

Knowledge Resource Management

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Abstract - The last 50 years of computing can best be as “tumultuous”. A variety of computers were introduced to solve different problems. As their capabilities grew, so did the types of applications. Each decade represented different milestone. The 1960’s: The MIS movement; Mammoth information systems resolving around centralized mainframes. The 1970’s: DataBase Management Systems; Designed to help integrate systems. The 1980’s: Personal/Distributed Computing; End users could tap into the data-bases for their own purposes. The 1990’s: Global Marketplace; Enterprises used information for strategic advantages in a global marketplace [1]. The 2000’s: Click&Mortar; Cyber Enterprises dominate the way of business overcoming distances and national boundary. Although computers and types of applications have changed, the problems in application development have not. Those problems are not different than they were 50 years ago. If progress is to be made, governing rules and principles have to be established. A company must learn Knowledge Resource Management in order to move effectively into the year 2010 and beyond [2]. Knowledge Resource that is accumulated in a company consists of 4 components. The first one is Organization resource. The second one is Systems resource. The third one is Information resource. Data is the fourth one. Human being assigned to organization uses information through the system processed from raw material of data. Data is stored in either manual file or computerized file. Controlling these resources gives a company definitive strategic advantages [3]. *The paper proposes a framework of Knowledge Resource Management for enterprise’s future wealth.*

Keywords: Knowledge Resource Management, Information Systems, IT, Data-Base, Organization Restructuring.

1 INTRODUCTION

Knowledge Resource Management represents an imaginative new way of thinking and conducting business in the Knowledge Age. It is not just another way of using computers and networks. Rather, it is concerned with innovation and management of all the resources required to create and utilize Knowledge. KRM will represent a radical departure from Information Age. The purpose of the paper is to convey to enterprises executives a practical approach for the resources consistent with their business objectives. Ultimately, the Knowledge Resource Management Approach demystifies their information systems process and put control back in the hands of executive management like Chief Knowledge Officer where it belongs. The concepts and ideas contained in the report created over thirty years of practices and experiences during the consulting jobs.

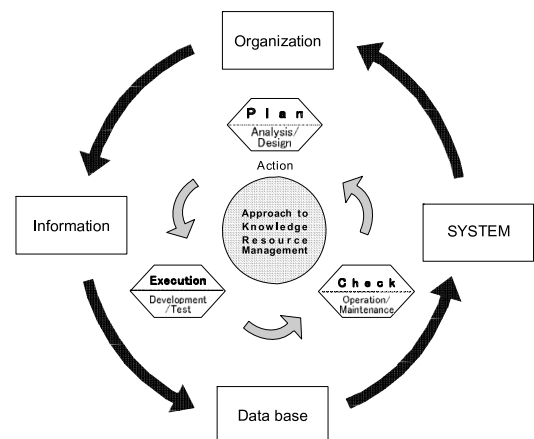


Fig.1 Approach to Knowledge Resource Management

2 BACKGROUND AND PROBLEM

Regrettably, in the past decade, attitude of computer orientation is still the “state of art” when developing system to solve business problems. In spite of the sophisticated technology available, the majority of enterprises still experience the following problems.

- Data-bases lack integration –The data elements used in the manufacturing system are not the same data elements used in the finance system. Each application jealously guards its data from shared use but other applications. As a consequence, data redundancy is rampant. A data element such as “part number” is typically defined and implemented differently for each application. This compounds problems when trying to implement changes to data on a consistent basis throughout an organization.
- Information requirements-Users at each organization level wants information for his/her decision-making on timing, but arrival of information is delayed and eventually useless. Users are estranged from IT department. Users want to talk about their business problems while IT experts want to impress everyone by talking technical jargons. The problems will become even more serious over time as end-users computing and personal computers proliferate.
- Systems are not documented-IT staff does not know where anything is. Systems users do not know how to use systems. Applications are difficult to maintain and modify. Consequently, systems require more man-hours than expected for keeping the systems up-

dated. In fact, due to poor documents of systems, it is often more expedient to completely rewrite the systems than to try to salvage existing investments with the current systems version.

- Organization are to be changed- Because of environmental changes, IT department is ready to respond for maintenance to adapt agile restructuring of organization. Adapting to the enterprise modifications, job descriptions, job manuals, rules and procedures must be modified.
- There is no control over the development process of organization, systems, information and data-base.

These problems are all to be traced back to the genuine belief.

3 PREDICTION

It is little surprising that there are not abundant research on the Knowledge of organization [4] [5]. Nonaka suggested SECI model for creation of Knowledge [6]. The day will come when management will recognize the importance of knowledge and learn how to apply it for strategic and tactical advantages. In order to use Knowledge resources in the same manner as other basic resources, such as financial, material and human resources, disciplined approach is required. In the environment of Enterprise Architecture, these Knowledge resources will be standardized for control and reuse among users of ERP packages. CKO is leading the change of enterprise, instead of CIO [7].

We predict a next generation after Knowledge Age will be Wisdom Age. Enterprises will experience significant prosperity. They will compete more aggressively and be able to change and move the organization at a speed unheard of in history. Their Information systems will be constructed based on the concept of Service Oriented Architecture. Evolutionally, a total new way of thinking and conducting business will be taken place (Table 1).

Table 1 The Four Stages of KRM Growth

Stage & Name	1. BIRTH	2. CHILDHOOD	3. ADOLESCENCE	4. ADULTHOOD
Feature	Data Age	Information Age	Knowledge Age	Wisdom Age
ENVIRONMENT	Data Processing	Decision Making	Enterprise Architecture	Service Oriented Architecture
APPLICATION	Bookkeeping & Calculating	Integrated MIS & DSS	ERP Based Systems	Service Based Systems
EQUIPMENT	Basic Computational Equipment	Centralized Computing	Decentralized Computing	Web Service Computing
PERSONNEL	•Office Manager •Clerical Staff •Programmer	•Chief Information Officer •MIS Department •System Engineer	•Chief Knowledge Officer •Project Office •Knowledge Engineer	•Chief Wisdom Officer •Wisdom Center •Service Scientist

4 METHODOLOGY

Perhaps the clearest way to describe what Knowledge Resource Management is that Knowledge Resource Management is the management of the resources necessary to produce knowledge to satisfy business demands. The underlying rationale behind KRM is to inventory all of the resources required to develop Knowledge in the most efficient and cost-effective manner.

When standardized and controlled, these resources can be shared and reused by the employees and managements. This orientation to managing the parts of a product is very similar to the philosophy of Material Resource Planning (MRP) found in manufacturing field. In the manufacturing facility, we set the work stations and the mechanism of production control. Through front work stations, we design product, and following work stations are called assembly lines for assembling from parts to a product. Any product has a standard 4 levels of structure. Each level provides specifications for the next process. In this way, manufacturing process is standardized and preset all the necessary tasks from initial concept phase of a new product to final assembly phase. In same manner, we set up standards for each component as phases of resources development.

The first component of the Knowledge is organization. Organization has four level of structure. From top to the bottom, each is management level, director level, and middle manager level, and operator/clerk level.

System has same four level of structure. From top to the bottom, system level, sub-system level, administrative-procedure/computer procedure level and operation for human being and computer program for computer level.

Information has same four level of structure. From top to the bottom, Strategic information, Tactic information, Administrative information and Operational information are structured. Data has same four level of structure. From top to the bottom, Data-base, File, Record, and data-element are structured. The each component has engineered 10 phases to design and build and maintain it as resource.

Explosion/Implosion concept is engineering concept for resources utilization (Fig. 2).

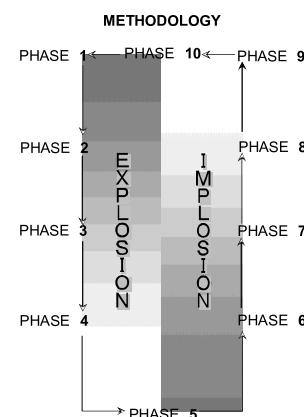


Fig. 2 Explosion/Implosion

Systems development methodology: PRIDE is well known. PRIDE methodology has 6 concepts and 10 phases [http://www.pmainstreet.com/mba/]. We suggest this methodology for system development and maintenance. Organization development methodology is created and proposed to apply it to become expert of Knowledge use. The methodology is consisting of 5 concepts and 10 phases. Both Information development methodology and Data-Base methodology which consist of 4 concepts and 10 phases are recommended for use.

5 QUADRANGULAR PYRAMID MODEL FOR 4 COMPONENTS

Fig. 3 shows the model with internal relations between 4 components of knowledge resource. Model is for the concrete understanding Knowledge resources.

Any impact to the Organization component should be examined and analyzed through Systems component. After it, change impacts should be analyzed to Information component and Data-base component. Since those components are internally connected, from Systems components to Information and Data components change impact analysis should be done perfectly [8].

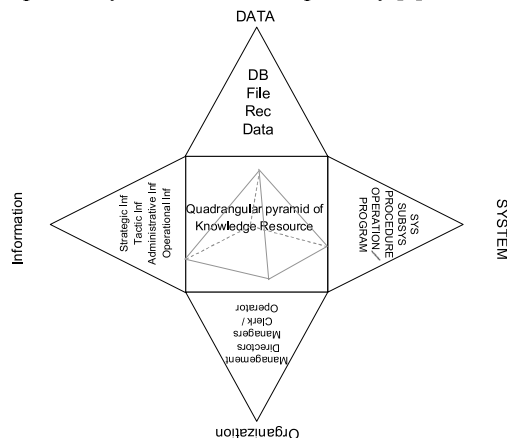


Fig. 3 Quadrangular pyramid of Knowledge Resource.

Whenever the enterprises see the sign of necessity for change, the Information requirements should be collected through out entire enterprise. Those definition sheets are to be analyzed and top management determines whether organization changes are needed or not. Then s/he decides type of organization pattern. Next to pattern selection among the types, s/he figures out concrete organization view pattern.

After these tasks, top management decides structures of enterprise using the collected sheets of Information Requirements. The last task is the drawing task of the organization charts. Without doing these tasks, Systems and Information and Data-Base should not be developed. Design or Redesign of Organization is the first task to do [9] [10].

6 INTEGRATED USE OF 4 METHODOLOGIES

Methodology must be applied to rationalize enterprise. To make it successful, integrated use of 4 methodologies are recommended. The way of use requires harmonized methods. Standard approach is that we should apply Organization

development methodology for Organization in the first. After it, Systems development methodology is to be applied. Next step is to use methodology for Information and/or Data-base [11].

Obviously, KRM is not a quick and dirty approach for solving managerial problems. Actually, it represents a cultural change for the entire enterprise, not just one area. Any enterprise has a culture: a way in which they behave and operate. Employees may be organized and disciplined by objectives which CEO has set up and elected to adopt. What is important is that in order for all employees to function and succeed, they must be able to recognize, accept and adapt to the culture. The decision on implementing the KRM methodology is a management issue, not just technical issue. Employees must first be convinced of its need.

Education on KRM concepts is necessary. Practices on Development of components like organization, systems,, information and database are inevitable.

A dictator approach may be fine if the dictator remain in power for some years.

Usually, the approach should be done with consensus by many of employees.

7 KNOWLEDGE RESOURCE MANAGER (KRM): THE TOOL FOR CONTROL

The Knowledge Resource Manager is the cohesive bond behind the Knowledge Resource Management concept. It represents the "bill of material processor" as illustrated in Fig. 4. It is the central storage where all of knowledge are inventoried and controlled. KRM software was developed by PJI in Japan [http://www.pji.co.jp].

To maintain the integrity of these resources definitions, they are cataloged in the KRM. This promotes sharing and reuse of all the resources by enterprise.

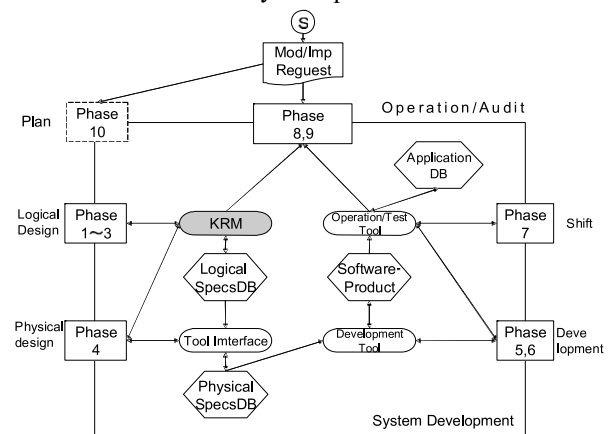


Fig. 4 KRM availability

8 SUMMARY AND FUTURE WORKS

Since Knowledge Resource Management is new to all of enterprise CEOs, the concept might be misunderstood. It is not a computer jargon. It is an effective management methodology. CEOs must learn from the bench-mark company and try to apply it to make enterprise profitable. Eventually, it will impact strongly to the organization and

change will occur. Until the wealth of benefits is realized, CEOs had better keep patience [12]. Following are the some benefits gained by implementation of the methodologies.

- It is a practical solution based on common sense. It does not make use of cryptic terms or esoteric theories of design and management. The terminology and concepts are explicitly defined and related in plain Japanese. By doing so, it promotes communications and cooperation between users, developers and managements.
- It is a comprehensive methodology addressing all facets of Knowledge Resource Management, not just idea of researchers. The integration between methodologies represents a cohesive approach spanning from development functions to maintenance functions, thus providing continuity and cooperation.
- It provides a defined working environment that is fully documented, which provides means to expedite employees training. This means faster start-up of new employees, including clerks/operators, managers.
- It can be used to control and manipulate all the Knowledge resources. Consequently, resources can be quickly found and reused as required. Such reusability promotes a sharing Databases and integration of Systems. Further, inventory control provides the ability to perform "impact analysis" of a proposed resource changes. It also provides complete and current documentations of all organizational knowledge including systems structure in meaningful way.

It provides the means of effectively and efficiently utilization of knowledge resources, then human, money and material resources well utilized in an enterprise. It places the enterprise in the superior position.

To make our study more practically useful, we must prepare real examples as a reference and work sheets for smooth works. Also, we should develop education and training class for all levels of organization workers. It means we are going to complete our methodologies into the packaged product. We have already 4 actual implementation sites in Japan, those enterprises will bring more braving insights in a few years.

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