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Kedar Amar Research and Academic Management Society known for it's acronym KARAM Society has been established in the year 2009 keeping in dream the empowerment and comprehensive expansion needs of society. The society has been established as a "Not for Profit" Company under the societies registration act, 1860 with a Registration no. S/65067/2009. In the present state -of-affairs, the KARAM Society engaged in the advancement of medical knowledge and provision of assistance to medical students and professionals.

The mandate behind KARAMS is to make certain transparency, accountability and adherence to corporate governance norms. Recently KARAM Society had put it's ware bouts in an online publishing and collaborated with Open Magazine Inc. and Publishes two hard core empirical research magazine on information systems (www.gjeis.org) and in medical science (www.agems.in). Both the Research magazines are now available in a Brick-&-Mortar mode also with an ISSN and eISSN Numbers respectively. The rationale of the KARAM Society is to promote empowerment and inclusive development with an emphasis on social, digital and financial inclusion; strengthening of delivery systems and participatory democracy for bringing about a systemic change to help meet development objectives better. During the past two decades founder members of KARAM Society have travelled transversely the country to learn critique and encourage social, digital, medical and financial inclusion. In the process, knowledge repositories have been created on what works-the most excellent practices-actively engaging all stakeholders from policy makers and civil society to ordinary citizens. The KARAM will allocate this knowledge for progression and nation-building all the way through e-learning modules and virtual platform for practitioners and publishing video documentaries on our portals. Recently it had started new portal http://open-journal.com which is backed by the gamut of great academician from different part of the world.

In the last few years KARAM Society conducted numerous health camps in a charitable mode in a various districts of Haryan, Rajasthan, Utta.rpradesh, New Delhi, etc. which are organized with support from corporate, civic bodies, the government, NGOs and individual volunteers. KARAMS has conducted over 75 general health camps till date and has benefitted more than 25,000 people directly. In line with the policy to provide healthcare services to the community around our facilities, KARAM Society has started a Mobile Medical launched Mobile Medicare Unit (MMU hereafter) to address the health concerns of older persons living in urban slums. Technical aids are provided to the poor elderly that could improve their quality of life and make them independent. Eye camps are organized every year now and then to screen beneficiaries for cataract. Awareness about diseases and healthy living is an important component and constant effort byKARAM Society is being made in this direction. The team of KARAM SOCIETY India consists of a medical doctor, a community health mobilizer, a pharmacist and a social protection officer. The team will not only provide curative medical services but will also raise public awareness on preventive and promotive aspects through awareness generation andmultidisciplinary medical camps, etc.

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Pedagogical View to Enterprise Information System

Message from the Editor-in-Chief's Desk

It's my privilege to welcome you all once again for the Second issue of "Global Journal of Enterprise Information system", which will known for its acronym GJEIS with a theme dedicated to this volume itself "Pedagogical View to Enterprise Information System".

I always uses to remember the saying that "When the things get tough the tough get going". Information Systems has been documented as the "enabler" of business in the 21st century. The speedy augmentation of IT within America, India and other parts of the world promise success for companies that expand operations worldwide. This might not have been the case a few years back but is unquestionably true of the present. As a teacher(s) of Information Systems we hear students inquire, "Why the course materials are so quickly outdated?" We tell them that teaching Enterprise Information Systems is like teaching the Big Bang theory 60 seconds rather a one minute after the event. The future is still being formed. Technology is always on the rise and change is endemic in enterprise system managements. You need to be on top of ongoing changes.

We are presenting you with a new journal called GJEIS. Our aspiration is to generate a new forum for exchange of information on all aspects of Information system. Future scope of the GJEIS is open to your suggestions. I would like to encourage you to submit original research notes as well as opinions, technical reports, and short communications in the general area of EIS. The journal is sponsored by KARAMs an NGO and we are going to keep you informed on oncoming events organized by the society, give you inside stories on the development strategies and directions, as well as introduce our staff to you.

I, therefore, respectfully ask that you consider preparing a submission for our Journal. Because submissions are peer-reviewed, I recommend that you allow me a preliminary review of your topic (send to: **gjeis.ejournal@gmail.com** before you spend an extensive amount of time on something that may not fit well. That said, however, we are especially interested in having our membership broadly represented on the pages of our publication so I tend to be flexible when GJEIS members send us submissions.

I wish to see GJEIS develop into an information based journal with the balance changing toward research communication rather than remain a bulletin. The success of this enterprise depends on your response. I would appreciate your feedback.

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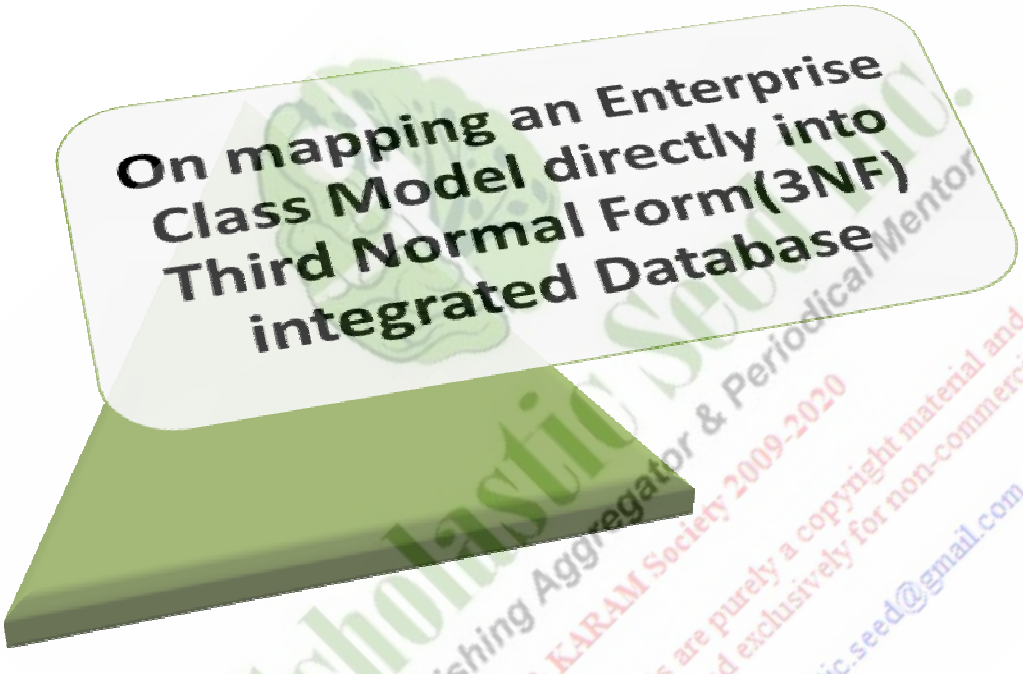

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Phase-II: Empirical Article

ABSTRACT

One of the most crucial steps in any ERP implementation is the creation of an Integrated data model. The company uses this integrated data for analysis and decision making. The normalization of integrated databases, in particular, relational schemas is the cardinal part of relational database design. The relational schema generated from the conceptual model is rendered normalized so that the redundancy in the data is removed and the scope of propagation of anomalies is reduced. Earlier the Entity-Relationship Diagram(ER Diagram) and subsequently the Extended Entity Relationship Diagram(EER Diagram) was used for conceptual modeling of the database. But now a days UML 2.0 Class Model is considered as the de-facto standard in the software industry for conceptual-modeling of the integrated data model of an enterprise. The conceptual model is then mapped to the relational database schema in a relational database. We present a formal algorithm to map the class diagram into relational schema . This schema then has to undergo various normalization checks based on different types of data dependencies, the primary of them being the functional dependency. In this paper we consider the functional dependencies and analyze why unnormalized relations are created when the integrated conceptual model of the enterprise(represented using class model) is mapped to integrated database schema. We propose the changes in the class model itself at the time of conceptual modeling so that the relational schema so generated will always be in 3NF. Our results will thus eliminate the need of database normalization upto 3NF which is otherwise a hectic and time consuming activity.

KEYWORDS

- Normalization
- Class –Model
- Functional dependency .

Introduction

The relational database model used for developing an integrated database for an enterprise relies on developing relational schemas which can support efficient query processing and are free from various anomalies like insertion, deletion and update anomalies. Basically two approaches for database design have been proposed in the literature viz. bottom-up-methodology and decomposition-methodology. A bottom-up design methodology would consider the basic relationships among individual attributes as the starting point and it would use those to build up relations. Other than the binary relational model, this approach is still not popular and suffers from the problem of collecting a large number of binary –attribute relationships at the starting point [4] and Universal relation problem[6]. In contrast top-down design methodology would start with a number of grouping of attributes into relations that have already being obtained from conceptual design and mapping activities. Design by analysis is then applied to the relations individually and collectively, leading to further decomposition until all desirable properties are met. The relational schema so obtained from the conceptual schema have to therefore go through rigorous normalization checks based on different types of data dependencies occurring. Although more than 100 data dependencies are known today but the primary of them are functional dependencies which are basis of First Normal Form upto Boyce Codd Normal Form, the other being Multivalued Dependencies(Fourth Normal Form) and Join Dependencies (Fifth Normal Form) etc. Practically every relational database used in an Enterprise is rendered at least in Third Normal Form. Since first three normal forms are based on the functional dependencies, the designer has first the responsibility of identifying the initial set of functional dependencies occurring on the relational schemas. Since this set may be incomplete at initial stage and similarly may also contain some redundant functional dependencies(FD), therefore the closure of a set of FDs is computed and then its minimal cover is obtained, which is practically a time consuming and hectic procedure. Further these relational schemas so generated then undergo normalization checks and consequently decomposed into multiple schemas. The aim of this paper is to remove this hectic process of database

designing. In this paper we propose a database designing methodology which makes the need of normalization redundant. We propose some changes in the conceptual database schema designing so that the relational schemas so obtained from the conceptual schema are themselves in third normal form and therefore there is no need to go for normalization checks.

For logical database design, there have been many methodologies, tools and notations that best model, design and build DBMS applications from analysis through to database implementation, the most famous and highly applicable was the ER Model[2] and subsequently the EER Model[4]. However some of the above methodologies were very strict in the process and very tool sensitive. The upper CASE tools & lower CASE tools were also used and some of the organizations preferred the best- of-breed solutions. The CASE tools followed a strict process and the best-of-breed solutions lacks in providing integration and information sharing. The UML had both the flavors, it is flexible enough and also support the teams involved to work together one way and to do their own part as needed [8]. UML has therefore become the de-facto standard in the Software industry for DBMS development. We use Class Model (also called Class-Diagrams) proposed in UML 2.0 for representing the conceptual schema of the database.

We first discuss a formal algorithm to map a class-diagram into relational schemas and then analyze the causes of the violation of the various normals forms based on functional dependencies forms in the relational schemas. We argue that since the conceptual schema is generating un-normalized relations therefore there is a scope of some improvement in the conceptual schema designing itself so that it may always generate normalized relations only. We propose rules to change the conceptual schema itself so that when relational mapping algorithm is applied the result is the normalized schema up to 3NF.

The paper is organized as follows: After discussing the introductory concepts in section 1, we present a formal class diagram to relational mapping algorithm in section 2. In section 3 ,we analyze the various causes of violation of normal forms and propose the rules to modify the conceptual schema so that the result generated is always in the respective normal form.

2. CLASS DIAGRAMS TO RELATIONAL MAPPING

Earlier the relational database design approach used the Entity-Relationship Diagram [2] to represent the logical Model. It was further extended to Extended Entity Relationship Diagram (EER Diagram)[4] to represent the concepts in a better way. Elmasri and Navathe[4] discuss the mapping rules to derive a relational schema from the conceptual relational schema. However no formal algorithm is available in the literature to map the class diagram into relational schema, although some informal rules have been discussed. In this paper we provide a formal algorithm to map the cardinal constructs of class diagram into relational schema. In this section we present a formal algorithm to map the important constructs of the class diagrams into database relations based on the approaches discussed in [3,8].

ALGORITHM:

1. For each class in the class diagram create a relation. Add simple attributes of the class as the attributes in the relation.. If primary key attribute is identified in the class, define it as the primary key attribute in the newly created relation otherwise designate one attribute (or a set of attributes) from the class as the primary key of the relation which is capable of identifying every row of the table uniquely.

2. For every multi-valued attribute of a class , create a separate relation. This relation will have a joint key composed of the primary key of the class along with the multi-valued attribute.

3. For every 1:1 association relationship R between the two classes C & D , include the primary key of C as a foreign key in the relation corresponding to class D.

4. For every 1 to many(0……*) association relationship R between the two classes C & D with C on '1' side and D on (0….*) side, include the primary key of C as a foreign key in the relation corresponding to class D.

5. For every many (o….*) to many(o…..*) relationship create a new relation . This relation will

have a joint key composed of keys of relations corresponding to both the participating entity types.

6. For every participation constraint in the class diagrams, create assertion to represent the constraint.

7. For every recursive relationship R with parent and child roles, create a new relation. The key of the new relation will be its child key.

8. For every n-ary association relationship, create a new relation R. This new relation will have a joint key composed of primary keys of all the relations corresponding to the participating classes.

For sake of brevity we are not providing here an implementation example which shows execution of the above algorithm , but it can easily be executed as given in [4,8].

3. EXTENDING CLASS DIAGRAMS TO AVOID VIOLATION OF NORMAL FORMS

In this section we discuss the changes in the class diagrams needed at the time of designing so that the relational schema generated after applying the mapping algorithm described in section -3 always generates a normalized schema . We analyze the causes of the violation of normal forms by discussing every normal form individually.

3.1: NON-FIRST NORMAL FORM CLASS DIAGRAM

The relational database theory mentions that a relation violates the First Normal Form if
(i) it contains an attribute which can have multiple values i.e it is a multivalued attribute.
(ii) it is a composite attribute.
(iii) it contains relations within relations.

As far as violation due to (i) condition is concerned, it will never occur because multivalued attributes are mentioned explicitly in the class diagrams and mapped accordingly (Rule 2 of Algorithm).

Secondly, in business class diagrams, the attribute types usually correspond to units that make sense to the likely readers of the diagram (i.e., minutes, dollars, etc.). However, a class diagram that will be used to generate code needs classes whose attribute types are limited to the types provided by the programming language, or types included in the model that will also be implemented in the system[1]. Assuming that the database is implemented in a programming language which does not support aggregate data structures, we find that the composite attributes (ii) will also never propose any violation of 1NF as any element belonging to the data-type is considered atomic. Moreover since there is no provision of creating class within a class in Class-Diagrams, so the question of existence of relation within a relation does not arise (condition (iii)). Therefore we find that the relation schema generated from a class diagram after applying the mapping rules will always be in First Normal Form.

3.2: NON-SECOND NORMAL FORM CLASS DIAGRAM

Since the class diagram generates relations, we have to ascertain that the relations generated by the class do not contain any functional-dependency which violates the 2NF. In this section we analyze those functional dependencies whose presence violates the satisfaction of 2NF criteria.
Let R(A1,A2…….. Ak,Ak+1,……An) be a relational schema corresponding to a class C in the class diagram such that A1,A2…….. Ak is the primary key/ candidate key denoted as “PK” of R and Ak+1,……An are the non-prime(NP)attributes of R. The second normal form is violated when there exists atleast one partial functional dependency $X \rightarrow Y$ such that $X \subset$ A1,A2…….. Ak and $Y \subseteq$ Ak+1,……An
. This shows that since a subset of PK i.e X is capable of functionally determining $X \cup Y$. Logically this must correspond to a separate class in the class diagram , then only the real world constraint specified by the functional dependency $X \rightarrow Y$ will be satisfied. So we create a new class say C’ containing the attributes $X \cup Y$ such that X is a full key of C’. Also the class C will have attributes (PK – X) $\cup$ (NK-Y). The new representation will provide a better logical design as all the relational schemas will now be in 2NF. We formally state the rule as follows:

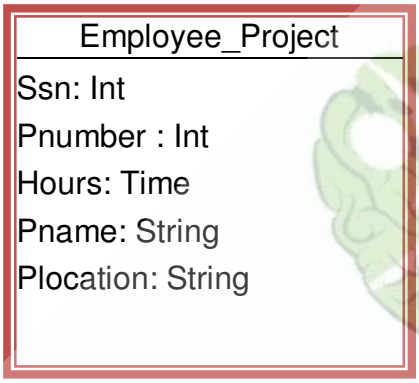
RULE 1:

For every functional dependency X →Y where X ⊂ PK and Y ⊆ NK,

(i) create a new class C' such that :
Attributes (C') = X ∪ Y
and PK(C') = X

(ii) Set Attributes(C)=(PK-X) ∪ (NK-Y)

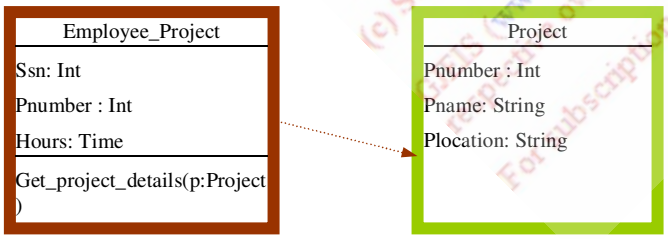
We illustrate our rule using the following example:
Let EMPLOYEE_PROJECT be class in the conceptual schema which contains information



about the employee working on different projects
In the above class the attribute set (Ssn,Pnumber) is the primary-key and the following functional dependencies hold on it.

Ssn,Pnumber → hours
Pnumber → Pname
Pnumber → Plocation

Here both the functional dependencies Pnumber → Pname and Pnumber → Plocation violate the 2NF condition as both of them are partial dependencies, so according to Rule 1 we will create another class PROJECTS with the attributes Pnumber, Pname and Plocation with Pnumber as the primary key. The



class EMPLOYEE_PROJECT will contain the attributes Ssn, Pnumber, Hours with (Ssn,Pnumber) as the primary key. Create a "dependency-relationship" between the class PROJECTS and EMPLOYEE_PROJECT as the class EMPLOYEE_PROJECT may use the class PROJECT to get the details of the projects in its operation therefore the class EMPLOYEE_PROJECT is dependent on EMPLOYEE.
Note that the relational schema obtained after applying the mapping algorithm will always fetch relational schema in 2nf.

3.3: NON-THIRD NORMAL FORM CLASS DIAGRAM

In this section we ascertain that the relations generated from the class-diagrams do not contain any functional dependency which violates the third-normal form.
Again, let R(A1,A2…….. Ak,Ak+1,……An) be a relational schema corresponding to a class C in the class diagram such that A1,A2…….. Ak is the primary key / candidate key (PK) of R and Ak+1,……An are the non-prime(NP)attributes of R.
Then R violates the 3NF when there exists atleast one functional dependency X→Y such that X,Y NP. According to the given FD X→Y, the set of attributes X functionally determine the attribute set Y irrespective of R-XY. This shows that there should exist a separate class C' in the class-diagram such that the attribute set X is the primary key of the relation corresponding to C' which is denoted by RC' so that by using the definition of the primary key we get, X→XY i.e X→RC' .
We should therefore create a new class C' corresponding to this functional dependency and exhibit a 1:M relation between these two classes C and C'. The rule can be formally stated as below:

RULE 2:

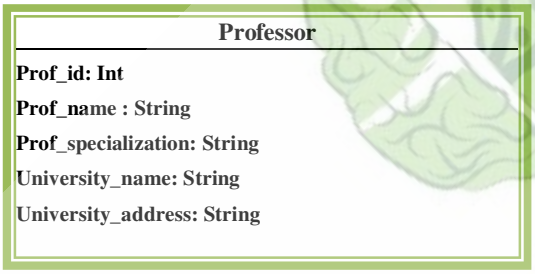
For every FD X→ Y ,where X,Y⊆ NP

(i) Create a new class C' in the class diagram with attributes X ⋃ Y and assign attribute set X as the key attribute of C' .

(ii) Set Attributes(C)=R-(X ⋃ Y). The PK attribute of the class C will remain the same.

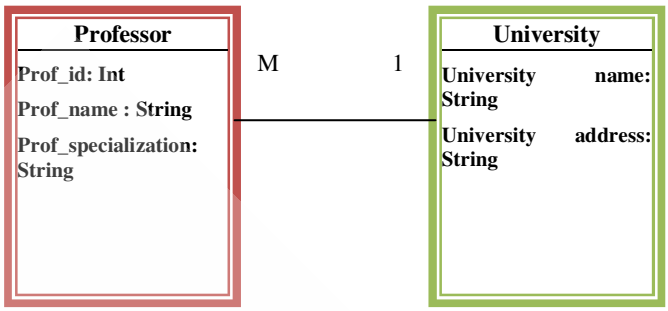
(iii) Set a 1:M relationship between the class C and C' such that class C is on the M side and class C' is on the 1 side.

Let us consider the following example from an Academic- system in which a class Professor is shown such that the following FDs hold on the class:



Prof_id → Prof_name
Prof_id → Prof_specialization
Prof_id → University_name
Univeristy_name → University_address

Here Prof_id is the primary key and let us assume that there is no candidate key. It can be easily noted that the FD University_name → University_address violates the definition of 3NF. Also note that the "University" is a separate entity and has its own existence . Therefore using Rule 2 , we create a new class "University" with the attributes University_name(PK) and University_address . The original class Professor will contain attributes Prof_id(PK) , Prof_name and Prof_specilization. We will also set a 1:M association relationship between the two classes as shown in the following Figure:



The new class diagram correctly represents the constraint that a professor in only one university but a university may employ more than one professors. We may also note that the relational mapping algorithm (section-2) will now create relations which are already in 3NF.

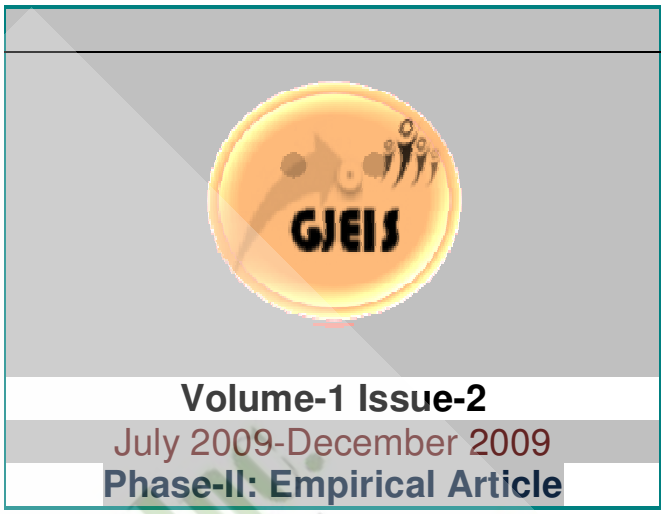
CONCLUSION

In this paper we have analyzed the causes of violation of the First three normal forms when a class model is mapped into database relations. We found that if aggregate data structures are avoided and multivalued attributes are mapped according to the relational mapping algorithm proposed by us then the relational schema so generated will always be in First normal form. We also found that if partial dependencies are analyzed carefully and the class model is changed suitably so as to accommodate some new classes and relationship (RULE 1), then the 2NF may always be achieved from the class model. We also found that our rule (RULE 2) will always lead to a 3NF normalized relational schema from a class model. We therefore conclude that if the methodology proposed by us is applied carefully at the time of conceptual modeling, then there is no need of the cumbersome normalization process based on the functional dependencies, and the time spent in normalizing relational schemas can be saved significantly.

FUTURE SCOPE

This paper proposes a methodology to eliminate the need of normalization process in relational database design for integrated DBMS of an Enterprise. In the present paper we have proposed two rules which eliminate the need of normalization upto 3NF based on the functional dependencies. But since BCNF is also based on 3NF, our focus in the future will be to propose a rule for eliminating the need of BCNF and

also the other normal forms based on multivalued dependency(4NF) and join dependency(5NF). If we are successful in implementing these results then it may revolutionize the relational database theory as there will be no need left to do the normalization of the database.



REFERENCES

[1] D. Bell, "UML Basics : *The class Diagram- An introduction to structure diagrams in UML 2.0*, IBM, http://www.ibm.com/developerworks/rational/library/content/RationalEdge/sep04/bell/index.html

[2] P.P.Chen, " The Entity Relationship Model: towards a unified view of data", *ACM Transactions on Database Design*, Vol . 1, No. 1 , 1976.

[3] S. Dietrich, S.D.Urban, "An Advance course in Database Systems : Beyond Relational Databases", First Edition, Morgan Kaufmann Publication, 2005.

[4] R Elmasri and S. Navathe, "*Fundamentals of Database Systems*, Third Edition, Pearson Education Asia,2000.

[5] T. Hussain, S.Shamail and M.A. Awais " *Eliminating Process of Normalisation in Relational Database Design*", In Proc: 7th International INMIC Multitopic Conference, December 2003.

[6] W. Kent , "Consequences of assuming a universal relation. *ACM Transactions on Database Systems*, Vol. 6, No.4 ,1981.

[7] W. Kent, "The Universal relation revisited,*ACM Transactions on Database Systems,* Vol.8, No.4, 1983.

[8] E. J. Naiburg and R.A.Maksimchuk " *UML for database design*", First Edition, Addision Wesley,2001.

[9] J. Rumbaugh, G. Booch and I. Jacobson " *Unified Modeling Language: The User Guide*", Addision Wesley, 1999.

[10] Alexis Leon, "ERP Demystified", Second Edition, Tata Mcgraw Hill Publishing Company,2008.

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ABSTRACT

• Information technology is one of the fastest spreading technologies in the world in terms of its usage and production. The Information technology is a very broad term, which is used for a host of technologies such as hardware and software technologies. The paper is based on study of problems faced by software companies in Northern region. It is worthwhile to examine the key issues for IT sector such as operational, software development and marketing so as to make comprehensive recommendations that can further accelerate the growth of this industry. The study also attempts to present a comprehensive view of the strategies being currently adopted by different application software companies. For the sake of present study, it has been assumed that the application software has not been developed and marketed in Northern India as it has been developed and marketed in other parts of India.

KEYWORDS

- Software Development
- .Micro Era
- Strategic Dependence

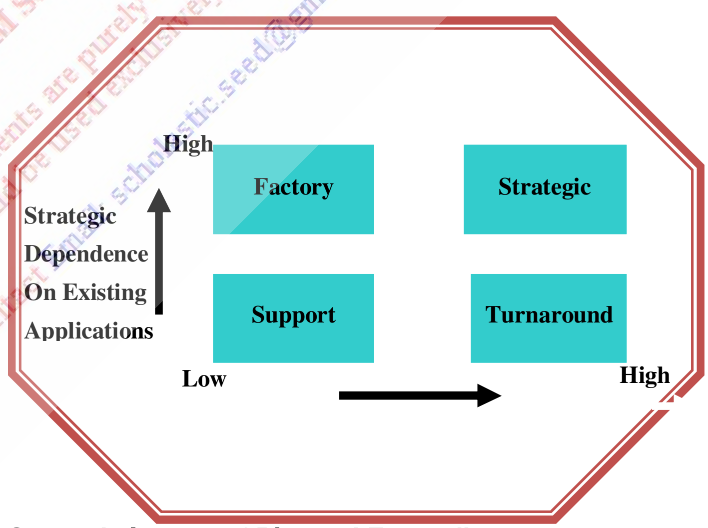
Introduction

1. Software Development: A Business Perspective

The stage model developed by Richard Nolan (1974) was originally developed to help managers understand the role and evolution of computers in their organization. It evolved from the discovery that plotting the annual expenditures on IT of an organization over time formed a classic "S-shaped" curve – the familiar learning or experience curve. Nolan had suggested following eras for the software organization:

Data Processing Era	: 1960 – 1980 (Industrial economy)
The Micro Era	: 1975– 1995 (Period of creative destruction)
The Network Era	: 1995–2010 (Era of transformed enterprise)

The theory holds that every organization must traverse the stages of learning in a sequential manner. The theory also leads to a contention that by managing the pathway through the stages integration and maturity can be achieved more efficiently, more effectively and perhaps more rapidly. An IT strategic grid was developed by Cash, et al. (1983) as below:



Strategic Impact of Planned Expenditure

Some of the observations of the above matrix could be summed up as:

1. Organizations in the support quadrant could at best use IT for cost reduction
2. Organizations in the Factory Quadrant can use IT for bringing in Efficiency
3. Organizations in Turnaround Quadrant are looking for managerial effectiveness through customer satisfaction
4. Organizations in Strategic Quadrant would use IT for bringing in cost competitiveness, cost leadership and strategic weapon.
5. Organizations would make an attempt to move from left half of the grid to the right half of the grid and their target destination being strategic Quadrant.

On the basis of the above observations it may be inferred that most of the organizations would use IT in general and application software in particular for bringing in effectiveness and efficiency. As a corollary of this inference, it is quite natural to assume that there should be market for application software in a country like India. As described earlier the application software is used in different user organizations for various support activities. Nirupam Bajpai et al. (1999) have highlighted following factors of competitiveness for Software Industry in India:

1. **Indian Edge:** A number of western companies seriously consider India as the first option when they have to outsource software development and services. According to a survey of World Bank, 82% American companies prefer software development or outsourcing from India. As per the NASSCOM study in year 2002, more than 158 companies out of the fortune 500 companies outsourced their software from India.
2. **Large Manpower Pool:** India today has the second largest English speaking scientific manpower pool in the world, second only to the USA. It also has a growing bank of 3.5 Million technical personnel. The quality of technical training is comparable to the best in the world.
3. **High Growth:** Indian software sector has been growing at the rate of 50% twice to the software industry of USA.
4. **Performance:** Indian software industry has grown as well as diversified and is committed to providing high quality and state of art technologies to today's global information industry.
5. **Quality:** In a report in the New York Times (Jan. 1994) Edward A Gargan noted that the Indian software industry is breaking new ground. The maturity of the Indian software industry in terms of quality can be measured from the fact that already 50 Indian software companies have acquired ISO 9000 certification. The Indian software industry has the maximum of ISO 9000 certified companies in the world for the software sector.
6. **Costs:** Indian software industry is successful because of low manpower costs.

Despite above-mentioned factors and India's success in software industry, the share of Indian software industry in the world's software and services industry is less than 1%. A study to examine the reasons behind this is therefore required. The study attempts to examine the software industry in the northern region to provide certain options that may help bridge the gap between the present position and the potential that could further be harnessed for India in the software sector. There may be multiple problems and trouble areas faced by the software companies of northern region; however, we have considered only marketing and software development related problems. The basic purpose is to present an empirical evidence and analysis that contributes to a better understanding of the issues associated with the marketing and development problems so that it may provide a basis for overall strategy formulation.

2. Objectives of Study:

The specific objectives of the study are:

- To concentrate on overall scenario of application software development and marketing strategy of IT companies of region
- To explore the major characteristics of development and marketing strategy as adopted by Software Industry in less IT developed areas (Such as Uttar Pradesh)
    - To explore the strategy adopted by different companies and firms, registered and operating in northern region with special reference to U. P. It is to be further explored as to what the specific development and marketing problems are faced by them and how to overcome them.

3. Research Design:

a. Objective of the Study:
In the present study only marketing and software development related problems have been examined. Further, the marketing problems have been divided into four basic marketing mix problems viz. Product, Price, Place and Promotion. While analyzing the Software Development related problems, only those issues have been considered which provide technology - human interface. Therefore the factors such as training and development, quality and technological support from respective agencies have been considered. The general problems such as recession, poor strategy and performance of software industry have also been considered.

b. The Data Type and Source:
The software companies of organized sector in northern region, especially in Delhi and Uttar Pradesh have been considered. For this purpose, the member companies of NASSCOM have been considered as population. The data to be used for this study is primary in nature and have to be gathered by means of structured questionnaires.

c. Population and Sample Size
As mentioned above, the companies, who are members of NASSCOM (National Association of Software Companies), form the population in this case. Although, the application software may attract unorganized sector as well, because of low level of investment and low number of workforce requirements, only organized sector has been covered, due to time and resource constraints.

- Total Number of member companies of NASSCOM in northern region : 150
- Total Number of companies developing application software in the region : 70
- Total No. of companies having turnover more than 25 million Rupees : 50
- Total No. of companies having turnover less than 25 million Rupees : 20

We have taken 21 companies from the population of 50 companies having turnover of more than 25 million Rupees, whereas 11 companies have been taken from a population of 20 companies with a turnover of less than 25 million Rupees. The population of 70 companies is thus divided in two broad strata and the companies have been selected randomly from each stratum leading to a total sample size of 32 companies.

d. Hypotheses:
The various hypotheses which have been tested under the study are mentioned below.

Hypothesis #1 "The Software Companies of Northern India face problems in product features".
Hypothesis #2 "The Software Companies of Northern India face problems in pricing the products"
Hypothesis #3 "The Software Companies of Northern India face problems in distribution channel"
Hypothesis #4"The Software Companies of Northern India face problems in product promotion"
Hypothesis #5 "The Software Companies of Northern India produce quality software"
Hypothesis #6"The Software Companies of Northern India have quality workforce"
Hypothesis #7"The Software Companies of Northern India send their developers for advanced training"
Hypothesis #8"The Software Companies of Northern India get good governmental support"
Hypothesis #9"The Software Companies of Northern India formulate good development strategy"
Hypothesis #10"The Software Companies of Northern India face unpredictable market behaviour"
Hypothesis #11 "The Software Companies of Northern India are at location disadvantage"
Hypothesis #12"The Software Companies of Northern India face problem of brain drain"
Hypothesis #13 "The Software market in Northern India is price sensitive"

4. Findings of the Study
The statistical analysis of the data collected through survey of the software companies has thrown significant light on certain aspects. Interestingly some of the hypotheses were rejected as an outcome of analysis. To minimize the biases in the data appropriation a number of statistical tests have been conducted. In some instances the results have varied. Z

test, as such, was administered for all the software companies, both small and big in order to draw major inferences. The Chi Square test and ANOVA were further conducted for testing the effect of various attributes on small and big companies. The findings are summarized as below:

i. According to the Z test software companies of northern region face problems in product features. ANOVA reveals that the problems faced by small and big companies are different.

ii. Z test shows that all software companies of northern India included in the sample face problems in pricing of the products. Chi Square further confirms that both small and big companies face this problem.

iii. According to Z test the software companies of northern region don't face any problems in terms of distribution channel. However according to ANOVA the nature of distribution problems, if any, are different for small and big companies. Chi square test also confirms it.

iv. According to Z test the software companies of northern region don't face any problems in promoting their products. ANOVA test establishes that the response of small and big companies is similar in this regard. However Chi Square test points out that the nature of problems pertaining to promotion is different for small and big companies. The findings from ANOVA and Chi Square test are therefore contrary to each other. The ANOVA takes into consideration all the factors influencing the outcome whereas the Chi Square takes into account the attribute under test. Thus Chi Square averages out the general response; ANOVA considers the relative effect of respective outcomes.

v. The Z test establishes that the software companies of northern India, included in the sample don't produce quality software. According to Chi Square test the smaller companies don't apply standard quality techniques, whereas on the contrary the big companies apply standard quality techniques like ISO 9000, CMM etc. Further, according to the data collected the big companies face the problems of brain drain, causing heavily on the quality of software produced.

vi. The Z test confirms that software companies of northern India have quality manpower. Thus we may accept that the software companies try to recruit best manpower. ANOVA also points out that software companies whether big or small have recruited quality manpower. According to the Chi Square test the big companies send their developers for the superior training, which itself shows that the companies not only have quality manpower but they aim to upgrade their skills also.

vii. According to Z test the software companies of northern India send their software developers for superior training. However Chi square test reveals that the response of small and big companies on this issue is opposite to each other. This is quite logical to assume that the amount of risk and investment perceived in the training and development of the software developers would be different for small and big companies. This has also been consolidated further by ANOVA.

viii. According to Z test the software companies of northern India included in the sample do not get good government support. However Chi Square test establishes that small and big companies respond in similar manner on this issue. Here one can safely assume the following:

a. The Government support is missing
b. The companies don't want govt. support
c. The tough rules, regulations and red tapes de-motivate the companies towards government support.
d. Government support is not enough.

ix. As per inference of the Z test the software companies of northern India, included in the sample don't formulate good software development strategy. This has been further established by ANOVA, which points out those both small and big companies don't formulate good development strategy.

x. According to Z test the software companies of northern India operate in unpredictable market. The response of small and big companies on the market behaviour has been similar, which has been confirmed by Chi Square test. In fact this may be associated with the formulation of developmental strategy. Since the software companies operate in an unpredictable market it is logical to assume that they are not able to make good developmental strategies.

xi. As per Z test the software companies of northern India are at location advantage. This has also been confirmed by Chi Square test, which states that both small and big companies accept that they are at geographical advantage. The reasons for this are given below:

- Delhi based companies consider themselves at location advantage.
- Noida based companies think that they are at location advantage.
- The only Lucknow based company may think that it is at location disadvantage. Single data item cannot influence the behaviour of complete data group; therefore this type of finding is there.

xii. According to Z test the software companies of northern India face the problems of brain drain. The ANOVA has further confirmed it. Both the small and big companies face the problems of brain drain.

xiii. According to Z test the software market in northern region is price sensitive, which has been further established by ANOVA and Chi Square tests. We can safely accept that both small and big companies are operating in a price sensitive market.

5. Strategic Marketing & Software Development Mix for Small Software Companies:

We would now like to suggest a strategic marketing and software development model for small and big companies, in the light of facts gathered and inferences drawn as a result of various statistical tests. (Singh, D B, 2004)

Product Strategy for the Small Companies

Around 80% of the small software companies included in our survey have faced problems in product features. However, only 1/3rd of the respondent companies have conducted a market research on products and market. The software companies implement quality, quite subjectively. The small companies contend that the customers compare their brands with the competing brands. According to companies more product features are demanded at lower prices. Apart from this, small companies further stress that the customers demand high level of customization.

Looking into the above product related problems currently faced by the small software companies, it may be suggested that the companies should conduct a market research for product type and market size. Since the amount to be spent on commercialization is usually large and the same may not be feasible for small companies, it is strongly recommended that the companies should focus only in specific regions. The small companies should not consider the option for product diversification. Moreover, the companies must consider quality of product as the most important feature to be offered to customers.

Pricing Strategy for the Small Companies

80% of the small software companies included in the sample have faced the problem of pricing. Currently the software companies are facing with three problems of pricing the application software. These are:

1. Customers' preference for lower prices
2. There is no functional or direct relationship between quality and price
3. There is no benchmark available in the market for pricing the product.

One of the reasons why, the smaller software companies are facing problems in pricing is attributed to the intangibility of the product itself. Secondly the companies follow the principles and practices of pricing of goods therefore they are either cost based or market based. Application software possesses more characteristics of services than mere goods; therefore different methods of pricing may be followed.

- The pricing strategy for the smaller software companies should be such that the demand fluctuations may be successfully handled.
- Smaller companies should also take into account the cost of tangible clues of intangible application software product.
- Smaller software companies should adopt the pricing strategy in such a manner that can effectively handle the competition within the geographical boundary and the time zone. Here we would suggest that the smaller companies should operate in a niche market.

Distribution Strategy for the Small Companies

A little more than 20% of the small software companies face problems in the channel. The channels of distribution for smaller software companies, as per facts gathered, are very short and direct. In most of the cases it is from Business to Customers (B to C) or at best one agent or middleman can be added to it. This is the reason why the smaller software companies have not faced any problems arising out of distribution channel. In respect of smaller software companies, direct selling sales channel is the only method through which the application software can be offered to the end customers at lower prices. However the smaller companies may also consider Internet as an intermediary for their services.

Promotion Strategy for the Small Companies

80% of the smaller software companies face problems in promoting their products. The main reason for this is the budgetary constraints. According to the survey the companies have given two main reasons for the problems faced in promotion of the software product:
1. Lack of marketing professionals
2. Traditional media is costly and hence it is not possible for the smaller companies to adopt that media.

Critical examination of the facts reveals that the lack of funds stops the smaller companies in selecting the electronic or print media. The smaller companies may therefore adopt one of the following strategies:
1. Development of personal relationship with the customers, which will result in customer delight.
2. Demonstration of strong impression of competency, honesty and sincerity so as to win the confidence of the potential buyers through road shows, exhibitions and awareness seminars.
3. Using indirect selling technique for example acting as a buying consultant for the potential buyers.
4. Creating and maintaining a fine image by positive word of mouth.

All the above strategies don't involve much cost. The smaller companies facing the problems of resource crunch in the path of product promotion would find the above promotional strategies quite helpful.

Infrastructure Strategy for the Smaller Companies

When we take up the issue of infrastructure especially in the context of software development we mean the following:
1. Physical facilities available
2. Power back up available
3. Hardware/ Software available
4. Communication facilities available.

50% of the software companies, as per survey, face problems of insufficient infrastructure. The main reason behind this could be attributed to lack of funds for plough back in infrastructure facilities. The appropriate strategy, in this respect, for the smaller companies, could be, to reinvest certain fixed percentage of the revenue in the up gradation of the available infrastructure. The latest software and hardware should be purchased for the software development. It is suggested that at least 20% of the total revenue should be reinvested in the infrastructure updating. This figure is suggestive and has got its genesis in the normal rate of depreciation of computer infrastructure as shown by software companies in their balance sheets.

People Strategy for the Small Companies

33% of the smaller companies face the problem of good software developers. When this problem is coupled with brain drain from the region it becomes fiercer. The reason for this problem is low remuneration to the developers in the existing companies and better prospects for them in competing companies. In any typical software company employees are essentially the contact personnel with the customers. Therefore software developers should be motivated enough as customer conscious employees. Smaller companies according to the survey results can create conducive internal environment among all the employees through:
1. Supportive management methods
2. Better personnel policies
3. Better planning and control procedures

The smaller software companies must realize that the software developers are the first market of the company. Application software must be fully developed and internally accepted before it is marketed. The employees should be offered the ESOP and other fringe benefits as available in the other companies of the same size. The growth prospects and the reward system of the smaller companies should be reviewed, as the success of any application software is directly proportional to the intellectual creativity of the software developers involved. This will not only help small companies to retain their employees but also help them to establish as a better software company.

Process Strategy for the Small Companies

20% of the smaller software companies, included in the survey, have encountered the problems in software process management. Since the application software is an intangible product, the processes decide about the delivery of the product. Some of the following issues pertaining to processes especially in the context of smaller companies need be addressed:

1. Operations Planning: detailed specifications of each module
2. Scheduling: Detailing the timings at which the software development should be completed by agreed delivery promises within available resources and with their economic utilization.
3. Quality Control: As already mentioned the smaller software companies are not adopting standard quality techniques, effective and standard quality control techniques such as ISO and SEI – CMM should be adopted.

Government Support Strategy for the Small Companies
Around 80% of the small software companies according to survey admit that they have not received any support from the respective government or related agencies. Many reasons could be cited for it, by software companies. Nonetheless, it is recommended that the smaller software companies must opt for government support in all technical and financial matters. This will further help the companies to remove the problems arising out of lack of funds and technical infeasibility of certain software projects.

Conclusion:

We have made an attempt to enlist the main marketing and software development problems faced by application software companies of northern region. However the list may not be exhaustive. We have also tried to explore a relationship between marketing and software development. On the basis of a pilot survey (Before the current extensive survey) null hypotheses were established and at that point of time it was manifested that the nature of problems faced by small and big companies should be different. The data analysis and inferences thereof have further confirmed this. However we have dealt the case of Small Software Companies separately and differently than that of Big Software Companies. We have provided a strategic model for small software companies that could serve as the basis for developing a strategic model for big software companies.

References:

1. Bajpai, Nirupam and Shastri Vanita. (1999) "Port Development in Tamilnadu: Lessons from Chinese Provinces", Development Discussion Paper No. 731, Harvard Institute of International Development, Harvard University, (November 1999)
2. Cash McFarlan, F. W., McKenney, J. L., and Pyburn, P. (1983) "The Information Archipelago: Plotting a Course," Harvard Business Review, Number 1, January-February 1983, pp. 145--156.
3. Gargan, Edward A. (1993) "India booming as a Leader in Software for Computers" New York Times, 29 December 1993
4. Gibson, C. F., and R. L. Nolan. (1974) "Managing the Four Stages of EDP Growth." Harvard Business Review 52, no. 1 (January-February 1974).
5. Indian IT Software and Services Directory (2003), published by NASSCOM, New Delhi
6. Nolan, R. L., and Cyrus F. Gibson (1973). "Organizational Issues in the Stages of EDP Growth." Data Base 5, nos. 2-4 (winter 1973): 50-63.
7. Nolan, R. L. (1992) "The Stages Theory: A Framework for IT Adoption and Organizational Learning." In America's Information Technology Agenda, edited by J. Mechling and C. Rosenberg. Cambridge: John F. Kennedy School of Government, 1992.
8. Singh, D B (2004). "Study of Development & Marketing Problems of Application Software in Northern India (With Special Reference to Uttar Pradesh), Ph. D. Thesis submitted with Allahabad University, Allahabad.

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Phase-II: Empirical Article

ABSTRACT

•Every ICT application needs a model of computation, a model of storage, and a model of communication. Since funds are involved in the implementation of every model, be it related to computation or storage or communication; so, its of prime concern that "How to optimize the effective usage of the available resources?", with no further expenses. Apart from this, the recurring costs like power consumption, is also to be taken care such that the organizational profits keep on growing. Thus, the statistical multiplexing necessary to achieve elasticity and the illusion of infinite capacity is required to be explored, such that each of these resources are used effectively, and at optimum level. The virtualization concept plays a dominant role in doing all this; the environment is virtualized to hide the implementation of how they are multiplexed and shared. In this paper we explore the possibilities, how the emerging data centre "Cloud" model of computing is going to more profitable and eco friendly, in comparison to the traditional computing model. The performed work is going to address the limitations of the usual Data centre, and how the same can be over come by bringing the concept of cloud computing in to the picture.

KEYWORDS

•Cloud Computing
•.Grid Computing
•Cyber
•Platform as a Service

Introduction:

Throughout the history of computing, there have been several paradigm shifts from main-frames to mini computing to micro processing to networked computers. On track to be the next major paradigm shift is that of cloud computing [1]. The shift of computing trend toward cloud computing started in the late 1980s with the concept of grid computing when, for the .first time, a large number of systems were applied to a single problem, usually scientific in nature and requiring exceptionally high levels of parallel computation. That said, it's important to distinguish between Grid Computing and Cloud Computing [2].

Cloud computing is often confused with the term Grid Computing ("a form of distributed computing whereby a 'super and virtual computer' is composed of cluster of networked loosely coupled computers, acting in concert to perform very large tasks"), Utility Computing (the "packaging of computing resources, such as computation and storage, as a metered service similar to a traditional public utility such as electricity") and Automatic Computing ("computer systems capable of self management"). Indeed many cloud computing deployments depend on grids, have automatic characteristic and utilities – but cloud computing can be seen as a natural next step from the grid-utility model. In short, Grid computing specifically refers to leveraging several computers in parallel to solve a particular, individual problem, or to run a specific application. Cloud computing, on the other hand, refers to leveraging multiple resources, including computing resources, to deliver a "service" to the end user.

Its not like that grid computing has no role in cloud computing, and it's a new technology developed from scratch, the previous technologies have considerable contribution in the evolution of the concept of cloud computing[2], refer to Figure 1 below.

Figure 1: Evolution of Cloud Computing [2]

So, to get Cloud Computing to work, you need three things: thin clients (or clients with a thick-thin switch), grid computing, and utility computing. Grid computing links disparate computers to form one large infrastructure, harnessing unused resources. Utility computing is paying for what you use on shared servers like you pay for a public utility (such as electricity, gas, and so on).

With grid computing, you can provision computing resources as a utility that can be turned on or off. Cloud computing goes one step further with on-demand resource provisioning. This eliminates over-provisioning when used with utility pricing. It also removes the need to over-provision in order to meet the demands of millions of users[4].

II - Cloud – services and classification

What is cloud computing?

Fundamentally , cloud computing can be defined as a push in designing services where information is stored and processed on internet (i.e. "the cloud") usually via massive large scale data centers which can be assessed remotely through various clients and platforms[8] . So, far as the offerings of the services through the internet is concerned [2] , So, Cloud computing in crux is "a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers" [9]. Some examples of emerging Cloud computing infrastructures are Microsoft Azure [2], Amazon EC2, Google App Engine, and Aneka [3].

Services offered by cloud computing

Cloud Computing has often been referred as applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services. The services themselves have long been referred to as Software as a Service (SaaS). The datacenter hardware and software is what we will call a "Cloud". Cloud computing delivers infrastructure, platform, and software (application) as services, which are made available as subscription-based services in a *pay-as-you-go model* to consumers. These services in industry are respectively referred to as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Clouds [11] aim to power the next generation data centers by architecting them as a network of virtual services (hardware, database, user-interface, application logic) so that users are able to access and deploy applications from anywhere in the world on demand at competitive costs depending on users QoS (Quality of Service) requirements [9]. Developers with innovative ideas for new Internet services are no longer required to make large capital outlays in the hardware and software infrastructures to deploy their services or human expense to operate it [12]. It offers significant benefit to IT companies by freeing them from the low level task of setting up basic hardware (servers) and software infrastructures and thus enabling more focus on innovation and creation of business values.

Cloud classification- Public, private and Hybrid

The Cloud may be *Public Cloud* or *Private Cloud.* When a Cloud is made available in a *pay-as-you-go* manner to the general public, we call it a *Public Cloud*; the service being sold is Utility Computing. We use the term *Private Cloud* to refer to internal datacenters of a business or other organization, not made available to the general public. Thus, Cloud Computing is the sum of SaaS and Utility

Computing, but does not include Private Clouds. People can be users or providers of SaaS, or users or providers of Utility Computing. So, far as the profitability in an eco friendly way is concerned, we will focus on SaaS Providers (Cloud Users) and Cloud Providers, and compare the issue with the provision and usage of usual data centre. *Hybrid clouds* are a combination of Public and Private clouds such that the secured components are usually contained on premises and the compute load is usually spread over the public cloud. These are planned for the future by major vendors like Microsoft for Windows Azure. But this can be custom assembled as of now using Public and Private cloud offerings.

Centralized And Distributed Clouds.

Most of the talk about Cloud Computing deals with *Centralized Clouds*. Which means the Cloud Provider will setup virtualized data centers in a geographical spread providing for failover zones and accommodating special regional requirements continuously built upon since then. The second category is *Distributed clouds,a* distributed cloud is usually based on P2P technologies and allows global distribution and pooling of compute resources, storage and enterprise integration.

SaaS, Platform and Infrastructure Clouds.

SaaS, the simplest and earliest of Cloud Offerings were *SaaS (Software as a Service)* offerings. Which basically provided a hosted multitenant application for use using a pay as you go model. E.g. Google Apps, Office Live and Zoho. Here no customization or plugins are available which an end users or developers could add to its functionality. *Platform cloud,*Then came the Platform cloud offerings which offered a Platform to uers in a pay as you go cloud hosted model. These were usually limited to a specific domain like CRM e.g.SalesForce or Social Collaboration e.g.FaceBook but offered an API that could be used to extend their features. Mostly accompanied by a marketplace for buying third party features.*Infrastructure clouds,* Infrastructure clouds are usually those offerings which give you an infrastructure like Windows Azure or Amazon upon which you can build almost any application.

III - Cyber infrastructure Resource utilization

The customers engaging in cloud computing do not own the physical infrastructure serving as host to the software platform in question. Instead they avoid capital expenditure by renting usage from a third party provider. They, consume resources as a service, paying instead for the resources they use. Many cloud computing offerings have adopted the utility computing model, which is analogous to how traditional utilities like electricity are consumed, while other are billed on subscription basis. Sharing "perishable" and "tangible" computing power among multiple tenants can improve utilization rates, as servers are not left idle, which can reduce costs significantly while increasing the speed of the application development. A side effect of this approach is that "computer capacity rises dramatically" as customers do not have to engineer for Peak loads, adoption has been enabled by "increased high-speed bandwidth" which makes it possible to receive the response time from centralized infrastructure at other sites [3].

Since, there are many ways in which computational power and data storage facilities are provided to users, ranging from a user accessing a single laptop to the allocation of thousands of computer nodes distributed around the world. Users generally locate resources based on a variety of characteristics, including the hardware architecture, memory and storage capacity, network connectivity and, occasionally, geographic location. Usually this resource location process involves a mix of resource availability, application performance profiling, software service requirements, and administrative connections. While great strides have been made in the HPC and Grid Computing communities [16,14] toward the creation of resource provisioning standards[15,17,18,19], this process remains somewhat cumbersome for a user with complex resource requirements, for which the answer is cloud computing[7]. It's the Cloud computing which delivers infrastructure, platform, and software (application) as services, which are made available as subscription-based services in a pay-as-you-go model to consumers. These services in industry are respectively referred to as Infrastructure as a Service (Iaas), Platform as a Service (PaaS), and Software as a Service (SaaS). On demand availability of cyber infrastructure, largely involves funds, and major of them for hardware setups. Thus in cloud computing, from a hardware point of view, three aspects are new which are :-

1. The illusion of infinite computing resources available on demand, thereby eliminating

the need for Cloud Computing users to plan far ahead for provisioning.

2. The elimination of an up-front commitment by Cloud users, thereby allowing companies to start small and increase hardware resources only when there is an increase in their needs.
3. The ability to pay for use of computing resources on a short-term basis as needed (e.g., processors by the hour and storage by the day) and release them as needed, thereby rewarding conservation by letting machines and storage go when they are no longer useful.

Hence, the key necessary enabler of cloud computing is the construction and operation of extremely large-scale, commodity-computer datacenters at low cost locations, which uncovers the factors of 5 to 7 decrease in cost of electricity, network bandwidth, operations, software, and hardware available at these very large economies of scale. These factors, combined with statistical multiplexing to increase utilization compared a private cloud, meant that cloud computing could offer services below the costs of a medium-sized datacenter and yet still make a good profit.

IV - Datacenters & the technology behind cloud computing – a profitable option.

Virtualization and Automation are the technologies that work behind Cloud Computing has existed in Data Centers for well over the last decade, Virtualization allows using high end physical machines with multiple virtual machines running on them, where as the technology of Automation usually means that snap shots of these virtual machines can be kept on a network storage and these snap shots can be provisioned dynamically within minutes, further in case of any hardware failure or needs they can be migrated to other physical machines, providing failover and scalability.

This doesn't mean that Clouds Computing is just a synonym of Advanced Data Centers, Which is not very accurate because usually a cloud provider provides add-on infrastructure or platform services. Actually, the computing power in a Cloud computing environments is supplied by a collection of data centers, which are typically installed with hundreds to thousands of servers [9]. The layered architecture of a typical Cloud based data center is shown in Figure 2. At the lowest layers there exist massive physical resources (storage servers and application servers) that power the data centers. These servers are transparently managed by the higher level virtualization [10] services and toolkits that allow sharing of their capacity among virtual instances of servers. These virtual instances are isolated from each other, which aid in achieving fault tolerant behavior and isolated security context.

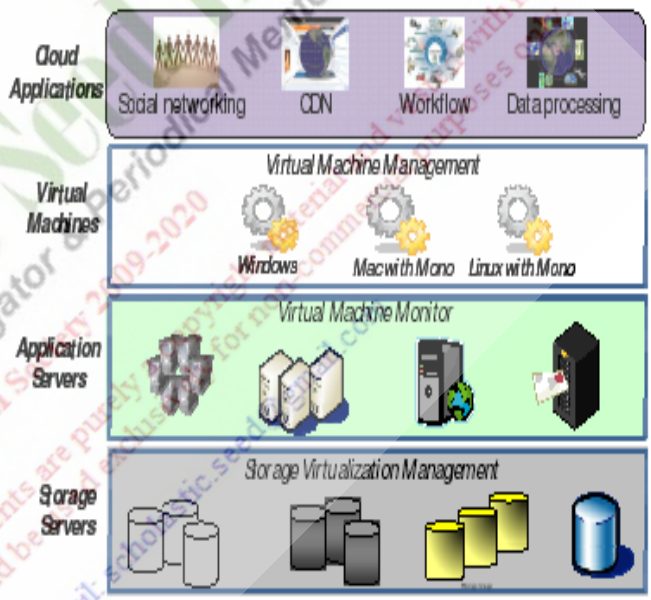


Figure 2 : The layered architecture of a typical Cloud based data center[5]

An organization of any size will have a substantial investment in its data center. That includes buying and maintaining the hardware and software, providing the facilities in which the hardware is housed and hiring the personnel who keep the data center running. An organization can streamline its data center by taking advantage of cloud technologies internally or by offloading workload into the public[5]. But without the concept of cloud

computing i.e. independently, the Data Centers are known to be expensive to operate and they consume huge amounts of electric power. For example, the Google data center consumes power as much as a city such as San Francisco. As Clouds are emerging as next-generation data centers and aim to support ubiquitous service-oriented applications, it is important that they are designed to be energy efficient to reduce both their power bill and carbon footprint on the environment. To achieve this at software systems level, we need to investigate new techniques for allocation of resources to applications depending on quality of service expectations of users and service contracts established between consumers and providers [13][6].

Thus the user of this emerging technology i.e. cloud computing are going to enjoy cost effective green computing environment because the user can avoid capital expenditures on hardware, software and services, rather paying a provider only for what they use. Consumption is billed on utility of the resources (e.g. resources consumed like electricity) or subscription (e.g. time based, like a newspaper) basis with little or no upfront cost. Other benefits of this time sharing style approach are low batteries to entry, shared infrastructure and costs, low management overheads and immediate access to a broad range of applications. Users can generally terminate the contract at any time (there by avoiding return to investment risk and uncertainty) and the services are often covered by SLAs- Service Level Agreements with financial penalties[4].

However, every operation of any ICT application needs a model of computation, a model of storage, and a model of communication. The statistical multiplexing necessary to achieve elasticity and the illusion of infinite capacity requires each of these resources to be virtualized to hide the implementation of how they are multiplexed and shared. In order to achieve this, different utility computing offerings should be distinguished based on the level of abstraction presented to the programmer and the level of management of the resources. Which in turn leads to profits, but to gain one should analyze that, When is Utility Computing preferable to running a Private Cloud?

Since, profitability is generally the key Moto behind running a private cloud, to work out this key parameter, we explore the practical situation in the form of cases, which are :-

Case-1: *When demand for a service varies with time.* Provisioning of the data center for peak load may sustain for few days per month but this leads to underutilization at other times. Instead, Cloud Computing lets an organization pay by the hour for computing resources, potentially leading to cost savings even if the hourly rate to rent a machine from a cloud provider is higher than the rate to own one.

Case-2: *When demand is unknown in advance*, example, a web startup will need to support a sudden rise in demand when it becomes popular, however it might be followed potentially by a reduction in this spike, when some of the visitors turn away.

For both cases i.e. Case-1&2, where a web business is unpredictable at any instance of time, that is the resource demand is varying over time and revenue is proportional to user hours, then to capture the tradeoff, the equation (1) is derived, where the expected profits made by using cloud computing are on the LHS whereas the profits made by a fixed capacity Datacenter are on the RHS of equation (1) given below.

$$\left[\text{UserHours\_Cloud} \times \left(revenue - Cost\_Cloud\right)\right] \geq \left[\text{UserHours\_Datacenter} \times \left(revenue - \frac{Cost\_Datacenter}{avg\_Utilization}\right)\right]$$

Assumptions made while deriving equation (1) are :

a) It is assumed that the Cloud Computing vendor employs usage-based pricing model, in which customers pay proportionally to the amount of time and the amount of resources they use.

Although more sophisticated pricing models for infrastructure services utilization [28, 6, 40] are available, but we worked with usage based pricing model because it will persist as a consequence of its simplicity and transparency, as demonstrated by its wide usage by real life utilities for electricity and gas companies.

b) Further, it is assumed that the customer's revenue is directly proportional to the total number of user-hours.

Analyzing equation (1), the left-hand side multiplies the net revenue per user-hour (revenue realized per user-hour minus cost of paying Cloud Computing per user-hour) by the number of user-hours, giving the expected profit from using Cloud Computing. The right-hand side performs the same calculation for a fixed-capacity datacenter by factoring in the average utilization, including nonpeak workloads, of the datacenter. *Whichever side is greater represents the opportunity for higher profit.*

Apparently, if Utilization = 1.0 (the datacenter equipment is 100% utilized), the two sides of the equation look the same. However, basic Queueing theory tells us that as utilization approaches 1.0, system response time approaches infinity. In practice, the usable capacity of a datacenter (without compromising service) is typically 0.6 to 0.8.Whereas a datacenter must necessarily overprovision to account for this "overhead," the cloud vendor can simply factor it into Cost cloud. (This overhead explains why we use the phrase "pay-as-you-go" rather than rent or lease for utility computing. The latter phrases include this unusable overhead, while the former doesn't. Hence, even if you lease a 100 Mbits/second Internet link, you can likely use only 60 to 80 Mbits/second in practice.) The equation makes clear that the cloud computing environment has better ability to control the cost per user hour of operating the service.

V – Result

Comparison of the factor of profitability for both Datacenter and Cloud computing, technologies for cyber infrastructure utilization is presented. It is found that cloud computing is a better option to manage the environment where the demand of the cyber infrastructure changes unpredictably.

VI – Conclusion

In this paper details, related to the evolution of cloud computing and its current classification is discussed, apart from this the confusions related to cloud computing and other technologies are presented. However from the discussion made in this paper ,it is concluded that the emerging trend of cloud computing is not only novel but also an innovative way to effectively use the cyber infrastructure and achieve cost effective, profitable and eco friendly environment.

VII – References

[1] Justin M. Grimes, Paul T. Jaeger, Jimmy Lin; "Weathering the Storm: The Policy Implications of Cloud Computing" available at nora.lis.uiuc.edu/images/iConferences/CloudAbstract13109FINAL.pdf

[2] Seeding the clouds : Key infrastructure elements for cloud computing by IBM , available at ftp://ftp.software.ibm.com/common/ssi/sa/wh/n/oiw03022usen/OIW03022USEN.PDF

[3]Cloud computing article available at http://en.wikipedia.org/wiki/Cloud_computing

[4]http://www.ibm.com/developerworks/web/library/wa-cloudgrid/

[5] Rodrigo N. Calheiros, Rajiv Ranjan, César A. F. De Rose, and Rajkumar Buyya; "CloudSim: A Novel Framework for Modeling and Simulation of Cloud Computing Infrastructures and Services"CloudSim-ICCP2009 available at http://www.gridbus.org/reports/CloudSim-ICPP2009.pdf

[6]Rajkumar Buyya, Chee Shin Yeo, Srikumar Venugopal, James Broberg, Ivona Brandic "Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility" available at http://www.gridbus.org/papers/Cloud-FGCS2009.pdf

[7] Daniel Nurmi, Rich Wolski, Chris Grzegorczyk Graziano Obertelli, Sunil Soman, Lamia Youseff, Dmitrii Zagorodnov, "The Eucalyptus Open-source Cloud-computing System"available at open.eucalyptus.com/documents/nurmi_et_al-eucalyptus_open_source_cloud_computing_system-cca_2008.pdf

[8] A. Weiss. Computing in the clouds. netWorker, 11(4):16{25, December 2007.

[9] R. Buyya, C. S. Yeo, and S. Venugopal. Market-oriented cloud computing: Vision, hype, and reality for delivering IT services as computing utilities. *In Proceedings of the 10th IEEE International Conference on High Performance Computing and Communications*, 2008.

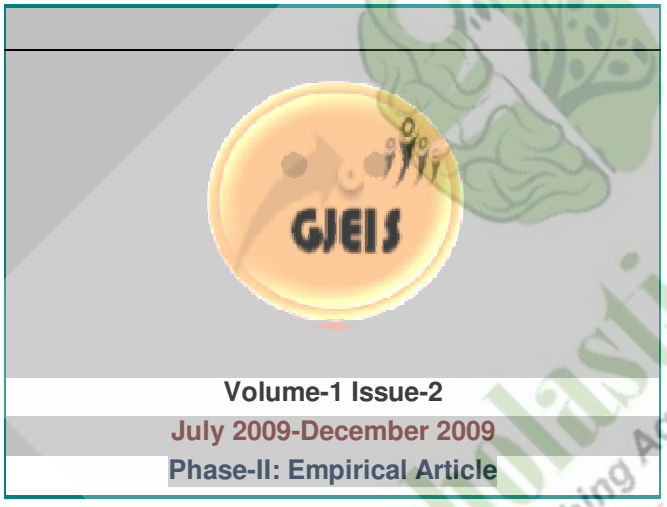
[10] J. E. Smith and R. Nair. *Virtual Machines: Versatile platforms for systems and processes.* Morgan Kauffmann, 2005.

[11] A. Weiss. Computing in the clouds. *NetWorker*, 11(4):16–25, Dec. 2007.

[12] M.Armbrust,A.Fox,R.Griffith,A.Joseph, R. Katz, A.Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica,M. Zaharia. *Above the Clouds: A Berkeley View of Cloud computing*. Technical Report No. UCB/EECS-2009-28, University of California at Berkley, USA, Feb. 10, 2009.

[13] K.H. Kim, R. Buyya, J. Kim, Power aware scheduling of bag-of-tasks applications with deadline constraints on DVS-enabled clusters, in: Proc. 7th IEEE Int. Symposium

on Cluster Computing and the Grid, CCGrid 2007, Rio de Janeiro, Brazil, May 2007.
[14] F. Berman, G. Fox, and T. Hey. Grid Computing: Making the Global Infrastructure a Reality. Wiley and Sons, 2003.
[15] I. Foster and C. Kesselman. Globus: A metacomputing infrastructure toolkit. International Journal of Supercomputer Applications, 1997.
[16] I. Foster and C. Kesselman, editors. The Grid – Blueprint for a New Computing Infrastructure. Morgan Kaufmann, 1998.
[17] D. Gannon. Programming the grid: Distributed software components, 2002.
[18] NSF TeraGrid Project. http://www.teragrid.org/.
[19] T. Tannenbaum and M. Litzkow. The condor distributed processing system. Dr. Dobbs Journal, February 1995.



Information Security in Flexible Supply Chain Network: A Decision Information Security (DIS) Model

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Phase-II: Empirical Article

ABSTRACT

•The Internet, with its unprecedented growth, is a promising platform to exchange information along the business channels. The purpose of this study was to determine the factors that are critical to organizations in their adoption decision of Information Systems (IS). Security assurance across flexible supply chain network is a critical factor for international business managers and in the evolution of international trade generally. A security system for a flexible supply chain network is progressing as a network security management in an existing security solution foundation. In this paper, it is tried to design a security solution structure for enhancing the internal security. This study proposed the structure of Decision Information Security (DIS) in order to build a supply chain network security management system which also have the inherent properties of the security systems e.g. confidentiality, authentication, availability. This paper suggests the needs for security mechanism capabilities that will allow private and public sector groups involved in global trade to effectively mitigate the threat of IT and loss of competitiveness.

KEYWORDS

•*Information System*
•*Security System*
• *Information Security Systems (ISS),*
•*Flexible Supply chain Network*
•*Internet*

Introduction

This In today's business environment, most organizations are facing significant pressure to make their operational, tactical, and strategic processes more efficient and effective. Information technology (IT) has become an attractive means of improving these processes. Consequently, organizations have implemented several strategies to improve effectiveness and to enhance efficiencies through the use of IT. Until recently, the main focus of many organizations was on improving internal operations. However, establishing strategic alliances between trading partners along the supply chain with full flexibility through the utilization of IT may result in great benefits. At the same time, there is a threat of the information security also due to the computer crimes.

However, most IS security managers pay more attention to technical issues and solutions such as firewalls, routers, and intrusion detection software, while pay less focus on soft issues such as the hazards caused by end users' lack of IS security awareness (Katz, 2005). Information security awareness can be described as a state where users in an organization are aware of their security mission (Siponen, 2000). It can be distinguished two categories of security awareness: framework and content (Siponen, 2000). The former concerns standardization, certification and measurement activities, whereas the latter addresses the human and socio-cultural aspects of information security awareness. Furthermore, Puhakainen (2006) points out that 59 IS security awareness approaches have been put forward by practitioners and scholars. These approaches can be classified into two categories. Studies in the first category consider IS security awareness to mean attracting users' attention to IS security issues (e.g., Hansche, 2001; Katsikas, 2000). Studies in the second category regard IS security awareness as users' understanding of IS security and, optimally, committing to it.

IS security awareness plays a significant role in the process of the overall information security of any organization (Thomson and von Solms, 1998; Straub and Welke, 1998). The important role of the human factor in IS security has been recognized by both the research community and IS security practitioners (Parker, 1998, 1999; Siponen, 2000,

2001). As such, users' IS security awareness is reflected in their attitudinal and behavioural patterns (Beatson, 1991; Lafleur, 1992; Gaunt, 1998, 2000; Ho¨ne and Eloff, 2002; Mitnick, 2002; Puhakainen, 2006).

In the present paper, the soft issues along with some technical issues have been taken into the consideration. To make the quick and safe decision in supply chain, a model of the Decision Information Security (DIS) has been developed and proposed in the present work. This system provides the inherent facility of the internet with a role based security mechanism for a flexible supply chain network.

The remainder of the paper has been arranged in the following manner: the literature review has been presented in section 2 and section 3 presents the flexibility in supply chain. The generic view of the information security has been presented in section 4. The proposed DIS model has been delineated in section 5. In section 6, the paper has been concluded.

2. Literature Review

There have been in recent years increased information security considerations in organizations (Straub and Welke, 1998; Schlienger and Teufel, 2003). This is mainly due to the fact that information systems and the Internet are today used not only by organizations to increase their competitiveness, but also by criminals. Based on recent studies (Whitman and Mattord, 2005), staff errors are rated among the top threats to information assets in organizations. It is essential to convince IS security staff of the imperative need to enforce information security measures (Pfleeger and Pfleeger, 2003). Cybertrust (2005) argues that the problem of information security is two-fold: firstly it is due to the increase in economic and political uncertainty and secondly to the pressure from customers and players of the network. In fact, a single case of abuse can cause more costs than the establishment of a security system (Czernowalow, 2005). Enforcing security awareness through education and training is hence paramount. It is essential to ensure that all users are aware of information security threats and concerns, and are equipped to support organizational security policy in the course of their normal work (BS7799, 1999). However, slowly but surely information security is getting into the forefront of things, and has been promoted from a by-product to an integral part of business operations (Conner and Coviello, 2004).

3. Flexibility in Supply Chain Management

A generalized model of a supply chain presented in figure 1 shows four levels in a supply chain. As a second player, the manufacturer produces the final product(s). The left most level is assumed to be the highest level while the rightmost is the lowest level in the supply chain. There may be any number of suppliers directly above the manufacturer. These suppliers may have their suppliers and the chain could extend to any number of tiers. At each tier some sort of value addition and/or physical transformation of goods take place. On the downward side of the manufacturer(s) is the level whose function is to supply the finished products to the retailers (distribution).

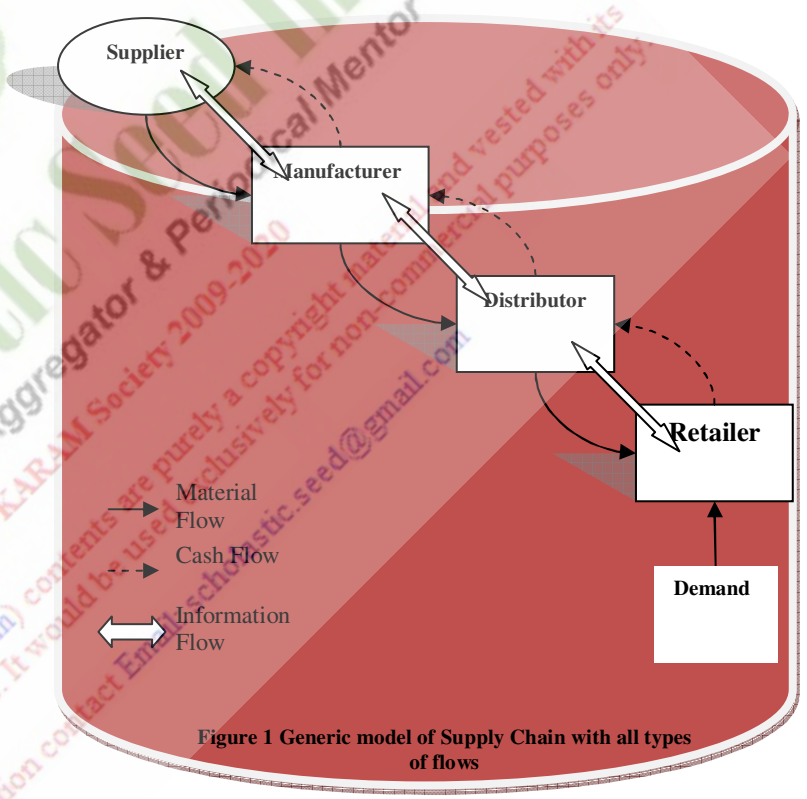


Figure 1 Generic model of Supply Chain with all types of flows

There are generally three kinds of flows along any two nodes of the supply chain as shown in: *material flow*, *information flow* and *cash flow*. The information flows from higher to lower echelons is generally

includes information regarding the quantity and the quality of the goods required (purchase order, etc.).
Flexibility as a generic notion is well known in several domains. The objective was to identify the performance of SC_s in dynamic and flexible environment. Garavelli (2003) views the supply chain flexibility and compares the results with no flexibility, partial flexibility, and full flexibility (figure 2). Wadhwa and Rao (2004) propose a unified framework for understanding flexibility in manufacturing system as well as supply chains. The framework is based on the key elements and basic constructs for analyzing their interaction for possible flexibility type. The framework is found to be useful as it could be applied to deal with the dynamic environment of SC_s. Similarly, Gunasekaran (2004) view supply chain flexibility as a way of providing options to the customers. Wadhwa and Rao (2003) examined the concept of flexibility in relation to the other important concept of agility and highlighted certain commonalities and differences and also suggested a possible vision for future evolution of these two important concepts. Therefore, it is necessary to deal dynamically with the information security to avoid problems in smooth running of supply chain. This is vital for SC_s to reduce overall cost with increased security. We have developed an information security system for flexible SC_s. In our model, we have shown only a single supplier, manufacturer, distributor and retailer and this model will work on the role base but in the case of FSCs, there will be a separate key of each node of the FSC.

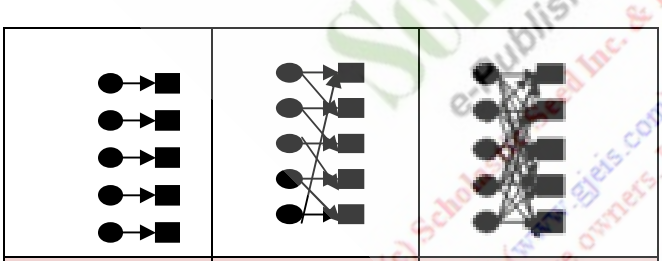


Figure 2: Supply Chains and Its Flexible Configuration based on Routing

4. Information System Security

4.1 Concepts

Information security is a broad subject that requires an adapted definition. The literature refers to both ''computer security'' and ''information systems security'', as these two concepts seem to be used interchangeably. According to (Ross, 1999), computer security can be defined in terms of domains, functions, and/or concepts. In terms of concepts, computer security can be categorized into confidentiality, integrity, authentication, access control, non-repudiation, availability, and privacy. In this context information security can also be defined as preserving confidentiality, protecting information from unauthorized use, assuring integrity and accuracy, and making data available to authorized users on a timely basis (Updegrove and Wishon, 2003).
In general, the principal reasons for providing IS security may include protection of resources, maintaining management control, ensuring safety and integrity, implementing policies and laws, and attaining operational advantages and economies (Turn, 1986). The expected outcomes of the effective information security system are as follows:

- Reduction on risk and potential impact on business strategies
- Value delivery through the optimization of investments
- Efficient utilization of resources
- Dynamic performance measurement
- Real time monitoring the operation in a supply chain to meet the business objectives

4.2 Supply Chain Management perspective

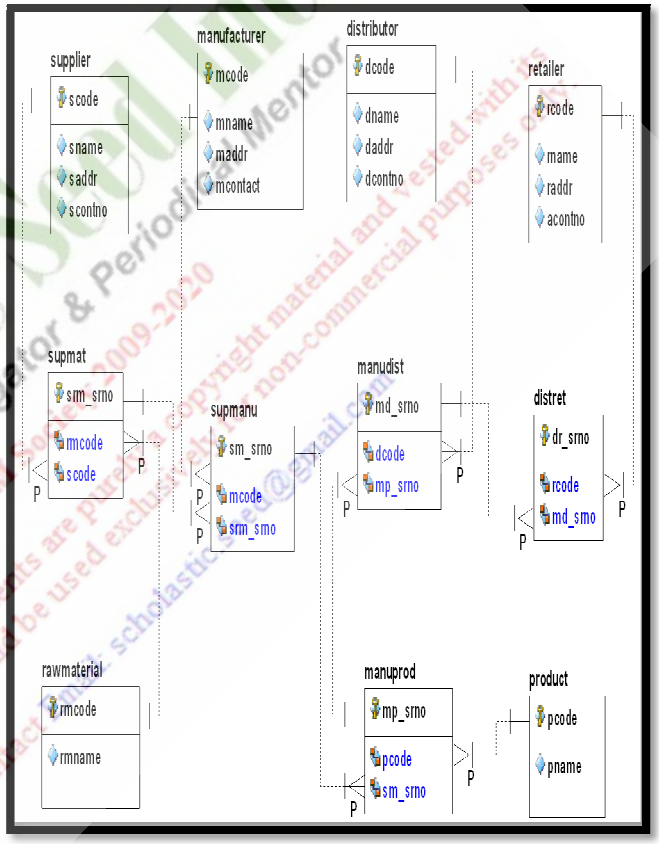
The vulnerability of any flexible supply chain is increasing with the advent of electronic commerce and open network architectures (Barsanti, 1999). Better computer literacy, increased computer user sophistication, and availability of advanced software tools may also contribute to increased IS security abuses in the future. Hence, management needs to pay more attention to IS security issues (Dhillon and Backhouse, 2000; Kankanhalli et al., 2003). Management attention for IS security has been low compared to other IS issues (Brancheau et al., 1996; Olnes, 1994). In a global information security survey of midsize and large firms, less than 50% of the 459 CIOs and IT directors polled said they had IT security awareness and training programs for employees (Verton, 2002). As highlighted in Kankanhalli et al. (2003), previous studies on IS security have focused on software for detecting IS security abuses (Straub and Nance, 1988), measures for preventing IS security abuses (Straub, 1990), perceptions of IS security adequacy

(Goodhue and Straub, 1991), and IS security planning models for management decision-making (Straub and Welke, 1998). For decision making problems, an ISS framework has been developed in supply chain which is described in the next section.

5. Decision Information Security (DIS) Model for Flexible Supply Chain

In the flexible supply chain framework, DIS will work among suppliers, manufacturers, distributors and retailers with its inherent facility of the confidentiality, integrity, availability and authentication. In such a framework, none of the players can be acquainted with the other players' capabilities or strategies. To develop such a model, the aim is to set a supply chain among all the players in such a manner that no one would be able to know the decision made by any member, which is not required by them. The proposed framework has been shown in figure 3. The detailed description of working of the proposed model has been described below.

In the propsed model of ISS, the leftmost echelon (supplier) is shown by the primary key know as *scode* and it includes the supplier name, address, and identification number (*sname, saddr, scountno*). The decision made by the suppliers can be shown by using these keys and the decision made by suppliers can be hid from the retailers by using the same key. Whereas raw material is identified by the primary key known as *rmcode*. The *rmcode* depicts the name of raw material delivered by the suppliers. The *supmat* table contains the data related to supplier (*scode*) and raw material (*rmcode*) i.e. which supplier is supply which raw material and each record is identified with a unique primary key *srm_srno*. The next player of supply chain (manufacturer) can use the primary key *mcode* for providing their information. It also shows the information regarding the name, address, identification number of manufacturers. In the *supmanu* table, the data is recorded associated with supplier, raw material and manufacturer i.e. a unique primary key *sm_srno* will offer the information of raw material provided by suppliers to the manufacturers. Thus *supmanu* table will be full of three data: *sm_srno* as unique key value for each record, *mcode* , and *srm_srno*. The data related to manufacturer, raw material and finished product is giving in the table known as *manuprod* and operated by *mp_srno*, a primary key. Product details are available in table product with uniquely identified key *pcode*. The role of the distributor can be played by using the primary key known as *dcode* and he can generate its demand to the manufacturer. Now the *manudist* table contains the data related to manufacturer, product and distributor and each record of distribution is identified with a unique primary key *md_srno*. The distributor is distributing which product to which retailer and each record is identified in the *distret* table with a unique primary key *dr_srno*. Retailer details are available in table retailer with uniquely identified key *rcode*. Here retailer can produce their demands. In the proposed framework, the decisions are saved in *supmat, supmanu, manudist,* and *distret* to show the decision made by suppliers, manufacturers, distributor and retailer. So they can secure their decisions information from any restricted member of the chain.



6. Conclusion

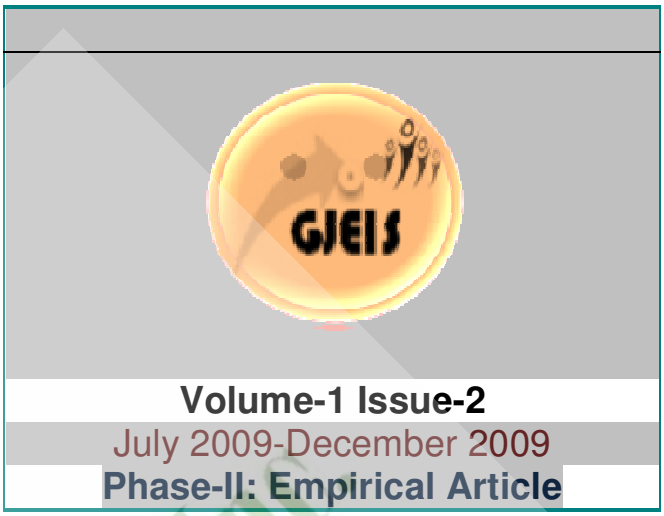
With the development of information society, the Internet based information system has brought convenience and pleasure to human life, but it is also misused by malicious or curious people to harm others and such side effects keep increasing. The present study analyzed the internet based flexible supply chain network development process and

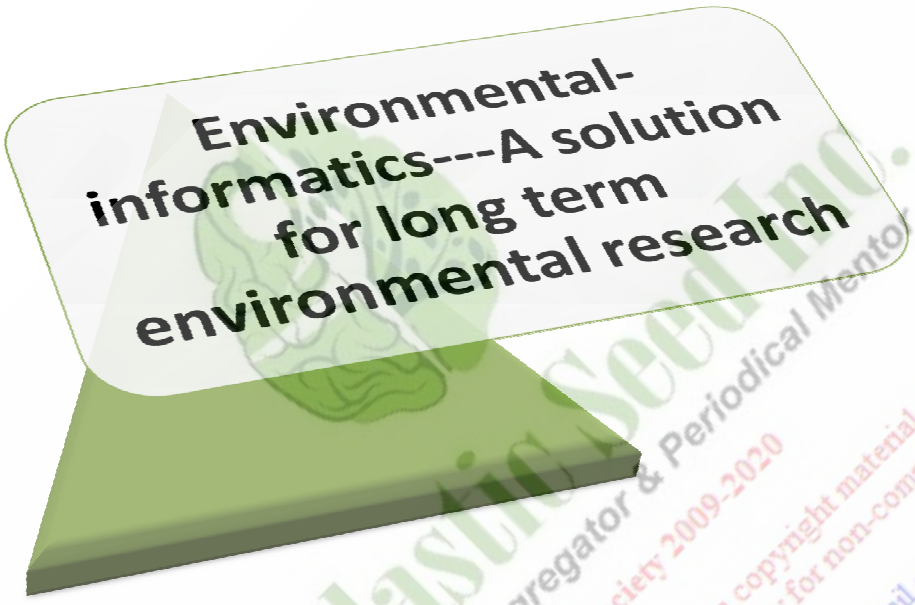
direction of security systems. In addition, we proposed a structure of Decision Information Security (DIS) model, which is the most fundamental goal of a security system, has been proposed. The proposed model restricts to know the decision of the entire member for any particular strategy. Thus they can maintain the confidentiality and privacy also. Simultaneously, they can provide the decision information to the right member at the right time. The structure is applicable to any security policies in building supply chain network security management systems. This security system provides some inherent properties e.g. confidentiality, integrity, availability and authentication etc. As a future scope, it is necessary to develop intrusion cut-off methods that distribute traffic so that the processing of a large quantity of data does not slow down the network speed.

References

1. Barsanti C., (1999) Modern network complexity needs comprehensive security. *Security*, 36(7), 65–8.
2. Beatson JG., (1991) Security – a personnel issue. The importance of personnel attitudes and security education. In: Dittrich K, Rautakivi S, Saari J, editors. *Computer security and information integrity*. Amsterdam: Elsevier Science Publishers, 29–38.
3. Brancheau JC, Janz BD, Wetherbe JC., (1996) Key issues in information systems management: 1994–95 *SIM Delphi results. MIS Quarterly*,20(2), 225–42.
4. BS7799., (1999) *Code of practice for information security management.* UK: British Standards Institute.
5. Conner FW, Coviello AW, (2004), Information security governance: a call to action, *Corporate Governance Task Force Report of 2004*,
6. Cybertrust, Justifying security spending: how to make a business case for information security Available online at: (http://www.cybertrust.com/media/white_papers/cybertrust_wp_security_spending.pdf) (2005) [accessed 13.08.07].
7. Czernowalow M. *Lack of policy causes IT risks*. Available from: ITWEB, <http://www.itweb.co.za> [accessed 15.07.05].
8. Dhillon G, Backhouse J., (2000) Information system security management in the new millennium. *Communications of the ACM*, 43(7), 125–8.
9. Garavelli. (2003), Flexibility configurations for the supply chain management, Int. J. Prod. Economics; 85, 141-153
10. Gaunt N., (1998) Installing an appropriate IS security policy in hospitals. *Int. Journal of Medical Informatics*, 49(1), 131–4.
11. Gaunt N., (2000) Practical approaches to creating a security culture. *Int. Journal of Medical Informatics*, 60(2), 151–7.
12. Goodhue DL, Straub DW., (1991) Security concerns of system users: a study of perceptions of the adequacy of security. *Information and Management*, 20(1), 13–27.
13. Gunasekaran A. Patel C. McGaughey R., (2004) A framework for supply chain performance measurement; Int. J. Production Economics; 87: 333–347
14. Hansche S. (2001) Designing a security awareness program: part I. *Information System Security,* 10(1), 14–22.
15. Hone K, Eloff JHP., (2002) What makes an effective information security policy? *Network Security*, 6, 14–6.
16. Kankanhalli A, Teo HK, Tan BCY, Wei KK., (2003) An integrative study of information systems security effectiveness. *International Journal of Information Management*, 23, 139–54.
17. Katsikas SK., (2000) Health care management and information system security: awareness, training or education? *International Journal of Medical Informatics*, 60(2), 29–35.
18. Katz, FH., (2005) The effect of a university information security survey on instructing methods in information security. *In: Proceedings of the second annual conference on information security curriculum development*; 43–8.
19. Lafleur LM., (1992) Training as part of a security awareness program. *Computer Control Quarterly*, 10(4), 4–11.

20. Mitnick KD., (2002) *The art of deception: controlling the human element of security*. USA: Wiley Publishing.
21. Olnes J., (1994) Development of security policies. *Computers and Security*, 13(8), 628–36.
22. Parker DB., (1998) *Fighting computer crime: a new framework for protecting information.* USA: John Wiley & Sons.
23. Parker DB., (1999) Security motivation, the mother of all controls, must precede awareness. *Comp. Security J.*, 15(4), 15–23.
24. Pfleeger CP, Pfleeger SL., (2003) *Security in computing*. 3rd ed. Prentice Hall.
25. Puhakainen P, (2006) *A design theory for information security awareness*. PhD thesis, University of Oulu.
26. Ross ST., (1999) *Unix systems security tools.* The McGraw-Hill Companies, 444. ISBN-10: 0079137881;
27. Schlienger T, Teufel S., (2003) Information security culture – from analysis to change. *SA Computer Journal*, 31, 46–52.
28. Siponen MT., (2000) A conceptual foundation for organizational information security awareness. *Information Management & Computer Security*, 8(1), 31–41.
29. Siponen MT., (2001) Five dimensions of information security awareness. *Computers and Society*, 31(2), 24–9.
30. Straub DW, Nance WD., (1988) Uncovering and disciplining computer abuse: organizational responses and options. *Information Age*, ISSN: 0261-4103, 10(3), 151–6.
31. Wadhwa, S., Rao, K. S., (2003), Enterprise Modeling of Supply Chains involving multiple entities flows: Role of Flexibility in Enhancing Lead Time Performance, *SIC Journal*; 12 (1):5-20
32. Wadhwa, S., Rao, K.S. (2004) A Unified Framework for Manufacturing and Supply Chain Flexibility, *Global Journal of Flexible Systems Management*; 5(1):15-22





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Phase-II: Theme-Based Paper

ABSTRACT

During recent decades the stirring up of the processes of globalization practically in all spheres of present day civilization has aggravated and brought forth numerous problems resulting from nature-society interactions. To overcome these problems, it is necessary to develop and adopt new concepts and techniques to evaluate the changes occurring on the earth ecosystem. For this, application of information technology is the best option. Various applications of information technologies are providing the ways to understand the environmental complexity across the entire range of scales. Understanding this complexity through applications will develop new strategies and ideas to manage ecosystem. This paper deals with one such field, i.e. environmental-informatics- new approach to process, analysis and synthesis of environmental systems using various models and IT applications

KEYWORDS

- *Environmental informatics*
- *ecological informatics,*
- *Computational environmental research*
- *environmental application.*

Introduction

The junction between present and future societies lies in the global commons: the shared physical, biological, and intellectual resources of the planet. The environment—specifically intact, functioning ecological systems—is essential to opportunities for individual development, the health and well-being of citizens and communities, and the generation of new wealth. Environmental science and technology are therefore a vital component of productive knowledge and thus a high priority for the Nation.

From past many decades, environment has been the source for industrialization and urbanization as a resource. As the population of world is growing rapidly and as its demands for survival, the stress on environment for its resources is also increasing through various reasons whether increase in technology or in energy dependency, international trade or in social complexity. For all this there should be something there to manage them properly, help in decision-making, minimize the time consumption etc. Information technology or Informatics – can be the answer for this with large scale computational capability to handle the various sophisticated data and analyze them so that proper decision can be made and the management could be done properly.

As connections between humans and the goods and services provided by the ecosystems of Earth become better understood, the scale and rate of modifications to these ecosystems are increasing. Environmental challenges are often exceedingly complex, requiring strengthened disciplinary inquiry as well as broadly interdisciplinary approaches that draw upon, integrate, and invigorate virtually all fields of science and engineering. Within the broad portfolio of science and engineering for the new century, the environment is emerging as a vigorous, essential, and central focus.

To see the ultimate limitations of the environment, analysis of the various environmental factors: biotic or abiotic has to be processed, their interactions with their environment (inner and outer) and with other organisms are being studied. But these efforts can only be successfully analyzed when the results obtained are evaluated and the proper sound decision alternatives are generated. Many scientists are working on applications based approaches, which has made easier to scrutinize complex interaction fundamentals of the nature system. Recent advances in information technology has made the development much easier by

providing easy search for sustainable development strategies, researches has been made for multi-scale data analysis and environmental modeling through multi-dimensional approach. This could facilitate the environmentalists, decision-makers to intimately think for the knowledge and a clear vision of social, ecological, environmental, economic objectives, with an advanced and interdisciplinary approach - environmental informatics. This field will bring together a multi-dimensional approach of information-technology based applications, in linkage with complex and versatile environment associated with mathematical modeling skills to overcome time consuming phenomena, risk, cost-effective and consensus-oriented solutions (Gunther, 1998; Chang *et al*., 2001, 2002).

Traditional mathematical simulation models are useful tools for the forecasting of environmental processes. It is commonly accepted that modeling frameworks offer a powerful tool for modelers, researchers and decision makers, since they allow the management, reuse and integration of models from various disciplines and at different spatial and temporal scales.

Li and Chen (1994) proposed a model for simulating organics removal and oxygen consumptions by biofilms in an open-channel. Kazmi and Hansen (1997) developed a numerical model for water quality simulation and applied it to a case study in the Yamuna river, India. L. Zadeh (Zadeh 1965) developed Fuzzy set theory for handling the uncertainty for the representation of vague expert knowledge and processing uncertain imprecise information. Construction of knowledge based models that capture insights domain experts have of system's structure and behavior is qualitative reasoning (a part of artificial reasoning) Bredeweg *et al.* (2006). Artificial neutral networks, a inductive model rely heavily on the comprehensive data induced from bio-inspired computation.

Nature's computation

A new paradigm requires a new way of looking at the world. The use of computers and information technology has stimulated a view in which the natural world is seen as a form of computation. DNA is the code for life's "program". The links between biology (including environment biology) and computers has been growing rapidly, but still there are some gaps in our understandings of genotype, phenotype, population and community which are the major challenges and need to be bridged.

One of the most relevant and important developments associated with natural computation is a new research field called *artificial life* (`A life' for short). This is the study of life-like properties in computational systems. One of the key ideas in Alife is that of an agent. An agent is a discrete entity that has certain computational capabilities, and can also interact both with its surroundings and with other agents. An important area of Alife research, and of advanced computing generally, is to study the properties and behaviour of multi-agent systems. This research is a beginning to grow into a significant body of theory about systems of this kind.

The goal is to study phenomena found in real-life evolution in a controlled manner, hopefully eliminating some of the inherent limitations of evolutionary studies that use live bacteria or mice. The simulated nature of the organisms and environments also allows for unorthodox and previously impossible experiments, such as a comparison of Lamarckian evolution and natural selection.

Also sometimes included in the umbrella term "artificial life" are other agent-based emergent properties, such as the development of economies or societies. The common thread of all "artificial life" is the concept of an interative population approach, generations of agents which can mutate and become fitter over time.

Informatics for environmental science

Long term environmental research has pioneered the use of bottom-up and research-driven approaches to informatics. Scientists know data and its uses but do not know the information technology available to them to solve problems on the other hand computer experts know information technology but do not understand the subtleties involved in the storage and use of the different forms of environmental data. By forming these integrative working groups, bringing together disciplinary specialists with information specialists, strong productive partnerships have been formed to solve real-world issues in environmental science.

From last many years training, courses, workshops, and Conferences has been organized in this field. These activities have led to the

accumulation of experiences and materials helping to formalize the index for next-generation scientists to applicate the informatics in environmental science.

Challenges

Environmental informatics has many challenges. As we know that the environmental systems are very complicated, the characterization of uncertain due intertwined fractions that makes environmental system extremely complex. Mathematical models are having the dependency on many environmental factors. As we know that the complexity of environment is beyond the limits, it's very hard to show the interdependency of some factors in the forms of model or mathematical formulas. Many times the data for some parameters are not been monitored from last many years or it also may possible that the parameters have not been monitored earlier, so the data have to be generated or rough estimation have to be made. It is difficult to conclude that the information which is available is correct from errors or not been measured correctly, in this situation the decision makers or the various applications will help to overcome this kind of problem. This shows that the values added into the modeled system is a small part of entire system to be studied. Therefore, it is not wrong to say that the output we get from the models is insufficient for helping the decision making and prediction. It needs a solid investigation for the insufficient information required by the models to get the maximum accuracy in decision making with the help of new methods and technologies.

One of the major challenges is the absence of raw data which creates difficulty in uncertain expression and also in solving the models that contain the uncertain factors or relationships. There are many scientists who have worked with inclusion of various methods like fuzzy, qualitative reasoning, artificial neutral networks and other modeling approaches with IT and mathematics as their base to overcome the uncertainty and risk factors in the models. Schleiter *et al.* (2006) used artificial neutral network as tools to model non-linear interrelation for studying the running water ecology. Another challenge is the risk factor that is present in measured data used in decision making interrelated with the uncertainty in modeling process. Presence of risk in environmental assessment and prediction can be another reason to be in doubt, these doubts or risks in environmental systems may affect the final decision in environmental management. Informatics can minimize the problem of uncertainties and risks through different various techniques or applications. To enhance the capability and applicability of models, there is a need to take help from innovative techniques with for regular monitoring and measurement.

"Models are the tools which help in decision making and informatics is the advancement helping this tool to get maximum accuracy."

Tools and techniques

Since years the scientist with computer experts are working on different computer based modeling techniques to study the environmental system and they provide the maximum accuracy in decision making. These computer based techniques have the advancement like artificial intelligence, data archival, retrieval and visualization which help in the management and provide assistance in solving problems and decision making system. This kind of innovative techniques can become the answer to question in those cases where the early warning, maximum accuracy in prediction and emergency is taken in account.

- High performance computing to provide high-speed data access and processing, and large internal storage (RAM);
- Object-oriented data representation to facilitate data standardization and data integration by the embodiment of metadata and data operations into data structures;
- Internet to facilitate sharing of dynamic, multi-authored data sets, and parallel posting and retrieval of data;
- Remote sensing and GIS to facilitate spatial data visualization and acquisition;
- Animation to facilitate pictorial visualization and simulation.
- Internet and www to facilitate interactive and online simulation as well as software and model sharing;
- Cellular automata to facilitate spatio-temporal and individual-based simulation;
- Fuzzy logic to represent and process uncertain data;
- Artificial neural networks to facilitate multivariate nonlinear regression, ordination and clustering, multivariate time series analysis, image analysis at micro and macro scale;

- Genetic and evolutionary algorithms for the discovery and evolving of multivariate nonlinear rules, functions, differential equations and artificial neural networks; - Hybrid and AI models by the embodiment of evolutionary algorithms in process-based differential equations, the embodiment of fuzzy logic in artificial neural networks or knowledge processing;
- Adaptive agents to facilitate adaptive simulation and prediction of ecosystem composition and evolution.

Reaching more accurate decision-making system with consensus based efforts with a recalling technique artificial intelligence will need the combination knowledge from scientists to engineers with complete network of decision makers.

Future perspectives

The system of environmental management has many aims, including complexities like intertwined of system factors, modeling expressions, interpretation of research results, etc., have to keep in mind while decision making. The system has to be simplified assuming the final errors in mind in terms of static or single objective, to measure the complex systems. The risk of failures of system analysis depends upon how accurately the system is simplified. This risk is the major challenge faced by the environmental researchers.

The insufficiency of data, moderate measures, natural conditions, and quality records, as well as the other relevant socio-economic and cultural factors can become the barrier for having the proper management. For these kinds of problems the researchers have to be solid on the study site as local managers and other people interrupt. Information Technology's involvement will provide the facility for studying the site without heavy involvement of on site investigation and with better knowledge and understanding. This kind of facilities encourage the agencies and research to build up the online-database management system which can help in decision support system to help the environment by giving pressure on the government and other social agencies to apply the proper management techniques and to develop more accurate, fast and friendly techniques for nature.

Today along with the information technology, remote sensing instruments can help in better understanding to study sites by providing the raw data. With the help of innovative technologies the data mining is possible which give a more accuracy in decision making and give the good results with the developed strategies. With wired or wireless network the data sharing and distribution is possible which facilitate us to understand the modeling results and for the spatial analyses. Computer can become the door through which we can cross many limitations by achieving a target of high-end sophisticated knowledge management for the better understanding of complexities of environmental systems, over come the uncertainties and with support system. With this kind of facilities a better view, knowledge and understanding develop and a better sustainable strategies could be develop with maximum support system, complete database and information .

Conclusion

The applications of IT have overcome the difficulties while handling dynamic and uncertain aspects of real-world environmental systems. As the nature of environment is not static and the conditions of environmental management system are changing with the time, the demand of periodic update in decision support is increasing. It is the need of management system in context of users and decision makers that the research outputs must be "dynamic". The advancement in IT will help to develop the new techniques and tools to environmental management system, however the role of these technologies has been limited but with the implementation and generation of graphical forms and visual presentations these limitations has been minimized. This role of new methodologies and better understanding of research outputs not only help to establish better environmental management system but also help in making sustainable development strategies. There contribution in management is associated with artificial intelligence techniques to promote long term usability of environmental informatics. With this trend of information technology in environment, will help to understand the complex environmental system and work as new niche in the field of engineering and environmental science.

References

1. Jaime J. Cornejo,: "*Current research and development on Environmental Informatics*
2. Tochtermann and Maurer (2000); "*Knowledge management and Environmental Informatics*" Journal of Universal Computer Science vol. 6, no. 5, Springer Pub. Co.

3. Peter D. Roopnarine; *"Ecological Informatics : Catastrophe Theory"* Department of Invertebrate Zoology & Geology. California Academy of Sciences, California (USA)
4. Parrott, L. (2008) (Pre-print). Ecological Informatics: Adaptive Agents. In: Jorgensen, S.E. (Ed), *Enclyclopedia of Ecology,* Elsevier, Netherlands. (In press)
5. Günther, O. (1998). Environmental information systems. Berlin; New York : Springer.
6. Huang, G.H. (1996). IPWM: an interval parameter water quality management model. *Eng. Optimiz.*, 26, 79-92.
7. Kazmi, A.A. and Hansen, I.S. (1997). Numerical models in water quality management: a case study for the Yamuna River (India). *Water Sci. Technol.*, 36, 193-199.
8. Alidi, A.S. (1998). A goal programming model for an integrated solid waste management system. *Arabian J. Sci. Eng.*, 23(1B), 3-16.
9. Briggs, D.J. (1995). Environmental statistics for environmental policy: genealogy and data quality. *J. Environ. Manage.*, 44, 39-54.
10. Atkinson, P.M. and Tate, N.J. (Eds.) (1999). Advances in remote sensing and GIS analysis. Chichester ; New York : Wiley.
11. Athanasiadis, IN (2007). Towards a virtual enterprise architecture for the environmental sector, In: (Protogeros, N, Ed.) *Agent and Web Service Technologies in Virtual Enterprises*. Idea Group Inc.
12. Daily, GC and Ehrlich, PR (1999). Managing earth's ecosystems: an interdisciplinary challenge, *Ecosystems* 2:277-280.
13. Newell, B, Crumley, CL, Hassan, N, Lambin, EF, Pahl-Wostl, C, Underdal, A, Wasson, R (2005). A conceptual template for integrative human-environment research, *Global Environmental Change* 15:299-307.
14. Rizzoli, AE, Donatelli, M, Athanasiadis, IN, Villa, F, and Huber, D (accepted). Semantic links in integrated modeling frameworks, *Mathematics and Computers in Simulation*.
15. Welp, MA, de la Vega-Leinert, A, Stoll-Kleemann, S, and Jaeger, CC (2006). Science-based stakeholder dialogues: Theories and tools, *Global Environmental Change* 16:170-181.
16. Cogan DG. 2003. Corporate governance and climate change: making the connection. A CERES Sustainable Governance Project Report, prepared by the Investor Responsibility Research Center (IRRC). Washington, DC: IRRC, and Boston, MA: CERES.
17. Andretta, M., G. Bernasconi, G. Corti and R. Mastropietro, OAS(2004): An Integrated multidomain Information System, *iEMSs, The International Environmental Modelling and Software Society Conference*, 14-17 June 2004, University of Osnabrück, Germany, URI: MINNE Mobile Environmental Information Systems project, University of Oulu, Finland,
18. Tochtermann, K., Hicks, D., Kussmaul, A. (1999). Support for Customization and Personalization on the Web. Proceedings of WebNet 1999 – World Conference on the WWW and Internet (AACE), Hawai (USA), pp. 1048-1053.

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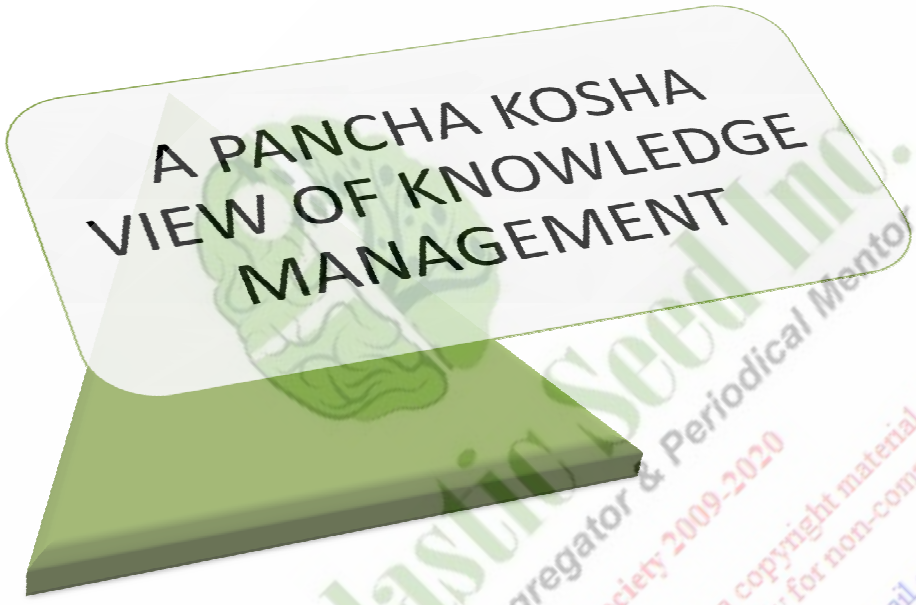
Phase-III: Theme-Based Paper



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ABSTRACT

- **ABSTRACT**:
- Thus far Information Technology has grown mostly from the 'T' or Technology side of IT. The 'I' side of IT is steadily becoming more important The purpose of information support in any domain is essentially to enable individuals to perform their functions and tasks based on reliable and relevant knowledge. According to a holistic (integral) view supported by the major spiritual movements and religions of the world, the human being consists of the physical layer, emotional layer, intellectual layer, and spiritual layer. The objective existence of the spiritual layer is uncertain as yet, but at least it manifests itself in the forms of spiritual experiences, information and beliefs. We can see that each layer has its functions. To perform the functions effectively with discrimination and in a balanced manner, information and knowledge (external and internal) should be accessible to the individual. Another aspect is that each layer also generates information and knowledge, which can then be communicated and used. Such a model can be projected to apply to communities made up of individuals, as well. It is the spiritual layer which has been least studied in connection with information phenomena, and therefore this area needs special attention. This paper attempts to bring out that the ancient Indian Vedic view of Pancha Kosha, i.e. the five-layers view of conscious human existence, together with 'Knowledge Management' (KM) model to provide some deep insight into how people, process and technology can be integrated holistically with capacity to drive the information space in ways that sustain knowledge enabled wealth creation by organizations.

KEYWORDS

- Knowledge Management,
- Information Technology
- Learning Organizations
- *Pancha Kosha*

Over the past decades, the world has been experiencing significant changes. The key to change is awareness, sharing ideas and coming up with new and innovative ways of staying ahead of the competition. There is a great need today to acquire, utilise and share knowledge. Today economies have evolved into knowledge economies and is characterised by the fact that knowledge become the major factor of production in the value-adding economic activities. In the knowledge economy, knowledge and information effectively overshadow physical assets as the primary units of production, distribution and consumption. The key to growth in the emerging environment is in innovation which is an outcome of development of knowledge. Organisations are discovering that they need to do a better job of capturing, distributing, sharing, preserving, securing, and valuing their precious knowledge in order to stay ahead of their competition (Liebowitz & Beckman, 1998). The ability of companies to exploit their intangible assets has become far more decisive than their ability to invest and manage their physical assets (Davenport & Prusak, 1998). By managing its knowledge assets, an enterprise can improve its competitiveness and adaptability and increase its chances of success. Managing knowledge is the top strategic agenda in all companies. Companies across all sectors recognise the critical role knowledge management will play in their future success. Today majority of Fortune 500 companies have knowledge management program in one or another form.

As the world hurtles from computers and networks through Information Communication Technologies (or ICT) and convergence towards the emerging Knowledge Society era, ***we need appropriate***

paradigms that help us master and sustain knowledge based wealth creation. Knowledge in a domain is used collectively by members of any group that works focused in wealth creating activities. They act in the real world in ways that sustain value propositions for the customers and stakeholders of that group. Knowledge based wealth creation depends upon understanding information and the capacity to use the insight gained from it in a given context to arrive at right judgments. Further, any group using information to create wealth should be equipped to act upon such judgments in ways that create value for the beneficiaries and stakeholders it serves. The tools and systems provided by ICT and convergence should be so deployed and made available such that they facilitate such collective insight-driven actions. In this paper we propose a *Pancha Kosha* paradigm that allows us to integrate the complex information systems and processes, the organization and management of the people or groups that use them such that IT can sustain effective value propositions to all concerned.

Information of value is that which effects a change of state of a user or a group that becomes aware of it. Henry Kissinger, in a speech delivered in Aug. 2003 at New York stated that, "***The role of technology should be to bridge the gulf between the availability of information and the ability to use it***." Bridging this gulf is the key to building enterprises in the Knowledge Intensive Products and Services area. President of India, Dr. A.P.J. Abdul Kalam constantly lectures upon building a knowledge driven economy as the central theme of his Vision-2020 [1,2,3]. The capacity of any organization to exhibit the characteristics of a Learning Organization [4] depends critically on systems thinking and knowledge management within the organization driven in relation to the wealth-creating activities it is engaged in.

It is increasingly recognized that such capacity is enhanced very substantially by groups working focused in knowledge driven activities and create value by the systematic practice of Knowledge Management. (KM), KM the art of involving in every organized activity of an institution or organization the People, Process and Technology to:

a) ***Capture*** and accumulate knowledge of people in an organization.
b) ***Disseminate*** knowledge where and when it's needed.
c) Enable people to ***re-use*** the knowledge work of others.
d) Provide
n
environment
to
collaborate.

We call the above aspects as the CDRC (for capture, disseminate, re-use and collaborate) functions of KM. Current KM literature [5] deals with how to (a) set up an IT framework to facilitate this CDRC; (b) how to build KM practices over an Intranet of any given company or organization that facilitates retention of organizational knowledge; and how to factor it into the management business and its growth [6].

However, we say that the above four CDRC functions are effective only if the group's management of the information dynamics (i.e. the information generation and utilization processes) obeys the following five 'fundamental Rights': ***Right Information*** to the ***Right Person or Group*** at the ***Right Time, Right Place*** and in the ***Right Context***. We call these five rights as the 5Rs. The effective application of KM by any group not only respects the CDRC functions, but also drives the capacity to sustain the 5Rs in ways that sustain the value propositions for the customers and stakeholders served by the group. The challenge that we address in this paper is ***to extend the KM paradigm from a purely technology driven, or, 'platforms' based intranet approach into a holistic Pancha Kosha paradigm*** wherein the people and processes in organizations are aligned with the facilitations provided by ICT and convergence. Such organization is necessary to build and efficiently manage ***Knowledge Intensive Products and Services*** **[KIPS]** as often referred to by Dr. Abdul Kalam (visit www.presidentofindia.nic.in).

THE THREE TIERS OF CONVERGENCE

Convergence in Technology is now well established and getting deployed rapidly. It is coming in the form of multimedia integration, IT, communication, and entertainment over the global net. Its very success has paved the way for studies and methods on how to exploit it in the different domains of business, economics, industry, education and diverse services. At a higher level, we are now deploying this ICT or convergence in different forms of Enterprise Applications Integration (EAI see [7] for coverage on different aspects of EAI), web-enabled services in the form of e-commerce, e-governance, e-learning, etc. At this higher level, we may call this as ***Convergence in Management***. It is about integrating the people and processes in any organization over the technology framework of convergence.

To effectively bring about this convergence in management, we need to build several component information systems that are aligned with the logic of the business and associated processes. In some sense, this is already happening in systems that support workflow, document management, web-enabled databases, learning management systems, digital library, etc. However, when we have to customise these enterprise applications for target domains (such as health, education, manufacturing, agriculture, finance, etc.), considerable work needs to be done in the development of appropriate classification methods. In fact the logic behind the classification itself delineates the boundary on the kind of knowledge questions that the systems are capable of supporting. This subject or domain specific knowledge map or taxonomy often has to be developed over a ***confluence of disciplines***. For example, let us take the case of developing a knowledge portal for agriculture trade. Such a portal needs to have underneath information systems built upon the classification of components related to the particular kind of trade, the

related agriculture domain and finance or business related information. We may call such confluence of disciplines as the ***Convergence of Disciplines***. In the emerging knowledge driven economy, we have to master all three tiers of convergence in prototyping and managing the corresponding systems that support enterprise application integration.

PEOPLE, PROCESS, TECHNOLOGY AND CONVERGENCE IN MANAGEMENT

Today the true or market value of any company or organization is not so much judged by the physical and financial assets it commands, but by the ability it has to create wealth and sustain value propositions through their capacity to mobilise human and relations capital. This is illustrated by the S. Kandia's [8] model given in Fig.1.

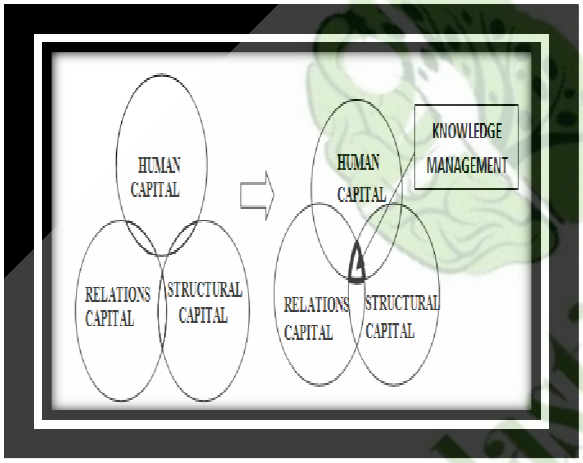

Fig. 1: A KM view of Skandia's Model of Organization's Capital

Traditional view of assets is shown on the left. Most companies treated and managed the three assets they possessed – the financial or structural, the human and the relations – separately by different management groups. The human and relations assets were not really treated as capital assets in a demand driven economy. Development of human capacity was and is often relegated to the human resources development functions. Customer and stakeholder relations, i.e. the relations, were largely driven by marketing and public relations. Since the 1990s, the weight assigned to structural capital has drastically dwindled. ***Today companies are assessed not by what they possess, but by what they can deliver competitively with what they are equipped with.*** With globalisation and competition, migration of talent has become a serious issue. Retention and building organizational knowledge has become a major priority. Hence an integrated approach to managing all three capitals of an organization – the physical and financial assets, human and relations capital has become a necessity. This need for holistic management of the three capitals is at the root of most organizations going for EAI. ***This integral perspective of capital management is forced by the need to be strongly competitive in a global marketplace where supply of goods and services is in excess and knowledge-worker retention a major concern for every industry.***

It may be useful to point out that the present audit mindset of governments in India, coming from the imperial days of the Raj accounts mainly the structural capital. It was a system designed by the empire to help measure what share the ruler could take in the form of some tax. Capacity for knowledge enabled wealth creation and sharing were outside the purview of such audit. It is a tragedy in India that even in the democratic framework of today with concern for development, our government continues inertially to a large extent this audit mindset and only feebly addresses how we promote and empower people through knowledge and skills to create wealth. This attitude of government is what makes governance ineffective and very expensive. ***A positive audit attitude needs to provide indicators through assessment, accounting the capacity that is built and the capacity to retain the human and relations capital of an organization to generate real (not speculative) wealth***. Such audit will help align the management to steer the organization in ways that maximizes wealth creation within the constraints it is forced to work. This is the role of effective knowledge management and ***convergence of people, process and technology***. This potential is realized only when the leadership and management of the organization is driven with objectives in consonance with vision and value propositions. Organizational learning needs to be a part of the culture to sustain this convergence as it is becoming essential for its healthy survival in a competitive and global environment.

THE PANCHA KOSHA MODEL OF KNOWLEDGE SOCIETIES

In the context of the three tiers of convergence stated earlier, there is a need for appropriate information organization and knowledge management paradigm. ***The paradigm should reflect the ways people are engaged in any focused wealth creating activity.*** It should delineate the boundary between the technology facilitation part of knowledge connectivity and the people driven organizational and processes part that uses the technology to create wealth through ***knowledge interactions***. In this paper we present a *Pancha Kosha* paradigm to structure knowledge driven organization that ***allows for human values to command attention over the value propositions that drive future knowledge enabled businesses and activities.*** This addresses to some extent the difficult issue of how to efficiently combine human values driven social context of interaction and collaboration in a globalised economy with business value- propositions driven organizations of knowledge activities.

THE PANCHA KOSHA DESCRIPTION

According to Indian tradition, every conscious and intelligent being is equipped with Pancha Koshas, i.e., five sheaths or layers. This model is stated in the ***Taitriya Upanishad*** [9] and interpreted in many Indian texts. These are respectively stated as follows.

(i) ***Annamaya Kosha***, or the physical body that is sustained by food (or Anna). This is the gross or body of the individual.

(ii) Pranamaya Kosha, or the vital energies (i.e. Prana) provided by the harmonious functioning of the different component 'pranas' - breathing, circulation, nervous systems, digestive and inner organs like the liver and the glands that endows the body with life. Without ***prana***, the body is dead and not alive.

(iii) Manomaya Kosha, or capacities like reflex, emotion, and similar functions of the mind and the system that sustains the instincts for self-preservation, perpetuation and related expressions. With Manomaya, the being responds to stimuli – both of the external world and of the instinctive or emotional world .

(iv) Vigyanamaya Kosha, or the discriminative faculty that helps in undertaking action according to what is 'right' and what is 'wrong' in the course of thinking and action. It is said that this aculty is dominant among human beings and weak among animals. It is also said that if humans do not use this faculty with wisdom and compassion, they may be worse than animals!

(v) Anandamaya Kosha, or the sheath of bliss. This corresponds to the state of bliss one attains when one is in total harmony with the internal and external environment even as one is engaged in action as necessitated by our state of living in the world. At this level, the person who works, the object of his work and the process of work itself constitute one holistic entity.

A small clarification is needed at this point in applying this concept of *Anandamaya* to people, processes and systems. One may say from a systems perspective that a human being exhibits the characteristics of *Anandamaya* as an emergent state. The main philosophical difference is that in the Indian and eastern traditions, this *Anandamaya*, or the state of bliss is the natural innate state of the conscious being. But this state gets masked by the conditionings one is born with and induced by the conflicting desires and reactions while living in a material world. It is also stated to be elusive unless one follows righteous actions with the right attitudes as dictated by conscience and discriminative faculty.

What is important in the above five-layer view of one's existence is the capacity for a holistic understanding of ourselves in all our aspects of life. In the systems thinking perspective the five have to function together harmoniously. This subject of sustainable attitudes – individual and collective – for harmony, happiness, need for a compassionate approach, etc. is vast. Indian tradition – from Vedas to Puranas, Upanishads, Bhagavat Gita, and the different schools of philosophy with many a sage or scholar – have been writing and interpreting this field. It is in no way the author's aim to write any commentary on any aspects of these under the context here. But with the increasing interdependence of modern life, we have little choice but to take cognizance of the intensely individual and spiritual ways of conducting our lives that has a base on which ***to build a model for practicing in modern times a collective behavioural version of the Pancha Kosha*** description stated above. To understand the functions and purpose of one layer we have to take cognisance of its relations with the immediate one or two neighbouring layers. The functions of each layer need to be practiced in the appropriate spirit. This is beautifully stated in the following two lines from the Yogavaasishta [10].

Bhaaro vivekina: shastram bhaaro jnanam cha raagina: /
Ashaantasya mano bhaaro bhaaro naatmavibho vapu: ||

In our context, we may broadly translate this as, "For one without discrimination (of what is right action or understanding), the capacity to apply sciences or scriptures is a burden; for one who possesses knowledge but is unwilling to quit old ways and act in the light of one's knowledge, the knowledge itself is a burden; for one who is agitated, the mind is a burden, and for one who does not understand oneself, the body itself is a burden". In essence, the wisdom spelt out above is that mere possession of faculty and capacity, no matter how awesome it may be from a materialistic perspective will not lead us to prosperity and well-being unless we also drive the same with the right values and processes that sustain our collective harmony and prosperity. The challenge is to build systems and institutions that address the complement of the spirit embodied in the above *shloka*.

Today we speak about Learning Organizations. In the emerging Knowledge society paradigm, what our ancient scriptures speak as quoted above in the light of '*Atmavidya*' or self-knowledge at individual level is becoming even more true of organizations (i.e., groups engaged formally in wealth creation activities) themselves. Lou Platt, former CEO of Hewlett Packard once stated that, "HP would be better off if HP knew what HP knew." In some sense this practice of *Atmavidya* increasingly becoming a necessity in organizations or companies is what constitutes a Learning Organization. It is important to note that in the recent investigation of NASA's Shuttle disaster, the investigating committee stated that, "NASA has not demonstrated the characteristics of a Learning Organization". Hence the above *Pancha Kosha* model has much to offer and guide the paradigm for structuring and orienting companies and organizations to build in organizational learning as part of their people and processes management. It is a good sign that in the increasingly globalised knowledge economy, those enterprises,

which are ethical, accountable and socially responsible, are the ones that are steadily growing.

In some sense, the above is reflected in the state of confusion prevalent in our modern society. With all its possession of information, immense amount of knowledge of the material world, ICT, capacity to carry out Herculean technological feats, etc., we appear to be at a dead-end when it comes to ***integrating people, processes and technology in ways that build and sustain harmonious, happy and prosperous societies built upon sharing and caring over a democratic and honest business or enterprise framework.*** The reason for stating the above paradigm is to help us build a practical reference framework that helps our human values and concerns to arrive at right value propositions which in turn drive the '***New* Society of Organizations'** as Peter Drucker [11] describes the emerging knowledge centric era. Such propositions should drive our knowledge activities at different levels – government, business, enterprise, societal or individual – over an integrated global knowledge-managed convergence framework.

In this paper a model has been developed for knowledge societies that are built over the global network upon an analogous framework to the *Pancha Kosha* of human existence described above. In arriving at this framework, we assume that we have little choice as human society but to live with the reality of increasing globalisation and all that related to the needs of societies functioning in healthy interdependent ways. Mahatma Gandhi once stated that, "It is every man's right to be independent; but it is every man's duty to be interdependent." ***What we try to arrive at is a structure that helps in managing such interdependence over a knowledge framework supported through convergence of people and processes over the vast network and knowledge connectivity underneath.*** It is essential that we all be intensely aware at this point that we are building together a paradigm of living that is at the intersection of technology, management, governance, society, sciences and culture that is driving every corner of collective human activities.

The Integration of Pancha Koshas with Five Layers of Knowledge Driven Organizations

ICT and media are fast growing from their infancy and adolescence period to the more mature adulthood era of being driven by knowledge management and knowledge enabled societies over virtual organizations. Ganesh Natarajan, in one of his 'Ganesha' columns in Dataquest articulates on how driving sustainable value propositions in IT are really the need of the hour. He goes to the extent of suggesting that something like a Knowledge Enabled Operational System (calling it KEOS) is necessary in all IT driven organizations to effectively manage the activities of economic importance. We may then ask where exactly in the hierarchy of information collection, processing, interaction, collaboration or knowledge management are the functions of such KEOS can be imbedded. Such imbedding should be natural in ways that we as individuals function in the kind of organizations and daily life we are likely to confront with. In this context, we present a five-layer view – a material knowledge interaction view analogous to the *Pancha Kosha* stated earlier – for a society that is engaged in knowledge enabled wealth creation over a convergence framework. It is illustrated in Fig. 2. The order of the layers is presented in reverse in conformance with the layers in networks.

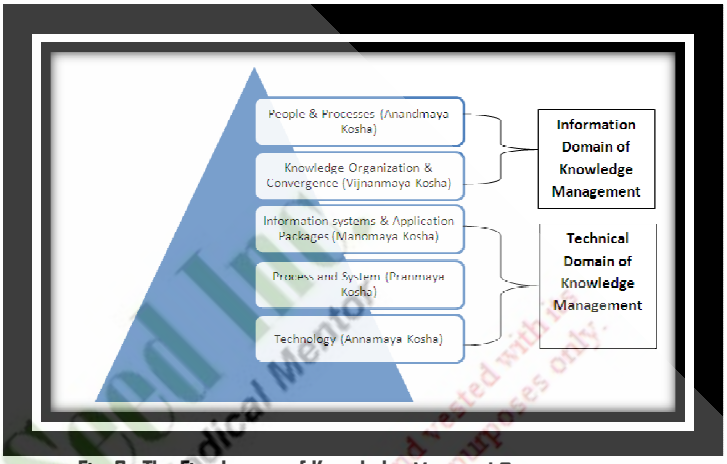

Fig. 2: The Five Layers of Knowledge Managed Organizations

In this figure, the authors delineated the boundary between the 'Technology' side of IT and the 'Information' side of IT from the following consideration. The lower three layers consider themselves with the collection, processing, presentation and interaction within the information space. The lower three layers of technology have been compared to first three Khoshas, viz. Annamaya, Pranmaya and Manomaya. The functional considerations and the different logic associated with each of the diverse systems of these layers are no doubt inspired by the need to address the real world problems. Each of them is much like the assumptions, models and approximations that we make to build a branch of science. These assumptions and models in turn are inspired by the need to address a class of problems. The class of such problems addressed becomes a branch or subject in itself. However the structure and behaviour of the upper two layers are more determined by the real world needs of people using the system to solve real world problems and is compared to Vijnanmaya and Anandmaya Kosha. In our presentation, the 'Information' side is taken to be the way people will use and apply it to solve real world problems and needs. It is the discipline behind such information management that is at the substratum of knowledge based wealth creation paradigms. The 'T' or Technology side of "IT" concerns with building information infrastructure, the mechanical parts of the information processing, communication and presentation of information. With the progress of technology, goods and systems on the 'T' side are available like commodities. ***The 'I' side of IT is about enabling and building capacity of people to use ICT and convergence in diverse ways to sustain***

knowledge enabled wealth creation in their respective domains, i.e. to serve the associated Knowledge Intensive Products and Services functions.

Pancha Kosha and three-way communications in organization

The *Pancha Kosha* model has much in common with the conventional management hierarchy. For example in an organization, the lowest corresponds to the physical infrastructure, real estate, transport, the equipments and facilities, etc. The second layer is the administration and offices, personnel management, recruitment, etc. The third layer is the set of facilities and systems that focus on the business and services provided by the organizations. Fourth (the *vigyanamaya*) is the set of processes and capacity of the management and groups to act with wisdom and discrimination that provide or sustain the value propositions of the business or services offered. ***The uppermost, i.e., Anandamaya is achieved and expressed in the share-and-care attitude and the feel-good-factor of triad of the people in the organization, the stakeholders and its customers or beneficiaries.***

Maslow's hierarchy of needs of employees in an organization – consisting of physiological, safety, social- esteem and self-actualisation - also corresponds to the *Pancha Kosha* description in the organizational behaviour context [12]. However, the real test and taste of a successful organization is the perceptible feeling of *Anandamaya*, something like the collective 'feel good factor' that pervades it. It may be viewed as an emergent property of correct implementation and practice of KM in the right spirit at all levels. We may also take the stand that the goal of any organization is to attain this *Anandamaya* in consonance with the purpose for which the organization has been set up. Such *Anandamaya* is elusive unless the organization, the attitude of serving its customers and the feel-good-factor of its stakeholders are all integrated in every substantive decision and action.

Anurag Srivastava of Wipro Infotech says that the spirit of KM in an organization is something amorphous and pervades like the protoplasm in a living cell. It pervades everywhere within the cell, is the medium that nourishes the health and in which the cell's genes grow and multiply. Analogously, the spirit of KM should pervade an organization at various levels and ensure that the behaviour of a living healthy organism is exhibited and felt by all who constitute it. ***Not to take cognizance of this pervasive aspect of knowledge management is akin to developing real estate indiscriminately without the environment or ecological impact that will forebode a future disaster in globalised world.*** This requires that effective communications exist both vertically and horizontally in every group driven activity. First is the communications within members of the group that is sensitive and respects the right information at the right time and the right context. The second is the communication across related groups for effectiveness. The third is the communications between the group and its stakeholders in the context of the vision, mission and objectives of the organization. Effective EAI implementation in every enterprise should facilitate this three-way communications. To ensure such communications, we need to understand the information – knowledge interactions in any knowledge enabled wealth creation activity.

CONCLUSION

In this paper we have brought out that the concepts of Knowledge Management are best extended and practiced along the line of a Pancha Kosha model as applied to focused groups whom we call as Knowledge Citizen. Such Citizen groups consisting of Knowledge Workers are the ones that sustain the knowledge based wealth creation processes. Such group space should be equipped with the IT and ICT facilitated appropriate indicators and actuators over a knowledge organization and convergence framework. The members of the K-Citizen access and manage their concerned K-Plant by a Knowledge Interaction Interface over the technical systems.

The model and concept proposed in this paper are helpful in taking the field of Knowledge Management towards understanding and managing knowledge enabled wealth creation paradigms in any human endeavor. It is about time that we study the organization, study and management of the 'I' in 'IT' along the above lines and make IT useful and productive for the welfare in the context of the increasingly globalised economy. The approach shown here has the potential to address the capacity building and as effective management base for the emerging knowledge driven economy. The concepts and the framework presented here will be of some help in building a Knowledge Society Vision for the country as a whole.

REFERENCES

1. A.P.J. Abdul Kalam and Y.S. Rajan, "India 2020: A Vision for the New Millennium", Penguin Books - 2002.
2. A.P.J. Abdul Kalam and A. Sivathanu Pillai, "Envisioning an Empowered Nation: Technlogy for Societal Transformation", Tata McGraw Hill – 2004.
3. Reader is also referred to the site: http://www.presidentofindia.nic.in/
4. Peter Senge, "Fifth Discipline", Doubleday, 1994
5. Amrit Tiwana, "Knowledge Management Toolkit", Prentice Hall, 2000
6. Ganesh Natarajan, "Knowledge Management: Enabling Business Growth", McGraw Hill, 2001.
7. Dataquest Magazine, Oct. 2003 Issue with special coverage on EAI.
8. The figure was taken from Dr. Anurag Srivastava's presentation. The reader is also referred to http://www.skandia.com/
9. Many texts and commentaries on Upanishads are available. The author benefited from the one by Sri Aurobindo, "The Upanishads – Texts, Translation and Commentaries", Sri Aurobindo Ashram, Pondicherry, 1981.
10. Several compilations of Yogavaasishtha are available. The author has used "The Essence of Yogavaasishtha" compiled by Sri Jnanananda Bharati, Samata Books, 1998. A recent commentary from a KM perspective by Prof. P.N. Murthy on Yogavaasishtha published by Bhavans Books (2002) is recommended.
11. Peter Drucker, "The New Society of Organizations", Harvard Business

Review, 1992.

12. Stephen P. Robbins, "Organizational Behaviour", 9th Edition, See Ch. 6, Prentice Hall, 2001
13. K.R. Srivathsan, "Management of refereed content generation and utilisation in formal higher education", Global Journal of Flexible Systems Management, Vol. 4 Nos. 1 & 2, January – June 2003.
14. K.R. Srivathsan, "Future ICT Infrastructure for Education", Jan. 2004, paper available for circulation.

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ABSTRACT

- **ABSTRACT**:
- The purpose of this study is to investigate and determine factors and barriers that organizations have encountered during the implementation of Enterprise Resource Planning (ERP) systems.

KEYWORDS

- ERP
- Integarted System

Problem Statement - There are numerous factors affecting successful implementation of an ERP system in an organization that have not yet been fully identified and described. The intent of this study was to identify, analyze, and investigate the factors affecting the implementation of an ERP system. Consequently, results of the data collection and analysis resulted in recommendations that can help companies make better decisions about future ERP systems implementation.

Significance of the Study -To help organizations to gain a better understanding of ERP and the factors that could prevent successful implementation of an ERP system. Organizations can benefit from this study by learning from other businesses' past barriers to successful installation and not repeating these same mistakes themselves.

Research Questions-The following research questions were framed that affect the implementation of ERP-

1. What problems and issues have companies encountered while implementing an ERP system?
2. What has been top management's involvement with the ERP implementation Process?
3. What kind of, and how much, training have the employees been given on an ERP system?

Research objectives -A Survey of the NSE/BSE100 companies was the research methodology for this study. This survey was designed to complete three objectives. The first objective of the survey was to identify important issues, problems, and factors encountered by companies during the ERP implementation process. The second

objective of the survey was to determine what involvement top management had with the implementation. Finally, the third objective of the survey was to determine what kind of training, if any, employees received for operating the ERP system before the "Go Live" date.

Research Assumption-First, the researcher assumed that organizations of different financial and physical sizes would respond equally to the questions, since the ERP process and ERP implementation is similar for all organizations. Second, the researcher also assumed that each participant in the sample would answer the questionnaire honestly. Third, the researchers assumed that the study findings would be truly representative of the organizations selected.

Design / Methodology -The population for this study was the 676 senior executives of BSE/NSE top 100 companies belongs to service and manufacturing industry. Of these, 131 respondents with a return rate of 19.4%. The standard deviation and analysis of the variance (ANOVA) were the statistical tests used to analyze the data.

Research Limitations-The barriers this study found were lack of top management involvement, improper training of employees, monitoring the information received in developing the application management strategy, application errors, and outage repairs of an application management. Since this study is limited to few companies based on BSE/ NSE enlisting (as on 15th April 2007), it is possible that the results are not generalized and only apply to these companies. Perhaps the survey instrument used for this study was not sufficient since it did not cover all the issues and barriers related in the literature review.

Research Implications-With the response rate of 19.4%, about 58% were in the manufacturing sector (the reason behind is the evolution of MRP II from manufacturing setup). All the respondents had implemented at least one of the ERP modules, 67% had implemented at least two modules, 30% had implemented at least three modules and 20% had implemented four modules.

Since most of the organization is already implemented an ERP system, recommendations and guidelines can be obtained which can be used to assist other companies in overcoming barriers to successful implementation.

Review of Literature

The current global business dynamics which is characterized by customer-driven markets, shorter product life cycles, and narrow e-niches generates the need for all organization to work together (Blue ocean Stretegy) to gain the competitive benefits. To meet international competition, One performance enhancing tool is advanced technologies implementation (Kremers & Van Dissel, 2000).

As much as technology has enabled improvements such as higher productivity, it has also made the business process more complex because of many different computer software systems used within all the different functions of an organization (Honig, 1999).

Competition is now based on delivery, lead time, flexibility, greater integration with the customers and suppliers, and higher levels of product differentiation. ERP can help with this make-to-order environment (Honig, 1999).

ERP system evolved to help organizations manage information throughout the company, from the plant to the back office, and now the front office (Oliver, 1999). Demand for expand functionality led to the current ERP system (Appleton, 1997; kapp, Latham & Ford Latham, 2000; Markus, Tanis & Fenema, 2000).

MRP is computerized methodology to the scheduling of materials purchase for assembly. It has usually been associated with distinct manufacturing operations and is not compatible to continous process industries. MRP rotates about the Bill of Materials (BOM) and the Master Production Schedule (MPS) (Kapp, Latham, & Ford-Latham, 2000). In the BOM, every product is broken down into progressively lower levels until reaching a raw material or brought kept (Kapp, Latham, & Ford-Latham, 2000). The MPS is a spreadsheet that forecasts demand for each product of organization over time. The core of MRP starts will a Bill of Materials Processor (BOMP). This helps plan the necessities of each part, materials and assembly (Kapp, Latham & Ford- Latham, 2000).

There are many benefits to be realized to be realized with the implementation of an ERP system, and this is the reason they are becoming so significant to business (Shanks,2000). Some of the benefits are :

1. ERP allows integrated information system, which lead to more efficient business processes that cost less than unintegrated systems.
2. ERP facilitates easier global integration. Barriers such as currency exchange rates, languages and cultural differences can be bridged automatically, allowing date to be more easily integrated.
3. ERP integrates people and data, and eliminates updating and repairing of many separate computer systems.
4. ERP allows management to manage operations, not just monitor them. When the system is implemented properly, these benefits can help the company achieve increased profitability and productivity.

5. ERP allows employees to share information, query data, and run reports. This eliminates the need to store duplicate information in more than one place and reduces the amount of work necessary to gather and analyze information.
6. ERP systems increase efficiency by freeing employees from performing time consuming, manual work. For example, legacy systems often require hours or days to run reports. With ERP, reports can be produced in seconds. These efficiencies allow employees to spend time on other tasks, reducing operating expenses (Shanks, 2000).

There exist two approaches for ERP Implementation – Incremental deployment or Big Bang Approach.

The Big bang Approach is not the best technique for every organization to use (Songini, 2000). There exist some critical point that requires top management's involvement is critical, communication with the employees is vital, and extensive training of staff is essential.

There is lot many of research on Survival strategies for an effective ERP implementation. According to Vowler (2000), ERP has spread like a "purple tide" across corporate businesses. Survival tricks identified by Shupe Consulting (2001) that are required during ERP Implementation.

Research Methodology

A Survey Instrument (Appendix A) was selected for NSE/BSE Enlisted top 100 companies. One objective of the survey was to determine if the companies had implemented an ERP system. Another objective of the survey was to identify issues, problems and factors that encountered with the implementation process. Aside to this the survey also asked if and how top level management has involved with the ERP project (through open ended comments (Appendix B).

Data Collection

We e-mailed 676 survey instruments with 30 questions in two sets. The questionnaire was mailed to BSE enlisted top 50 companies, as on 15th April 2007. The next set of questionnaire was sent to 176 senior executives of NSE (Nifty- fifty and Junior Nifty) enlisted top 50 companies, as on 15th April 2007.

Data Analysis

We used the statistical package for social Sciences (SPSS) software to analyze the data from the survey.

Method of Data Analysis

The Statistical techniques used to compare different variables were the mean, standard deviation, and analysis of variance (ANOVA). When the mean and standard deviation were too close in numerical value to make a determination of which factor had the largest impact on the ERP implementation, the ANOVA was used to make the decision. Frequencies and percentages were also used to analyze some of the survey questions. After frequencies were calculated they were converted to percentages. The purpose of this was to determine which responses received the most replies and what impact they have on ERP Implementation.

A total of three categories were analyzed and compared by means of the ANOVA: (1) The effectiveness of the information received in developing application management strategy, (2) labor hours spent on repairs to ERP Applications, and (3) Percentage of application errors. The factors in these groups were analyzed and compared to determine which factor within each group had the largest impact on an ERP Implementation.

SPSS was used to analyze the data from the survey instrument for the calculation of the mean, standard derivation, and ANOVA.

Survey Information

A Self administered questionnaire was mailed to 676 top executives at the NSE/BSE top 100 companies. When Mailing the survey instrument to the exchange enlisted companies,duplicate companies (those on both lists) were eliminated, since they had previously been surveyed. Examples of the survey instrument, cover letter, and follow-up letter can be viewed in Appendix A. Each survey question had a different number of responses. The initial mailings and subsequent follow-ups resulted in 131 responses, a response rate of 19.4%. This was an acceptable response rate given that the individuals in the targeted organizations were extremely busy top executives with high-level responsibilities.

Demographics of the Respondents

Respondent's Job Title- The respondents reported their job titles as follows- CIO numbered 71(54%), CTO's numbered 38 (29%), Director, Manager, Supervision of IS numbered 14 (11%), and the category of "other" numbered eight (6%).

Functional Area- The respondents' functional areas were reported as follows: Application development numbered

12 (9%), system integration numbered three(2%), IT senior management numbered 76 (58%), application implementation numbered four (3%), and Enterprise Management numbered 38 (28%).

Number of employees - The number of employees in the respondents' organization were as follows: 500 or fewer numbered two (1.5%), 501-1000 numbered three (2.3%), 1001-2500 numbered four (3%), 2501- 5000 numbered nine (6.8%), 5001- 7500 numbered 10 (7.6%), 7501-10,000 numbered four (3.1%), 10,001- 20,000 numbered 31 (23.7%), and over 20,000 numbered 68 (52%).

Organization's Business Activities- The Business activities of the respondents' organizations were as follows-

Conclusions

With globalization being one of the main buzzwords for the new millennium, there will be numerous changes in technology. One of these technological changes has been the implementation of an ERP system. According to Schneider (2000), "doing the homework" on the implementation of an ERP system is one of the best ways to prevent problems and overcome the barriers to and issues of successful installation. A strong infrastructure is the key to successfully completing the ERP system installation process.

One of the barriers organanizations experiences dealt with top managemment's involvement with the ERP system's

Recommendation

The following are study-based recommendations that should be considered before deciding to implement an ERP system.

1. Appoint a project team with a strong leader that can help employees understand the options offered by an ERP system.
2. Implement a "Train the Trainer" program. This program trains a person, the trainer, on the ERP system by the ERP software vendor. The trainer would then be responsible for training the employees.
3. Educate the project team and allocate an employee training budget. A dedicated training room is essential for employee
4. Identify the business goal and objectives of the company.
5. Establish a clear vsison
6. Understanding all the functions of an ERP system. Extensive planning and understanding of the concepts of an ERP system saves time.
7. Choose the ERP features that the organization needs, and do not install the whole ERP system if it is not needed.

Future Research

We are highly

1. The correlation between ERP failure and non-use of Total Quality Management (TQM) principles in ERP system design and development.
2. Integrating ERP in the business school curriculum.
3. The cost and benefits of system implementation.
4. The impact of ERP system on the accounting and auditing profession.
5. Determination of how top management can help with the change management resulting from an ERP implementation.
6. Determination of the proper amount of training employees need before the "go-live" date.
7. Determination of additional barriers to successful implementation that the study did not uncover.

References

1. Appleton, E. (1997). How to survive ERP. Datamation, 43, 50
2. Brown,J.(2001). ERP doomed by poor planning. Computing Canada, 27(3),11.
3. Cliffe, S. (1999). ERP Implementation. Harward Business Review, 77(1), 16.
4. Honig, S. (1999). The changing landscape of computerized accounting system. The CPA Journal, 69(5), 14-19.
5. Kapp,M., Lathan,B., & Ford-latham,H. (2000). Learning requirements planning: A model for developing enterprise wide training and education. Production & inventory management Journal, 41(3), 52.
6. Kremers, M., & Van Dissel,H. (2000). ERP system migrations. Communication of the ACM, 43(4), 22.
7. Lee, A(2000). Researchable directions for ERP and other new information technologies. MIS Quarterly, 24(1), 6.
8. Markus,L., Tanis,C.,& Fenema, P. (2000). Multisite ERP implementations. Communication of the ACM, 43, 42.
9. Romeo, J. (2001a). ERP: On the rise again- The reports of ERP's demise were greatly exa
10. Schnieder, I. (2000). Information please. Bank Systems & Technology, 37(12), 46-47.
11. Schmenner, R. (1998). Operations Management. Business Horizons, 41(3), 3-4.
12. Songini,M.(2000). Despite odds. Georgia hits it big with ERP system,Computer World, 10-11.

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ABSTRACT

- In this world of competitive business environment where every thing is getting supersonic speed, the old business trends are not finding them to provide the most suitable business solutions. Business world is becoming global market and the business rules, business processes and techniques are also required to be updated. The new threats and challenges are emerged as the outcome of globalization though the opportunities are also enhanced. The one of the major challenges of the business world is handling of huge data volumes to find relevant data and then to extract relevant and meaningful information to design planning and strategy to get the maximum benefit in any business domain. Although it seems to be
- Electronic commerce (e-Commerce) is a general concept which covers any form of business transaction or information exchange executed using information and communication technologies (ICT's).E-Commerce includes electronic trading of goods, services and electronic material e-Commerce systems include commercial transactions on the Internet but their scope is much wider than this e.g Electronic Market, Electronic Data Exchange (EDI), Internet Commerce. It is the commercialization and popularization of the Internet that has put e-Commerce towards the top of the public and political agenda but e-Commerce using electronic markets and EDI have been an established part of the business scene for at least a decade prior to the 'Internet era'. This article is provides an account of electronic commerce with respect to the link with various stake holders.

KEYWORDS

- *E - Commerce*
- *Electronic Data Interchange (EDI),*
- *Electronic Fund Transfer (EFT),*
- *C-Commerce,*
- *L Commerce*

History of Electronic Commerce

Electronic commerce (e-Commerce) is a general concept which covers any form of business transaction or information exchange executed using information and communication technologies (ICT's).E-Commerce includes electronic trading of goods, services and electronic material. E-Commerce systems include commercial transactions on the Internet but their scope is much wider than this e.g Electronic Market, Electronic Data Exchange (EDI) and Internet Commerce. It is the commercialization and popularization of the Internet that has put e-Commerce towards the top of the public and political agenda but e-Commerce using electronic markets and EDI have been an established part of the business scene for at least a decade prior to the 'Internet era'. The need for electronic commerce stems from the demand within business and government to make better use of computing and to better apply computer technology to improve customer interaction, business processes, and information exchange both within an enterprise and across enterprises.

During the 1970s, the introduction of electronic funds transfer (EFT) between banks over secure private networks changed financial markets. Electronic funds transfer optimizes electronic payments with electronically provided remittance information. Today there are many EFT variants, including the debit card whose use is becoming ubiquitous at points of sales (POS) in grocery stores and retail outlets, and direct deposits to employee bank accounts. Each day, over $4 trillion change hands via EFT over the computer networks linking banks, automated clearinghouses, and companies. The U.S. Treasury Department estimates that 55 percent of all payments by the federal government in 1995 were made by EFT. During the late 1970s and early 1980s electronic commerce became widespread within companies in the form of electronic messaging

technologies: electronic data interchange (EDI) and electronic mail. Electronic messaging technologies streamline business processes by reducing paperwork and increasing automation.

Business exchanges traditionally conducted with paper, such as checks, purchase orders, and shipping documents, are conducted electronically. Electronic data interchange allows companies to send/receive business documents (such as purchase orders) in a standardized electronic form to/from their suppliers. For example, combined with just-in-time (JIT) manufacturing, EDI enables suppliers to deliver parts directly to the factory floor, resulting in savings in inventory, warehousing, and handling costs. Electronic mail does much the same for unstructured organizational communications both inside and across the organizational boundaries. Over the years, EDI has evolved into several different technologies. Electronic data interchange has been particularly successful for retail category management. Category management seeks to meet customer needs by putting the right product, at the right price, in the right amount, in the right place on the store shelf.

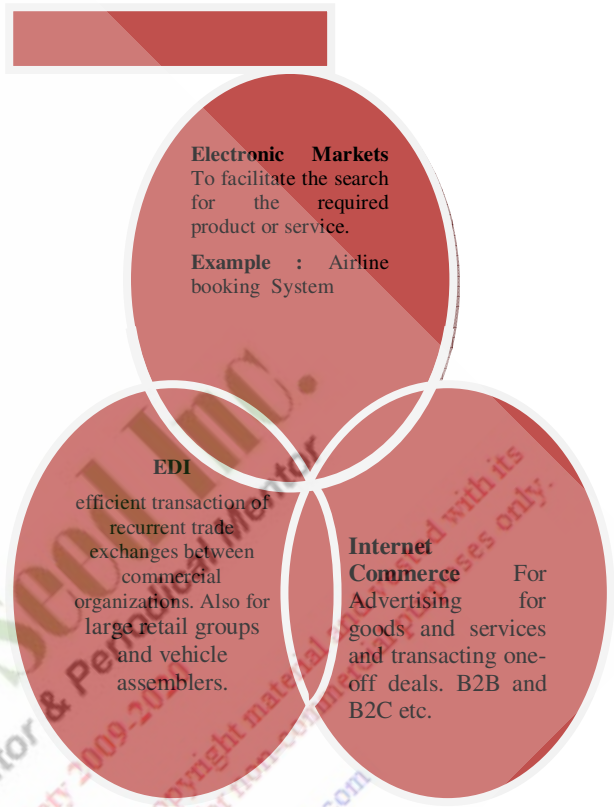
All products are divided into distinctly manageable groups, such as ready-to-eat cereal, and category managers make decisions on all similar items in a category instead of focusing on a single product. The uses of e-commerce for common man are very. Instead of just buying the lowest priced items, buyers utilize information about buying patterns and employ EDI technology to seek the largest savings for "hot" items in a category. This technology has improved buying practices and reduced costs for both manufacturers and retailers.

E-Commerce has got popularity due to world wide digital revolution. The Global village concept has emerged out and has brought unique changes in human culture by affecting their daily activities, professional and personal lives and also associated with it – business and commerce. Electronic commerce is based upon two components – electronic tools and commerce. E-Commerce involves the transactions in commerce with the support of electronic tools and communication media. Electronic commerce covers EDI, email on internet, Shopping at World Wide Web, Product sales and service sites on the web, electronic banking or funds transfer, outsourced customer care and employee care operations.

Features of E Commerce

It automates the conduct of business among enterprises, customers, suppliers & employees anytime anywhere. It also creates inter dependencies between company value chains & their suppliers & customers. The company can create competitive advantage by optimizing & reengineering those value chains to outsiders by automating them. The tools are electronic & the applications are commerce.

Figure 1 Categorization of E-Commerce



(Source: Whitely, David (2001), E Commerce: Strategy, Technologies and Applications, Tata McGraw Hill

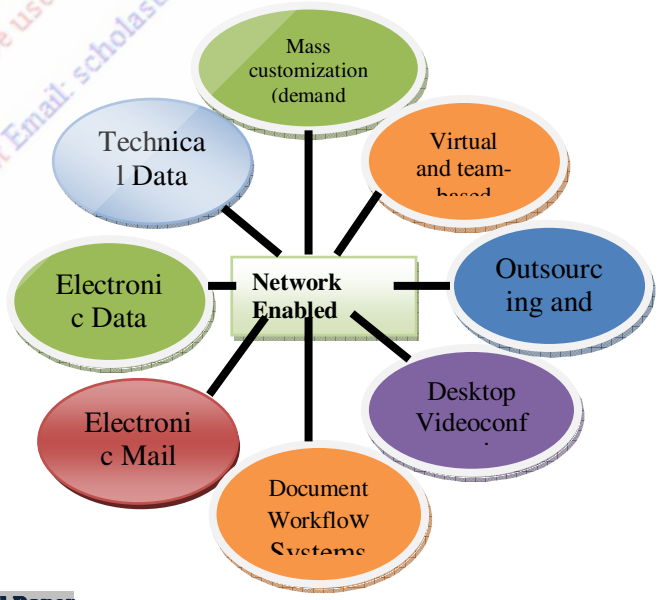


Figure 2 Network Enabled Business Practices

What is Electronic-Commerce (e-Commerce)?

E-commerce refers to a wide range of online business activities related to products and services. It is the process of buying, sailing or exchanging products, services, and information through computer networks. It also pertains to "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact.". E-commerce is usually associated with buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network. Though popular, this definition is not comprehensive enough to capture recent developments in this new and revolutionary business phenomenon. Another Comprehensive definition is: E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals.4.
Dimensions of E-commerce
Digital Products
Digital Processes
Digital Agent
What is Traditional commerce ?
In traditional commerce, the dimensions are all physical in nature. All The business transactions are performed off-line. Physical agents and representatives are making the buying and selling of products.

What is Pure E-commerce
Pure e-commerce is having all the dimensions digital in nature. The all the business organizations are pure virtual (online) organizations. The buying and selling of products is all online.
What is Hybrid approach for commerce?
The hybrid commerce is an amalgamation of physical and digital dimensions of commerce. Major business is carried out in the physical world and it also provides some services on-line.
What is Mobile Commerce (M-Commerce)?
M Commerce means E-commerce in a wireless mobile environment.
What is Location Commerce (L-Commerce)?
M-commerce transactions targeted to individuals in specific locations at specific times.
What is Intrabusiness E-commerce?
This includes all internal organizational activities among various departments and sections in an organization.
What is Collaborative commerce (C-commerce)?
Individuals or groups collaborate online.
What is E-Business?
It is broader form of EC, which also includes
Servicing customers
Collaborating with business partners
Carry out transactions electronically within an organization

Basic Functions of Electronic commerce Systems
The companies also create electronic commerce capabilities out of a fear of falling behind competitors or as result of general momentum to expand the use of an existing Internet presence. But the primary value proposition is the prospect of increased revenue from new markets and creating of new, lower-cost, electronic-distribution channels.
Customer's perspective
From a customer's perspective, the purpose of an electronic-commerce system is to enable that customer to locate and purchase a desired good or service over the Internet when the customer is interested in making the purchase. Its function is no more or less than providing a virtual store.
Merchant's perspective
From a merchant's perspective, the key function of an electronic-commerce system is to generate higher revenues than the merchant would achieve without the system. In order for this to happen, the electronic-commerce system must recreate or utilize existing data and business processes. All of the same processes that the merchant must have in place to support an in-store or catalog purchase must also be in place for an electronic purchase; product information, inventory systems, customer service, and translation capabilities (including credit authorization, tax computation, financial settlement, and shipping).

Additional functions of an electronic commerce system, related to revenue generation, are to help redefine and enhance an enterprise's brand strength, customer-service capability; and supply-chain effectiveness. An electronic-commerce system is one of the areas of an enterprise's infrastructure that is open to customer via the web, but it should be linked with other information technology (IT) systems that affect customer service (i.e inventory and billing).
Service Provider's perspective
The benefits to the service provider of hosting electronic-commerce services include the following:

- Hosting revenue for providing connectivity to electronic-commerce services.
- Enablement revenue for helping clients develop electronic-commerce offerings (Web sites, catalogs, storefronts) for the customer's hosted offering.
- Advertising revenue for aggregating traffic within hosted offerings.

The value to a merchant (the service provider's customer)) of an electronic commerce- hosting service is that it enables the merchant to focus on its core business processes, leaving the service provider to manage the Internet access, network management, network security, quality of service, and server management. In this scenario, the home

shopper still needs Internet access and an access device, but the service provider could provide any or all of the remaining components on behalf of the merchant.

It is important that the service provider provide a hosting infrastructure that can scale and maintain quality of service as the customers requirements grow. The electronic-commerce platform chosen by the service provider must support a variety of tasks :

- the creation of a standard environment for storefronts and advertising sites
- the provision of a secure transaction environment
- the extraction and communication of orders
- the authorization of credit and clear payments
- the provision of site activity reports
- the provision of billing systems based on customer activity and advertising

In addition, the service provider's customers will look to it for a variety of enablement services: the creation of tools to build storefronts and advertisements; the documentation of the setup and site-building process; and the staging of the environment preliminary to production of the on-line hosting environment.

The customer, the service provider, or a third party could be responsible for the creation and hosting of the customer's web site, the creation and hosting of the catalog information, and the provision of systems-integration requirements for various information systems.

The service provider must also consider how it will expand its hosting capabilities to enable its customers to obtain the full value possible from an electronic-commerce environment, including links to customer service, inventory, and billing systems.

Electronic commerce requirements:
Enterprises, large or small, tend to develop their Web presence in stages, once a web presence is created, then the enterprise wants to use that site to enhance customer service and to produce revenue. It is at the latter stage that electronic commerce comes into play.

A service provider hosting customers will go through the same evolution described in the preceding module. It is not enough just to pick off the high-end client who represents the highest per-client revenue; there simply are not enough of them. Furthermore, the future opportunity is to provide a platform that can move a client along the range from low to high-function as client sophistication and needs evolve.

Many small and medium sized businesses are struggling with the high cost of entry to electronic commerce. Creating a complete on-line selling environment can require considerable time, money, and technical expertise. Many businesses are stalled at the first or second of the three steps to building an effective electronic-commerce Internet presence. The Three Steps include the following

Step One

- Develop a content site (i.e, as opposed to a database-driven catalog) and handle transactions off-line
- Advantage : Simple Web sites can be developed easily and quickly at low cost.
- Disadvantages : This limits Internet function to promotion; no revenue opportunity is involved.

Step Two

- Develop an on-line catalog and handle transactions off-line.
- Advantages: No need for sophisticated technology is involved; the catalog can manage large product assortment.
- Disadvantages: Catalog building adds expense, without the possiblility of reducing expense through on-line transactions.

Step Three

- Develop an on-line catalog and handle transactions on-line
- Advantages: This can manage large product assortment and complete sale sat lower cost.
- Disadvantages: Catalog building is expensive, and on-line transaction management requires sophisticated technology.

Emerging Strategic Issues
Critical strategy issues that are increasingly being considered in decision-making for electronic-commerce hosting are the following: A number of factors weigh in the decision of which segment to target, including the following:

- Host's existing business relationship with segment – Will this be atotally new offering to unfamiliar clients? or, will this be a new offering to a captured base of clients ?
- Business-to-business, business-to-consumer , or both- will the business clients be selling to other businesses or consumers ?
- Host's resources and competencies – Large enterprise clients typically require more care and feeding from the commerce host than SMB customers. At the same time, SMB clients typically cannot afford extensive custom services from the host. The host must also weigh which skills will be required in managing these customer relationships and whether they currently exist-or whether they must be developed from the ground up.
- Customer requirements – Large enterprise may demand more extensive features and functions than SMB, thus requiring greater expense on the part of the commerce host.
- Market dynamics-Which segments will demand commerce services now and in the future ?

Competitive Advantage Using e-Commerce

Force	System	Competitive Advantage
New Entrants/Substitution	Internet e-Commerce	• Reduced entry costs • New Sales Channel • New service opportunities
Suppliers (& Trade Buyers)	e-Commerce	
Logistics	• Cost reductions	

- Quick response
- Lockin

Buyers (Consumers) Internet e-Commerce
- New sales channel
- dis-intermediarisation
- Customer Information

Competitive Rivalry e-Commerce
- Cost leadership
- Differentiation
- Focus

Security issues

The security is the major concern of any kind of business transaction, whether it is paper based or electronic. The major security concerns implies the prevention of

- Destruction of information
- Unauthorized access to information

This leads us to deal with the following issues regarding electronic transactions.

Confidentiality : The information related to individuals and transactions must be protected against the unauthorized access. The confidentiality is associated with internal, external users including hackers. The specially designed algorithms are used as the tools to ensure confidentiality of the information. Such algorithm are capable to transform the original information in a special format which is not but obvious for the unauthorized users. Only the authorized user can re-transform the information back to its original version to make its use.

Integrity : Integrity leads to reliability. The information at the receiving end must be exactly same as that of the information which is transmitted from sending (source) end. There should be a provision to generate alerts in case of any kind of modification (Addition, Deletion, Editing) with the original information contents. Integrity also prevents information 're-play' i.e regeneration of the original contents by misusing the authorization features of the original authentic contents. Special purpose mechanisms are used to ensure the end-to-end content authentication.

Availability : The information should be available on the real time basis i.e it must be accessible within a predefined time constraint whether the information is stored or transmitted across communication networks. The major grounds of unavailability of information are operational errors, network problems, power failures, soft ware errors, hardware errors and virus attacks. Although the remedial measures are available for such threats but always not within the possibility of end-to-end message security w.r.t to electronic commerce.

Authenticity: It leads for genuineness. It is very important rather must to ensure the legitimacy of the source and the receiver of the transmitted information. This implies the need for a mechanism that can ensure the authenticity of the transmitted contents.

Non-repudiability : This ensures that neither the originator nor the receiver can deny the sending and receiving of the message respectively at a later date. Therefore, there should be a mechanism to bind messages and message acknowledgements with their originators.

Auditability : Audit data must be recorded in such a way that all specified confidentiality and integrity requirements are met.

The Forces behind e- Commerce

The changes like mass production to mass customization, increase in the number of knowledge workers, changes in the organizations strategies especially regarding the utilization of knowledge and relationship management with employees, internal as well as external customers. The earlier business strategy was capital intensive but now the knowledge intensive business is flourishing. The shift from traditional capitalists are changing their focus towards venture capitalist domain, which is the combination of the traditional business experiences like ability to project profits & loss forecast on the basis of set pattern & models of businesses and industries with very rich experience of years as functional/working business model thus having a well-documented historical data collection to be analyzed which is not the case with dot com era, which is not having that much of historical data to perform the SWOT(Strength/Weakness/Opportunities/Threat). Thus the term venture capitalist has emerged out as a new business concept. Another force behind the e-commerce is heavy dependency on systems & networks, due to state-of-art technologies which are easy to handle & reengineer.

Earlier business were having product as the business theme but in the present business arena services have also made their presence it the business world, which further strengths the relationship strategy of the modern business era. The earlier business infrastructure was based upon brick and mortar structure, but the present business is shifting towards the virtual organizations thus leading towards the efrastructure in place of infrastructure. And the new business models are also focusing on the less cost and less manpower requirements but more knowledge utilization.

Economic forces : Although e-commerce is providing benefits to the seller as well as buyer in the business world the most obvious benefits are like reduction in cost e.g economic electronic transactions at high speed, low cost efrastructure (technological infrastructure), economical communication cost, lower cost of information sharing, lower advertising cost and service alternatives for customer leads towards the economic efficiency of business model. The economic benefits can be internal or external integrations like electronic networking of corporations, suppliers, clients/customers, service providers under a virtual environment community using Internet and Extranet as a medium a medium of communication.

On the other hand, the internal integration is achieved by connecting various independent as well as interdependent departments within a business house along with the business operations and processes. This

provides an environment where vital business information can be stored in digital form which can be transmitted electronically over network instantaneously and can also be retrieved efficiently.

Intranet is the best example of internal integration by the corporate houses. Some companies with corporate intranets are IBM, Intel etc.

Market forces : The need of the hour, e-commerce, is having its applications in business world also, thus persuading the business models to use e-commerce for advertisement, marketing and promotion to make their presence in the international markets also irrespective of the size of the market.

The Internet is as well used as a backbone medium for enhancing customer satisfaction by providing more efficient services and support. Also the use of Internet provides ease for business houses to retain their customer base by providing them more comprehensive product details and service related information.

Technology forces : The venture of computer and Information and Communication Technology (ICT) has played very effective role in the growth of e-commerce. For example technological revolution in the area of digitizing content, compression and the promotion of open systems technology have designed the way for the fusion of communication services into single window service platform.

Emerging technologies has minimized the overhead of deployment of network services by eliminating the need of separate networks establishments for television broadcast, cable television, telephone services and Internet access. This leads for lower communication costs such as Triband service of Mahanagar MTNL.

The high cost of installing landlines in thinly populated rural areas is a discouragement to telecommunications companies. But it can be more encouraging to the private sector if revenues from these landlines are not limited to just telephone call charges, but also include Internet and cable TV charges. This will ensure the affordable access to information even by the rural population and also the government will be able to save installing of expensive landline networks.

Non economic benefits of e-commerce

E-commerce serves as a Gateway for the start-up establishment for small- and medium-sized enterprises to reach the global market. If we consider the case of Amzaon.com, which is a pure virtual bookstore having no bricks and mortar space. Even though the annual sales rate is approximately $1.2 billion, which is giving competition to 235 Barnes & Noble superstores. The Amazon has spent only $56 million on fixed assets, where as Barnes & Noble has spent about $118 million for 235 superstores.

But, it does not reject the point that without a good e-strategy (e-business strategy) ecommerce may in some cases discriminate against SMEs because it shows proprietary pricing information.

Even if the e-business plan is very well defined it does not fully disregard traditional (old) economy values. The proof in the support of this philosophy is dot-com bust.

As per the statistics of Webmergers.com, since the height of the dot-com bust in January 2000, approximately 862 dot-com companies have failed.

Most of these were ecommerce and content companies. The slump of these companies caused the downfall of Internet-content providers, infrastructure companies, Internet service providers, and other providers of dial-up and broadband Internet-access services.

Conclusion

The information technology and internet dramatically changed the way of business. In the real life business activities, participants often negotiate various multiple issues. But in e-commerce, these interactions between the businesses and their consumers are improved and combined with new information (e-business) technologies may not have been given much macroeconomic attention in the past, its effective implementation can help firms reduce costs, increase revenues, boost efficiencies, and expand market opportunities. The research evidences strongly suggests these improvements are linked to macroeconomic benefits which focuses the bottom line is that new information technologies make more and better information available in real-time at lower costs to those who need it. And the end result is that consumers benefit from lower prices, higher quality products and services, and animproved variety and selection of goods.

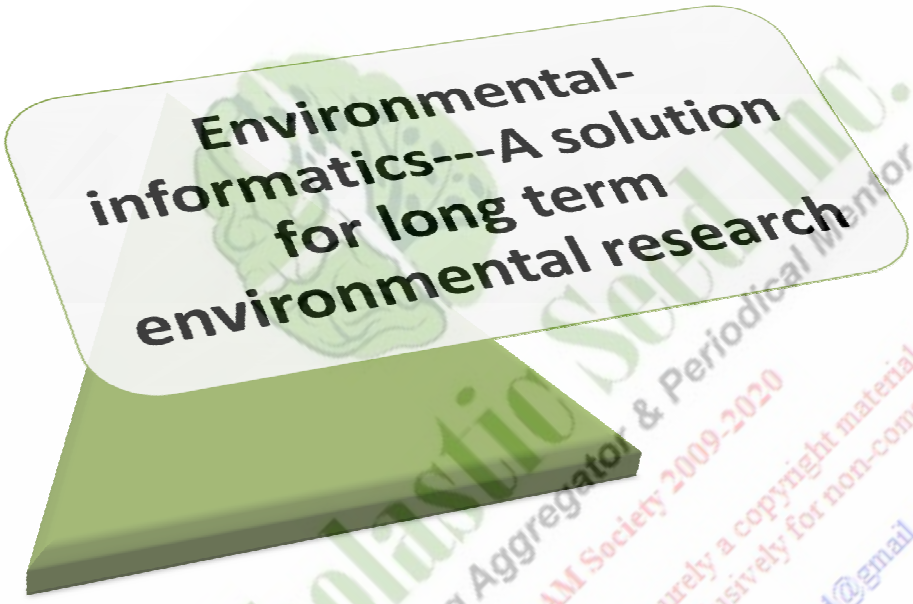
References

- Bajaj, Kamlesh K & Nag, Debjani (2004), "E-Commerce, the Cutting Edge of Business", Tata McGraw-Hill, New Delhi, 16th Ed
- Bandopadhyay, Tapati, (2003),"Fundamentals of e-Commerce", Galgotia Publications, Delhi
- Gupta, Anil K., and Amit Basu (1989), "Information Technology and Changing Patterns
- of Economic Coordination," Annual Review of Communications and Society, 149-75.
- Whitely, David (2001), "e-Commerce: Strategy, Technologies and Applications", Tata McGraw-Hill, New Delhi
- http://www.apdip.net/publications/iespprimers/eprimer-ecom.pdfIAnita (Last accessed on 16 June, 2008)
- http://www.facweb.iitkgp.ernet.in/~isg/INTERNET/SLIDES/Lecture-35.pdf (Last accessed on 16 June, 200
- http://www.apdip.net/publications/iespprimers/eprimer-

ecom.pdfl Anita (Last accessed on 16 June, 2008)

- http://www.facweb.iitkgp.ernet.in/~isg/INTERNET/SLIDES/

cture-35. pdf(Last accessed on 16 June, 2008)



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Phase-II: Theme-Based Paper

ABSTRACT

• Information technology is the greatest wonder of the world. It started in America in 1947 with the invention of the transistor. The computer was invented at Pennsylvania University in 1946. First the computer was known as Electronic Numerical integrator and computer. The ENIAC had so many problems, but the invention of the transistor removed all of them. Silicon Valley is the most important name in the development of information Technology. The area of Silicon Valley in America near Sanfrasisco. Because of the substance silicon used in the transistor, it was named so and soon became very famous. The next millennium seems to challenge managers at all levels to gain strategic advantage over their competitors. This competitive edge is a gift of Electronic Commerce as now organizations can buy, sell, support product & services & even make payments on the Internet. Everything in today's world is electronised whether it is sending message (E-main) or exchanging business documents (EDI) or naking payments (EFT) or sending letters (E-Stamp). All these have enabled E-commerce to have direct computer to computer link between customers & organizations & organizations & suppliers. Electronic commerce has linked organizations to suppliers as well as within organization for faster and efficient transaction processing and decision making thus enabling to from unbeatable powerful virtual teams. Once upon a time not so long ago, a consumer had ample time to go from store to store to locate the desired item, followed by bargaining, placing an order and finally getting the supply. This entire process could range from a few hours to weeks depending on the product, quantity, quality and source of purchase. But the entire scenario has changed. Everything in today's world is electronised whether it is EDI (Electronic Data Interchange), EFT (Electronic Funds Transfer). E-Cash (Electronic Cash), E-Stamp (Electronic Stamp), E-mail (Electronic Mail), E-Business (Electronic Business and) E-Commerce (Electronic Commerce).

KEYWORDS

• *Information Technology*
• E-commerce

INTRODUCTION

Information Technology is now playing a vital role in the lives of people. It has revolutionized, the way are used to live. Now, it has made its mark on every fact of the world one cannot, now imagine a world without computers, without information technology. Every field of human activity, may it be his daily life, official life, everything is how influenced under the cover of Information Technology. It made things happen really wonderful. It gave a virtual world itself, where there are no barriers for communication, information sharing, idea sharing etc. Some of the most common application of Information Technology, IT in Education and Training, IT in science and technology, IT and Entertainment, IT and Health Industry and IT in Business and Industry. Most of our current day business operations are dependent on the Information Technology either partially or entirely. The Information Technology has not become a part and parcel of the everyday business life. The basic reasons for the use of

Information Technology in business are, Efficient business operations, Better managerial decision making, Gaining competitive advantage, Business process reengineering, Solving business problems, Globalization of business, Spontaneous activity, Office automation, Communication and Collaboration, Interactive marketing and Electronic Commerce etc. Electronic commerce, more popularly known and talked about as E-commerce or E-com, is the current day phenomenon, in which everyone is really looking forward to. Now, people look at E-commerce as a tool to modernize business, make it global and to make it more profitable.

The Business process is under the Information Technology revolution which is transforming the way we do the business. The way our basic business operations like decision making, customer service, operations, marketing strategies, financial management, Human resource management etc.

Electronic commerce (e-Business), more popularly known and talked about as E-commerce or E-com, is the current day phenomenon, in which every one is really looking forward to. Now, people look at E-commerce as a tool to modernize business, make it global and to make it more profitable.

We can define e-commerce as doing commerce i.e., business electronically i.e., using electronic media (Internet) in precise. But when we look into all aspects of e-commerce, it is not only doing just business, it is a way to revolutionize the way we used to do our business. E-commerce is associated with the concept of buying and selling of anything, may it be information, products, services, etc. Through the use of computer network i.e., I-way of the current infosphere.

Greenstein and Fein man defined e-commerce as; "The use of electronic mediums(Telecommunications) for engage in the exchange, including buying and selling of products and services requiring transportation, either physically or digitally, form one location to another."

E-commerce not only includes buying and selling but also sharing, collaborating with other Organization, the much valued information, the resource which is invaluable. E-commerce is not only used for generating revenue by doing direct buying and selling, but also for those activities, which support revenue generating, like marketing, providing customers service, facilitating communicating act.

E-commerce the latest addition to this area denotes the exchange of good and services with help of electronic devices and internet. It covers any business deal that generates commerce and leads to payment on the net. E-commerce in such context can be referred to as 'any process of delivery of information products or services and payment by telephone lines, computer networks or other similar means'. The internet's two way flow of information from, as well as to, the customer facilitates business houses with a powerful means to expand the richness of their offerings. E-commerce addresses he needs of organization merchants and customers to cut costs while improving the quality of products and enhancing the speed of delivery. It also covers the use of computer networks to search retrieve information in support a human and corporate decision making. India is slowly stepping into the era of Electronic Commerce. New technologies, have changed the entire concept of doing business. Business needs to respond, to these challenges in order to remain globally competitive as survival is of the fittest. Electronic Commerce is a critical action tool for competitive business strategies in international trade. Electronic Commerce encompasses the entire online process of developing , marketing, selling, delivering, servicing and paying for products and services.

There has been a number of factors which have led to the growth of E-Commerce. A few of them are :

1. Age of competition.
2. Globalization of economy.
3. Commercialization and privatization of Internet.
4. High labor cost and lesser available time.
5. Higher volumes of sales at lower profits.
6. Shorter product life cycles due to changes in technology.

Faster communication of information over computer networks thus reducing distances world wide as a result of emergence of a new field Information Technology which is a combination of telecommunications and computer science. The information Exchange of goods services between individuals and groups has been in existence since time immemorial. A wide range of methods, devices, techniques and tools developed by technocrats and traders have made the process more dynamic. There are four parties involved in e-commerce, (Business) (B), Customer (C), Government (G) and Employee (E). Classification of e-commerce transaction, Business-to-Business (B2B), Business-to-Customer (B2C), Business-to-Government (B2G), Customer-to-Business (C2B), Customer-to-Customer (C2C), Customer-to-Government (C2G), Government-to-Business (G2B), Government-to-Customer (G2C), Government-to- Government (G2G), Business-to-Employee (B2E), Employee-to-Business (E2B).

CLASSIFICATION OF E-COMMERCE TRANSACTIONS

	BUSINESS	CUSTOMER	GOVERNMENT
BUSINESS	B2B	B2C	B2G
CUSTOMER	C2B	C2C	C2G
GOVERNMENT	G2B	G2C	G2C
EMPLOYEE	E2B	E2C	E2G

E-business and the mobile internet: strategies and business models

The "New Economy" has spawned at least six e-commerce models. Each impacts a different part of the value chain. The real challenge is to choose and adapt the one that might be most appropriate for your company, and to make it profitable. This tie back into the question of the Vision you have for the company and the priorities that come out of your strategic planning.

Six e-commerce models Four "new economy" models to and two updates Generate revenue focusing on productivity.

Business-to-Business (B 2 B) Applications

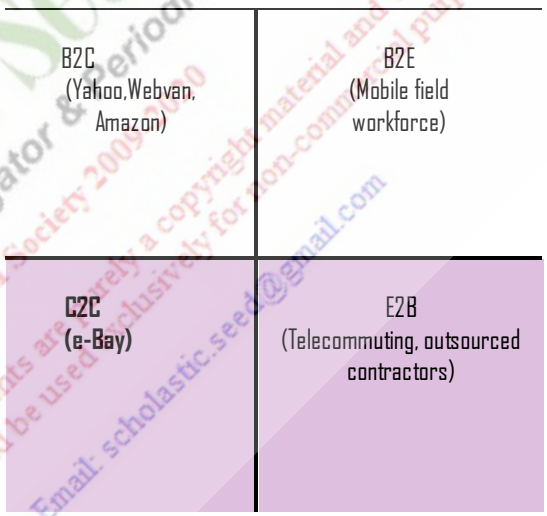
The most popular form of doing e-commerce is by establishing the websites of business house & letting the different customers interact with those websites. These category of E-commerce applications involve

electronic transactions for trade and business activity between business concerns. This category of applications is now becoming most vital, as they are now reengineering the business processes. Using B 2 B applications, now almost every business transactions, with clients, business partners and the channels of supply and distributions are trade automated, where computer talks with computer using the network media removing the human intervention.

INDUSTRIES	00	01	02	03	04
MPUTER	0.2	3.3	7.3	6.2	2.9
TER VIHCAL	.1	.0	1.2	5	5
TRO CHEMICALS	0	9	3.2	.5	9.2
LITIES	9	5	.3	.1	6.4
PER & OFFICIAL ODUCT	4	7	9	.5	3.3
NSUMER PRODUCT	2	1	.5	5	.5
OD MATERIAL	5	2	9	3.1	1
NSTRUCTIONS	3		6	2	0
ARMACUTICAL & DICAL PRODUCTS		7	2	.2	.0
USTRIAL TOOLS / PPLY			8	3	3
EEPING & WARE USING		5	4	5	1
RO SPACE & FENCE		3	1	.0	9
AVEY INDUSTRIES			3	3	5
TAL	6.2	.6	6.9	13.4	95.5

This application can be categorized as a business-to-business applications of E-commerce as it involves business organizations, which do the data interchange using the electronic media. E-commerce includes electronic market Electronic Data Interchange (EDI) and Internet Commerce.

We can define EDI as the "interprocess communication of the business information between computers to computer, in a standardized electronic form." Thus EDI is to data transfer between computer of two organization, may be government, other business units or banks, in order to carry on their transactions. The e-commerce, Business transaction, only Business-to-Business (B2B)



Parties are show in the following table 2000-2004.

BUSINESS TRANSACTIONS IN B2B CATEGORY (RS. IN CRORE)

(SOURCE: FORESTER RESEARCH INK)
E-Commerce in World Wide Scenario

Presently there are 100-150 million paid Internet user excluding students and university graduates, by the and of next year. E-commerce is expected to grow very fast. According to Mr. Negroponte, the Microsoft Master by the end of the next year mare than one-sixth of the

world population will be accessing the net. Today more than 27000 news papers have online business. The U.S. Market alone amount to about 206 billion dollars of which trade through Internet will be 80% thus the e-commerce market shall be 3 time more significant in U.S. economy. E-Commerce in World Wide Scenario is show in the following table 2000-2010.

E-business and the mobile internet: strategies and business models
The "New Economy" has spawned at least six e-commerce models. Each impacts a different part of the value chain. The real challenge is to choose and adapt the one that might be most appropriate for your company, and to make it profitable. This tie back into the question of the Vision you have for the company and the priorities that come out of your strategic planning.

- Six e-commerce models
- Four "new economy" models to Generate revenue.....and two update focusing on productivity...

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Projected market share of e-commerce

Year	*Market share (in billion U.S. dollars)*
2000	2645
2005	3874
2010	5663

Source: NASSCOM

1. **Business-to-Customer Applications (B 2 C):** These are those applications, which make business come close to the consumers to customers and vice versa, in order to offer an attractive electronic market place, where products and services can be sold and purchases.
2. **Business-to-Government (B 2 G) Applications:** Whenever, a business transaction involves governmental agency like Forex Clearances, Customs, Central Excise etc., one has to submit his papers, which will then be checked, then they are passed, even the routine documents have to go through the cycle, which may take plenty of time, which will hamper or hinder the transactions with governmental agencies, therefore a proper frame work for E-commerce applications, which connect governmental agencies to businesses, where one can automate these transactions, we can save lot of time and enhance productivity, therefore now B 2 G E-commerce applications are becoming very popular.
3. **Consumer-to-Consumer (C 2 C) Applications:** These type of applications facilitate the consumers to interact with fellow consumers for resale and repurchase of goods they have or information exchanges. These applications in general are like auctions where consumers brings in what he has to sell and others purchase it and vice versa. This concept is provided as an add-on service by many portals, facilitating a platform to do the activity. We can take www.bazee.com as a goods example for this.
4. **Consumer-to-Government (C 2 G) Applications:** When a consumer requires certain information form administration agencies like governmental agencies, instead of visiting them, spending lot of time to retrieve information, one can now look forward to some applications, in this area, where consumers can directly get information through E-commerce sites and also get their grievances handled.
5. **E-Commerce in Indian Scenario:** On Independence Day of 1995 there were about 2000 internet connections and 10,000 users in India. This has been increased to be 60 lakes of internet connections and 16 million of net users in the beginning of net users in the beginning of 2003. According to NASSCOM study as on 31st March 2000, total number of personal computer in India was 4.3 million. The target 2008 in 20 million and 18 million user by march 2003. India a had 1.8 million internet connection on December31, 2000 with 5.5 million users. By the end of 2003, internet connection is expected to increase to 10 million with 30 million users. Till recently, there were only a few websites for Indian business houses and this has enormously increased of present. There is at least one major site announcement per day and the nature and appearance of sites also have changed drastically. E-commerce revenues in India rose dramatically over the last three years. During 2003-04, e-commerce is expected to generate 30 million dollars with an approximate user base of 1million.In India, the major

share of e-commerce revenue is being generated from B2B market than from B2C. It is estimate that there would be considerable increase both in B2B and B2C transactions with the infrastructure development of telecommunication by 2005. E-Commerce in Indian Scenario is show in the following table 1999-2002.

E-Commerce transaction

Year	Total e-commerce (RS. million)	B2B (RS. million)	Others (RS. million)
1999	4,500	4000	500
2000-2001	35,000	32,000	3,000
2001-2002	150,000	132,000	18,000

Source: NASSCOM

Why has E-Commerce become so popular

Product Promotion: The web is a new medium of advertising that escapes from the fixed format of paper and the limited time slot of broadcast media. It is can be changed for the individual customer and it can be take input from the customer.

New Sales Channel: Internet e-commerce is a new form of direct selling. It does not require retail premises. It combines many of the advantage of catalogue selling and telesales and it can extent the applicability of direct sales to new market, products and services.

Direct Saving: Selling on line cut the cost of retail premises and potentially reduce the staff requirement. Using a public access network cuts the cuts the cost of network facilities. Order entry is by the customer straight into the system. Information can be made available without the paper work, portage and handling cost.

Time to Market: New product can be put online as they are ready. Time can be saved on many aspects of conventional product launch and promotion cycle.

Better Customer Service: Internet e-commerce as an information rich environment, gives new opportunities for direct retailers to excel in many areas of customer information and customer report.

Brand Image: It gives an up-to-date image to be on the web.

Technological and Organizational learning: Companies taking part in e-commerce markets, using involving technologies need to be flexible and agile. An organization at the forefront of e-commerce learns new capabilities that can be potentially exploited in the future.

Low Erring Cost: Procurement processing cost, of purchase, sales and marketing cost can be lowered. It also reduces the inventories.

Better Marketing through Better Customer Knowledge: Establishing a storefront on the web positions enterprises for one-to-one marketing the ability to customize products and services to individual customers rather than large market segments.

Affordability: Internet and web based electronic commerce in more affordable than traditional EDI. Moreover, it also allows more business partners to be reached than with traditional EDI System.

Customer Relations: It allows an organization to develop a closer a relationship with the customer, who is king of the market. The organization can learn the customer need and involve its product or service option to meet that requirement.

New Product capabilities: Information from customer can be used to customize products or could be the spark that inspires new products or services.

New Business Models: The use of networking gives opportunities to develop new business models and network organizational structures.

Problems of E-commerce in India

Business houses have been experiencing several hurdles in the process of conducting trade through cyber way. For the growth e-commerce, the communication infrastructure facilities play crucial role it is the base for

the interaction of customers with World Wide Web. These facility and there awareness among the society are restricted and limited.

Most important drawback is that the computer literacy continues to be awfully poor in India. Without an improvement to this sad state of affairs, computer facilities available throughout the country make no sense. The common man's phobia to the computer and internet is something that requires serious attention of planners, policy makers and administrators.

Another major barrier is the apathy of consumers in India towards plastic money available in varied forms like credit cards, debit cards and other similar smart cards. Though there are a large number of card holders, the proportion of active card users is less than 20 percent. This is likely to make plastic money an inappropriate device to provide support to e-commerce out the net specially among the common rural mass. Inadequate facilities for electronic payment make the situation worst.

Yet another obstacle to e-commerce is the security an privacy issues. E-commerce is unwittingly exposing private customer information including

name, address and data related to plastic money. Owning to security concerns of credit and information, the consumers are afraid of effecting online purchases.

Absence of cyber laws was another major problem for e-commerce deals in India. The IT Act 2000 was introduce with intention of eliminating this hindrance. However, consumers are yet to gain confidence that cyber laws are effectively implemented.

Payment and delivery system are the vital ingredients that determine the ultimate success of e-commerce. Delivery system in India are mainly handled by courier network. Delayed delivery is one of the major issues confronted by the parties involved in e-commerce. Inadequate bandwidth that limits growth of web and e-commerce is a major issues that requires proper management. Other barriers include inadequate volume, non-availability of skills, high rate of technological obsolescence and increases in infrastructure costs.

Conclusion

With the advent of IT revolution and adoption of globalization, Liberalization and Privatization Policies, e-commerce has been gaining popularity in India on a wide scale. The growing importance of e-commerce in the era of globalization and Liberalization along with membership of WTO has brought about signification changes in the business deals in Indian economy. It has opened new vistas to the entrepreneurs in India and the real success depends upon the efforts and attitude of business units as well as consumers to make use of opportunities by availing the protection and security measures provided in the IT Act. Let us hope that electronic means of trading activities would pave the way to revolutionize the marketing system ensuring maximum benefits to the entrepreneurs and consumers in the coming days. The overall impact of e-commerce will be positive for Indian scenario as it will open new opportunities in all sectors. It industry is growing at a fast rate of around 15-16 per cent per annum and thus is poised for a big take off. In order to compete globally, entrepreneurs will have to make use of e-commerce to the maximum extent.

References

1. Dutt, Ruddar and Sundharam, K.P.M. Indian Economy, S. Chand and Compan
2. Ltd. New Delhi- 110055.
3. Forester research ink, 2005
4. National Association of Software and Services Companies (NASSCOM), 2004
5. Parag Dewan and Sunil Sharma, 2000 e-Commerce- A managers guide to e- Business, vanity Books international, New Delhi.
6. WWW. vancechan. Com./e-business.htm

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Phase-II: Theme-Based Paper

ABSTRACT

•Technology is the vital force in the modern form of business globalization. Technology has revolutionized the global economy and has become critical competitive strategy. It has globalized the world, which drive all the countries to more ethical standards. This paper attempts to show how Technology revolution is sweeping the globe and the transition from manual to electronic delivery of services both in public and private sector leads to advancement of business community throughout the world. Globalization has lead to new markets and information technology is one of the technologies fostered to the new market in this increasing competitive world. Technology has helped us in overcoming the major hurdles of globalization and international trade such as trade barrier, lack of common ethical standard, transportation cost and delay in information exchange, thereby changing the market place. Technology has enabled the software experts to work collaboratively over the network with companies from around the world. The technological advancement has helped a lot in creation and growth of global market. Multinational Corporations (MNC) can be seen as a central actor in globalization. Markets have become global at a rapid pace, as indicated by several kinds of trade extended to foreign countries. The innovation in host country is often undertaken by MNC based in one country and due to the technological advancement MNC(s) have expanded to other countries by some kinds of FDI also facilitating the movement of research and development. The researchers have analyzed that though the technology has globalized the business but economically well developed countries have been more benefited. While technology has created many opportunities for global networks of tasks it is important to look at the friction in the system to understand the limitations. The sources of friction are many and could bring the system to its knees. Companies and countries that want to thrive in this era of globalization will seek to mitigate the abuses, while dealing with the friction.

KEYWORDS

•*Technology*
•Globalization
•Innovation
•MNC

Technology is vital force in the modern form of business globalization. The technological advancement has helped a lot in creation and growth of global market. Multinational Corporations (MNC) can be seen as a central actor in globalization. Markets have become global at a rapid pace, as indicated by several kinds of trade extended to foreign countries. The innovation in host country is often undertaken by MNC based in one country and due to the technological advancement MNC(s) have expanded to other countries by some kinds of FDI also facilitating the movement of research and development

This paper attempts to show how Technology revolution is sweeping the globe and the transition from manual to electronic delivery of services both in public and private sector leads to advancement of business community throughout the world. Globalization has lead to new markets and information technology is one of the technologies fostered to the new market in this increasing competitive world.

In past when we used our lives to shape technology, now days our lives are actually being shaped by new technology.

Marshall Mchuhan, coined the term, "the global village" in the 1960s to express his belief that electronic communication would unite the world.

The main driving forces behind the transformation in world's economy are:-

- Due to technological advancement distance, time and location doesn't matter now.
- Concept of E-commerce, E-business and E-banking has been the latest trend of doing business as it allows voluminous transaction to be done speedily and easily through Internet.
- Large pools of skilled and quality human resources
- Dramatic fall in international telecommunication cost.
- Government bodies changing their mind sets and promoting privatization of various sectors especially in India

How the technology can help in the growth of MNC ?

- According to many experts the answer is simple – globalize. With careful management, company should have the knowledge of infrastructure and strategic timing
- To succeed globally, it is important to adapt to other cultures and learn.
- Survey conducted by Clark University found that localization of market is healthy and there are great market opportunities for localization service providers, which will continue to grow within next three years.
- More attention is required when using innovation process with the emergence of globalization.
- Though technological innovation process are being used, but success depends as much on social factors i.e. key roles of trust, shared values and community as on economic, scientific or engineering values.
- Technology has removed the barrier to free trade which has enabled our business to grow.
- For business to grow one has to be real active participant and need to think globally i.e. not only company have to see that their products are manufactured but should have a good supply chain with dynamic marketing teams.
- Indoor mobile network coverage should be increased.
- Telecommunications should be accessible to all – creating products that are usable by older generations and the younger generations rather than focusing mainly on the needs of the younger generation. This will also contribute greatly to corporate social responsibility.
- Can seek help from business continuity experts to plan, design – architect and implement communication policies and solutions.
- It should be based on open standard, as it is used to build a global infrastructure that will give people and industry access to more resources world wide. Open standards are important catalyst for driving new business and innovation. Open standards are a product of independent people working together to collaboratively develop solution for addressing common requirements and goals that help business and ultimately consumers.
- The rising power of emerging market of mobile operations – cellular mobile operations in emerging markets look set for high growth in 2009 and operators in developed countries should therefore move quickly if they wish to compete in these markets.
- Should encourage business members to understand & document core business processes. The details of the business should be understood by employees and the head of Department. Employees should know the relationship with different units and their specific reliance on technology system units says" Swartz"
- "Scenario based testing" should be done, to make sure the plan covers all the necessary elements.
- Threats to business Continuity are present in 90% of companies. But with the right preparation, companies can position themselves to side step threats to this operation and can protect themselves from disaster.
- Effective planning, proper preparation, improving corporate security & business continuity.
- The information is vital assets for any organization; the safeguard for information must increase. Theft, sabotage or merely temporary disruption of information flows can wreak havoc with a business or its customers.
- Technology expansion leads to increased complexity and more potential points of failure- So one should be prepared for exposure of business to unexpected risk.

Reasons for Business decline

- Managers lack a solid understanding, what a business is? The basic risk is that people hadn't been aware of it.
- There is threat of terrorism looming over business and their employees.
- Increasing globalization, labour disturbances, political instability and unrest, antiglobalisation sentiment and disparate operation, all increase the risk of business disruption
- Poor planning flawed analysis and deficient communication can make a bad situation worse.
- Organizations with multiple locations are more likely to suffer, as it is difficult to manage the IT environment.
- Skilled labors are less.

How technology helps in removing the hurdles in the field of globalization?

Technology advancement has lead to the progress and prosperity of various business firms throughout the world. Indirectly it leads to the improvement and advancement of other sectors of economy and also benefits the consumer by providing them up-to-date information when and where required. It leads to industrial growth by saving energy and time and thereby bringing improvement in productivity.

In India the concept of Software Technology Park (STP) was introduced in 1986 with objective of promoting software exports to other countries and in pursuance thereof first Technology Park was set up in 1987. The companies operating under STP exported software worth Rs16 crores upto Dec 1996 against India's total software export of Rs.675 crores at the end of 1996-97.

The technology has increased the productivity and flow of information stimulating competition within short time span across the world. Electronic Trade is one of the examples of the applications of Internet economy in the socio-economic activity. The new pressures occur and urge business enterprises to fastly adapt themselves to and creatively use wonderful achievement in Internet. For e.g. General Motors, Ford & Daimler – Chrysler announced to consolidate their Internet supply networks for product and materials exchange with other auto companies and sales agents.

Technological development is one of the main driving forces of globalization. It can be defined as the socialized knowledge of producing goods and services. On one hand improve the capacity to produce either goods or services. On the other hand, it has lead to change in the way of conducting business e.g. E-Business, etc. Global networks help in realization, maintenance and reproduction of the system – basically the capitalist system. Electronic banking, EFT, etc has made it much easier for consumers and trading firms to send and receive financial assets among banks. Internet and especially E-commerce are the terms basically used for justifying the recent approach of techno-globalism.

*The impact of internet on globalization has both positive and negative aspects. If we see on positive side, Internet technology has lead to the modernization and improvement in business sector throughout the world. Business improves their global competitiveness and productivity with more efficient electronic transaction processing and instant access to information. It has a direct impact on the way the products and services are bought, sold and delivered, altering relationships among clients, firms and employees and speeding the globalization of the consulting industry. The relationship between the clients and the firms is also improved as up-to-date information and fast query processing technique is available.

When we talk about the negative impact, the less developed countries are being exploited and do not benefit as much as that of developed countries. There is also a risk in global environment because of the hazards linked to industrial production, for example, can quickly spread beyond the immediate context in which they are generated.

Positive Impact of technology on globalization

Internet has facilitated opportunities for economic development in MNCs. It has initially started off as a medium for sharing information among academics but now it has paralleled the emergence of globalization as a concept. Its positive impacts can be discussed as follows:-

- For developing countries Internet is an opportunity to gain access to knowledge and services from all around the world. A poor land line telephone system is being by passed by mobile phone with Internet access which has allowed developing countries to step forward in their development of infrastructure and business.
- Those countries who were technological late comers have drastically improved with globalization as it provide a unique opportunity for low-income countries to raise per capita income which shows that technological upgrading is important for development.

- Research shows that improved access to technology imports is improving the demand for skilled labor in many low income countries which will provide job opportunities for the professionals and in turn will bind to work in its own country.
- By going global those firms whose output was significantly more limited by the size of their domestic market have chance to reap greater advantage from economies.
- An inflow of technology can raise labor prices by increasing productivity. In general, one would expect wages across countries to equalize as technology and production techniques spread. Increased trade may contribute to innovation and the spread of technology, and thus indirectly affect wages.
- Most invention is incremental in nature. Improvement in the technology have led to cheaper and more efficient electronics, the manufacturing cost and complexity have increased at a similar pace.
- With invent of technology, the company has become globalize and one has not to restrict within his own country.
- No mediator is required to run the business online.

Negative Impact of technology on globalization

The innovations in technology have enabled many countries and regions to spread their business across the borders, thus, widening the scope of selling of products in global market. Though MNCs have been acting as a central actor in globalization but there have been some negative impact also which can be described by a number of globalization indicators associated with technology related activities.

- If we take a look on the historical primacy, we get very little that shows that widespread globalization of the generation of technology has occurred. The leading industrialized countries have been benefited by this. So mainly globalization of technology generation have been concentrating particularly in intra-European countries like North America, Europe and East Asia.

- The earnings are invested in the financial markets throughout the world. The fate of this is ultimately determined by a series of factors out of which some are related to the economy also. Because of the complexity and unpredictability, the network in which all firms is anchored need to reform and readapt themselves in this endless variation. The organizations that do not follow the networking logic are wiped out by competition, since they are not able to cope up with the new information and business era.

- The main role of MNC's is to maximize the profit by using the technological processes and marketing the products in international markets. This process has been so emphasizing that many analysts have defined globalization entirely in terms of technological exploitation – as the international integration of markets. SO, this has downplayed the role of technology. Often technological change is relegated to a modest, facilitating function (e.g the process by which the innovation of information and communication technologies lowers the costs of moving goods and knowledge around the world)1.

- When we talk about manufacturing of goods abroad due to lower cost of labour we hire overseas agents and contractors. The raw material is supplied to them and they manufacture the products. These finished products again are shipped to other countries where firms can earn higher profits. This leads to higher shipment cost also. So if we leave technology aside, this could be a key source of friction in international trade. But if these manufacturing jobs are given to the contractors in the same country then it would generate more

jobs for the people of that country. SO in one sense, when we say that technology is promoting globalization, in other sense it is "eating up" certain kinds of jobs.

- The technology has reduced the communication gap between the trading firms. But, the information based products that will be clearer through personal contact do not gain popularity through electronic communication.

- The information and communication technology has modernize the production system and communication system thereby leading to the economic growth. But the economies or the countries that have not adapted this new technological system are getting retarded day by day. The more technology savvy economies are dominating the other countries thereby blocking the path of development of less tech savvy economies.

- The firms or countries using advanced business management systems attract other countries (example MNCs) leaving aside their own population who is not able to cope up with the new technology system thereby reducing their motivation level to a greater extent. So that part of population would never be able to develop and work with the pace in this tech era.

- Rich countries are generating more contents in the Internet; it becomes a form of cultural imperialism in which western values usually dominate.

- The drawback of this new technology is that it is creating new gaps between the rich and the poor. As we are moving from industrial age to information age. Poor countries are not taking part in this information revolution and are falling further behind.

Impact of Globalization and Technology on Indian Economy

India's economic growth has been high, exports have boomed, incidence of poverty has been reduced, employment has surged, dependence by India for economic aid has stopped, long-term inflation rate has gone down, scarcity of goods have disappeared, the quality of products available have improved substantially and overall India has become progressively vibrant and internationally competitive. Indian companies are setting up companies abroad, India has better technological development for the benefit of the common man (mobiles, road transport, cheap clothes, etc - only because of globalisation.

The new economic reform, popularly known as, Liberalization, Privatization and Globalization (LPG model) aimed at making the Indian economy as fastest growing economy and globally competitive. The series of reforms undertaken with respect to industrial sector, trade as well as financial sector aimed at making the economy more efficient.

Now that India is in the process of restructuring her economy, with aspirations of elevating herself from her present desolate position in the world, the need to speed up her economic development is even more imperative. And having witnessed the positive role that Foreign Direct Investment (FDI) has played in the rapid economic growth of most of the Southeast Asian countries and most notably China, India has embarked on an ambitious plan to emulate the successes of her neighbors to the east and is trying to sell herself as a safe and profitable destination for FDI.

Effect of globalization on Indian industry has been very positive, though some industrial firms with the baggage of high cost, inefficient plants and processes inherited from the past because of closed economy's government dictated industrial policies and priorities had to face serious problems in the beginning. But soon most of the industries have become more and more efficient; customer focused and improved their international competitiveness in terms of costs, prices, product quality and variety. Industrial growth has been very high and strong during the past decade because of globalization. Exports have increased tremendously. Indian industries are also expanding abroad. Foreign companies have substantially increased their investments in Indian industries. Wages of industrial labour has increased substantially as they have become very productive. Lock out and strikes have declined to insignificantly low levels because industrial labor is happy. Those who cannot be

efficient and past their prime age to retrain themselves in modern methods and processes have been retired with very attractive voluntary retirement schemes. The trade unions are finding it difficult to influence industrial workers into agitation because labor has started benefiting from the positive fallout of globalization on the prosperity and growth of the industrial sector. Talented and merited labor is commanding premium compensation in the labor market. Several new type of industries have also come up. Small scale industries of the past have fast grown into medium scale companies. Incidence of industrial sickness has gone down drastically.

The survey conducted of 100 business and technology professionals indicated that while almost all of their companies have business continuity & IT contingency strategies, the majority wok out pass muster in real emergency

The key resources in the new world economy are knowledge and technology spread on global scale and India is well prepared to become a key player in this global arena. The key strength of Indian Economies are:

- Presence of large Industrial base with both skilled and unskilled labour.
- Since many foreign countries are ready to invest in India due to availability of required resources so the factor of investment bottleneck is also solved to some extent.
- Presence of good quality educational institutions like IITs and IIMs. Moreover, Software Technology Parks available also help in technological development that further enhances globalization.
- Global success of Indian IT sector.
- Presence of global mindset required in the field of Research and Development.

Conclusion

The researchers have analyzed that though the technology has globalized the business but economically well developed countries have been more benefited. While technology has created many opportunities for global networks of tasks it is important to look at the friction in the system to understand the limitations. The sources of friction are many and could bring the system to its knees. Companies and countries that want to thrive in this era of globalization will seek to mitigate the abuses, while dealing with the friction.

With the development and discovery in technology new dimensions are revealed and open a new world in itself as we explore the new technology and move step forward the new technology seems infinite, endless. With the passage of time the knowledge and understanding in the world of technology is expanding at a rapid pace all over the world and MNCs are taking ahead in this era.

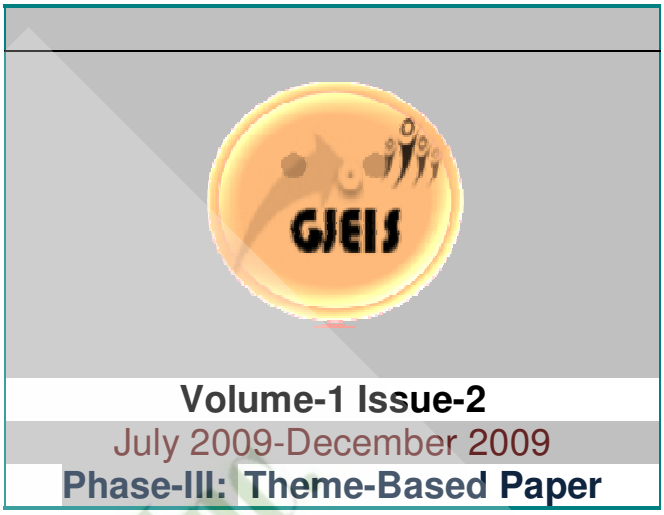
The modern interpretation of globalization suggests that trade can be accomplished across borders with the same ease in transaction that it can be accomplished within local markets. However, globalization, unlike local trade, was created to ensure that prosperity would come to all countries participating in global trade, bolstering profits, and sending financial capital across every border. This trade, therefore, allows the world to become one single marketplace wherein all businesses have the opportunity to grow. Yet, globalization also insists on businesses aligning themselves with new technologies in order to be part of the competition.

Though business continuity planning is very crucial for the growth of business but only 25 percent of companies have invested in business continuity planning. Unfortunately, a staggering 40 percent are gone within three years. Any time a business faces a crisis, the key to its survival is to stop or minimize business interruption. When an organization is forced to shut down for any reason, typical effects include;

Loss of revenue, Liability claims, Loss of brand image, Loss of share value, Delays in accounts receivable and billing and invoicing, Tax and regular penalties, Cost of replacement assets.

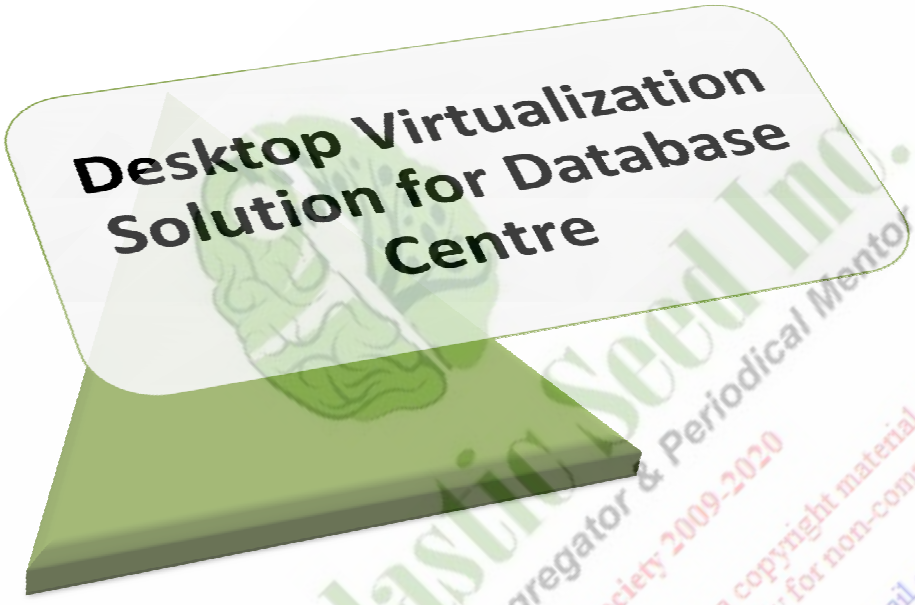
Typically, the most prepaid area of business continuity is technology and computers. Information technology has become an integral component of all business operation, with increasing depending on partner system.

Clearly, the importance of business continuity planning and security protection will continue to grow. Several key trends will have an overarching effect on business continuity preparedness and potential for failure or disruption.



References

- Geoffrey garret, " The causes of Globalisation ". Comparative political studies. August-2000, pp.941-991;
- Kare Penner. "Trade: Two Steps Forward, One step back." Business week. August 31, 1998,pp 116-119
- George Papaconstantinou, "Globalisation, Technology, and Employment: Characteristics and rends," STI Review, No.15, 1995, p. 177
- 4 Daniele Archibugi and Jonathan Michie, "The Globalization of Technology: A New Taxonomy," Cambridge Journal of Economics, February 1995, pp. 121-140.
- Robert W. Rycroft and Don E. Kash, The Complexity Challenge: Technological Innovation for the 21st Century,London: Pinter Publishers, 1999, pp. 80-81.
- David C. Mowery, "Collaboration R & D: How effective Is it? " Issues in Science and Technology, Fall 1998, pp, 37-44



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Phase-II: Theme-Based Paper

ABSTRACT

•Virtualization can enable more dynamic centralized management by separating the elements of the traditional desktop computing. Many desktop virtualizations' forms can help organizations satisfy users' needs for mobility and flexibility by cutting costs, security and compliance of Information Technology (IT) departments. This paper focuses on database virtualization and making the organizations to move towards desktop virtualization quickly in easier way. This paper explains how virtualization can help organizations solve the desktop dilemma, and outlines the ways in which VMware is harnessing expertise and market leadership in desktop and server virtualization to deliver comprehensive database solutions for unified access to universal clients. This will allow the organizations to strike a balance between IT and user needs.

KEYWORDS

•OS
•Server-based computing
• VM
• Virtualized PCs
•Remote Display Protocol (RDP)
•Virtualized desktop infrastructure

The act of decoupling one computing resource from others without impacting the usability across these resources is called Virtualization. Virtualization has changed totally the way of running information systems through the permission of flexibility of hardware and software for the industry. Timely expansion of the resources of mostly available servers, the optimal utilization must be enabled without problems [1]. Virtualization technologies loosen the direct dependencies on the parts - the operating system (OS) to the hardware, the application to the OS, and the user interface and data to the local machine on each other rather than locking these layers together. Any organization responsible for more than one PC should seriously consider the advantages of moving to desktop virtualization. By taking advantage of today's low-cost yet ever more powerful computers, even the smallest organization can realize immediate benefits without the high expense of mainframe computing or the complexity and performance limitations of server-based computing [2]. Today's desktop is an end-user environment defined by a profile consisting of applications, documents and configuration data. As end users rely more and more on mobile devices such as laptops, smart phones and removable storage drives, they need desktop environments that they can access anytime and anywhere. IT administrators are cleaning up the debris from the patchwork client-server systems that were sewed together hastily in the traditional storm as the need for interoperability and flexibility has increased. IT organizations are under due pressure to reduce costs and increase productivity. They are strengthening security and tightening control over corporate information systems.

Some organizations use thin clients to centralize their desktop infrastructure, but traditional thin client models cannot accommodate mobile laptop users and present unique challenges in terms of application compatibility. The synergy of blade architectures and virtualization offers customers the ability to sudden increase utilization of their server investments; and thus provides a more resilient and available infrastructure. The model proposed through this paper roll out new infrastructure and services more quickly and skillfully. The same technologies also lower costs directly- through an immediate reduction in power and cooling costs, and indirectly- through a reduction in IT administrative costs associated with server hardware and the infrastructure software management.

Virtualization in Database

Virtualization considered for this paper uses three categories:

1. Operating system
2. Storage and
3. Applications

Operating system

Virtual operating systems (or virtual machines) are quickly becoming the most prevalent form of virtualization of the IT infrastructure today -the form of virtualization to which end-user is most familiar with. Virtual machines are the full implementations of standard operating systems, such as Windows Vista or RedHat Enterprise Linux, running simultaneously on the same physical hardware. Virtual Machine Managers (VMMs) manage each virtual machine individually;

each OS instance is unaware that on one hand it's virtual and on the other hand other virtual operating systems are running at the same time. Companies like Microsoft, VMware, Intel, and AMD are leading the way in breaking the physical relationship between an operating system and its native hardware, extending this paradigm into the data center. Data center consolidation is bringing the benefits of virtual machines to the mainstream market, allowing enterprises to reduce the number of physical machines in their data centers without reducing the number of underlying applications. This trend saves enterprises money on hardware, rack space, power, cable management, and more.

Server Virtualization:

The concept of application server virtualization is best seen with a reverse proxy load balancer which is an appliance or service that provides access to many different application services with transparency. In any deployment a reverse proxy will host a virtual interface accessible to the end user on the "front end." While on the "back end," the reverse proxy will load balance a number of different servers and applications like a web server. The virtual interface or Virtual IP or VIP represents itself as the actual web server, and manages the connections to and from the web server on need. This enables the load balancer to manage multiple web servers or applications as a single instance, providing a more secure and robust topology than one allowing users direct access to individual web servers. This is a one-to-many virtualization representation in which one server is presented to the world, hides the availability of multiple servers behind a reverse proxy appliance. Application Server Virtualization (Bury & Nelson 2004)[3] can be applied to any type of application deployments and architectures, from fronting application logic servers to distributing the load between multiple web server platforms. It can be applied to all the way back in the data center to the data and storage tiers with database virtualization.

Application Virtualization:

The application virtualization is also called "thin clients". These implementations depend on the virtual application running locally and the management and application logic running remotely; for example Softgrid by Microsoft deploying application virtualization. Though it may be running Microsoft Word locally on a system, personal information, the binaries, and running state are all stored on, managed, and delivered by Softgrid. The local system/laptop provides the CPU and RAM required to run the software, but nothing is installed locally on the machine. Other types of Application Virtualization are Microsoft Terminal Services and browser-based applications.

What is Desktop Virtualization?

A hardware virtualization layer is added to the centralized database center server or servers in a typical desktop virtualization model. In a network the end user software is

distributed and packaged with application virtualization [4]. This goes with standardized web services initiative making the IT sector surprising. So many virtual machines (VMs) are hosted in this virtualization layer. Each virtual machine (VM) is associated with an operating system, applications, device configurations, and a unique desktop environment (or GUI). Every user uses the desktop for a given VM including customizations, such as Windows wallpaper and screen savers. The structure of a desktop virtualization solution is shown in Figure 1.

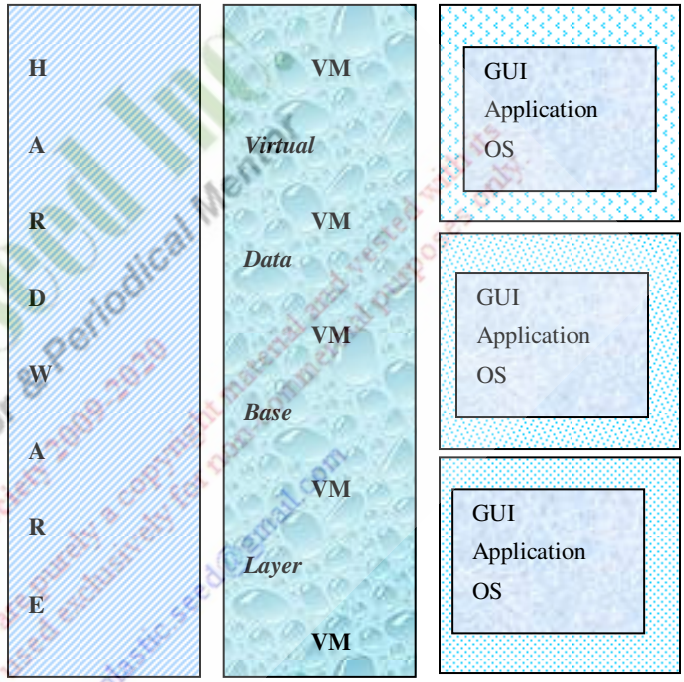


Fig.1 Desktop Virtualization

The virtualized PCs (workstations) running on the remote server constitute the desktop Virtualization. The centralized server hardware performs every computation work. The users get the user interface on client machines on the network. IT administrators create virtual machines on a central server for building a virtual desktop solution machine. Then a connection broker is installed. Now install desktop operating systems on the virtual machines like Windows® XP or Windows Vista®. Finally install the desktop applications.

Users will get fully devoted OS sessions on the shared central server as every virtual machine is a complete instance of a PC (the user session functions just as a locally run version of the operating system). The users access the virtual desktop remotely from a traditional PC, thin client. They can access otherwise from a repurposed computer directly or through a connection

broker connecting the user to the appropriate virtual machine. Each hosted VM runs freely on the server protecting from unauthorized access. The virtual desktop is delivered to the client using a remote presentation protocol, such as Remote Display Protocol (RDP) or Virtual Network Connection (VNC) resulting into the hosted desktop images, completely separated from each other on the secured database center server.

Current challenges:

Some organizations use thin clients to centralize their desktop infrastructure, but traditional thin client models cannot accommodate mobile laptop users and present unique challenges in terms of application compatibility and the overall end-user experience. The dilemma is how to accommodate user needs which may include freedom, flexibility, mobility, also to accommodate the needs of IT administrators including security, control, manageability, and compliance using a common framework. Virtualization connects all of the components utilized in delivering an application over the network, and includes the process of making all pieces of an application work together regardless of where those pieces physically reside. This paper explains how virtualization can help organizations in solving the desktop dilemma by delivering comprehensive solutions for unified access to universal clients, allowing organizations to strike a balance between IT and user needs while improving the bottom side.

The most challenging issues associated with traditional approaches to enterprise desktop computing are:

Security Risk:

Traditional desktop management solutions do not provide adequate security for endpoint data, especially when it is stored or accessed remotely or on mobile devices such as laptops and USB drives. Many organizations are looking for a fundamentally better solution. For organizations focused on data security as a top priority, Centralized Virtual Desktops have created a tremendous amount of interest.

Backup and Recovery:

The traditional desktop computing has the decentralized nature, due to these desktop applications, user data and documents are very difficult to back up. Backing up an entire office full of desktops is not practically possible for most of the organizations. In a condition if a desktop goes down or a laptop is lost, it can take hours or days to get the end user back up and recovery.

Patch and update management:

The hardware, operating system, applications and users are all tied to a single device with the traditional desktop computing. Updates to any of these can tend to cause conflictions. Hardware refreshes can cause driver conflictions with the operating system. The operating system updates invariably can give rise to application incompatibilities and many more things can happen.

Compliance and Policy Enforcement:

The mobile devices and employee-owned PCs make it extremely difficult to enforce corporate policies, prevent data leakage. The organizations discovered that they rarely maintain the comprehensive audit trails necessary to demonstrate compliance with the ever growing number of government and industry regulations. The challenge is how to back up user data and settings scattered from PC to PC and restore users' productivity if a laptop is lost.

Costs Cutting:

It can be very costly and difficult to provisioning, managing and supporting traditional desktops. In large, geographically distributed environments that may include a mix of operating systems, devices and access points it becomes more and more expensive.

Moving from distributed to consolidated infrastructure:

As with the introduction of any new technology, the return always comes only after the investment, IT organizations face the challenge of generating executive backing for the initiating investment amount in moving from distributed to consolidate to save more amounts later after deployment of the technology.

These and many more reasons are keeping the organizations to move away from the traditional model to a better way to operate their end user environments. The Virtualization offers the better solution for the same.

Solving the Problem with virtualization:

According to Forrester "Organizations will instead identify their users by criteria like task-based, knowledge, or power users and will deliver dynamic desktops accordingly. After speaking to organizations looking at desktop and application virtualization, we know that client virtualization is not just an emerging trend, it's the future of the corporate PC." (Forrester 2008)[5]. The purpose of this paper is to make it easier for companies to move to Desktop Virtualization. Customers may choose to deploy some applications locally on the PC and some applications remotely using Terminal Services.

Application virtualization can be used with the deploy technologies available for both of these scenarios.

Virtualized desktop infrastructure (VDI), including server virtualization and some storage virtualization, used management tools and automation tools such as workload redistribution and automatic workload migration (>25%). These were used both on live VMs and on cold OS images for meeting service-level agreements and availability goals (systems achieve 40% to 60% or more capacity utilization)

Savings Versus Unvirtualized (%)	Total Costs per User per Year ($)	
Unvirtualized	165	NA
Basic virtualization	107	Up to 35
Advanced virtualization	80	Up to 52

Table 1: Business Value of Virtualized Deployment: Total Costs [6]

Integrated solutions from vendors such as HP, provide essentially all of the same benefits of a basic virtualization scenario through a hardware based solution, offers the HP Insight Dynamics - VSE in conjunction with the company's HP c-Class Blade System products (using the HP Virtual Connect technology). This is a means of virtualizing Ethernet and Fiber Channel network connectivity for blades. This solution can utilize a hyper visor to further extend customer benefits. In this scenario, it delivers some of the attributes IDC defines in an advanced virtualization scenario. Table 1 compares the annual costs per user for deployment of this technology. The reduction of staffing costs and increasing business agility can be changed into long-term benefits that for years to come will deliver ongoing returns on the investment required.

According Gartner research, virtualization will be the biggest driver for IT infrastructure and operations spending over the next several years. The report, "Virtualization Impact on x86 Server Shipments" [7], emphasizes that virtualization is the "highest-impact trend" for IT through 2012, predicting it will determine how IT administrators manage, buy, deploy, and plan their future strategies. Gartner projects that more than four million virtual machines will be installed on x86 servers by next year – which is almost as many virtual PCs in operation today. Clearly virtualization is a major technology shift. As a result, it requires visionary changes in thinking and operating procedures to better plan, manage, provision, and orchestrate resources throughout the enterprise.

"Many people feel that all they need to be successful is buy some virtualization software and install it. That might get them started on the virtualization life cycle, but doesn't complete it. You'll be more successful if you address all the steps in the life cycle." [8]

When planning the life cycle of desktop virtualization the organizations must measure the behavior and the resource consumption of each desktop application, over time, in order to properly assess the hardware resources necessary for migration. The performance of every critical application is evaluated by its performance in a virtualized environment to understand the impact upon user productivity. Analysis of each consolidation target platform needs to be ranked in a number of key areas, like CPU and memory utilization, to best determine the right virtualization broker for each organization's suite of virtualized applications (thin clients).

Today organizations are adopting VMware virtualization technology to increase freedom and flexibility while providing IT organizations with the centralized management and control. They need to lower costs and increase security and control in there database. The

virtualization breaks the bonds between these elements into isolated layers, enabling IT staff to change, update and deploy each component independently. End users is benefited from virtualization as they get the same rich desktop experience, but with the added ability to access that computing environment of devices and access points in the office, at home and on their journey. Desktop Virtualization solution can be used to provide access to applications and data to remote users who are not within the company firewall. For example take the case, when an IT department wants to support users who work from home or in other, geographically dispersed places. Supporting such users is a difficult task. In such case of problem, the user often sends their desktop or notebook to the main office for repair. Desktop virtualization solution to database centre makes the problems easier to fix since the virtual systems are maintained in the data center where there is an IT staff. Desktop virtualization is the act of decoupling the different computing layers and storing some / all of them in a data center figure shown below as-

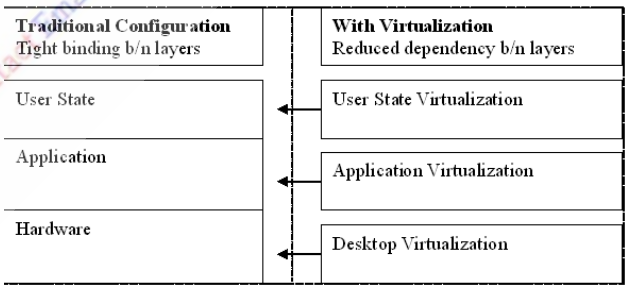


Fig.1: Desktop Virtualization in Database centre

Employees can access their applications and data very safely over a network and the risk of data loss is minimized through virtualization. Virtualization boosts deployment of new capabilities without needing to acquire new hardware and configure components and reduces application testing requirements and compatibility issues and simplifies disaster recovery and compliance. Virtualization of desktops is also heading over terminal services as they remove the headaches of application sharing and application compatibility. Instead of of sharing application and compatibility each end user gets a complete, standardized and customizable desktop computing environment which is nothing else but virtual machine. Each virtual desktop is completely isolated from other virtual machines. IT administrators have provision and manage OS and application software just as they do with a traditional PC.

Many competitive solutions have been introduced in the market which includes multiple implementations of the open source Xen hypervisor technology integrated into both main stream commercial Linux distributions and non paid Linux distributions. It has been commercially packaged into a standalone product. During 2008, Microsoft rolled out its Hyper-V hypervisor, replacing its Virtual Server product that has been used primarily for test and development purposes and low-scale with low-performance production deployments.

VMware has revolutionized server-based client computing with VMware Virtual Desktop Infrastructure (VDI) by delivering fundamental improvements over the legacy terminal services paradigm. The VMware deliver fully isolated virtual desktops from the database center, each with its own operating system, applications and user configuration data. VMware has established itself as the leader globally in both desktop and server virtualization. It is bringing together the best of its desktop and server virtualization technologies. VMware has expanded the VDI paradigm to include both server- and client-hosted virtual desktops to run on any desktop computer, providing unified access to centralized database resources, with or without a network connection, on the widest possible variety of endpoint devices. Now organizations can manage hardware, operating systems and applications independently of each other within a unified framework. This will result in a user-centric approach that improves desktop management by reducing costs, strengthening security and tightening control over corporate assets. On the other side it will provide end users with a flexible knowledge desktop experience. The main advantage of desktop virtualization is unified access to universal clients.

Advantages:

The key advantages of desktop virtualization are-

United Equipment adoption of VMware server and desktop solutions improve disaster recovery, and enhance remote access to their Microsoft Dynamics ERP application.

The desktop virtualization standardizes their IT infrastructure, centralize management, tighten security, and make organization move in easier way. Each user can completely customize the desktop virtualization environment with different applications and settings.

Users can be provided more control of their own virtual desktops. They are enabled to install and modify applications. It is possible to mix several different operating systems or different versions of the same operating system within a single virtualized desktop environment. Example, some virtual desktops run Windows XP, while others run Linux—all comfortably hosted on the same central server. Desktop virtualization makes it possible to consolidate enterprise desktops. IT administrators can replace computer workstations with expendable, low-cost thin client terminals. This helps extend computer life cycles, as older computers can be repurposed for other duties. They can more easily manage large numbers of enterprise clients from the data center, rather than from each individual user's desk. Data can be made more secure, as user desktops— including operating system images— are running on servers within the walls of a centralized data center. Desktops are managed centrally in the virtualized desktop model, simplifying software installations, backups, and maintenance, as well as reducing technical support and administration. Desktop virtualization separates user desktops from specific hardware resources. Thus makes possible live migration of virtual machines among physical servers. A virtual machine can be suspended and the server can move the memory contents of the desktop virtual machine to a disk, another virtual machine can be provided on another physical hardware, and the virtual machine can then be brought back online. Once this penetration is completed, users can pick up right where they left. Computing resources can be conserved for autotime user sessions. The user's session can be disconnected from the client which can be still running on the server. The system can then suspend the session by moving the memory contents to disk and leaving the hardware for another user. Next time the first user logs in, his original session is re-connected and the user can continue work. Desktop virtualization can be an effective solution in scenarios that benefit from features such as reduced desktop administrative and management tasks like quick addition, delete, upgrade, and patch applications. The desktop virtualization can be more effective in centralized security, and the ability to safeguard and back up data.

Limitations:

The infrastructure supporting a virtualized desktop framework is comprised of enterprise-class server hardware which is connected to a storage area network (SAN), it may become a single point of failure though server hardware is typically very robust and fault-resistant. The failure of the server may take down client environments running on it. It is solved by putting the virtual machines, encapsulated as files, on the SAN for redundancy.

This failure extends to the network. The flexibility and management benefits of desktop virtualization require a low-latency connection between the client and virtual infrastructure. The client environment cannot operate without a network

connection. It is generally difficult to provide a rich graphical experience to the end user in virtualized desktop scenarios, because virtualizing the Graphics Processing Unit (GPU) is very complex and incurs significant overheads. Also delivering a rich graphical experience can consume significant network bandwidth. Therefore applications such as computer-aided design (CAD) tools and computer games may not be suitable in virtualized desktop environments. Server-based desktop virtualization is not the best solution for users who need the flexibility of being able to work offline, because of its heavy dependency on network connectivity,

Conclusion:

Desktop Virtualization solution offers the simplified desktop management, data protection, and cost savings through green technologies. Its success will be determined by the user experience that it can deliver. Existing distributed desktop computing model will continue to be around and adding new collaboration applications for the years to come. Using both existing and new technologies, the desktop virtualization can help scale and optimize virtual desktop delivery to improve the user experience and serve as a common platform for consistent policies in an increasingly heterogeneous desktop and application environment. In modern trend VMware is bringing virtualization to mobile phones through the new VMware Mobile Virtualization Platform (MVP), yet another step towards the vision of providing organizations with the means to deliver unified access to universal clients in a way that is completely hardware-independent. Desktop virtualization is not a substitute for today's PC technology, even today there are plenty of scenarios where Desktop is the better solution. There may be purely financial reasons, security-related regulations, flexible working models or a mixture of all of these. Desktop virtualization combines the inherent benefits of hardware virtualization like portability, isolation, and flexible use of operating systems with the power and adaptability of remotely hosting productivity computing on centralized servers. Users can access these virtual desktops using RDP, hosted from their desktop PC thin client.

References:

[1] Narendra Kumar Tyagi, "Database Virtualization Layer", research paper "Global Journal of Enterprise System (GJEIS) Jan2009-june 2009 (page121) from http://gjeis.academician.co.in/

[2] Connor, Deni. (2005). Welch's reaps benefits from server virtualization. Network World Fusion. Retrieved April 15, 2005 from http://www.nwfusion.com.

Broughton, Eric. Periscope: Access to Enterprise Data. Retrieved March 24, 2005 from http://www.tusc.com.

[3] Burry, Christopher M. and Nelson, Craig. (2004). Plan on server virtualization. Computerworld. Retrieved March 24, 2005 from http://www.computerworld.com.

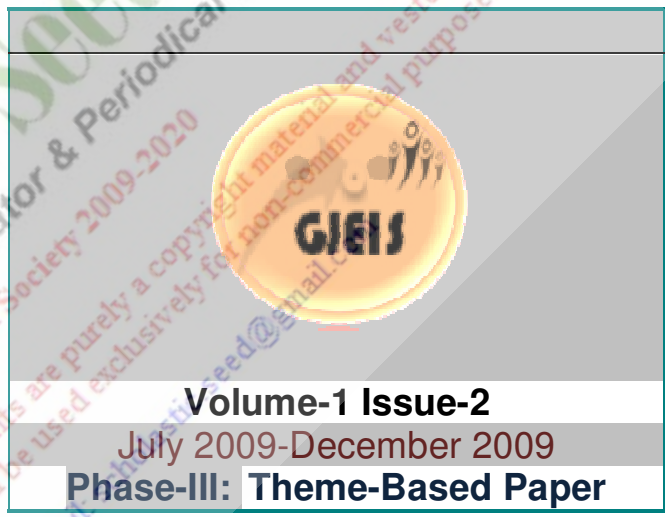
[4] Singh, Amit. (2005). An Introduction to Virtualization. Retrieved March 14, 2005 from http://www.kernelthread.com.

[5] Forrester Research,"Demystifying Client Virtualization", April 9, 2008 from http://www.forrester.com

[6] Source: IDC's Business Value of Virtualization Research, 2008 from http://h18004.www1.hp.com

[7] Gartner, Virtualization Impact on x86 Server Shipments, March 2008 Update; 28 March 2008 by Adrian OConnell, Jeffrey Hewitt, Jonathon Hardcastle, and Philip Dawson, from http://www.aternity.com

[8] Wiley's Virtualization for Dummies handbook, December 2007, Bernard Golden, pp. 31-32.



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Phase-II: Theme-Based Paper

ABSTRACT

- Spam is the abuse of electronic messaging systems (including most broadcast media, digital delivery systems) to send unsolicited bulk messages indiscriminately. While the most widely recognized form of spam is e-mail spam, the term is applied to similar abuses in other media: instant messaging spam, Usenet newsgroup spam, Web search engine spam, spam in blogs, wiki spam, online classified ads spam, mobile phone messaging spam, Internet forum spam, junk fax transmissions, social networking spam, television advertising and file sharing network spam. Spamming remains economically viable because advertisers have no operating costs beyond the management of their mailing lists, and it is difficult to hold senders accountable for their mass mailings. Because the barrier to entry is so low, spammers are numerous, and the volume of unsolicited mail has become very high. The costs, such as lost productivity and fraud, are borne by the public and by Internet service providers, which have been forced to add extra capacity to cope with the deluge. Spamming is universally reviled, and has been the subject of legislation in many jurisdictions. Spamming is now considered to be a serious threat to the Internet and is posing a serious threat to both ISP and users' resource. Service providers are under mounting pressure to prevent, monitor and lessen spam attacks directed toward their customers and their infrastructure. The Internet is part of the serious national infrastructure. Attacks that are seen everyday on the Internet include direct attacks, remote reflective attacks, worms, and viruses. Emerging classes of messaging abuse in the mobile environment have led to neologisms like "SMishing," or SMS phishing. A SMiShing attack could introduce viruses or other malware to the network or add massive charges to corporate cell phone bills.

KEYWORDS

- Virus, Spam
- wireline-to-wireless threats
- wireless-specific threats

Attacks of all kinds have become much more complicated and harder to detect. The nature of computer attacks has changed over the past few years. Like early viruses that were often created by hackers whose sole interest was in gaining visibility within the hacker community, the new attacks are much more disturbing and have just the opposite visibility goals; they are usually motivated by the desire for money. The result is often fraud committed on thousands of unsuspecting users, commonly referred to as "crimeware". For example, capturing personal or company information without the knowledge or consent of the owner of the computer system can lead to catastrophic results for individuals, as well as for businesses, government entities, medical/healthcare organizations and educational institutions. Even the innocent act of playing a music CD on a computer can leave it open to attack. Spyware can accompany the music when it is automatically downloaded onto the hard drive, rendering the computer vulnerable to attack.

Types of Attacks

The most common attacks are no longer simple (or even complex) viruses. Many forms of malware and other unwanted software programs are using complex combinations of attacks to spread — not simply relying on one method alone. The following are some of the major areas of vulnerability that could result in attacks.

- Operating system and software application vulnerabilities.
- Accepting downloads from unknown sources when visiting websites.
- Active-X, Java and scripts can either contain malicious code or download malicious code from various websites.
- Email files attachments.

Viruses

A computer virus is a computer program that can copy itself and infect a computer. The term "virus" is also commonly but erroneously used to refer to other types of malware, adware, and spyware programs that do not have the reproductive ability. A true virus can only spread from one computer to another (in some form of executable code) when its host is taken to the target computer; for instance because a user sent it over a network or the Internet, or carried it on a removable medium such as a floppy disk, CD, DVD, or USB drive. Viruses can increase their chances of spreading to other computers by infecting files on a network file system or a file system that is accessed by another computer.

As stated above, the term "computer virus" is sometimes used as a catch-all phrase to include all types of malware, adware, and spyware programs that do not have the reproductive ability. Malware includes computer viruses, worms, trojans, most rootkits, spyware, dishonest adware, crimeware, and other malicious and unwanted software, including true viruses. Viruses are sometimes confused with computer worms and Trojan horses, which are technically different. A worm can exploit security vulnerabilities to spread itself automatically to other computers through networks, while a Trojan is a program that appears harmless but hides malicious functions. Worms and Trojans, like viruses, may harm a computer system's data or performance. Some viruses and other malware have symptoms noticeable to the computer user, but many are surreptitious or simply do nothing to call attention to them. Some viruses do nothing beyond reproducing themselves.

There currently are five recognized types of viruses: File Infector Viruses, Boot Sector Viruses, Master Boot Record Viruses, Multi-Partite Viruses and Macro Viruses.

Trojan Horses

Trojan Horses are impostors – files that claim to be something desirable but are, in fact, malicious. A very important distinction between Trojan horse programs and true viruses is that they do not replicate themselves. Trojans contain malicious code that when triggered cause loss, or even theft, of data. For a Trojan horse to spread, you must, "invite" it onto your computers. For example, you could open an email attachment or download and run a file from the Internet.

Trojan horses require interaction with a hacker to fulfill their purpose, though the hacker need not be the individual responsible for distributing the Trojan horse. In fact, it is possible for hackers to scan computers on a network using a port scanner in the hope of finding one with a Trojan horse installed, which the hacker can then use to control the target computer.

A trojan differs from a virus in that only a file specifically designed to carry it can do so.

Due to the growing popularity of botnets among hackers, Trojan horses are becoming more common. According to a survey conducted by BitDefender from January to June 2009, "Trojan-type malware is on the rise, accounting for 83-percent of the global malware detected in the world".

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Worms

Worms are programs that replicate themselves from system to system without the use of a host file. This is in contrast to viruses, which require the spreading of an infected host file. Although worms generally exist inside of other files, often Word or Excel documents, there is a difference between how worms and viruses use the host file. Usually the worm will release a document that already has the "worm" macro inside of it. The entire document will travel from computer to computer. In other words, the entire document could be considered the worm. W32.Mydoom.AX@mm is an example of a worm. Worms spread by exploiting vulnerabilities in operating systems. All vendors supply regular security updates, and if these are installed to a machine then the majority of worms are unable to spread to it. If a vendor acknowledges vulnerability, but has yet to release a security update to patch it, a zero day exploit is possible. However, these are relatively rare. Users need to be wary of opening unexpected email, and should not run attached files or programs, or visit web sites that are linked to such emails. However, as with the ILOVEYOUworm, and with the increased growth and efficiency of phishing attacks, it remains possible to trick the end-user into running a malicious code.

Hoax

Virus hoaxes are messages, almost always sent through e-mail, that amount to little more than chain letters. One of my favorite phrases associated with virus hoaxes is, "Forward this warning to everyone you know!" Most hoaxes are sensational in nature and easily identified by the fact that they indicate that the virus will do nearly impossible things, like blow up the recipient's computer and set it on fire, or less sensationally, delete everything on the user's computer. They often include announcements claimed to be from reputable organizations such as Microsoft, IBM, or news sources such as CNN and include emotive language and encouragement to forward the message. These sources are quoted in order to add credibility to the hoax. Virus hoaxes are usually harmless and accomplish nothing more than annoying people who identify it as a hoax and waste the time of people who forward the message. Nevertheless, a number of hoaxes have warned users that vital system files are viruses and encourage the user to delete the file, possibly damaging the system. Examples of this type include thejdbgmgr.exe virus hoax and the SULFNBK.EXE hoax. Some consider virus hoaxes and other chain e-mails to be a computer worm in and of themselves. They replicate by social engineering—exploiting users' concern, ignorance, and disinclination to investigate before acting. Hoaxes are distinct from computer pranks, which are harmless programs that perform unwanted and annoying

actions on a computer, such as randomly moving the mouse, turning the screen display upside down, etc.

Spam

Spam is not very different from the junk mail you've been getting at home or in the office for decades. Only now, the junk mail is coming through your e-mail accounts to your computers at home and in the office. Nonetheless, spam is by far worse than junk mail. The only real cost of eliminating junk mail is buying a larger recycling bin. Spam and Phishing, which we will discuss later, can actually cost you and your organizations time, money, and worst of all, the loss of data and confidential information. It can also create legal liability issues because of its content. If you talk to some end users they don't see much difference between Spam and the ordinary junk mail that mail carriers have delivered for years. They may say "all you have to do is hit delete". Obviously these people have never had hundreds of Spam messages hit their inbox in a very short period. Additionally they have never run a network or email gateway. The cost to corporations in bandwidth, delayed email, and employee productivity has become a tremendous problem for anyone who provides email services. Many customers think their Internet Service Provider (ISP) should be able to fix the problem. But Spam is a world-wide problem, and email systems around the world are not setup in a consistent manner.

Real-time Black-hole Lists (RBLs)

RBL's are lists on the Internet that track the IP addresses of machines recently known to be Spamming. Subscribers use these lists to check if a sender is a suspected Spammer and reject email from IP addresses on the list. Unfortunately there are several lists, and they don't all work the same. Some actually charge you to get off the list, and then others may block addresses of innocent users that are in the same IP range as a Spammer. Blacklists prevent millions of innocent e-mails from arriving at their destinations. Don't get me wrong. Blacklists mean well, and have been a helpful tool in helping curb Spam, however too many lists run differently sometimes creates a real problem for email administrators, ISP's, and legitimate users of email. But RBL's have also been very helpful in bringing awareness to the Spam problems, and have played an important part in helping curb issues. Hopefully someday the need for RBL's will be obsolete.

Typically the goal of Spam is to sell some product or service. Of course not all of these services are always good and proper, but then again some are. It would be nice if all Spam advertising could be tracked back to a store front like typical advertising, however Spammer's typically do not operate this way. Why, because if it were easily traced it would be easily stopped. Of course there is always the Spam that comes from "off-shore" where laws do not apply. But the majority of todays Spam comes from compromised end user machines. Think about it, if you could use the computer of some unsuspecting person to send out millions of emails to huge lists of people, your now using the resources of someone else's computer, and

some service providers bandwidth to do your "dirty advertising" for free. Then if the recipient of the Spam complains, they are are never really reaching the actual Spam advertiser.

Phishing

Phishing, as the name implies, is when spam is used as a means to "fish" for the credentials necessary to access and manipulate financial accounts. Invariably, the e-mail will ask the recipient for an account number and the related password, explaining that records need updating or a security procedure is being changed that requires confirming an account. Unsuspecting e-mail recipients that supply the information don't know it, but within hours or even minutes, unauthorized transactions will begin to appear their accounts.

By now, most people know that giving this information away on the Internet is a no-no. With Phishing, however, it's almost impossible to tell if the e-mail is a fraud. Like spam, e-mails from Phishers usually contain spoofed FROM or REPLY TO addresses that make the e-mail look as though it came from a legitimate company.

The RapidShare file sharing site has been targeted by phishing to obtain a premium account, which removes speed caps on downloads, auto-removal of uploads, waits on downloads, and cooldown times between downloads.

Defenses

The daily challenge for IT managers and administrators is to continue the freedom of computer users to access to the information they need, but at the same time, protecting all systems from malicious threats. This has been made more difficult by the growing complexity of threats, especially blended threats that combine Viruses and Spam. These new and emerging combined methods of propagation are, in some cases, taking advantage of the vulnerabilities of Operating Systems.

Wireline-to-wireless threats AND wireless-specific threats

These two threat types are considered individually due to technical and economic reasons, which play key roles in how likely they are to proliferate in the wireless environment and what are the appropriate methods to stop them.

Wire line-to-wireless threats

Technology convergence has helped decrease the cost of devices and services that bridge traditional wireline services such as email and Web and wireless services such as SMS and WAP. Economic barriers, such as the relatively high cost of sending SMS from a handset, have kept the wireless space almost clear of the volume of messaging abuse seen by wireline networks. This barrier, however, has been lowered by the increasingly seamless interface between the two technologies. Email to SMS gateways enable any email user to send messages free of charge to mobile subscribers around the world. Since spammers are not penalized for sending SMS/text messages, this potentially opens up the possibility of low-profitability spam, like the "Viagra" spam, being an issue for mobile users. Email to SMS is a popular service that subscribers use to reach friends and page groups of users,so discontinuing or severely restricting this service is not a good option. Therefore, mobile operators need to protect their email to SMS gateways with the same type of filters and

content analysis systems that large ISPs use to cover their email infrastructure. As mobile customers demand more features currently available only over the Internet, the economic constraints that restrict mobile messaging abuse will disappear, leaving mobile devices vulnerable to the same forms of messaging abuse as those terminating on laptops and computers. To make matters more complicated, email and other forms of communications are extending to new categories of devices beyond just mobile phones and PDAs. Internet connected devices ranging from television set-top boxes to refrigerators are rapidly expanding the footprint of messaging-capable platforms. The latest wave of gaming consoles and portable entertainment devices also have Internet connectivity and messaging capabilities, which raises additional concerns about inappropriate content reaching minors who are the majority of users of these devices. While the incidence of abuse on these platforms is still unknown, the sheer number of these devices together with the affinity of the users makes these platforms compelling targets for spammers

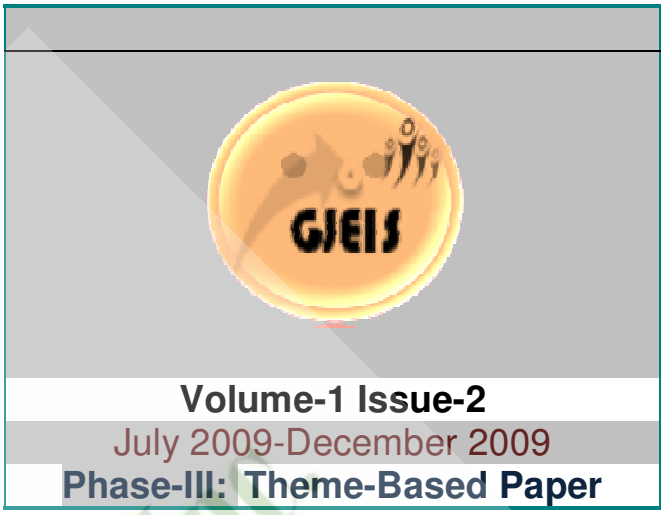
- *Wireless-specific threats*

Wireless-specific messaging threats will be similar to those pioneered in the wireline domain, but will diverge due to specific economic factors. Asia has consistently led the way in mobile content and usage trends, and events there may be indicative of what's to come in other developed mobile markets such as the U.S. and Europe. In Japan and South Korea, where the cost of sending SMS is around a penny, the rate of mobile spam is almost on par with email spam. On 2 Japan's NTT DoCoMo's network, 9 out of 10 messages are spam. In South Korea, subscribers receive on average one spam per day on their mobile phone. Until the per message cost associated with sending SMS drops in the U.S. and Europe, users there will likely see short codes and narrowly-targeted announcements instead of URL s and large broadcast mailings that are prevalent in wireline networks. For example, a user may receive a spam SMS enticing him to sign up for a text service using a short code that is tied in with the mobile operator's billing system or he may be tricked into calling a premium rate number. The ease in setting up premium rate phone numbers makes this type of fraud particularly appealing to scam artists. These "false pretext" messages have a direct and immediate monetary impact on subscribers, leading to high customer dissatisfaction.

Conclusion

To be concluded we can say that In the past, threats have often been managed using separate threat management components, such as anti-virus, anti-spyware, etc. Recent attacks have involved combinations of different kinds of malware, limiting the effectiveness of separate components designed to combat only a single type of attack. A more effective approach is an integrated threat management solution that provides centralized management of all anti-threat capabilities. Cloudmark's flexible; content-agnostic solution is uniquely able to combat mobile spam, phishing and viruses that originate from mobile devices or the Internet. Cloudmark can be implemented to stop

messaging abuse at the network's edge, thus ensuring that spectrum, network resources and service quality are not impacted. For mobile operators, Cloudmark's comprehensive messaging security leadership translates into lower subscriber churn and support, as well as loyal subscribers who can confidently adopt innovative services.



References:

1. http://www.techzoom.net/publications/insecurity-iceberg/
2. http://ca.com/Files/WhitePapers/ca_threat_management_wp.pdf
3. http://www.purewire.com/purewire_web_security_service.php
4. http://www.techzoom.net/publications/insecurity-iceberg/
5. http://www.allspammedup.com/anti-spam/knowing-the-threats-of-spam/
6. http://www.cloudmark.com/releases/docs/wp_taxonomy_of_mobile_threats_2009-05.pdf

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Paul is one of the leading commentators on ERP systems and specifically SAP solutions. His knowledge is well respected in both industry and academia and accordingly is often required to assist companies with their ERP strategies. He has presented at Sapphire, ASUG and SAUG conferences and is a member of SAP's Global University Alliance Curriculum Initiative. He has been a committee member of the SAP Australian User Group for the past six years and is responsible for knowledge transfer.

Paul Hawking is one of the leading commentators on ERP systems and specifically SAP solutions. His knowledge is well respected in both industry and academia and accordingly is often required to assist companies with their ERP strategies. He is a senior lecturer at the Victoria University School of Management and Information Systems, and SAP academic program director. He has been a committee member of the SAP Australian User Group for the past six years and is responsible for knowledge transfer. He graduated Diploma of Business Information Technology (Swinburne Institute of Technology, 1992), Master of Business Computing (Victoria University, 1996), and he has doctorate degree in Business Administration (Victoria University).

Paul is also one Australia's best selling IT authors having written 10 book which are sold throughout the world. His areas of teaching and research are ERP systems strategy and implementation, and Business Intelligence.

He had in the

- *Coordinator Victoria University's ERP Research Group website*
- *Professorial Fellow, Beijing Jiaotong University, China*
- *Program Chair SAP Australian User Group Summit 2009 website*
- *Forum Moderator SAP University Alliance Portal*

GJEIS

Volume-1 Issue-2

July 2009-December 2009

Phase-XI: Biographical Note of the Luminary in an Area of IS

Global Journal of Enterprise Information System

Blockchain Federation of India [BFI]

Blockchain Federation of India is the primary and principal body of blockchain professionals in India. It was founded on 13th March 2019 by a few academician and Cyber professionals including its co-founders Col. Inderjit Singh Barara and Dr. Subodh Kesharwani which has now grown to be the national body representing blockchain professionals on a PAN India basis, in fact informally through social networking cites group exists from 2017 onwards. BFI is a non-profit professional meet to exchange views and information learns and share ideas. The wide spectrum of members is committed to the advancement of theory and practice of Blockchain and Technology Systems, Science and Engineering, Information Processing and related Arts and Sciences. The Federation also encourages and assists professionals to preserve truthfulness and aptitude of the profession and fosters a sagacity of partnership amongst members. Besides formulating the activities held at the chapters and student branches, the society will also conducts periodic conferences, seminars. The society will be in touch with various International bodies of blockchain for an international alliance.

BYLAWS OF BLOCKCHAIN FEDERATION OF INDIA

Blockchain Federation of India known for its acronym (BFI) is an Indian customized international organisation dedicated to raising digital competence standards in the workforce, education and society in blockchain perspectives. BFI have a certain vision and mission:

- To bring all block chain researcher and technocrats under one roof
- Formulation of Block chain Virtual university
- Developed Own Teaching Contents in Block chain

BLOCKCHAIN VIRTUAL UNIVERSITY

Blockchain Federation of India is an international organisation dedicated to raising digital competence standards in the workforce, education and society vis-à-vis blockchain. Our proposed certification programmes, delivered through an active network in multiple countries, enable individuals and organisations to assess, build and certify their competence in the use of blockchain tools to the globally recognized BFI standard, known as BFI worldwide. As a nonprofit social enterprise Blockchain Federation of India (BFI) benefits from the exclusive support of experts from national technical societies and partners international to enlarge vendor-independent standards which define the skills and knowledge required to use blockchain technology in actual fact. We work with education and training partners, local and regional authorities, national governments, international development organisations as well as public and private sector employers in all sectors, in the delivery of our programmes. The quality and reputation of BFI is built on years of expertise earned by it's founders and associated office bearers. Our accomplishment is maintained by our forthcoming innovation in certification programme development, our commitment to rigorous test design methodologies, and consistent adherence to our quality assurance standards. Blockchain Federation of India planning to support the initiatives of National Operators of the programme in various parts of world. All Blockchain Federation of India operations work closely with regional, national and local partners to develop the global network of BFI Accredited Test Centers.

BYLAWS OF THE BLOCKCHAIN FEDERATION OF INDIA

ARTICLE I. NAME

- The name of the Federation shall be the "Blockchain Federation of India", and it shall be incorporated as a nonprofit corporation in Republic of India with a Headquarter in New Delhi.

ARTICLE II. PURPOSE

- The purpose of the Federation shall be to promote Blockchain education through faculty development and to encourage that the teaching and learning \ related to blockchain implementation in various upcoming field.

ARTICLE III. RESTRICTIONS ON ACTIVITIES

- Section 1. No part of the earnings of the Federation shall inure to its members, officers, or other private persons, except that the Federation shall be authorized and empowered to pay reasonable compensation for services rendered in direct support of its purpose.
- Section 2. No part of the activities of the Federation shall be directed towards influencing legislation or intervening in political campaigns.

ARTICLE IV. MEMBERSHIP

- Section 1. The Board may establish and/or change the membership classes. The Board of Directors shall set the dues amount and the criteria for each class of membership.
- Section 2. All individuals who are members in good standing shall have the right to vote, hold office, and serve on committees. To be in good standing, a member must not be more than six months in arrears in his/her dues and financial obligations to the Federation. Individuals more than six months in arrears in their dues will be declared inactive, but retained on the membership rolls for an additional six months. Inactive members can reinstate their good standing by payment of current and all past dues.
- Section 3. Individuals whose dues are more than one year in arrears shall be dropped from the membership rolls.

ARTICLE V. OFFICERS

- Section 1. The Officers of the Federation shall be the President, President-Elect, Secretary, Treasurer, and the Immediate Past-President. The election procedure is as described in Article VII.
- Section 2. President & Secretary. The President and Secretary of BFI is the highest ranking officer of the Federation and are directly accountable to the membership and the Board. The President leads the Board of Directors as a chairperson and Secretary will be the Convener in development of the strategic goals and objectives of the organization and provides direction and leadership. The President serves as the Chair of the Board of Directors, Executive Committee and Annual General Meetings. A detailed position description, approved by the Board, shall be maintained on the Federation's website.
- Section 3. Immediate Past-President. In those years when a new President is elected, the current President assumes the office of Immediate Past-President. The Immediate Past-President remains in office until a new Immediate Past-President assumes the office. A vacancy in the office of Immediate Past-President cannot be filled by appointment. A detailed position description, approved by the Board, shall be maintained on the Federation's website.
- Section 4. President-Elect. The President-Elect is the third highest ranking officer of the Federation and shall support the President and secretary to advance the work of the Federation. At the end of the term, the President-Elect shall assume the office as President of the Federation. In the event that the President is temporarily unable to fulfill her/his duties to the Federation, the President-Elect may be appointed Acting President by the Board of Directors. If the President resigns or is unable to fulfill their duties for an extended period, the President-Elect shall become the President and a new President-Elect shall be elected by a majority vote in a special election of the Board of Directs within 30 days. A detailed position description, approved by the Board, shall be maintained on the Federation's website.
- Section 5. Secretary: The Secretary oversees the recording of proceedings of meetings of the Federation and the Board of Directors, and is responsible for the Federation's correspondence. A detailed position description, approved by the Board, shall be maintained on the Federation's website.
- Section 6. Treasurer: The Treasurer oversees the financial records of the Federation according to standard accounting practices, and, whether performed personally or through the Federation's administrative office, is responsible for safeguarding the Federation's funds. The Treasurer presents periodic reports on the financial status of the Federation to the Board of Directors and a full report to the membership at the Annual Federation Meeting. A detailed position description, approved by the Board, shall be maintained on the Federation's website.

ARTICLE VI. BOARD OF DIRECTORS

- Section 1. The Board of Directors shall be the principal governing body of the Federation. The Board of Directors shall consist of eleven (11) Directors plus four (4) Officers plus the Immediate Past-President,

if the Immediate Past-President is not an elected Director. When the Immediate Past-President is not an elected Director, the Immediate Past-President would be an ex-officio member of the Board of Directors and the Executive Committee until a new Immediate past President assumes the office. In that capacity, the Immediate Past-President has a vote only to prevent a tie (so when an even number of Directors and/or Officers is present).

- Section 2. Directors shall be elected for a three (3) year term. The terms shall be staggered and at least three (3) seats will be elected annually. Directors may not be elected to serve consecutive terms but may be reelected after an absence of one year. The election procedure for Directors is described in Article VII.
- Section 3. The Board shall meet quarterly, or more often if the need arises, at the call of the President or at least three members of the Board. Board meetings may be held in person, by teleconference, or other electronic means. A proposed agenda and supporting materials shall be made available to Board members prior to a Board meeting.
- Section 4. A quorum shall consist of one more than half the current number of Board members and must include at least two members of the Executive Committee.
- Section 5. In the event a vacancy occurs on the Board in a Director position, the President shall, with the approval of the Board, appoint a member to fill the vacancy. These appointed members shall serve out the term of the individuals they replace on the Board. The new Director shall complete the term of the former Director and shall be eligible for reelection if the remaining term is less than two years. Individuals joining the Board of Directors by appointment as a Director shall not serve more than three consecutive years in that office as a Director in addition to the partial term they served as replacement. In the event a vacancy occurs in an Officer position, the Board will immediately elect a new officer to that position in accordance with Article VII. The elected member takes office immediately, shall serve out the term of the individual she or he replaces as an Officer and will still be eligible for one complete term (of two years) in that same Officer position in addition to the partial term she or he served as a replacement.
- Section 6. With the approval of the Executive Committee, the President may recommend that any Board member be removed from office by the following procedure: 1) reasons for the proposed action must be provided in writing to the member, 2) the member shall have 60 days in which to represent themselves at a meeting of the Board, 3) a two-thirds vote of the current number of Board members shall then decide.

ARTICLE VII. NOMINATIONS AND ELECTIONS

- Section 1. Nominations. The Nominating Committee shall on or before January 25th submit to the Federation Manager a list of candidates for each position subject to election in that year. The names of these individuals, and other such supportive materials as deemed appropriate by the Nominating Committee, shall be posted to the Federation's website on or before February 1. The Federation's administrative office shall mail or fax a copy of these materials to those BFI members who have previously indicated they do not have Internet access. Between February 1 and February 15, members may petition for additional candidates to be added to the ballot. Such nomination petitions may consist of either a single document or separate letters. To be nominated by petition, each candidate must have the support of at least 15 BFI members in good standing. All petitions and letters must be addressed to and received by the Federation Manager on or before midnight (IST) of February 15.
- Section 2. Elections. On March 1, a secured, electronic ballot shall be activated on the Federation's website, along with instructions for electronic voting. All ballots must be electronically submitted to the website on or before midnight (IST) March 15 to be counted. Results shall be posted to the Federation's website by April 1. A plurality of the votes cast is needed for election. In the event of a tie, the election shall be decided prior to April 1 by a majority vote of the current number of Board members.
- Section 3. Newly elected Directors will assume their office at the conclusion of the Federation's annual meeting.
- Section 4. The Officers (of the Federation President, President-Elect, Secretary and Treasurer) shall be elected by a majority vote of the Board of Directors by electronic vote before December 15th, and assume their duties on January 1st. If the elected Officer is a current Director, the newly elected Officer must resign as a Director before assuming the role as an Officer. Officers serve a two-year term of office, and may not serve consecutive terms. However, they may be reelected to the same office after an absence of one year. An Officer may be elected to a different position on the Executive Committee immediately following his/her current term. There is no limit on the number of times an individual may serve as an Officer. The President-Elect, Treasure, and Secretary shall be elected by the Board of Directors as described in Section 5 below. Officers may be removed by a two-thirds vote of the entire membership of the Board of Directors.
- Section 5. Nominations for Officers. In the year the Officers are to be elected, a special Officer Nominating Committee will be formed, composed of the Immediate Past-President, President-Elect, two members from the BFI Nominating Committee (elected by the Nomination Committee) and one current Director

(elected by the Board of Directors). No committee member can be a concurrent candidate for an Officer position. The special Officer Nominating Committee shall on or before November 1st submit to the Federation Manager a list of candidates for each Officer position. Candidates must be BFI members in good standing. The names of these individuals, and other such supportive materials as deemed appropriate by the Nominating Committee, shall be posted to the password protected Board website on or before November 7th.

- Section 6. If a conflict arises concerning elections of Directors or Officers, the current Chair of the BFI Nominating Committee and 2 recent Past Presidents will be appointed to resolve any conflicts.

ARTICLE VIII. STANDING COMMITTEES

- Section 1. Membership and Term of Service. Standing Committees are defined in these Bylaws of BFI and can only be removed or redefined by majority vote of the membership. Other committees may be created by the Board to serve specific duties important to the organization
  - Chairs of Standing Committees, except the Executive Committee, are nominated by the President and approved by the Board. They serve three-year terms until the close of the next Annual Business Meeting and may be reappointed.
  - Members of Standing Committees, except the Executive Committee, the Professional Development Committee and the Nominating Committee, are appointed by the committee Chair, who will notify the Board of all committee membership changes. All appointed members shall serve one-year terms until the close of the next Annual Business Meeting and may be reappointed.
- Section 2. Executive Committee. The Executive Committee, which consists of the Officers, shall make decisions and take actions on behalf of the Board in between Board meetings. The President shall call meetings of the Executive Committee.
- Section 3. Nominating Committee. The Nominating Committee shall be responsible for determining a suitable group of candidates for election to the Board of Directors. It shall consist of five members who are neither current members of the Board nor current Committee Chairs. They may not be current candidates for the BFI Board. The President shall appoint a Chair plus two members with the approval of the Board of Directors. Two members shall be nominated and elected by the membership at the Annual General Meeting.
- Section 4. Professional Development Committee. The Professional Development Committee shall be responsible for recommending the overall scientific and educational programs of the Federation to the Board. Membership will include the current BFI President, President-Elect and Chairs of the Publications Committee and of other Committees with missions relevant to professional development activities, as determined by the Board.
- Section 5. Publications Committee. The Publications Committee shall be responsible for oversight and management of all publications of the Federation. They will work in concert with the Editorial Board of the Federation's journal.
- Section 6. Membership Committee. The Membership Committee shall be responsible for evaluating the needs of the membership and recommending appropriate ways to meet those needs. The committee will develop methods and programs for active membership recruitment and retention.
- Section 7. Finance and Organizational Development Committee. The Finance and Organizational Development Committee shall assist the Treasurer, who shall serve as Committee Chair, in maintaining the financial health of the Federation, including preparation of the annual budget. It will also be responsible for pursuing appropriate federal, foundation, corporate, and private funding to support the work of the Federation. The Committee shall be chaired by the Treasurer.

ARTICLE IX. MEMBERSHIP MEETINGS

- Section 1. Annual General Meeting Time, Place, and Purpose. The Annual General Meeting of the Federation shall be held at such time and place as may be selected by the Board of Directors and stated in the Notice of Meeting. The Annual General Meeting shall include the transaction of such other business as may properly be brought before the membership.
- Section 2. Notice of Meetings. The Federation Manager shall give notice of all Federation meetings stating the place, day, and hour of the meeting and, in case of a Special Meeting, the purpose for which the meeting is called. Such notice of special meetings shall be not less than ten or more than fifty days before the date of the meeting. Notice of the Annual General Meeting is to be given no later than the prior Annual General Meeting.
- Section 3. Quorum. A quorum for transaction of business shall be not less than 10% of the total membership in good standing.
- Section 4. Voting and Representation. Each member who is present shall be entitled to one vote at all BFI meetings. A membership roll showing the list of members as of the record date, certified by BFI's Secretary, shall be produced at any meeting of the members upon request. All persons appearing on such membership roll shall be entitled to vote.

ARTICLE X. AMENDMENTS

- Section 1. Amendments of the bylaws may be proposed by a majority of the Board of Directors or by a petition, sent to the Secretary, bearing the signatures of at least 15 members in good standing.
- Section 2. Notice of proposed amendments, shall be posted to the Federation's website on or before March 1. The Federation's administrative office shall mail or fax a copy of these materials and the slate of nominees, described in Article VII, Section 1, to those BFI members who have previously indicated they do not have Internet access. On April 1, a secured, electronic ballot shall be activated on the Federation's website, along with instructions for electronic voting. The Federation's administrative office will mail or fax a ballot containing the proposed changes and the slate of candidates, described in Article VII, Section 2, to those BFI members who have previously indicated they do not have Internet access. All ballots must be electronically submitted to the website or received in the post by the Secretary on or before midnight (IST) of April 30 to be counted. The Secretary shall tally the votes and send the results to the Federation Manager for posting on the Federation's website by May 15.
- Section 3. In the event of an urgent requirement for an amendment, the Board of Directors, by a two-thirds vote, may authorize posting a proposed amendment to the members at any time. Notice of proposed amendments shall be posted on the Federation website for a 30-day period prior to balloting. At the end of the posting period, a secured electronic ballot shall be activated on the Federation's website, along with instructions for electronic voting. The Federation's administrative office shall mail or fax appropriate information and a ballot to those BFI members who have previously indicated they do not have Internet access. All ballots must be electronically submitted to the website or received in the post by the Secretary within 30 days of the opening of balloting. The Secretary shall tally the votes and send the results to the Federation Manager for posting on the Federation's website.
- Section 4. All amendments of the bylaws require an affirmative vote of two-thirds of the members in good standing who submit valid ballots.

ARTICLE XI. INDEMNIFICATION

The Federation shall defend and indemnify any qualified person against any threatened, pending, or completed legal action resulting from actions taken in good faith on behalf of the Federation. Qualified persons shall be present and former officers, employees, and officially elected or appointed members of boards, councils, committees, and other components of the Federation.

Indemnification will not be provided to any person who shall be adjudged in a legal action to be liable for negligence or willful misconduct in the performance of duty, or when such person did not reasonably believe that the action was within the law and in the best interests of the Federation.

Indemnification shall cover cost of defense and any judgments, fines, and amounts paid in settlement actually and reasonably incurred by a qualified person, up to a limit of one-million dollars in any single case except in circumstances expressly prohibiting such limitation under the law. Such indemnification shall be in accordance with the established policy of the Federation.

ARTICLE XII. OTHER PROVISIONS

- Section 1. The fiscal year of the Federation shall be on a calendar year basis (1st April to 31st March).
- Section 2. The Federation shall be governed Income tax rules of Order, as currently revised. In case of a conflict between Rules of Order and these bylaws, the bylaws shall take precedence.

ARTICLE XIII. DISSOLUTION OF THE FEDERATION

In the event of the dissolution of the Federation, the Board shall give all its assets to one or more nonprofit, tax-exempt organizations. If the Board cannot decide, the decision shall be made by the applicable Court in the Union territory of Delhi, India

ARTICLE XIII: MODE OF OPERATION & SIGNING AUTHORITY

Founder President and Secretary will be the whole time signing authority and operates banking transaction physically & virtually jointly

Col. Inderjit Singh Barara
President

Dr. Subodh Kesharwani
Secretary

Scholastic Seed Inc.
e-Publishing Aggregator & Periodical Mentor

SUBSCRIPTION FORM

Blockchain Federation of India

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First Name: .....

University/Organization/Company: .....

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Address:.....

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E-mail: ..... **Telephone:** (__).....

Complete Invoice Address (i.e your University/Organization/Company):

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Subscription Fees

Country	Indian Membership			Corporate Membership		
Year	One Year	Two Year	Three Year	One Year	Two Year	Three Year
National	₹ 1800	₹ 4000	₹ 6000	₹ 50,000	₹ 1,00,000	₹ 2,00,000
International	$120	$ 200	$300	$1000	$ 1500	$2000
Membership years run 1st January to 31st December of every year						

Please check appropriate registration fee for BFI:

- Student BFI Member ☐
- Student Non BFI Member (includes 1 year membership) ☐
- Senior/Industry BFI Member ☐
- Senior/Industry non BFI Member (includes 1 year membership) ☐

PAYMENT METHOD

Payments should be made by bank transfer at:

Bank Name	:	IDFC Bank
Bank Account No.	:	10020469746
Payment Favouring	:	Scholastic Seed Inc.
IFSC Code	:	020102
MICR Code	:	110751003
Account Branch	:	New Friends Colony (NFC)

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Corresponding Author's Full Name …….... Signature……

Co-Author's Full Name……..... Signature……

Co-Author's Full Name……..... Signature……

WE JUST WANT TO SAY... THANK YOU!

10 Incredible Years of GJEIS 2009-2019

To,

Prospective Contributors & Researchers
Global Journal of Enterprise Information System
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Dear Mam/Sir,

2019 is really a benchmark for the GJEIS Journal as it had completed the ten year service of serving the researcher and facilitates learning by and large in totality. GJEIS published four times annually (January, April, July, and October). Accordingly, 40 issues have been published in the first 10 years. GJEIS is a methodological journal that focuses on articles about mixed methods research across the Enterprise, Information & System. GJEIS is also an international and multidisciplinary journal that publishes manuscripts in two various categories: methodological/ theoretical papers and original empirical studies. Although there are other methodological journals that publish mixed methods studies, GJEIS focuses exclusively on mixed methods research and solicitants different types of article in GJEIS Journal which mainly focuses on research issues in the EIS and IT related areas.

1.	Empirical Research Papers (ERP) report on completed EIS research that complies with rigorous scientific standards. ERP present original results of completed research studies with the aim of obtaining feedback from fellow researchers. [Limit 16 Pages]
2.	Theme Based Papers (TBP) are short papers that present the design and preliminary results of ongoing EIS research studies with an endeavor of obtaining early feedback and further guidance from experts and peers. TBP will be evaluated using the same academic standards as regular research papers (except for completeness requirements). [Limit 12 Pages]
3.	Case Study Based Papers (CSBP) describes real-life experiences with EIS that authors wish to share with fellow practitioners and EIS researchers. They focus on problems and solutions in specific contexts. Their aim may be to help other practitioners facing similar problems or to solicit help and possible solutions from other practitioners (or EIS researchers). [Limit 10 Pages]
4.	Review of Literature (RoL) aim is to review of the suitable "literature" (books, journals, magazines, URLs, Videos) discussing the topic one want to investigate. It discusses modus operandi and mechanism that are apposite for investigating the subject matter just a simple summary of the sources, but it usually has an organizational pattern and combines both summary and synthesis with intent to explore gap. Objective behind creating this type of phenomenon in GJEIS is to give grassroots researcher a roof to synthesize and weigh up the guiding notion of research questions. [Limit 8 Pages]
5.	View Point (VP) is a situation for which something is pragmatic or considered as a point of view. The purpose of VP is to share different views about the IT related products and what individual think about that. [Limit 6 Pages]
6.	Research Thought (RT) can refer to the opinion or arrangement of research ideas that effect from thinking, the act of producing thoughts on diverse interdisciplinary collaborative research areas or tools with which researcher can formulate it's research paper, choose a method for undertaking a study, write up for findings and discuss the outcomes in a discussion section. In this head author can throw a light on various research tools which can be helpful in formulating a research paper. [Limit 5 Pages]

7. Student Research Initiatives (SRI) is a research initiative by a grass-root researcher and technocrats. This head facilitate students/learners to pursue independent academic and imaginative effort and engage in research under the supervision of a faculty mentor with an intention to heighten student research as a means of collaborative learning, critical thinking and the establishment of knowledge. [Limit 12 Pages]

8. Dissertation Snapshot (DS) is an excerpt from a researcher's own thesis or dissertation which had been previously published or submitted in the form of research project or its own doctoral work. The rationale is to raise the curtain on an application and thought used by researcher in a brief manner with an intention to promote the future researchers to sequel their thoughts. [Limit 10 Pages]

9. Questionnaire Format (QF) A new philosophy called "Questionnaire Format" had been introduced, in which we are going to publish distinguish questionnaires that navigates the usefulness of it in building research and how to communicate with the respondents. The rationale behind introducing this QF is to give a glimpse about the structure and the pedagogy. QF on the other hand provides a niche to grass-root researcher about their various thoughts related to preliminary research and facilitates them in linking with a respective research papers which the researcher had visualize or going to plan in a coming future. This is a new inventiveness under the GJEIS Academic Social Responsibility (GASR) and would be complimentary/charitable in nature. [Limit 5 Pages]

10. Book Review (BR) is a literary criticism in which a book is analyzed based on content, style, and merit. BR can be a primary source opinion piece, summary review or scholarly review. Books can be reviewed for printed periodicals, magazines and newspapers, as school work, or for book websites on the internet. A book review's length may vary from a single paragraph to a substantial essay. Such a BR may evaluate the book on the basis of personal taste. Reviewers may use the occasion of a book review for a display of learning or to promulgate their own ideas on the topic of a fiction or non-fiction work. [Limit 3 Pages]

11. Biographical Note of the Luminary in an Area of IS We as per our culture acknowledge in every issue a great leader, Entrepreneur, Technocrats, Academician etc., who contribute a lot to a society in an area of IS. [Limit 2 Pages]

12. Great Enterprise Contribution to Society in Information System Perspectives deals with those enterprises contributing a lot to the society, and considering themselves a wizard in the field of Information System, we publish their profile, with the intention that their creation/contribution would be viewed and duly appreciated by the corporate and academics, all-around the globe. The purpose behind this is to broadcast the most visually powerful, immersive and engaging rich media applications on the Web. [Limit 2 Pages]

13. Award is something given to a person or a group of people to identify their fineness in a definite field especially in an area of EIS, it is rather a certificate of excellence for their contribution in academia or in a corporate world. This start throws a light on an entity or a gamut of researcher who had been honored for their extra ordinary input. [Limit 2 Pages]

14. Homage means great respect and tribute, or something done to honor a person. We in GJEIS pay homage to our ancestor's and say prayers in admiration to their memory which includes academicians, technocrats and great thinkers. The special respect would be shown publicly by sharing their achievements and contributions in writing which includes images, excerpts, testimonials, write-up, etc. [Limit 2 Pages]

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About New Submission Policy (NSP) 2019

The NSP-2019 consists of following features:

1. Paper will be strictly submitted online at : **www. gjeis.com**
2. Priority would be given to pure empirical article which revolves around first hand information and backed merely by primary data collection will be accepted promptly as these article uses data based on actual observation or experimentation during formulation.
3. It is mandatory for Indian authors to submit research article along with a foreign co-author as a first author or corresponding authors due to journal global in nature characteristics and its wide international presence and listing in various directories across the globe. The submission by the foreign authors will fulfill the global mandate of journal and facilitate in listing and enhanced impact factor in future course of action. Though the journal have been listed in various directories and had a good impact factor but we expect in 2019 to be listed in few leading indexing.
4. There will be a waiting time of minimum **12 months** from the date of submission i.e. April 2019, as paper require rigorous review by **3 internal reviews** from India and **3 blind reviews from outside India** based on the subject expertise and themes.
5. From April 2019 we are putting a Reviewer comment in a Paper under Category Called: Anonymous Reviewer-1, Anonymous Reviewer-2, and Anonymous Reviewer-3. Though tracking record from Submission to online first would depict with various dates in a paper. Visit sample article and reference style. Journal also publishes a similarity index detail of ithenticate plagiarism report at the end of an article.

Paper Code (DOI): $$$$$ **Originality Test Ratio:** @@%**; Submission Online:** DD-MM-YYYY**; Manuscript Acknowledged:** DD-MM-YYYY**; Originality Check (ithenticate):** DD-MM-YYYY**; Peer Reviewers Comment:** DD-MM-YYYY**; Double Blind Reviewers Remark:** DD-MM-YYYY**; Author Revert:** DD-MM-YYYY**; Camera-Ready-Copy:** DD-MM-YYYY**; Editorial Board Citation:** DD-MM-YYYY**; Published Online First:** DD-MM-YYYY

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7. Certificates for Article Publication and Reviewers effort would be endorsed and acknowledged with a separate certificate and exclusively send by the Research & Academic Management Society and Scholastic Seed Inc.
8. Form will be submitted with a new link using Google form link available on a GJEIS portal.
9. One indicator of GJEIS's kudos is the impact factor of 2.219 which is coming up gradually due to peer review procedure followed by journal. GJEIS an inaugural impact factor of 2.219. Regarding the topics examined in these editorials, the reflections are about diverse issues: research questions, perspectives, training, data analysis, paradigms, integration, and challenges for mixed methods research, among others. Moreover, some editorials examine the same topic. Thank you for the ten noteworthy years of tenderness, acquaintance, and hold up. We enormously couldn't have made it without you, nor can we catch the next steps without your backing. I hope you'll keep holding us to high standards, and telling us when we've congregates your expectations and when we've let you alongside.
10. Fast Track Publication (FTP) will be enabled for Indian Author with a complimentary subscription of one year either by the Research Institute. Reviewers and other compliance will be managed by the editorial office on a priority basis and paper published in a same quarter if fulfill the eligibility and able to adapt suggestion by a blind reviewers.
11. FTP consist of a features like "Online First" in which article published in a fast track basis and uploaded online without the Volume and Issue date and automatically transfer to the routine forthcoming issue. www. gjeis.com

Subodh K. Kesharwani

Editor-In-Chief
Notified Tenure 2018-2020

Fast track journals are crucial for research articles that are amazingly noteworthy and necessitate essential propagation, or where there is a funding policy raison d'être for urgent publication. Fast-track peer review prioritizes a manuscript and decreases its publication time. GJEIS offers this opportunity by fast tracking as just speedy review and quick publishing. When a paper is marked for fast track during submission line www.gjeis.com it is recurrently reviewed and a publication decision is made swiftly. Fast tracking might also shrink the amount of time allocated for peer review and editing as it will parallel send to blind and peer reviewer and constantly dedicated publishing team would be allocated simultaneously. It typically cuts the overall publication time by at least one-third.

GJEIS have developed fast-track peer review options to restrain some of the needless instance that lapses between a manuscript being submitted and its periodical. GJEIS Fast Track Publication service which better known as FTBS is an **"optional service"** which provides author a platform to publish their papers in **just 9 weeks**, usually a journey time from submission to publication takes 12 Months. The purpose of creating **FTPS** is to facilitate the author in publication of their paper in a prescribe time frame and do all the process in a fast track mode without compromising with quality. There are certain prerequisites which are mandatory to include under FTPS:

- ✓ Article should be Plagiarism Free and pass the Originality Test by http://www.ithenticate.com (Prevention Plagiarism tool) with similarity test index below (10%)
- ✓ Expedited review will be offered, on request, for submitted research articles after the editorial board consist of 5 members approved.

GJEIS has started a non-compulsory speedy examination for fast-track publications to draw attention to noteworthy developments in the various fields of the academic research without compromise with superiority. GJEIS goal is to endow with the research group of people with rapid and on the spot entrée to freshly completed research works in a variety of research vicinity that are speedily developing with great impending impact. The research community as a whole advantageous from the realism that primary edge research is made reachable to a extensive audience more punctually. Kindly note that we acknowledge a limited number of the article under fast track in one quarter due to it's frequency and further email journal's primary contact for the inquiry. After receiving express review request for the article, we will tell to our contributor in a week time whether we can offer rapid review for the submission or not. If we decide not to we may offer to think about your paper either in the normal mode or provide you date from when we can consider it under rapid review.

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- Article having Zero% Plagiarism checked by iThenticate a plagiarism detection service with a research orientation automatically comes under waiver list and published within 9 Weeks from the date of Submission or generation of DOI from Crossref USA www.gjeis.com

Note

This facility is an optional service, hence the price quote would be based on article-to-article and would be intimated by the editorial office depend on the submission and subject to aforementioned points under waiver list

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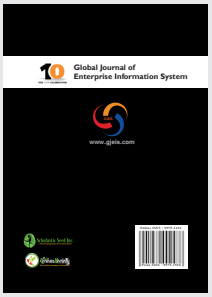
GJEIS is a Peer Review restricted access subscription base Research Journal started in a year 2009 and does not charged any fees or Article Processing Charges(APC) from the author during or after publication. Fast Track Publication service (FTPS) is an optional service which had been originated to facilitate the submitter to reduce the time-frame and helping in strengthen their rights.



Scholastic Seed Inc. is in the e-publishing business from last one decade. The first creation the group had originated was the Peer Review Research Journal founded in the year 2009 known as Global Journal of Enterprise Information system (GJEIS). At the later stage group has come up with a sequel in the form of a medical journal in collaboration with it academic and research consortium NGO, KARAM Society & MEDANTA Hospital doctors in a name of AGEMS (Annals of Geriatric Education and Medical Sciences). The consortium currently having contemporary out-of-box approach and are now well acknowledge as an e-publishing aggregator and periodical mentor. The company till date had published few journals and facilitates/consulted lots of Brick-&-Mortar periodcials into a digital dynamic format. Till date we had consulted 20 periodical and entered into a book publishing business.

Journal Initiated under Scholastic Seed Ambit

GJEIS-2009
KARAM Society & Informatics Publishing Ltd.

AGEMS-2014
KARAM Society & Innovative Publications

SIRIFORT-2018
Sirifort Institute of Management Studies & KARAM Society

CYBERNOMICS-2018
Scholastic Seed Inc. & KARAM Society

E-GOVERNANCE-2018
Scholastic Seed Inc. & KARAM Society

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How the Credit ability of an institute deteriorated without periodicals

- As we know that Institution creditability would be judged on the basis of the periodicals they published as these periodicals such as newsletters, journals, magazines, annual reports, etc are their front face and if these front face are digitally equipped it would be definitely a win-win stage for the students and the institutions and further by adding a feather in a cap.

Why there is a need of Online Periodicals

- Free access • Self-archiving • Repository • Author foot fall • Pre or post publication irrational fear Eradication

DO's AND DON'T

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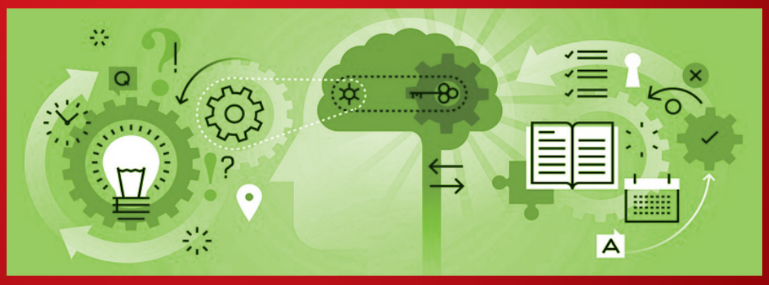
- Have a Digital Object Identifier (DOI)
- Have a good team of editorials and reviewers
- Google Scholar and Citation is an important ingredients for choosing a journal
- Scopus, ICI, WoS and UGC Listing is a parameter to select journal
- Always check the H-index of an author
- Know the Impact factor of journal before Publishing an article
- Check the Ethical issue and Privacy Policy of the journal
- Frequency and consistency would be an important ingredient to judge the creditability

- It is suggested to an editor not to publish anything without Originality check
- Don't Prefer Pay and Print Model

Services

How Scholastic Seed Involved with institution in E-publishing and Journal making



- Website Creation includes coding in PHP and SQL Database Ready-to-Run Software with a Source code right transfer model.
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- Digitalizing the Content Electronically and Uploading on Web (Frequency: Monthly, Quarterly, Bi-annually & Annually)
- Online tracking of articles submitted.
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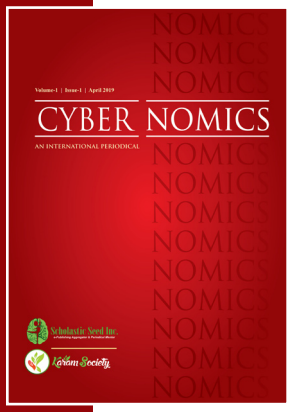
- Other Indexing would be done by the society/ Scholastic Seed Inc. time-to-time, but other expenditure incurred would intimate and levied accordingly if charge by the agency on time-to-time basis.
- Process for Both eISSN and ISSN and Documentation
- Facilitate in Getting RNI No. From Registrar Of Newspapers For India

CYBER NOMICS

CYBERNOMICS is being published as a co-published peer-reviewed magazine by KARAM Society and Scholastic Seed Inc. The subjects covered by the magazine are IT linkages in business and management and others field related to cyber and its economics fields. It also covers many aspects in Information System and related areas which are burgeoning. The Magazine provides an international forum for the exchange of ideas, principles and processes concerning the application of diverse topics of Cyber to organizations, institutions and the world at large. CYBERNOMICS considers research submissions in several categories but revolves around Cyber threats, Security remedies, etc.



CYBERNOMICS magazine aims at achieving the growing demands for understanding and addressing issue pertaining to real-worlds Cyber-Attacks, Cyber Threats, Cyber threat Intelligence, Cyber Warfare, Cyber Terrorism, Darknet and Crypto Currencies and threats to information infrastructures critical to the national security of country.

The magazine publishes articles and reviews in the areas including, but not limited to:

- Cyber Threats
- Cyber Warfare
- Darknet and Darkweb
- Cryptography and its applications
- Network and critical infrastructure security
- Hardware security
- Software and System security
- Cybersecurity data analytics
- Data-driven security
- Adversarial Reasoning
- Malware Analysis
- Privacy-enhancing technologies and anonymity
- IoT Security
- Blockchain Security
- Cryptocurrencies
- Machine Learning
- Big Data Analytics
- Artificial Intelligence

Global Journal of Enterprise Information System

GJEIS Indexing till 2019

GJEIS in collaboration with Scholastic Seed Inc. and KARAM Society, publishes a new peer-reviewed open access e-journal in Enterprise Information System (EIS) areas of business which covers IT linkages in business, finance, marketing, management, organizational behaviour, buyer behaviour and other relevant fields. It also covers many aspects in Information System and related areas. The journal provides an international forum for the exchange of ideas,principles and processes concerning the application of diverse topics of EIS to organizations, institutions and the world at large. GJEIS considers research submissions in several categories but revolves around three buzzwords Enterprise Information and System Journal takes into consideration professional plagiarism detection and prevention technology for it's scholarly publication and research article in order to ensure the originality of written text before publication. The GJEIS receives submissions only through it's journal website www.gjeis.com. The journal has a very good impact factor and is listed and indexed in almost fifty directories and libraries all around the globe. GJEIS is also a scholarly publisher that uses services of Crosscheck offered by CrossRef, USA and facilitated by iThenticate software. The journal had implemented a Search Engine Optimization (SEO) and web analytics dedicatedly for it's online portal to provide glimpse about the articles having highest citation. GJEIS is also associated with International DOI Foundation (IDF) USA. GJEIS is also concomitant of Publsher International Linking Association, Inc (PILA) a not-for-profit membership organization. USA.

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Deep Learning Architectures is a class of Machine Learning Algorithms

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