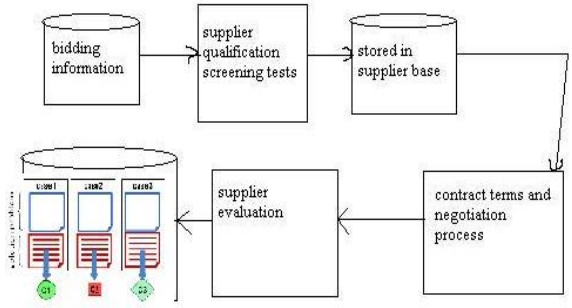

Fig.3 Overall process of knowledge creation for Supplier selection

F. Knowledge Codification

Knowledge codification means converting tacit knowledge to explicit knowledge in a usable form for the organizational members. The resulting knowledge base supports training and decision making. The codified knowledge is represented in the knowledge base. The various tools that are used to perform knowledge codification are : Computer Mediated Communication tools, Content/Document Management systems, Problem Solving tools, Intelligent Agents. Among these CBR technique has been chosen as the best one for decision making.

G. Case Based Reasoning (CBR)

It is one of the codification tool that solves new problems by adapting previously successful solutions to similar problems. The Knowledge management cycle includes creation, sharing and usage. Created knowledge in transferred in two ways: Personalization (direct) and Codification (indirect). Knowledge codification means Knowledge codification means converting tacit knowledge to explicit knowledge in a usable form for the organizational members. Tacit knowledge is identified and leveraged through a form that is able to produce highest return for the business. Explicit

knowledge is organized, categorized, indexed and accessed. CBR is a cyclical process comprising---retrieve the most similar case, reuse the case to attempt to solve the problem, revise the proposed solution if necessary, Retain the solution as part of a new case.

H. Intelligent supplier relationship management system(ISRMS)

ISRMS is used for the organization to master its core competent by means of subcontracting operations that cannot be used in building up the knowledge inside the organization. ISRMS uses one of the applications of CBR technology, which belongs to the classification task integrating CRM with SRM to provide the prediction and assessment of supplier capability. The architecture of the ISRMS is divided into front end and back end. In the front end, ISRMS is linked with the company's local and overseas customers such as wholesalers and retailers to acquire their Information related to the products. The back end of ISRMS consists of a case base data warehouse containing cases stored in various departments within the company's local and overseas offices as well as in other plants. Moreover, the CBR engine which use the stored cases for problem solving is also installed in the back end. By doing so, CRM and SRM functions are linked up by the front and back end of ISRMS.

The two CBR modules in ISRMS responsible for matching the customer demand with the respective supplier capability for a particular product are the CSSM and the help desk module. Increased demands on, and expectations of a firm's suppliers create the need for careful analysis of supplier selection and volume allocation decisions. The vendors are selected based on a number of parameters The vendor selection criteria is shown in Fig.4.

Algorithm for supplier selection:

- Input :Five parameters such as cost, quality, location, reliability ,payment options are taken into consideration.
- Output : Best supplier is chosen based on the highest total

Step 1 : Each parameter is assigned a weight.

Step 2 : Each supplier's value for the parameter is given.

Step 3 : Relative weights for each of the factors is determined by multiplying the parameters by the scores already entered.

Step 4 : Total is obtained for each supplier.

IV EXPERIMENTAL RESULTS AND DISCUSSION:

Algorithms presented in the paper are compared with recent methods and it has shown improvement than other methods. It shows that our approach provides significant improvement over standard CBR techniques. The Suppliers bidding and other qualification information are stored in supplier base.

Then the suppliers are evaluated based on the supplier evaluation criteria shown in Fig.4. Relative weights for each of the factors is determined by multiplying the parameters by the scores already entered. Then the total is obtained for each supplier. The resultant supplier data after evaluation is shown in Fig.5.

supplier id	Cost	Quality	Location	Reliability	Payment Options	Total
3040	1	0	0	1	3	
3041	0	3	2	2	1	
3042	2	2	1	3	0	
3043	3	0	3	2	1	
3044	2	2	3	3	0	
3045	1	1	0	2	0	
3046	3	2	1	1	3	
3047	2	3	3	2	0	
3048	1	2	2	2	1	
3049	0	0	0	2	2	
3050	1	1	1	2	2	
3051	1	2	3	1	1	
3052	3	2	2	3	3	
3053	3	0	1	0	0	
3054	0	2	3	3	1	
3055	2	3	3	2	1	
3056	2	2	3	3	1	
3057	3	3	2	1	2	
3058	2	2	2	1	1	
3059	2	3	3	3	0	

Fig.4 Supplier selection parameters

The resultant supplier data in case base is shown in Fig.5.

supplier id	Cost	Quality	Location	Reliability	Payment Options	Total
Weights:	4	5	1	2	3	
3040	4	0	0	2	9	15
3041	0	15	2	4	3	24
3042	8	10	1	6	0	25
3043	12	0	3	4	3	22
3044	8	10	3	6	0	27
3045	4	5	0	4	0	13
3046	12	10	1	2	9	34
3047	8	15	3	4	0	30
3048	4	10	2	4	3	23
3049	0	0	0	4	6	10
3050	4	5	1	4	6	20
3051	4	10	3	2	3	22
3052	12	10	2	6	9	39
3053	12	0	1	0	0	13
3054	0	10	3	6	3	22
3055	8	10	3	4	3	28
3056	8	15	3	6	3	35
3057	12	10	2	2	6	32
3058	8	15	2	2	3	30
3059	8	0	3	6	0	17

Fig.5Supplier case base after evaluation

V. CONCLUSION

Government vendor selection decisions in today's increasingly complex, competitive global environment are inherently multi-objective in nature. Therefore, we have developed a Knowledge-based Decision Support System for vendor selection and bidding (KDSSVSB) to provide and refresh real-time information which decision-making officers can use to quickly and accurately infer and generate suggestions.

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