Executive Committee
2010-11/12

President
Prof. P Thirumurthy
president@csi-india.org

Vice-President
Mr. M D Agrawal
vp@csi-india.org

Hon. Secretary
Prof. H R Vishwakarma
secretary@csi-india.org

Hon. Treasurer
Mr. Saurabh H Sonawala
treasurer@csi-india.org

Immd. Past President
Mr. S Mahalingam
s.maha@tcs.com

Regional Vice-Presidents
Mr. M P Goel
rvp1@csi-india.org
(Region I)

Mr. D P Mukherjee
rvp2@csi-india.org
(Region II)

Prof. S G Shah
rvp3@csi-india.org
(Region III)

Mr. Sanjay Mohapatra
rvp4@csi-india.org
(Region IV)

Dr. D B V Sarma
rvp5@csi-india.org
(Region V)

Mr. C G Sahasrabuddhe
rvp6@csi-india.org
(Region VI)

Mr. S Ramanathan
rvp7@csi-india.org
(Region VII)

Mr. Jayant Krishna
rvp8@csi-india.org
(Region VIII)

Division Chairpersons
Dr. Deepak Shikarpur
div1@csi-india.org
Division-I (Hardware)

Dr. T V Gopal
div2@csi-india.org
Division-II (Software)

Dr. S Subramanian
div3@csi-india.org
Division-III (Applications)

Mr. H R Mohan
div4@csi-india.org
Division-IV (Communications)

Prof. Swarnalatha Rao
div5@csi-india.org
Division-V (Edu. & Research)

Nominations Committee
Dr. Shyam Sunder Agrawal
Prof. (Dr.) U K Singh
Dr. Suresh Chandra Bhatia

Publications Committee
Chairman
Prof. S. V. Raghavan
sv@cs.iitm.ernet.in

Chief Editor
Dr. T V Gopal
gopal@annauniv.edu

Director (Education)
Wg. Cdr. M Murugesan (Retd.)
director.edu@csi-india.org

Executive Secretary
Mr. Suchit Gogwekar
hq@csi-india.org

Published by
Mr. Suchit Gogwekar
For Computer Society of India

CONTENTS

Theme Section : BUSINESS ANALYTICS

04 Business Analytics : An Insight
Prabin K Panigrahi

07 What is a Business Analyst?
Derrick Brown and Jan Kusiak

11 Are you treating your enterprise data as an ‘Asset’
Usha Venkatasubramanian

15 Golden Rules for Business Analysts
Colin S. Penn

HR Column

19 HR & Technology Speak Different Languages
Nikhil Indrasenan

Articles

21 Future Trends in Wireless World
Gagan Deep, Ashwani Kush, Brijesh Kumar, Bharat Bhushan

24 Collective Intelligence Transforming The World Wide Web
Vivek Kumar Singh

28 Integration of eLearning in Delivery of Technical Education
N K Mehta

34 IT-Enabled Supply Chain Management using Decision Support Systems
Prashant R Nair & O A Balasubramaniam

41 RFID Applications in Health Care Sector
Kanchan Prasad

Departments

02 Community Talk

03 President’s Desk

CSI Topics

44 Seminar on Recent Trends in Software Testing – A Report
Ranga Rajagopal & H R Mohan

D Vijendra Babu & H R Mohan

46 INDIACom – 2010: 04th National Conference on Computing For Nation Development

48 First IFIP International Conference – A Report

52 Obituary – Satish Doshi

54 From CSI Chapters
Business Analytics (BA) refers to the skills, technologies, applications and practices for continuous iterative exploration and investigation of past business performance to gain insight and drive business planning. Analytics have been used in business since the time management exercises that were initiated by Frederick Winslow Taylor in the late 19th century. Henry Ford measured pacing of assembly line. Business analytics focuses on developing new insights and understanding of business performance based on data and statistical methods.

The field of business analytics has improved significantly over the last few years, providing business users with better insights, particularly from operational data stored in transactional systems. Unfortunately, the gap between the relevant analytics and the critical needs of the intended business users still remains significant. The following challenges highlight characteristics of this gap:

1. **The time taken to perform the overall cycle of collecting, analyzing, and acting on enterprise data must be reduced.**
2. **Within this cycle, the time and analytic expertise necessary to analyze data must be reduced.**
3. **Clear business goals and metrics must be defined.**
4. **Data collection efforts must have clear goals based on the chosen set of metrics.**
5. **Analysis results must be distributed to a wide audience. The broader base of business users need the results to be translated into language and visualizations that are appropriate for the business needs.**
6. **Data must be integrated from multiple sources that use different format.**

Over the last several years, the **Business Analyst role** has evolved and developed beyond eliciting, analyzing and documenting software requirements. The work of business analysts does sometimes leads to a business case, but there are many other functions that enterprises business analysts perform, such as:

- Driving business architecture discussion and development
- Creating-functional decomposition of business areas
- Providing thought leadership within their organizations
- Assisting business areas in understanding the big picture (rather than talking in terms of project teams and business lines)
- Aligning project portfolios with overall business strategy
- Creating feasibility studies for new products, markets and systems
- Making strategic recommendations for process improvements and streamlining across departmental divides and geographical locations

There are a wide variety of Business Analytics Tools to support the above functions of a Business Analyst. Some pertinent categories of these tools are given in the figure below the signature.

Ron Bonig, CIO of the George Washington University, USA has the following insights to offer. Good Business Analysts should fall back on what Bonig calls the "old list of questions taught in Journalism 101"—who, what, where, when, why and how. "If one can describe the problem using these attributes," Bonig says, "a solution is generally well within reach." Business analysts who answer these questions at the outset of software projects (Bonig says he uses this method all the time) will have a better chance of success.

Prof. Prabin Panigrahi, the Guest Editor has been traveling over the past few months. On many occasions he was in rural areas where there were frequent power cuts and no internet connection. He has raced against time to keep up his commitment to "Guest Edit" this issue. On behalf of all the readers of CSIC, I thank Prof. Prabin Panigrahi.

---

**Dr. Gopal T V**
Hon. Chief Editor
gopal@annauniv.edu

---

### Business Analytics Software

**Performance Management Applications and Tools**

- Financial Performance & Strategy Management Applications
- Budgeting, planning consolidation, profitability mgmt/ABC, scorecards
- CRM Analytic Applications
- Sales, customer service, contact center, marketing, Web site analytics, price optimization
- Other Supply Chain Analytic Applications
- Related to procurement, logistics, inventory, manufacturing,
- Supply Chain Production Planning
- Advanced Analytic Data Mining and Statistics
- Analytic Spatial Information Management Tools
- Workforce Analytic Applications
- Query, Reporting, Analysis Dashboards, production reporting, OLAP, ad-hoc query
- Services Operations Analytic Applications
- Operational analytics in financial services, education, government, healthcare, etc.
- Business Intelligence Tools
- Query, Reporting, Analysis Dashboards, production reporting, OLAP, ad-hoc query
- Data Warehouse Platform
- DW Management and DW Generation (ETL + Portions of Data Quality)

---

Fig. : Business Analytics Software at a Glance

Dear Affectionate Members of CSI Family,

During April 2010, I had requested the Office Bearers (OBs) to share their vision for the year and to help in energizing hidden passion among CSI colleagues, setting new directions and in strengthening the HQ offices at Mumbai & Chennai. Some of the accomplished include the following:

Governance at CSI HQ Mumbai & CSI Education HQ Chennai and membership services:
- To support services to members on education and research activities, three working level executives were selected from Tata Institute of Social Science, Mumbai. They would help to augment membership services and starting new initiatives at both Chennai and Mumbai.
- Suitable measures were applied for handling immediate problems on membership services.

Courses on Emerging areas and Value addition Programs:
- Several members have desired to have syllabus content of emerging areas that could be considered to offer by Academic institutions as per the requirement of Industry. Education directorate was advised to meet that requirement by involving Industry & Academia. Interested Institution members/chapters may contact Neetu@csi.india.org for possible help on forming syllabus.
- Also, I am happy to inform you that Prof. C R Muthukrishnan, past President & Fellow of CSI has kindly accepted to help us and coordinate the process of developing Value addition programs in association with CSI Education Directorate during the year 2010-11.

Connect with Chapters & team building:
- OBs met Managing Committees (MCs) of Kolkata and Chennai, got apprised and shared new initiatives that may go long way to help the chapters.
- MCs of both Delhi and Hyderabad chapters had responded to my call with short notice to meet me on my visit to both the chapters.
- As a result of these meetings MC members and other senior members including Fellows of CSI had shown new interest in strengthening CSI activities. Gen. Balasubramanyan, the founder secretary of CSI (when formed in 1965), came and blessed all OBs and MC members at Chennai and participated in discussions. A Salute to these founders of CSI for their vision in pooling the passionate people on the name of CSI and making the Voluntary strength, a bondage of connectivity to help the society. I am grateful for each person who attended our meetings at Alcutta, Chennai, Delhi and Hyderabad during April 2010, to interact and to plan the activities to promote and help the CSI members at large.
- On appreciating the services of some our CSI members in different chapters, It was decided that ExecCom would offer new roles at National / State level, as and when opportunity arises. Some of the contemplations:
  - Mr. Phulghani Mukharjee of Kolkata as regional student Co-ordinator for Eastern Region,
  - Mr. Ramaswamy of Chennai as State level Student Coordinator for Tamil Nadu,
  - Mr. Ranga Raj Gopal, from Coimatore as National convener for CSI-ICT Quiz,
  - Prof. K. Rajasekhar Rao from Koneru Chapter as State level Coordinator for Andhra Pradesh,
  - Dr. Paresh Virparia of Vallabh Vidyanyagar as State level Student Coordinator of Gujarat,
  - Mr. Srikant R Karode, Fellow of CSI as Hon. Coordinator of Industry-Academic Interactions
  - Mr. Venkatesh Parasarum of Hyderabad Chapter as CSI E-initiatives Lead of K M Portals.
  - Mr. HR Mohan & Mr. Pavan Kota as editors of the CSI E-News letter

Mr. M D Agrawal, Vice President could visit Indore Chapter and help in pooling the members to renew the activities. Mr. S Kundu, Fellow of CSI could volunteer to initiate activities in Kanpur Chapter. Prof. H R Viswakarma could spend time in contacting ExecCom members and others in forming the statutory committees and Various committees by involving as many volunteers as possible to assist our members at different places in the country. He welcomed new Volunteers.

CSI Journal: A review has been made and the Chief Editor of the CSI Journal has been requested for his help in bringing up the pending publication. An action plan is being worked out to improve CSI publications.

New Initiative:
- Considering CSI’s long term objectives for strengthening IT knowledge, an idea of starting a ICT academic-Industry connect forum is actively considered. In each Region/ state, a committee of academicians and Industry experts would identify few activities (including Guest lectures, Industry visits, interactions with Software/IT project teams, organizing joint programs of ICT Academicians and Software Professionals), so that Faculty members get good opportunities to know IT Industry and pass this knowledge to students and help to improve quality of education.
- SIG-E Governance has recommended one semester course as part of MBA. Education Directorate is having the details. Thanks to Prof. Ashok Agrawal, SIG-E-Gov Chair and his team for their contributions to the society.
- A good calendar of events could be worked out by the members of ExecCom and members can make use of these programs.

I have requested Vice-President Shri M.D. Agrawal to write about some of the new initiatives and invite nominations at large from our CSI members to participate in helping our members and student members. They include the following:
1. ICT Academic-Industry connect forum
2. SIG review and invite new SIGs in association with Divisions
3. IFIP activities Review and involve the corresponding Divisions to prepare calendar of events

Event(s):
CSI Student branch at Dronacharya College of Engineering, Farrukh Nagar, Gurgaon has been inaugurated on 24 April 2010. Mr. M.P. Goyal along with the new MC members of Delhi Chapter lead by the chapter Chairman Mr. K S Dhill attended the inauguration. In that college, teachers performance is evaluated by the management on getting the students’ feedback. I am impressed by the magnanimity of the Chairman Dr. Satish Yadav who honours the successful teachers every year with attractive cash/prizes. (A good practice that is usually followed in Industry), is implemented in academics.

Appeal:
Chapter chairpersons are requested to approach hq@csi-india.org and get the log in pass word details so that they can access the list of distinguished speakers and help the chapter members and Institution members.

I shall get back to you on some of the Research initiatives soon.

Prof. P. Thrimurthy
President, Computer Society of India
Business Analytics : An Insight

Prabin K Panigrahi

Professor [Information Systems], Indian Institute of Management Indore, Prabandh Shikhar, Rau - Pithampur Road, Indore 453 331. Madhya Pradesh INDIA. e-mail: prabin@iimidr.ac.in

Introduction

In recent years Business Intelligence (BI), Decision Support Systems (DSS), Performance Management (PM), and Business Analytics (BA) are the buzzwords in many companies. Due to significant advances in data acquisition technologies, decrease in data storage cost, and increasing realization of the importance of data as an asset, there is an exponential growth of data volume. Companies are overloaded with huge repositories of data with important information and knowledge buried in it. They are facing data explosion problem: drowning in data but starving for knowledge or insights. In this situation it is impossible for decision-maker to apply only human analytics to discover insights from the data that help in the decision-making. Whether data is more or less, getting insights is a big challenge for the human being with average logical analysis capability. Human beings can do limited cognitive work.

In the above context, analytics has become a major enable that provides business value to the organization. According to Davenport, business analytics in simple term is a method of logical analysis that involves analyzing business data of a company by conducting widespread computation in a sophisticated and non-primitive way. Analytics is increasingly being used in functional areas of management. Depending on the purpose and applications, organizations adopt different categories of analytics such as predictive analytics, marketing analytics, financial analytics (decision science), customer analytics, supply-chain analytics, and service analytics etc. Business analytics improves business decisions and provides competitive edge to organization. It empowers decision makers in taking real-time and proactive decisions. It is often found that decisions derived from analytics are better than decision derived only from intuition.

Business Analytics: A Source of Competitive Advantage

In order to remain competitive, it is not sufficient for the organization only discovering past and present trends by analyzing historical data. Business Intelligence (BI) primarily aims at increasing the productivity by acquisition of data from various transaction systems and presentation of information. Most of the organizations stop after this analysis. OLAP (On-Line Analytical Processing) operations on past data have limited business value and do not provide competitive advantage in reality. On the other hand business analytics aims at improving and optimizing business process. By using appropriate business analytics such as predictive and descriptive analytics organizations can understand the bigger picture and can get insights more on future i.e. what, how and when to do as well as explaining various what if scenarios. Analytics can be used before, during and after the activities related to any business process. These help the users in planning appropriate actions, understanding of business activities in real time, making continuous improvements in business operations and evaluating activities. Organization achieves dramatic improvements in performance that may provide competitive advantage.

The Success Stories

The number of businesses in various industries competing on the basis of business analytics and are successful is increasing. A partial list (Table-1) is provided.

The above companies leverage their data and build strategies around their analytical capability and business process. The top management of these companies passionately get involved in analytical environment, takes several initiatives such as preparing integrated data at enterprise level, conducting adequate experiments and applying advanced predictive and descriptive analytics in a focused area of their core competency. The companies use analytics “visibly” as primary activity in their business processes. Business processes of each of these companies differentiate the company from its competitors. Analytics supports the overall business strategy.

Analytics Firms

The number of large analytics firms is very few. Analytics firms are focusing more on specific vertical applications in a particular industry rather than one solution for serving all industries. Task specific knowledge is incorporated into the analytics. Analytics software provides tools for collecting, tracking, analyzing, and presenting data in support of decision-making for various business applications. The tools include data warehousing (DW) for data management at enterprise level, business intelligence for query, reporting, and data mining. Some of the leading vendors that provide analytics products including predictive and descriptive analytics are given in Table-2.
### Business Analytics in India: Issues and Challenges

Business analytics in India is in infant stage. Very few companies in banking, insurance and telecom sectors have just started or planning for using business analytics. The real applications of analytics in Indian companies have not started yet. It is a well-known fact that India has some talent in the area of analytics for which US and Europe companies (Table-2) outsource their analytical works to Indian companies (Table-2). There are many third party service providers in India (Table-2) that provide high-end analytics service across various industries such as retail, and telecom. There is an ample scope for Indian companies migrating to the higher end of value chain of knowledge activities. Banks, telecom companies, and insurance firms are leveraging their data by using customer analytics. Some of manufacturing and logistic firms are using supply-chain analytics. Besides MNCs such as HSBC, Target, Citibank, and Barclays, some of the Indian companies such as ICICI, HDFC, Airtel, and Kotak Mahindra have increasingly adopting analytics in their processes. Also few companies have joined as analytics players in India that includes FifthC, Global analytics, Marketelligent, and Fractal Analytics.

Although there are lots of opportunities for analytics in India, various issues and challenges related to it need to be addressed. Poor quality data is one of the major issues. Most of the companies do not have reliable data. There exist different types of data, and integrating different formats and types of data is a major challenge. Fraudulent transactions and data tampering are some other issues in companies. Many companies are function-based rather than process-based. The operational systems are not streamlined, and business processes are outdated. Organizations do not adopt enterprise wide approach to data management and analysis. The data is available in different silos, not integrated and managed by different managers. Mergers and acquisitions make the situation more complex. Large organizations adopt distributed approach to data warehousing rather than single, large data warehousing. When companies get data from outside the enterprise, it is difficult for them to centralize it. When data is not integrated, it is very difficult to apply business analytics effectively and hence very difficult to justify ROI for business analytics. Customer analytics ROI is achieved by applying analytics on the data. At the same time revenue is increased and cost is decreased. Analytics software is difficult to be integrated with other existing systems that would have helped the users clients analyze data and build digital dashboards, exception reports and key trend reports.

Business schools and higher educational institutions need to play an important role. The students must acquire knowledge on business process besides technology. India has talent with good numerical ability skills. They should acquire business knowledge and domain expertise. Quantitative and analytics related courses are least subscribed in B-schools. Students are not motivated to take such courses. India needs to increase its talent base with sound data analytics capability. Analytical environment needs to be created and analytical skills are to be sharpened. Very few institutions in India are offering courses related analytics. Similar situations exist in companies. The analytical culture is lacking. Decision-makers make critical decisions based on gut feeling and experience. The senior executives shy away from implementing analytics. Few organizations are using analytics only in limited way.

There are problems in developing and implementing analytics applications. Companies do not disclose complete and accurate information to outside analysts. There is a feeling of insecurity. The use of business analytics is ad-hoc in nature. The interaction between external analyst and company executive (decision-maker) is very high and on a personal basis. The analyst puts lots of efforts in explaining the model and results to the decision-maker. In most of the cases, company executives
lack knowledge in analytics and expect immediate result that is possible with short-cut process. The process is more time consuming and the success depends on the personal relationship between the two, the interest and knowledge level of the executive and the process knowledge of analyst. In this case, decisions are not system-based, automated, and instantaneous. Therefore decisions are short-lived, may not be consistent and reusable. The analyst has limited options to explain other solutions that take more time to analyze and require specific business process. In this situation it is difficult to justify ROI. It is a push-based approach where the vendor or expert tries to explain the benefits of analytics and pushes the product and services.

The Future of Business Analytics and Emerging Trends
The future of analytics is its application on unstructured data such as weblog data, and semantic web. Applications of blog data on Internet have already been reported. There is an ample scope of bloggers and marketers using analytics themselves and get insights of the huge data available. There will be convergence of structured and unstructured data analysis. If partner companies can share private data automatically on a real time basis, analytics can be applied on it for getting insights. Through web service, companies can avail business analytics via software-as-a-service (SaaS). They need not buy the analytics software and worry about upgrading the same. They will pay on a per use basis. The analytics service provider (ASP) provides data and analytic software online to the user’s computer software directly. The user gets complete information from different sources (both internal and external) and can take decisions. The users need to be empowered themselves to analyze the data rather than taking help from any analytics expert. The analytics model must be simple, easy to understand and subject to visual interpretations. Companies have realized that business process can play a key differentiator. The demand for embedding analytics in business processes will increase. This will help in automating operational decisions. The decisions can be recorded, monitored, audited and reused. Organizations can address performance management and compliance issues (for example in finance and insurance sector).

There would be a transition from offline-business analytics to real-time analytics. The business processes that can take advantage of real-time analytics are yield management, fraud detection, and personalization. Corporate performance management, business process management, and business activities monitoring (BAM) will be more effective and efficient by using advanced analytics. There would be emergence of more number open source business analytics tools. Currently vendors such as Pentaho, JasperSoft and Actuate’s BIRT are providing open source analytics tools. The war between Google and Microsoft for dominating Internet in the business analytics domain is intense. Both the companies try to leverage users’ on-line data analysis potential for getting insights. Microsoft offers Analysis Services as its flagship business analytics product that utilizes power of Excel. In order to counteract Google, Microsoft offers Google Analytics as a free software. In future there would be more use of predictive and descriptive analytics rather than just finding past trends and use of dashboards. Visual analytics is another trend in the field of analytics. There is a mismatch between the speed at which application data is generated acquired and the analysis of the same. Visual representations of complex dynamic information help human in taking decisions without any difficulty. The analytical reasoning is facilitated by interactive visual interfaces. Visual analytics uses visualization technologies, data mining, statistics, and other disciplines.

Analytics must be part of the overall system in an organization and hence to be designed accordingly considering all the related issues. The objectives of many analytics are to develop customer-centric applications. The organizations should go beyond this and apply in sales, marketing and other key business processes areas. A myth exists in companies that analytics must lead perfect decisions. It is not true. If appropriate analytics are used and the pitfalls of using analytics are avoided, analytics may provide better decisions.

References:
1. An Arrow in the Corporate Quiver, Harvard Business Review South Asia, October 2008

Business Analytics at a Glance

<table>
<thead>
<tr>
<th>Issues and Challenges for implementing business analytics</th>
<th>Future Trends of Business Analytics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor quality data</td>
<td>Analytics on unstructured data</td>
</tr>
<tr>
<td>Function-based organizations</td>
<td>Analytics via SaaS</td>
</tr>
<tr>
<td>Outdated business processes</td>
<td>Real-time Analytics</td>
</tr>
<tr>
<td>Department approach to data management</td>
<td>User-oriented analytics process</td>
</tr>
<tr>
<td>Distributed approach to data warehousing</td>
<td>Analytics embedded in business process</td>
</tr>
<tr>
<td>Lack of analytic culture</td>
<td>Open-source analytics tools</td>
</tr>
<tr>
<td>Poor knowledge in analytics</td>
<td>On-line user-oriented analytics</td>
</tr>
<tr>
<td>Short-cut personal approach</td>
<td>More use of predictive analytics</td>
</tr>
<tr>
<td>Lack of data integration</td>
<td>Visual analytics</td>
</tr>
</tbody>
</table>

About the Guest Editor

Prabin, a Ph.D alumnus of IIT Kharagpur, is a faculty of Information Systems at IIM Indore. Prior to joining IIM, Indore, he was working with Xavier Institute of Management (XIM), Bhubaneswar and Loyola Institute of Business Administration (LIBA), Chennai.

He has international as well as national research publications in refereed journals. Prabin has coauthored books titled Introduction to "Database Management Systems", and "Modern Systems Analysis and Design". He has authored one research book titled “Fuzzy Object-Oriented Database Systems”. He is a member of CSI, IETE, and IEEE.
What is a Business Analyst?  
(2010 updated edition)

Derrick Brown and Jan Kusiak

When this paper was first published in 2003, business analysis was just starting to emerge as a distinct profession in its own right. Prior to this the role was often performed by the systems analyst who would carry out both the analysis and the design on a new system or enhancement. This often meant that a “problem” was made to fit the “solution”. The transition from telling the client what they would be getting - versus analysing their problems and recommending solutions – was still a new one for many organisations.

How things have changed – we now have an international organisation solely for business analysts (with over 11,000 members) plus a professional, experience-based qualification. We also have a reference guide - The Business Analysis Body of Knowledge (BABOK®) - now into its second edition.

And yet the underlying skills needed by business analyst have remained remarkably constant – analysts still need investigative, analytical and communications skills for dealing with clients and stakeholders. They also need specification and modelling skills when dealing with developers and solution providers.

In this latest version of the paper we’ve updated the methodologies, techniques and tools references to reflect current trends and usage – but the mix of soft and hard skills which was the basis of the first version of this paper remains consistently relevant today. The business analyst can be confident that their fundamental skills will not be outdated anytime soon.

"Everything old is new again"

Introduction

The term business analyst is still synonymous with a career in the IT industry, but the most successful and valuable analysts are those who understand the “business” rather than those who understand IT. By “understanding the business” we don’t mean having an in-depth knowledge of how the business operates. Rather, it’s the ability to take an analytical, detached view of business processes and quickly identify key issues and problems.

The value add that the analyst can then offer is to work with clients and stakeholders to help them take advantage of business opportunities, to meet operational or legislative needs or to help them solve problems.

So what exactly is a business analyst? What does the role involve, what skill set is required, what type of person is the best fit? What training is required and available? We explore some of the issues here.

The modern business analyst – a definition

First we need to clarify our terminology. One of the most commonly accepted definitions of a Business Analyst (BA) is that of communicator. The BA is the link between business requirements (the client) and the software solution (the development team).
1. The BA identifies business and client requirements
2. Communicates these requirements to the project team, vendor, software factory, outsourcer...

It’s worth stressing that the BA’s job is to identify the requirements of the business - as well as those of the client. Sometimes these are not always the same - the client’s needs may be only a subset of what the business really needs. The BABOK® summarises this quite well “The business analyst is responsible for eliciting the actual needs of stakeholders, not simply their expressed desires”.

The skills required by the BA are much more than just good inter-personal communication skills – a range of tools and techniques are needed, as well as an appropriate background and personality.

Whilst the modern BA performs a highly critical role in software development, the real skills needed for success are not technology centric. It’s worth reviewing the evolution of the BA to understand how we arrived at this.

Evolution of the Business Analyst

In the early days of commercial computing all of the investigation, design and development work for a software application was performed by the computing specialists, who often had little knowledge of the business they were doing.

During the nineties and early noughties it became common for staff from the business user community to get more closely involved in computer systems development. This move was designed to ensure that computer-based systems were targeted at the real business issues. The title Business Analyst became common, although there was no commonly-adopted role definition. The staff filling this role knew about the business – or the part of it that they worked in – but they knew little about IT and their analysis skills were often very limited.

Following on from this, business analysis began to emerge as a clearly identifiable profession. Today, business process analysis, requirements specification and outline design - plus much of the acceptance testing and systems implementation work - is performed by the BA.

The BA requires a range of analytical and creative skills, data and process modelling skills, together with requirements interpretation and specification-writing skills. They also need interpersonal skills for interviewing and for leading workshops to find out what the clients really want and need. BAs also have to ‘sell’ the solution to decision-makers and development teams whilst negotiating and compromising on the three crucial elements of speed, cost and quality. To quote Arthur C. Clarke: “Do you want it quick, cheap or good? I can give you any two.”

On top of this, BAs will often be working in teams - they may need team leadership skills and many are required to take on a project management role. In short, the modern BA needs a range of ‘hard’ skills - data and process modelling, design, specification writing – and a range of ‘soft’ skills – analysis, creative thinking, interviewing, presentation, negotiation - to perform effectively.

Survey reports have constantly reported that more than 50% of large software projects are over budget or behind schedule. As recently as December 2009, The Australian newspaper reported on a Sydney organisation where a customer management system - estimated to cost $70 million - would take more than 37 years to break even. The main reason given was underestimation of the complexity of the project. With inadequate, inappropriate or inaccurate requirements as a major contributor to project overruns and failure, the role of the skilled BA in a project team is more critical than ever.

Typical background requirements for business analysts

Academic level

In our experience the most successful BAs are those with formal, structured education and training. Business administration and similar qualifications are certainly helpful, but not essential. Similarly, a qualification in a computing topic, while also helpful is not essential. Professionalism is not widely sought-after or recognised, and most BAs are not members of the ACS© (Australian Computer Society). As at January 2010, The International Institute of Business Analysis (IIBA®) lists 827 certified business analyst amongst its worldwide membership of 11,700. Of these certified business analysts, 38 are in Australia.

Experience

A broad experience of business is required, the more varied, the better. Business experience in insurance, HR, banking, retail, manufacturing, processing, logistics and technology industries, etc. is transferable, no matter what the recruiters might say.

Personal characteristics

The BA has to get along with everyone, maintaining good relationships at all levels from senior management to junior staff. They must be able to understand the business objectives and be able to quickly prioritise their work, so that they do not spend undue time on the small things before they’ve sorted out the main issues. They must be analytical and be able to deal with the abstract; this is most important. They must be good with detail, and tenacious – following issues through to conclusion. They must be good organisers and good with their own time management.

“...you have two ears and one mouth. I suggest that you use them in that proportion.”

G.K. Chesterton

Software developers sometimes make the move to an analysis role, not always successfully. Programming requires a particular personality - comfortable with detail and logical precision. Business analysis is more about the big picture. It is a rare individual that is comfortable - and competent - in both areas.

![Diagram of the Hard/Soft Continuum showing Business Analysis skills](image-url)
Today’s business analyst – the job role

At the core of a BA’s skills are requirements elicitation (investigate, analyse, specify) and business systems modelling (process, data and business rules). However, because the BA has a highly visible role in the project, the expectations from clients, colleagues and the organisation are often far higher, and extend through the life of the project.

A BA may find themselves involved in some or all of the above roles. The required skill set may be classified as follows:

<table>
<thead>
<tr>
<th>Primary Skills</th>
<th>Secondary Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Analytical &amp; investigative skills</td>
<td>Presentation &amp; training skills</td>
</tr>
<tr>
<td>• Process modelling</td>
<td>Technology &amp; vendor knowledge</td>
</tr>
<tr>
<td>• Data modelling</td>
<td>SDLC knowledge</td>
</tr>
<tr>
<td>• Specification writing</td>
<td>Project management</td>
</tr>
<tr>
<td>• Business writing</td>
<td>Team leadership</td>
</tr>
<tr>
<td>• Inter-personal communications skills</td>
<td></td>
</tr>
</tbody>
</table>

Even if the BA works predominantly in the domain of primary skills, to be effective within the organisation they will need a balance of secondary skills as well.

Techniques and methodologies

It can be extremely difficult to describe exactly what and how things are done in a large organisation, even more difficult to agree on what and how things should be done. Techniques and methodologies are critical elements in this process but there are no hard and fast rules - it’s what works for you (and your organisation) that’s important. Here’s some interesting research data.

In late 2008, the IIBA® surveyed over 1,100 business analysts (68% with over 5 year’s experience) on techniques and methodologies. The survey asked them both what they used and what they had experience of.

Under the category of software development methodologies, 68% said they had experience with waterfall development, 46% said iterative whilst object-oriented (44%) and agile (34%) also rated highly.

If we assume that many of these analysts would be working for large organisations - with mainframe systems - it’s not surprising to see waterfall so widely represented. We can also conclude that analysts need to work on a variety of different applications - iterative, OO and agile being very common methodologies on web services and client/server projects.

Interestingly, disciplines like ITIL and Six Sigma, which have received lots of press recently, only rated 20% and 17% respectively.

Whilst the most regularly used diagramming technique was flowcharting (63%), when it came to formal diagramming notations, use case led the way (55%) followed by data flow diagrams (42%), activity diagrams (38%) and context diagrams (34%). Entity relationship diagrams were still widely used (30%) and BPMN came in at 13%.

For requirements gathering, 67% said interviewing was the most frequently used method. Requirements workshops came in at 45% and JAD sessions 34%.

The survey showed there were a huge range of tools, techniques and methodologies in widespread use - probably too many for the poor analyst to master. As always, it comes down to the old saying that it’s not so much what you know, it’s how you use it.

Software tools

A frequent question at many IRM training courses centres on the use of software tools. What’s the best tool for modelling, what about capturing requirements?

Let’s look at each of these two points individually – first why are we modelling?

Project Phase            Expected Roles

- Project Initiation
  - Investigate, formulate & agree terms of reference
  - Establish relationships

- Analysis & Specification
  - Investigate business system
  - Establish & agree business requirements
  - Establish cultural & organisational changes required
  - Advise on technology options

- Design
  - Propose outline design & specify business functions
  - Appraise software packages
  - Design manual interfaces, design implementation & training processes

- Build
  - Liaise with technical services provider
  - Plan/build/present training courses

- Test
  - Liaise/manage acceptance testing

- Implement
  - Liaise/manage implementation

There are three main reasons:
- To help us to understand the current (as is) system
- To help us conceptualise the (to be) solution
- To help us better communicate with others

As such we need a tool that is easy to use and easy to understand – but we also need one that has in-built support for standard diagram types such as use case, data flow, entity relationship and BPMN diagrams. These diagrams have underlying rules with specific meanings for each symbol, there is little chance of misinterpretation.

Quite often a simple drawing tool will do this diagramming job cheaply and effectively without the need to invest in a more expensive and more complex software development toolset. This may be needed later in the project cycle but a BA is primarily involved with drawing business models - logical models of how the business will operate. A physical (design) model comes later.

When it comes to recording and tracking of requirements, many organisations opt for the simple approach – word processors, spreadsheets, database applications. BAs work closely with clients and development teams, refining, changing and sometimes re-defining requirements. The humble word
A skills roadmap for the professional business analyst

So where should today’s BA focus, and what are the best training strategies to pursue?

There is no substitute for practice and as the BA evolves into a highly skilled practitioner they become of immense value to their organisations. Those working in the field either become very proficient technically or move into management positions, or a combination of both.

The diagram below is a logical grouping of skills and a roadmap structure developed by IRM from the experience gained in training over 2,000 BAs from many of Australia’s Top 500 companies.

(Note: IRM’s training roadmap is continuously updated. For the latest version visit www.irm.com.au)

Today’s BA will have in depth expertise in some of these domains - and just as importantly will have a conceptual understanding of all of them.

As long as companies and organisations want to add new capabilities or improve existing business processes, there will be an ongoing need for professional business analysts.

The deeper and broader the range of a business analyst’s skills, the greater will be the return to their employer and the further their own individual career will take them.

Acknowledgements

i Arthur C. Clarke’s quote is used by many training companies to illustrate the inherent compromises of today’s project-oriented world.

“if you want a product, service or project to be:
• Cheap and fast, it won’t be good
• Good and fast, it won’t be cheap
• Good and cheap, it won’t be fast”

Courtesy: Cooney Training Services Pty Ltd

ii “Teaching HARD, Teaching soft” Colin Corder. 1990 Gower Publishing Company Ltd

iii Author’s survey of 2,000 Australian course delegates over five years

You may use this article in your newsletter or internal document free of charge provided that you do not alter it in any way and that you include the following:

By Derrick Brown and Jan Kusiak © 2002-2010 IRM Training Pty Ltd
training@irm.com.au

Overwhelming Explosion of Data

“80% of business is conducted on unstructured information.”
“Unstructured data doubles every three months.”

Source: Gartner Group

Business Analytics can then be viewed as the combination of domain expertise and all forms of analytics in a way that creates analytic applications focused on enabling specific business outcomes. These applications strive to be prescriptive by answering the question: “How can we achieve the best outcomes”? The focus shifts from selecting analytical tools to holistically developing analytic applications.

Target Applications

Examples of analytic applications include:

- Fraud Mitigation
- Employee Satisfaction
- Claim Analytics
- Call Center Optimization
- Innovation
- e-Discovery
- Clinical Analysis
- Quality & Safety
- Customer Acquisition & Retention
- Regulatory Compliance
- M&A Due Diligence
- Reputation Management
- Subrogation & Recovery
- Anti-money Laundering

Source: Frank Diana, Developing a Business Analytics Strategy, Best Practices Series
White Paper, enherent Corp., New Jersey, USA [fdiana@enherent.com], March 2010.
Are you treating your enterprise data as an ‘Asset’

Usha Venkatasubramanian

L&T Infotech Park, Mount Poonamallee Road, Manapakkam, Chennai 600 089. e-mail: Usha.V@lntinfotech.com

With the advent of global business houses and faster means of providing information, organizations face the risk of data exposure and loss of control. Recently, the Privacy Rights Clearinghouse put the count of data loss incidents at 330, involving more than 93 million individual records, since February 2005. While IT governance is confined to the premises of IT teams, data governance is a broader spectrum activity covering IT and business functions at an enterprise level. This paper proceeds to discuss at length, a framework and an approach to Data Governance.

Background

Many organizations have been managing data through a data management team which primarily would consist of database administrators (DBAs) and infrastructure personnel. However, due to growing data volumes and increased demand for consumption, the existing management functions are not sufficient. Particularly, in the case of data originating from different divisions, the ownership and the right of distribution should be the responsibilities of a larger team. A centralized policy to treat data as business asset and to govern it is the need of the hour. This requires active involvement of stakeholders from corporate and divisional IT teams, all lines of business, spanning all the functional areas and geographic areas.

Data can be protected if the business is aware of its worth. To know the worth, the questions to be answered are:

- Where is the data?
- How is it used?
- When and where to integrate and federate the data.

Along with this assessment, the risks of loss or theft should be evaluated. It is then possible to determine the investment on a data governance program.

What is Data Governance?

Data governance is a process focused on managing the quality, consistency, usability, security, and availability of information. This process is closely linked to the notions of data ownership and stewardship. The critical role of data governance is to truly managing data as an asset. The prime mission of governance is to serve as the link between an enterprise’s corporate and strategic initiatives and its business and technology teams. Executed properly, the governance function can actively and effectively direct an organization’s resources to maximise the value obtained from its data assets.

Why is Data Governance important?

Between February 2005 and February 2006, in 130 separate incidents, over 53 million private data records were lost, stolen, hacked, freely given to criminals, or improperly displayed to the public. Recently, the Privacy Rights Clearinghouse put the new total (of data loss incidents) at more than 330, involving more than 93 million individual records since February 2005. Even though data governance has been there around since 1970s, after these incidents, experts agreed that effective corporate data governance would be a good start.

There are many tangible and intangible benefits that an enterprise implementing data governance can reap. They are:

- Confidence that the stakeholders have in the data available within an enterprise due to the accountability of data brought in by good governance. In addition, there is also the ease of access through well articulated presentation formats and modes. This translates directly into informed and timely decisions.
- Due to high levels of competitiveness and the...
extent of automation in today’s world, confidentiality of data has assumed greater importance. Access control implemented through a good governance practice ensures that your data is secure and made available only on a ‘need to know’ basis.

- Reduction in data duplication and building a common vocabulary for the entire information reduces the efforts required to maintain data.

Implementing an effective data governance system can result in avoiding data breaches and lost customer opportunities to the tune of $98 per record, as per a study conducted by Ponemon Institute in 2007. As per CDI Institute, around 86% of Global 5000 organizations have understood the need for data governance and have embarked upon data governance programs.

Data Governance Program

Data is vulnerable and there could be many touch points during its movement from where it could be easily stolen. Identification of such potential threats, their frequency of occurrence could be some of the challenges in architecting a data governance program. In order to achieve the objectives of availability, quality, consistency, usability and security, a well-architected data governance program should address the following:

- A complete documented directory of all the data assets in the enterprise.
- Unambiguous owner of a particular data asset.
- Assigning responsibility for defining and ensuring various data characteristics such as:
  - Accuracy, Accessibility, Consistency, Completeness and Updating.
  - Process of storing, archiving, backing up of data.
  - Control mechanism to prevent data leakage.
- Standards and procedures for handling data by authorized personnel.
- Controls and audit procedures to check ongoing compliance with statute.

A pre-requisite to good data governance system is proper data management. A proper foundation includes proper data management tools and methodology, comprehensive data model supporting an enterprise’s business systems, data attributes and metadata.

![Image of Data Governance Program]

Data governance is relatively new to many enterprises and hence, a few quick wins that excite the upper management are essential to keep the momentum and management commitment. When there is no success, nobody is excited about anything. A communication mechanism is essential to keep executives up-to-date with every success, however small it might be.

The return on investment (ROI), like any Business Intelligence initiative, is difficult to quantify in the case of a data governance program. A well-defined set of metrics to measure the benefits covering scope, progress, maturity model, dollars saved, dollars earned, risk mitigated is vital to report to all the stakeholders, more tangible the better. Where do we begin the Data Governance program?

Data governance program without meticulous planning can be a disaster since it is relatively new and not understood fully. It is essential to clearly articulate the objectives of the program, set appropriate scope and develop a risk management plan. A strong PMO is essential to co-ordinate and manage many organizational units / functions. The team must have the ability to manage multiple data-centric projects and multiple data environments and prioritize areas to achieve defined objectives.

Start small if data governance is being implemented for the first time in an enterprise and expand the scope. It may be desirable to take external assistance to scope the first initiative out of the many components that form a part of data governance. The scope of a data governance program may include one or more of the following:

- Data quality/certification
- Data to be included - Metadata, Master data, Transaction data
- Data security/access
- Data standards and architecture

An effective organization must be made or tailored to achieve specific data governance goal. Introduce an Executive Governance Layer with senior executives to set direction and sponsor the program, a Strategic Governance Layer represented by business owners who set standards and policies for the program and a Tactical Governance Layer comprising Data stewards divided by the major area of application to take ownership of data and make changes in many processes. Data stewardship is an approach to data governance that formalizes accountability for managing information resources on behalf of others and in the best interests of the organization. A steward is someone who manages something on behalf of someone else.

How does an organization mature in its approach?

Maturity Level 1: Basic Data Governance

Data Governance at any organization starts with loose controls which could be primitive in nature. At this level, organizations have distributed data governance in place. Each line of business understands its own data. Also each line of business identifies the points of data distribution. IT is used as an enabler to protect the data and distribute it in a controlled manner. Specific project or application needs are taken care of. Technology investments are only pertaining to the specific needs and there may or may not be room for sharing or reuse. Again, the data distribution boundaries may cross over other lines of business. Therefore, the risk of data exposure is higher and a common control is not maintained. In the long run, data becomes more and more vulnerable and is as good as not having any control. The organization’s exposure to risk is identified through occurrence of events such as customer churn or supply chain disruption etc. This results in a transition to the next maturity level.

Maturity Level 2: Reactive Data Governance

At this level, organizations think globally and act locally. Applications that cut across various lines of businesses, different geographies and different functionalities seek to maintain a common platform for holding data. Silos of data on user’s desktops are considered as invalid. Any information is shared from the common database. Though the technology layer remains the same, data definitions could be different. There is no global authorization for data distribution. Data is made available to different internal and external stakeholders, crossing the boundaries of lines of business and raising a cause for concern. Whenever, a data loss incident is noticed, a patch work is done to prevent further loss.

Maturity Level 3: Proactive Data Governance

Organizations at this level are more matured and have learnt from the reactive governance that was in vogue within their organization. A need for common data definitions or data rationalization is felt. A transition from reactive to proactive mode requires corporate buy-in and continued support. Various initiatives such as Master Data Management and Metadata Management are launched to bring the data together. Collaborative data sharing is in
Data quality is greatly improved. Vulnerable data is identified and controlled collectively by the different lines of businesses. Risk of data loss is greatly reduced. However, the process of data creation, data updation and retiring the data is still the responsibility of each department. Process variations exist and may lead to accidental injection of unwarranted data. There is no method by which the effectiveness of the data governance could be measured or audited. **Maturity Level 4: Comprehensive Data Governance**

This is the highest level of maturity that an organization can reach in its path towards a totally controlled, measured and audited data governance system. At this level of maturity, the data across the enterprise is rationalized. Processes are standardized. It could be visualized as an integrated BPM system. A formalized organization with defined roles and responsibilities exists as an apex body to govern, protect and manage the data. Appropriate audit mechanisms are in place. Metrics are collected periodically and continuous improvement processes are in place. Whenever any new initiative is launched, its impact on the existing data architecture is studied and suitable additional controls and metrics are introduced, before the launch. The entire architecture would be service-oriented. “Zero-defect” policy for data management is in place and is constantly maintained.

**Framework for Comprehensive Data Governance program**

An enterprise level data governance framework would comprise 3 dimensions, namely, people, processes and technology. In establishing the framework, even if one element is missed out, it could cause one or more of the following – missed deadline, data anomalies, loss of confidentiality, incomplete results etc. Therefore, we propose a framework which covers all the 3 dimensions.

**Exhibit 3: Data Governance Framework**

The People dimension describes the involvement of various teams namely data owners team, data management team, data governance team and application support team during different phases. While the data ownership team is involved throughout the data governance program, the data governance team is formed only after few initial activities are completed. Likewise, the involvement of the data management team is during the initial phase and later on during the implementation phase. The data management team, comprising DBAs, IT administrators, Mailing System administrators and Network administrators, responsible for managing the current systems, would contribute substantially towards initial knowledge capture. The data ownership team, comprising data originators and data authorizers, form rules and business scenarios for converting data into meaningful information and act as key advisors in preventing data thefts. The data governance team would be responsible for setting up the processes in alignment with the needs of all stakeholders and would ensure that they are followed and maintained on an ongoing basis. In addition to these, the application support teams would be involved during the development phase, where additional controls may have to be placed in the existing data handling applications. A project could be launched under the purview of the data governance program to handle such change requests.

The Process aspect includes all the activities that need to be taken care of in achieving the goals of data governance. This would start with an initial step of defining the data assets and their owners, establishing characteristics and control, moving ahead to the data presentation related definitions and then to the distribution related factors. This process is not a one-time activity, rather it is a continuous improvement program, which monitors and measures the effectiveness of data governance. The next section of this paper elaborates the process steps that would be typically followed in a data governance program. It is essential to include all the steps, while some of them could be done in parallel with some other steps.

On the Technology front, various tools could be used. Data profiling tools help in capturing the existing data characteristics such as cardinality, interdependencies etc. As data from various LOBs and functional units would all be governed by a single governance team, there could be a need for integrating data. This leads to the usage of data integration tools and data quality tools. In addition, metadata tools would also be required to identify similarities, analyze the impact of changes and to understand the lineage of data. While creating scripts and procedures, it would be useful to gather audit and control information with the help of audit mechanisms available in various tools. In order to achieve controlled data distribution, suitable data presentation, distribution and security tools have to be identified. In many cases, all these can be achieved through a single platform or suite of tools. Finally, in order to maintain the data governance program in its full fervor and form on an ongoing basis, continuous audits and improvements need to be carried out. This calls for changes in the scripts, procedures, presentation or security. Hence suitable version control tools should be in place to ensure that the versions are maintained.

**DIECAST – An approach to Data Governance**

The DIECAST approach starts from the initial identification of data assets and developing a roadmap for covering them in the governance program. The coverage can be incremental, starting from the most critical data asset, gradually covering all identified data assets. Going ahead, the method for protecting each data asset is identified along with the stakeholders who would form the governance body. As a final step, the governance team is established and continuous monitoring of data is achieved.

**Exhibit 4: Steps in achieving Data Governance**
The DIECAST process ensures that the data is molded as expected by the data ownership team and is distributed as per standards set by them and governed at an overall level by a data governance team. The steps of DIECAST process are detailed in this section.

Define Data Assets
The Data definition begins with understanding all the data in the organization.
This includes data from:
- Database Systems
- File Systems
- Mailing Systems

An evaluation of criticality is carried out. The requirements for data governance are spelt out. This could include a requirement for data integration.

Identify Owner
The Owner who is responsible for maintaining each data asset is identified. In case of multiple owners, the appropriate combination is worked out. The ownership team would then be a combination of data originators and data authorizers.

Establish Characteristics
Data Characteristics such as the following are discussed with the owners:
- Accuracy – with a level of precision
- Accessibility – with the ease of access
- Consistency – across various outputs
- Completeness – level of completeness in %
- Permanence – Permanent / Temporary / Semi-permanent
- Dependencies – Fully / Partially dependent / Independent

In case of any known discrepancies, which relates to the quality of the data, a suitable data quality program may be launched, before going ahead.

Control against leakage
As an essential step towards governing data assets effectively, suitable control mechanisms should be built. This could include the following:
- Build metrics and audit mechanisms for data protection.
- Define workflows and enterprise controls for data distribution.

These are defined by the ownership team and while implementing would include adequate change management steps at an enterprise level.

Authorize for Distribution
A complete list of users of these data assets should be prepared. Also, the mode of providing access, the time of data delivery etc. should be identified and agreed upon. This is the entry point for the data governance team, which was so far a virtual entity. While data ownership teams may have different purposes of data distribution, other data requestors may have different reasons for their requests. Identifying commonalities and resolving conflicts would be a major challenge for the newly setup data governance team. There could be a series of workshops and meetings to finally arrive at the list.

Standardize usage
All sets of data identified for similar use should be in a similar form. The form and style of data presentation and the mode of distribution should be decided. This could include the following:

I. Form and Style of presentation:
   - Pie charts
   - Bar charts
   - List reports
   - Crosstab reports

II. Mode of distribution:
   - Distribution through web
   - Print media
   - Personalized dashboards

After going through these various process steps, a suitable system should be put in place and rolled out at an organization level. Thereafter, a need for continuous betterment arises.

Tailor And Maintain Through Ongoing Audits
In order to continuously monitor and maintain the data assets, a process should be in place, to take care of the following:
- Additions/Deletions/Changes to Data Assets
- Changes in Ownership/Distribution list
- Changes in data characteristics
- Changes in data presentation standards

Conclusion
Data governance is the enterprise function focused on protecting and managing data as a corporate asset. As such, it is critical for obtaining the maximum business benefit from the organization’s data. The framework and approach presented in this paper incorporate several guiding principles for data governance. First, the effectiveness of governance is directly related to the degree of active support provided by high-level executives.

Second, governance is more than standards, reporting, and prioritization of projects; it is a business function providing structure for maintaining high data standards and guarding against the risks of data theft or loss. And finally, governance is not static; it must evolve over a period of time to meet the changing objectives of the organization.

Generally, there is a general concern that the structure required to provide ongoing governance will be too costly. In reality this is not true if an appropriate level of governance model is set up and governance standards and procedures are simple to follow. Let us take the right step in time to get the best out of the enterprise data.

Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA</td>
<td>Database Administrator</td>
</tr>
<tr>
<td>ROI</td>
<td>Return on Investment</td>
</tr>
<tr>
<td>LOB</td>
<td>Line of Business</td>
</tr>
</tbody>
</table>

About the Author
Usha Venkatasubramanian, is the deputy head of the Business Analytics Services practice at L&T Infotech. She holds a Masters Degree in Electronics Engineering and a Bachelor’s degree with Honors in Electronics and Communications. She has 19 years of industrial experience in IT consulting. She has helped organizations to evaluate their BI platforms. She is actively involved in MDM and Data Governance initiatives at L&T Infotech.

About L&T Infotech: L&T Infotech, a wholly-owned subsidiary of the $8.5 Billion Larsen & Toubro group, is a provider of IT & Technology solutions and services to global clients across industry segments encompassing Telecom, Manufacturing, Banking, Finance, Securities, Insurance, Energy & Petrochemicals. L&T Infotech delivers high fidelity solutions based on time-tested institutionalized processes and a deep-rooted belief that quality is a cost-saver. Accredited with the prestigious SEI CMMi LEVEL 5 certification, its motto is “Quality Drives Productivity”.

L&T Infotech’s vision is to provide world-class services to clients in its areas of focus, offering solutions that are based on business and technology insights.

For more information, visit us at www.Lntinfotech.com or email us at info@Lntinfotech.com
Golden Rules for Business Analysts

Colin S. Penn

IRM Training Pty Ltd ACN 007 219 589, Suite 209, 620 St Kilda Rd, Melbourne, Vic. 3004, Australia

Like all professions, business analysis has its golden rules – rules that are fundamental to the design of successful business systems. They might seem like common sense but it’s surprising how often we forget them and get ourselves into hot water. Here’s a short list of some of the more relevant ones…

The sooner you find a problem, the cheaper it is to fix

Get the specifications right

Recognise the total cost of a system

Don’t design the solution before you’ve analysed the problem

What applies to small systems doesn’t apply to large ones

Don’t allocate conflicting roles in a project to the same person

Now let’s have a look at what they mean, together with some real life examples witnessed by the author.

Background

You might feel that working with IT systems demands a constant refresh of skills and knowledge. Companies want efficiencies and reduced costs through new procedures such as Six Sigma, ITIL, COBIT. They must also accommodate new laws such as Sarbanes-Oxley plus IT governance and privacy legislation. People working directly with technology need vendor certification, be it Microsoft, Sun Microsystems, SAP, CISCO, Oracle…etc. In project management there are certification bodies – AIPM, PMI – plus industry accepted methodologies such as PRINCE2. Even the business analysis profession now has its own qualifications – CBAP and QBAP (see the glossary for what all these acronyms mean).

With business and technology changing at breathtaking speed, the choices with accreditation and certification can be bewildering. How we apply this knowledge however still relies on fundamental principles which don’t change quite as fast, if at all.

What are the characteristics of a fundamental principle – a golden rule? Usually it’s a rule that can be applied whatever the business system or application, whatever the software or hardware platform. Consider the following and see how many apply in your environment.

1) The sooner you find a problem, the cheaper it is to fix

Barry Boehm¹ (noted software engineer and creator of the spiral development model) was one of the first people to consider how to estimate IT projects and where resources must be concentrated to achieve success. He showed that the cost of removing a fault in a system rose exponentially throughout the systems development life cycle. The following graph (courtesy IEEE Computer Society) illustrates the huge jump in costs the further along the development cycle that you go.

Boehm’s research showed that for very dollar spent correcting a fault in the requirements phase:

- $3.27 would be spent once the system went live
- $10.45 would be spent correcting it in the requirements phase
- $2.00 would be spent correcting it in the coding phase
- $7.03 would be spent correcting it in the design phase
- $3.27 would be spent correcting it in the maintenance phase
- $14,102 would be spent once the system went live

What does this mean for a business analyst? Let’s suppose you’ve got problem on your current project. You’re in the requirements gathering phase and one of the requirements just doesn’t make...
sense. To remedy this you need to organise an additional 2-hour workshop with stakeholders and managers to discuss and clarify the requirement. Let’s say the cost to the company of this workshop is $1,000 in people’s time.

Now let’s suppose you didn’t spot the problem with this requirement until the design phase had started. Suddenly, the cost to your company of fixing it jumps to 3.27 times what it would have cost to fix it in the previous phase. ($3,200 in round figures). If you didn’t spot the problem until the coding phase the cost increases 7.03 times ($7,000) and if you didn’t fix the problem until testing it would be 51.33 times the initial cost. By the time your system is in production and under maintenance the cost of fixing your problem (which might originally only have cost you $1,000) has now mushroomed to $101,000 or 101.45 times the original cost.

With projects under ever increasing time pressures, it’s often easy to overlook Boehm’s Law “errors are most frequent during the requirements and design activities and are more expensive the later they are removed”.

Case study - a city council developing a replacement payroll system believed that council staff (users) had comprehensive knowledge of all the business requirements. After all payroll was a highly procedural business process that staff had been performing on the previous system for several years. It was assumed that there was no need to analyse the current system and that resources could be better used elsewhere. However none of the current staff or IT team had participated in building the old system – they had no knowledge of how it was built, or the undocumented business rules it performed. When implemented, the new system could not correctly calculate employee benefits nor apply tax rules. The new system was eventually abandoned with all development costs written off.

2) Get the specs right

This golden rule is often called Glass’s Law. You only need to see the title of Robert Glass’s 1998 book Software Runaways: Monumental Software Disasters to understand the message “requirement deficiencies are the prime source of project failures”.

To put some statistical perspective on this – in 1994 the Standish Group published groundbreaking research (the CHAOS report) showing that over 20% of all IT project failures were caused by incomplete or badly managed requirements.

Not a lot has changed today - research published in IEEE Software magazine (September 2008) claims that around 30% of software projects are cancelled or unsuccessful with one of the main reasons being badly managed requirements.

Additionally, the Business Analysis Benchmark – published in 2008 by IAG Consulting – surveyed over 100 companies with an average project size of US$3m. The results found that over 40% of the total development budget was consumed by poor requirements.

Glass’s Law further confirms the need for sufficient resources in the analysis phase. It ensures the greatest return on investment (resources). Thorough analysis catches more faults - removes them at the lowest cost - in the fastest time.

Case study - The CFO of a large corporation insisted upon a certain ERP software application being implemented. The IT department tried to insist on a selection process to consider a second ERP which would be a good fit to their infrastructure and their methods of doing business. However the company (having just come through difficult financial times) owed its survival to a strategy from the CFO so he won the political battle.

The ERP selected was new, untried and developed by a small vendor. Within a short time it was realised that the application’s functions did not match the way the company operated. To make it fit, the company attempted to convert many of the functions in the application to work the way they wanted. The cost was high and they found they were subsequently unable to upgrade to the next release of the ERP because of all the changes they had made. After a short life span it had to be replaced.

3) Recognise the total cost of a system

Many people think only of the cost of developing or buying an application system. However, once it’s in production the cost of running, maintaining and enhancing it over 5, 10 or more years, far exceeds this. Because these costs are spread over several years they are often ignored or glossed over. It’s only when the accountants get involved and perform a Net Present Value (NPV) calculation of the total system cost over its total life span that the truth emerges.

Maintenance\(^2\) constitutes the vast majority of the total cost of an application system throughout its complete working life.

Some maintenance costs are obvious, some less so. Some will depend on how the system is rolled out - client server, web services - others will vary depending on the use of existing infrastructure.

Consider the following list – are they development costs, maintenance costs or both? Sometimes the development system can be used for production, sometimes you will need a separate one. How will costs vary if a system has a 5 year lifespan – or 10 years? What if the number of users or customers grows by 5% a year – what about 20%?

- Development costs
- Development system
- User acceptance testing
- Production system hardware and software
- End user hardware and software
- Maintenance contracts (hardware & software)
- Rollout of production system
- Data centre (floor space, electricity, cooling)
- Rollout to end-user systems
- End-user training
- Network hardware & software
- Communications costs
- Backup and contingency planning
- Periodic disaster recovery/business continuity testing
- Mid-life hardware refresh and migration costs
- Software upgrades
- Personnel – maintenance team, help desk, operations
- Audit costs, insurance cover
- End of life decommissioning

As a business analyst we may have little control or influence over these factors but we can make a significant contribution nevertheless. The business world is full of horror stories of undocumented systems - some of them at embarrassingly large companies. Do your bit by making sure the requirements documentation is as precise and unambiguous as it can be. In years to come, when your company wants to modify the business functionality of a system, it will be your requirements documentation they consult.

4) Analysis first, design second

As a business analyst we can often be caught between giving the business user what they want and knowing what the company is (or is not) able to deliver. Herein lies one of the greatest traps the analyst can fall into – designing the solution before they’ve understood the problem.

It is very difficult to gather information on requirements - without starting to design a solution. It is often hard to distinguish

\(^2\) Maintenance is a generic term used to describe everything that happens once a system goes into production (goes live). It includes operational and enhancement costs as well as bug fixing.
between a requirement and a solution as both look like similar functions. However we must stop and think about what we are doing in the context of the big picture. Analysis breaks something that already exists down into its components to so we can understand how it works (or doesn’t work).

**Case Study - The State of Florida** planned to implement a new welfare administration system. The IT project team were instructed to re-use several million lines of code from an already developed system. Unfortunately, it was a centralised system whilst the requirements called for a distributed system. The difference in architecture prevented a successful implementation despite all efforts. Choosing a specific solution without considering the requirements, while merited on financial grounds, simply did not work.

**5) What applies to small systems doesn’t apply to large ones**

This golden rule is based on the highly regarded 1976 publication by Frank DeRemer and Hans Kron3 which described how complexity grows exponentially the larger the system. Here’s a modern day example.

With the advent of the home PC, home networks and the Internet, business users are well acquainted with the use of computers in various environments. They then wonder why the costs of larger corporate systems are so high. Business analysts must work to educate business users about levels of reliability, redundancy, recoverability - and the ensuing complexity.

**Take data storage and RAID disc technology. RAID (redundant arrays of inexpensive disks) is now creeping into home networks but has been a staple of corporate systems for almost 20 years. A RAID disk looks to a system like one logical unit but is actually a cabinet containing many individual disk drives. By configuring these drives in different combinations (RAID 0,1,2,3,...etc) we can have a choice of disk mirroring, data striping or just using the full capacity of each disk.**

Home users can now buy an affordable RAID system as a home server. However if it has 1TB total capacity with two disks inside and is configured as RAID 1 then you’re only getting 500GB (half a terabyte) of usable storage as your data is being duplicated on each disk. Your real cost of storage is double your purchase price on a $ per GB basis i.e. disk utilisation is 50% (usually less when you take into account system overheads).

In a corporate data centre it’s typical to have different RAID configurations depending on the application. Some configurations are best for performance others for recoverability. What’s important to note is that disk utilisation (or bang for buck) can vary from below 50% to almost 100%. When you have an online data farm approaching 100TB or more then costs – including management, backup, maintenance - are in a different league to home systems. Therefore as a business analyst you may have to explain to users the pros and cons of keeping all customer data online when, for example, discussing requirements for a new data warehouse (data mart) system.

**Case study - A government department decided to re-develop all of its reports as data marts and a reporting database. They began gathering requirements by inviting personnel from every section and team to attend a presentation of what the project would provide. The people invited were not the ones who knew how the business processes in the department worked so they could not provide the information that the IT team required. They were however, able to state what they wanted from the new system.**

The presentation raised expectations throughout the department and increased scope. When the schedule was delayed and no news was heard from the project team, the users became disenchanted and critical with the project. Users did not understand how adding more requirements had such an impact upon resources, costs and delivery times. Each user had a computer at home and could buy software online and install it in minutes. They couldn’t understand why the project team could not do the same. The system was eventually delivered successfully, but not to the user’s complete satisfaction.

**6) Don’t allocate conflicting project roles to the same person**

Project members will typically be given more than one role in a project team. But some roles have conflicting objectives. One of the most common mistakes is to allow a programmer to conduct all of the testing on their own programs. The programmer can do their own unit testing, but another person should test it again later. It’s so easy to miss our own mistakes. How many times have you proofed something you’ve written yet missed the obvious mistake?

Another potential conflict occurs between product managers and project managers. The former represents the user and wants as much functionality in the application as possible. The project manager must ensure delivery of what is in scope, on target, on budget, of good quality, and must resist (without formal consideration) additional functionality.

**Case study - A software provider of a configurable application used their project managers as client account managers. Clients inevitably tried to get the vendor to include new functionality. This usually came in the form of several small requests as the client slowly gained more experience of the software. The project/account manager fell under pressure to accept them. The project team operated under a constant stream of scope creep. The software provider’s company culture accepted this as normal, but most of their profits were eaten up in freebies to the**
client. The client however, did not respect the provider for being so easy to dictate terms to. The provider lost even more respect when the application was delivered late because of the extra functionality. The provider was less profitable than they were expected to be and during some difficult financial times, were taken over quite easily and cheaply.

Summary

Methods, techniques, tools and trends will come and go, to be replaced by others. Some will be totally new ideas, others are will come and go, to be replaced by others. Summary taken over quite easily and cheaply. During some difficult financial times, were profitable than they were expected to be and the extra functionality. The provider was less the application was delivered late because of the provider lost even more respect when the provider for being so easy to dictate terms to the client. The client however, did not respect the provider for being so easy to dictate terms to. The provider lost even more respect when the application was delivered late because of the extra functionality. The provider was less profitable than they were expected to be and during some difficult financial times, were taken over quite easily and cheaply.

Glossary

- Six Sigma: a formal set of business management practices, originally developed by Motorola to remove defects in manufacturing and improve business processes. Now in widespread use around the world.
- ITIL: a set of best practices for managing IT infrastructure and operations. Developed by the Office of Government Commerce in the UK and in widespread use.
- COBIT: another set of best practices, this time for implementing IT governance and audit controls. COBIT was developed by ISACA an organisation for IT governance professionals.
- Sarbanes-Oxley: a US Federal Law specifying minimum reporting standards for public companies in the wake of the Enron and WorldCom accounting scandals. Seen by many as the global, de facto, governance standard.
- AIPM: Australian Institute of Project Management. Formed in 1976, has 8,000+ members.
- PMI: Project Management Institute. Over 265,000 members in 170+ countries.
- PRINCE2: a widely used project management methodology from the Office of Government Commerce (UK), the same body responsible for ITIL.
- CBAP: Certified Business Analysis Professional qualification from the International Institute of Business Analysis.

Avoiding Burnout

Excerpted from:


In leadership, Peter [Drucker]’s enormous contribution has been his insistence that leaders come in all shapes, sizes, races and genders, and that leadership is not some mysterious blend of charisma and luck. Rather, Peter has argued persuasively that leadership most commonly arises from a commitment to serve others rather than self...

– Frederick Harmon

With IT so critical to today’s organizations, the demands on the staff can be enormous. Glassy-eyed programmers, cases of Jolt soda, sleeping bags under desks, and 3 a.m. pizza deliveries have become routine.

IT demands are heavy because:

+ Virtually every aspect of an organization is dependent on IT and its services.
+ The tasks and their solutions are hard, complicated, and intense.
+ In the digital world we now live in, the workplace is often 24/7, and the demands are non-stop. The technology allows people to work 24 hours a day, squeezing in time for sleep only when the body refuses to stay awake.
+ The lure of a complex technical challenge often excites people to work 20 hours a day. (In the early days of developing the Macintosh, Steve Jobs handed out T-shirts that read: “Working 90 hours a week and loving it.”)
+ IT staff is needed during working hours to ensure systems are running as they should and responding to problems. However, the staff is also needed during off-hours because that’s often the only time that certain work (e.g., maintenance, upgrades, etc.) can be done.
+ Unlike the days of assembly-line labor, the work of IT isn’t measured in products produced per unit of time. So there are no clear external indicators of when the work is “complete.” (“The IT job is one where you get an ‘F’ if you fail but only a ‘C’ if you succeed– this stuff is supposed to work, right?” Bill Gates, Business @ the Speed of Thought, p. 322.)
+ Highly energized and motivated employees may not even realize the condition they are getting themselves into. While it may be tempting to push your staff, or allow them to push themselves to the limit, it’s important to remember that you won’t get much work out of them once they’ve hit that wall.

Make Your Employees Aware of the Dangers of Burnout

Often people most susceptible to burnout are the ones unaware of the problem. They work like dogs for two years and then they crash.

Outline the Prices Employees Can Pay

When making them aware of the problem, outline the cost of burnout:

+ Deterioration of health
+ Errors on the job
+ Relationships with co-workers deteriorate
+ Problems at home with family and with relationships
+ Loss of job

The short-term gains for working weekends for two years in a row don’t outweigh the long-term losses of any of the above.
I happen to be looking for a senior resource for an organization in the North of India. A contact had forwarded a profile to me and I found the resume showing relevant technical skills. I called this person and, in course of the conversation asked him if he knows more than 2 languages. He was from deep South and I was keen to know if he could get by in the North. He promptly told me he knows multiple languages - C, C++, Java, .NET; and, he was into learning the emerging languages too!

Nothing can be closer to the truth than the declaration that technology and HR speak two different languages. While jargon is the prevalent universal language, HR tends to balance jargon and English - customary language used for expression. However, technologists prefer to code and if at all there is a need to speak out, then a few uttered jargons would do the needful. It is amazing how one can get by with jargon alone. Give me a quick download, this shirt is an enhanced version of the old brand, the point per se seems fine, this is FYI – oh, the list is endless. But what takes the cake is the statement made by a colleague (a programmer) when our networking executive finally identified the girl he wanted to marry. My techie pal advised- ‘think through buddy, you will not be able to upgrade later!’

A job interview paneled by a HR person and a Line manager will demonstrate that language & communication entail two entirely different perspectives. Human communication is defined as the process of making sense out of the world and sharing that sense with others through verbal and nonverbal messages. How two people, due to their nature of respective jobs, communicate with the candidate is a classic example. The HR manager will look at the overall personality of the candidate and focus strongly on communication skills like verbal proficiency, body language, and listening skills. To the technical managers, these aspects would seem fairly trivial as he/she would be testing the technical knowledge and application skills of the candidate. After all, the job is all about that, right? However, organizational Heads would look beyond this and want their people to possess balanced competencies in both functional and soft skills. I remember a Business Head’s assessment of a software engineer after interviewing him – excellent technical skills; however keep him one continent away from the client!

Of late, soft skills are gaining prominence and the need for linguistic skills along with technical knowledge is established. Now, all organizations, without exception, list communication skills as a core competency to check during job interviews. From front office executive to Finance Head, communication, the business kind, is the most important skill to possess. Long gone are the days when domain skills and softskills were regarded as mutually exclusive. Now companies want people who have a healthy attitude, possess eagerness to learn and demonstrate excellent communication skills. The objective is to bridge the gap between technology and language which has hitherto caused many a client to say, “You don’t speak my language,” This comment can be taken as a direct criticism of a professional who uses language ineffectively. Selecting language that is appropriate to the situation is crucial to success. The type of language used must be chosen on the basis of an awareness of the setting, the client’s disposition towards the existing external environment and the nature of the subject in question.

An individual’s type of communication and vocabulary used depends largely on how he/she stores data and processes information. Three such frameworks have been identified by learning experts:

‘Can you throw some light into this’, ‘I don’t see why we need to meet today’, ‘are you looking for a solution’ - these are by people who are focused on visual stimuli.

People who pay close attention to hearing are better students as they concentrate in class and absorb what is imparted by the faculty. Their typical vocabulary would be - ‘keep a ear to the ground’, ‘yes, that rings a bell’, ‘sorry, I don’t like the sound of your complaint’.

The third category is the kinesthetic variety of people. Primarily experiential, be it academic learning or work performance, these people like to get the ‘feel
of the issue' and are uncomfortable if they are not able to 'put a finger on the problem'. They are literally ‘hands on’ professionals.

Language proficiency is only one aspect of communication. Listening skills, business etiquette, body language and emotional sensitivity are equally important.

Availability of options to learn is advantageous, yes, but at times proves detrimental too. By options, I mean the internet, television and so on as the knowledge and skill building media. The erstwhile learning methods were only through reading (the book variety) and listening. Both these aspects, critical to communication, were thus consistently honed. The advent of self paced learning and computer based knowledge transfer combined with the inherent impatience the youth of today profess, listening skills have taken a beating and the reading habit is almost lost. Communication is now a consciously cultivated skill.

Based on an understanding of needs, wants and attitudes between two communicators, effective communication hinges on comprehending the message and responding in terms that move the exchange forward to a preferred direction.

The gamut of communication skills covers written skills; proficiency in this can go a long way in a professional’s career. Language being a habit, spoken skills are picked up casually, and speech tics, conversational fillers, question tags and so on help cover the flaws in spoken language.

In India, furthermore, we have the advantage of blending regional dialect and English to make a very comprehensive, unique, but deeply communicative language. To become players in the emerging global market we would need to correct our adopted and customized local language. Communication, with English in its pure form, would aid international interaction.

Almost all business communication is done through email. Writing emails may seem the easiest form of written language as a mail has to be brief, to the point and quick. Language skills or the lack of it may not be the challenge here. Emailing, nevertheless, has certain norms and boundaries as words have the power to impact thoughts and actions, and also have the power to make or break relationships. One needs to keep abreast of linguistic changes and adopt the designations, form of address currently preferred by the cultures of various countries. Email etiquette is the key become a professional and business communicator. Non sexist and neutral terminology, formal address (unless the person specifies form of address), relevant subject line, minimal jargon and absolutely nil sms-es would comprise the fundamentals of email communication.

Use of symbols, specially emoticons, are of course a strict no-no. Imagine a HR person rising to the trendy manner of jargon and absolutely nil sms-es would make or break relationships. One needs to be a good listener, create focus in approach, cultivate logical thinking, build command over the language, practise crisp delivery skills, and lastly, be empathetic enough to see the receiver’s viewpoint.

Can you visualize the impact a sound technologist, with good body language, apt choice of vocabulary and excellent connect with audience, makes in his presentation? Well, he will have the client eating out of his hand.

Now, this would be the ideal example of visual, auditory and tactile (kinesthetic) framework!

---

**About the Author**

Nikhil Indrasenan possesses over 18 yrs of entrepreneurial and industry experience.

Nikhil joined Ma Foi as a Consultant in 2000, doing consultative selling of Ma Foi’s services across industries. He has donned a variety of roles since, including recruitment, business development, channel and general management.

Nikhil has managed and delivered on over 30 high volume recruitment assignments across multiple industries/locations and found career opportunities for over 5,000 professionals in his tenure. He set up the company’s first Business Partner Operations in Tamil Nadu and Kerala in 2003 and moved to Sri Lanka in 2004 to set-up the company’s Lankan operations. He currently holds a dual responsibility of Head - Ma Foi Academy and Country Manager and Director of Ma Foi’s Sri Lanka’s subsidiary.

Nikhil holds a Masters’ Degree in Business Administration (Marketing) and a Bachelors’ Degree in Chemistry, from the Madras University.

---

**BUSINESS FACTS**

“90 trillion - number of emails sent on the internet in 2009.”

*Source: Radicati Group*

“126 million – number of blogs on the internet.”

*Source: BlogPulse*

A 2009 Gartner paper predicted these developments in the business intelligence market:

- Because of lack of information, processes, and tools, through 2012, more than 35 percent of the top 5,000 global companies will regularly fail to make insightful decisions about significant changes in their business and markets.

- By 2012, business units will control at least 40 percent of the total budget for business intelligence.

- By 2010, 20 per cent of organizations will have an industry-specific analytic application delivered via software as a service as a standard component of their business intelligence portfolio.

- In 2009, collaborative decision making will emerge as a new product category that combines social software with business intelligence platform capabilities.

- By 2012, one-third of analytic applications applied to business processes will be delivered through coarse-grained application mashups.
1. 1st/2nd/3rd Generation communication

The first wireless network (1G) came in the 1980s and are based on the AMPS (Analog Mobile Phone Service) standard. While 1G system implemented was identified as a variation of total Access Communication Systems (TACS). It is based on the idea of cells. Analog systems were primarily based on circuit-switched technology and designed for voice, not data. The spectral efficiency of 1G network was very low and the effective “energy/bit” was high. Handsets had short talk/standby times.

The advent of voice coding and digital modulation technologies brought the evolution to the 2G wireless networks. The 2G of the wireless mobile network was based on low-band digital data signaling. 2G wireless networks are digital networks. It is used for spectral efficiency and not for digital services. Various standards in 2G are TDMA (Time Division Multiple Access), GSM (Global System for Mobile Communications), CDMA (Code Division Multiple Access), PDC (Personal Digital Cellular), FDMA (Frequency Division Multiple Access). GSM was first implemented in 1991, are now operating in over 125 countries. GSM technology is a combination of FDMA and TDMA. In addition to GSM, a similar technology, called Personal Digital Communications (PDC), which uses TDMA-based technology, emerged in Japan. While GSM and other TDMA-based systems have become the dominant 2G wireless technologies, 2G technology is recognized as providing maximum data rates of 9.6 Kbps to 14.4 Kbps, digital voice, enhanced telephony features such as caller-id and services such as text based messaging, downloads of still images and audio clips, etc.

Because 2G data rates are too slow for today’s Internet, GSM, PDC and other TDMA-based mobile system providers and carriers have developed a 2.5G technology. It is a General Packet Radio Service (GPRS) packet overlays on 2G networks and increases the high data communication speeds. It is a new wireless standard, Enhanced Data GSM Environment (EDGE), has been developed to increase the bandwidth of GPRS and to increase the throughput per timeslot for both HSCSD (High Speed Circuit Switched Data) and GPRS. It is an always-on connectivity and instant messaging with small attachments service. EDGE almost triples the bandwidth capacity of GPRS 144 kbps to 384 Kbps. 2G/2.5G will eventually be phased out by the 3G wireless technologies. It provides high speed bandwidth to handheld devices i.e. high data transfer rates up to 2.05 Mbps for stationary devices, 384 Kbps for slowly moving devices and 128 Kbps for fast moving devices. With these advantages 3G also offer a wide variety of improved data services that combine realtime, streaming multimedia and high-speed mobile IP services, information technology, rich media, and offer diverse content. In the end, the evolution of the 3G networks will bridge the gap between the wireline and the wireless worlds.

2. Device Support

PDA: A personal digital assistant (PDA) is a handheld computer also known as small or palmtop computers. The first PDA was CASIO PF-3000 released in May 1983 but the term was first used on January 7, 1992 by Apple Computer. Newer versions of PDAs have both color screens and audio capabilities, enabling them to be used as mobile phones, smartphones, web browsers, or portable media players and also have a feature to access the Internet, intranets or extranets via Wi-Fi, or Wireless Wide-Area Networks (WWANs). Many PDAs employ touch screen technology.

Most modern PDAs have Bluetooth wireless connectivity, an increasingly popular tool for mobile devices. It can be used to connect keyboards, headsets, GPS and many other accessories, as well as sending files between PDAs. Many of them have Wi-Fi or WLAN-B02.11- connectivity, used for connecting to Wi-Fi hotspots or wireless networks but some older PDAs predominantly have an IrDA (infra-red) port.
Some of the popular PDAs are E-TEN, Abacus PDA Watch, Acer N Series, AlphaSmart, Amida Simputer, Blackberry, Fujitsu Siemens Loox, HP iPAQ, iPod Touch, iPhone, Palm, Inc.

iPad: The iPhone is an internet connected multimedia smartphone with a flush multi-touch screen and a minimal hardware interface. Lacking a physical keyboard, a virtual keyboard is rendered on the touch screen. The iPhone’s functions include those of a camera phone and portable media player in addition to text messaging and visual voicemail. It also offers Internet services including email, web browsing, and local Wi-Fi connectivity. The first generation phone hardware was quad-band GSM with EDGE; the second generation also adds UMTS with HSDPA.

Apple announced the iPhone on 9 January 2007. The announcement was preceded by rumors and speculation that circulated for several months. The iPhone was initially introduced in the United States on 29 June 2007 and is in the process of being introduced worldwide. It was named Time magazine’s Invention of the Year in 2007. On 11 July 2008, the iPhone 3G was released and supported faster 3G data speeds and Assisted GPS.

The iPhone allows audio conferencing, call holding, call merging, caller ID, and integration with other cellular network features and iPhone functions. Voice dialing and video calling are not supported by the iPhone.

The iPhone includes a visual voicemail feature allowing users to view a list of current voicemail messages on-screen without having to call into their voicemail. Unlike most other systems, messages can be listened to and deleted in a nonchronological order by choosing any message from an on-screen list. AT&T, O2, T-Mobile Germany, and Orange modified their voicemail infrastructure to accommodate this new feature designed by Apple.

There are several applications located on the Home screen: Text (SMS messaging), Calendar, Photos, Camera, YouTube, Stocks, Maps (Google Maps), Weather, Clock, Calculator, Notes, Settings, and iTunes (store). Four other applications, docked at the base of the screen, delineate the iPhone’s main purposes: Phone, Mail, Safari, and iPod.

Table 1: Media Comparison

<table>
<thead>
<tr>
<th>Media</th>
<th>Data rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 MHz Spread spectrum</td>
<td>2-6Mbps</td>
</tr>
<tr>
<td>6 GHz Spread Spectrum</td>
<td>2-6Mbps</td>
</tr>
<tr>
<td>23 Ghz Microwave</td>
<td>6Mbps at 50 kilometers</td>
</tr>
<tr>
<td>Intra building Infrared</td>
<td>10Mbps</td>
</tr>
<tr>
<td>Medium distance inter building Infrared</td>
<td>10Mbps at 500 meters</td>
</tr>
<tr>
<td>Long distance inter building Infrared</td>
<td>155Mbps at 500 meters, 1200 meters. Less than 20Mbps at 1200 meters</td>
</tr>
<tr>
<td>Bluetooth Version 1.2</td>
<td>1 Mbps</td>
</tr>
<tr>
<td>Bluetooth Version 2.0 + EDR</td>
<td>3 Mbps</td>
</tr>
</tbody>
</table>

characteristics are 9.7-inch (diagonal) LED-backlit glossy widescreen Multi-Touch display with IPS technology, 1024-by-768-pixel resolution at 32 pixels per inch (ppi), fingerprintresistant oleophobic coating, Support for display of multiple languages and characters simultaneously. The capacity is 16GB, 32GB, or 64GB flash drive. The processor used is 1GHz Apple A4 customdesigned, high-performance, low-power system-on-a-chip. It has sensors as Accelerometer, Ambient light sensor. It supports Audio playback as Frequency response: 20Hz to 20,000Hz, Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV. It also has TV and video Support for 1024 by 768 pixels with Dock Connector to VGA Adapter; 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable, H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats. It has Mail attachment support as Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel).

It supports Languages as Language support for English, French, German, Japanese, Dutch, Italian, Spanish, Simplified Chinese, Russian, Keyboard support for English (U.S.), English (UK), French (France, Canada), German, Japanese (QWERTY), Dutch, Flemish, Spanish, Italian, Simplified Chinese (Handwriting and Pinyin), Russian, Dictionary support for English (U.S.), English (UK), French, French (Canadian), French (Swiss), German, Japanese, Dutch, Flemish, Spanish, Italian, Simplified Chinese (Handwriting and Pinyin), Russian.

Accessibility is Support for playback of closed-captioned content, VoiceOver screen reader, Full-screen zoom magnification, White on black display, Mono audio Mac system requirements are Mac computer with USB 2.0 port, Mac OS X v10.5.8 or later, iTunes 9.0 or later, iTunes Store account, Internet access.

Windows system requirements are PC with USB 2.0 port, Windows 7, Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later, iTunes 9.0, iTunes Store account, Internet access.

Environmental requirements are Operating temperature: 32° to 95° F (0° to 35° C), Nonoperating temperature: -4° to 113° F (-20° to 45° C), Relative humidity: 5% to 95% noncondensing, Maximum operating altitude: 10,000 feet (3000 m).

3. Future Trends

WiMedia : WiMedia’s Ultra-WideBand (UWB) project was backed by the Bluetooth Special Interests Group and promises increased speeds for the Bluetooth data rates, that could reach speeds of 20 MB/s.

However, despite the fact that WLANs (802.11n Wi-Fi) and IMT-2000 devices usually are not paired to operate simultaneously, the inclusion of the 802.11n Wi-Fi as an underlying platform for Bluetooth-enhanced data transfer rates would mean that the two standards will be running at the same time. For instance, if an upcoming high-speed Bluetooth device is using the 802.11 antennae, it could disturb the IMT-2000 services that run in nearby frequency bands.

Despite the possible interferences, 6GHz Ultra-WideBand is the only alternative for high-speed data transfers over Bluetooth. Smartvue : Smartvue’s 802.11N draft MIMO (multiple input, multiple output) wireless is a compelling new approach that addresses the wireless communication challenges of IP video transmission such as range, reliability, signal fading, increasing interference and limited spectrum. Smartvue technology results in
MIMO (Multiple Input Multiple output) is the only multiple antenna technique that increases spectral capacity by delivering two or more times the peak data rate of a system per channel or per MHz of spectrum. The MIMO in Smartvue is much more than just smart antenna technology. Smartvue uses multiple transmitting radios, multiple receiving radios, and a lot of signal processing on both ends to create a complex, multi-dimensional, radiofrequency transmission that provides the highest-performing, most robust wireless IP video surveillance technology on the market today.

In particular, some such key technologies include:

- Smartvue offers wireless IP cameras that clearly display both light and dark areas in a single scene using an innovative ultra wide dynamic range (95dB typical, 120dB max) sensor. The Smartvue sensor which also offers 17 bit data capture and progressive scan imaging, converts light to a digital signal at each pixel, enabling each "point" of data in the image to have independent exposure times to deliver the highest image quality and color accuracy.

- Smartvue’s image consistency and accuracy is known for overcoming typical impediments of other cameras, which have trouble producing positive subject identification because of image blooming and smear, as well as limited color fidelity. In addition, most other IP video camera systems produce less than optimal quality video using single aperture capture, lower bit sensors, less efficient compression algorithms (MJPEG and MPEG4) and interlaced imaging.

- Smartvue is a network “edge” device. It uses its own secure wireless network to send video data directly from the cameras to the Smartvue wireless recorders. This system does not require video to be transmitted over the network for storage. Most IP video systems require cameras on the network which send bandwidth intensive video data to the network video storage device. This puts stress on the network, requires stricter security management of the cameras and network video recorder, and increases network maintenance and management resources.

1. Smartvue offers the very highest security for IP video applications.
2. Smartvue eliminates wireless interference.
3. Smartvue offers “wireless” camera power.
4. Smartvue works on practically any PC in most all browsers - with no software to install.
5. Smartvue offers instant remote access for free from almost any PC or cell phone.
6. Smartvue offers accurate “plug and play” video analytics. By taking advantage of multipath and simultaneously transmitting multiple unique data streams through the same radio channel, Smartvue multiplies the performance of wireless IP video:
- Smartvue multiples speed to deliver high bandwidth for high resolution, high quality IP video
- Smartvue multiples coverage to provide the longest IP video wireless range coverage
- Smartvue multiples capacity to allow for up to 10 cameras to reliably deliver
- video to a single DVR
- Smartvue multiples reliability making reliable wireless IP video surveillance a reality.

Table 2 : Comparision of Smartvue and other IP Cameras Technologies

<table>
<thead>
<tr>
<th>Properties</th>
<th>Smartvue</th>
<th>Other IP Cameras</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Technology</td>
<td>802.11N</td>
<td>802.11ab/g</td>
<td>Better technology</td>
</tr>
<tr>
<td>MIMO (Multiple Input Multiple output)</td>
<td>Yes</td>
<td>No</td>
<td>Solve the problem of range, reliability, interference, signal fading etc.</td>
</tr>
<tr>
<td>Multiple Antenna Technique</td>
<td>Yes</td>
<td>No</td>
<td>Better speed will be delivered from 3.18Mbps/MHZ to 6.35 Mbps/MHZ</td>
</tr>
<tr>
<td>Cost</td>
<td>Very Less</td>
<td>High</td>
<td>Cost just eliminated.</td>
</tr>
<tr>
<td>IP Address and Security Settings for Network</td>
<td>Automatic</td>
<td>Manual</td>
<td>Save time and gives more security.</td>
</tr>
<tr>
<td>Video Quality</td>
<td>H.264(AVC/MPEG4)</td>
<td>MPEG-2</td>
<td>It improves digital video quality and less storage requirements.</td>
</tr>
<tr>
<td>Video quality in Light and dark areas</td>
<td>Excellent</td>
<td>Poor</td>
<td>It produces highest image quality and color accuracy.</td>
</tr>
<tr>
<td>Stress on the network</td>
<td>Approximate to zero</td>
<td>High</td>
<td>Network maintenance management will be easier.</td>
</tr>
<tr>
<td>Security for IP video applications</td>
<td>Highest</td>
<td>Lower</td>
<td>It offers secure virtual technology which enables 128-bit encrypted USB access keys for remote and local access.</td>
</tr>
</tbody>
</table>

Advantages for video quality as well as reduced storage and network bandwidth requirements over the most common video compression algorithms such as MPEG and MJPEG, H.264 (also known as AVC or MPEG-4 Part 10) also provides more flexibility for a wide variety of networking environments.

5. Conclusion

This article takes a view at the emerging technologies in the field of Wireless communications. The latest trend being the Cameras which can be attached to any electronic device without wires. This new technology will revolutionize the use of cameras as a tool for PCs and other machines. Table 2 gives a Comparison of Smartvue and other IP Cameras Technologies.

6. References
1. Available at smartvue.com/why_smartvue_.html
Collective Intelligence Transforming The World Wide Web

Vivek Kumar Singh
LM-CSI & Assistant Professor, Department of Computer Science, Banaras Hindu University, Varanasi-221005, India Email: vivek@bhu.ac.in

The World Wide Web has undergone major transformations during last few years. The ability to gather information from billions of users on the web has enriched web applications and created innumerable new possibilities. Users are no longer only consumers but are actively participating to create new content and to add value to existing content. On one hand Wikis, Search Engines and Blogosphere are acting as a platform for collective intelligence of large number of users and at the same time techniques like information aggregators, rating & reviews, tagging and recommendation systems are adding value to applications by harnessing collective wisdom of users, and also giving users a better and personalized service. With increased use of appropriate semantic web data structures to organize the data on the Web, it is destined become an incomparable knowledge source and engine.

Keywords: Collective Intelligence, Web 2.0, Participative Web, Blogosphere, Semantic Web.

1. Introduction

Collective Intelligence can be defined as the ability of a group to produce better solutions to a problem than group members could produce working individually [1]. It is a form of intelligence that emerges from the collaboration and coordination of many individuals. Although it got wide attention very recently, it is not an entirely new concept and is not even limited to human beings. It involves both people and non-people entities. It is found in a variety of forms of collective working of animals like Ant Colonies, Bees and Bird Flocks etc [2]. The entities also need not interact directly, as in the case of stigmergic interactions in Ant Colonies [3]. Collective Intelligence as a perspective and phenomenon has existed since primitive societies. Tribes of hunter-gatherers, nations, modern corporations and political parties all act collectively with varying degrees of intelligence. But this ancient phenomenon is now occurring in dramatic new forms. With new communication technologies - especially the Internet - huge numbers of people all over the planet can now work together in ways that were never before possible in the history of humanity [4]. This makes it necessary to understand collective intelligence at a deeper level; and possibly because of this it has now become an active field of research involving people from Computer Science, Sociology, Business and Mass behaviour.

Internet has allowed very large numbers of people across wide geographical locations to work together resulting in totally new ways of interaction that were not possible earlier. Besides diminishing geographical distances it has also reduced the psychological and cultural factors inhibiting collective intelligence, such as individual biases, attitudinal problems and cultural boundaries, in direct group settings. There are two broad manifestations of Collective Intelligence in the World Wide Web (Web). The contributions of billions of users across the world have made the Web itself as a collective knowledge system. Applications like Wikipedia, Youtube, and Amazon are good examples in hand. In addition to the aggregated forms of collective knowledge, collective intelligence also involves deriving new knowledge from collective sets of interactions and contributions made by users. Applications like rating, reviews, tagging, recommendation engines, blogosphere mining are all examples of this category. The important thing in both cases is, however, not just to collect and display information, but to quantify and process it in an intelligent way to generate new and relevant information.
2. Collective Intelligence

Collective intelligence as a phenomenon is found in a variety of forms since ages. All organizations whether they be companies or sporting teams, families and even countries are all groups of actors doing things individually and at the same time resulting into macroscopic behaviour which seems intelligent. This capability is also seen in insects and animals, which have limited cognitive abilities. The way ants forage in their environments, the bees decide and exploit nectar, or the termites create complex mounds, may make one to believe that these are quite intelligent creatures, though the opposite is true. The individuals in all these cases have extremely limited cognitive capacity, yet collectively they make intelligent systems and cope with complex situations. Going slightly down the scale one can even take human brain, a collection of individual neurons working collectively to produce intelligent behaviour, to be an example of this sort.

Collective Intelligence, however, is not just a phenomenon; it’s also a perspective that can be applied to many different kind of phenomenon. To apply the perspective of collective intelligence to a phenomenon, the following elements must be identified: (a) a group of actors; (b) a set of resources available to those actors; (c) a set of actions that the actors take; (d) the collective results of the actions; and (e) a way of evaluating the results. Once these elements are identified, one can analyze how intelligently a given group acted given the resources it had or if they could be connected in some other ways to act more intelligently. The MIT centre for Collective Intelligence has added a new dimension to it by framing the key research question in collective intelligence as “How can people and computers be connected so that collectively they act more intelligently than any individual, group, or computer has ever done before?” [5].

Collectives of human groups sometime fail to produce collective intelligence. The difficulties with meetings and committees, where a number of competent people come together to solve a problem or devise a plan but often fail to come to a better conclusion, suggests for alternative structural and dynamical settings. The Web has provided an entirely new way of interaction and collective working, which seems to have overcome many of the factors inhibiting collective intelligence. In fact, the diverse nature of users, relatively informal organizational structure, dense communication structure, incentives for contribution and the opportunity for learning & better awareness over the Web, facilitates collective intelligence. Collective Intelligence manifests itself in web applications in primarily two forms: (a) as collective knowledge systems, which is seen in applications like Wikipedia & You Tube; and (b) as emergent & derived knowledge, which is obtained by using suitable techniques to extract knowledge from collective sets of interactions and contributions made by users, such as rating, reviews and tagging. While collective knowledge system [6] is an aggregation of intelligence of a large number of users and is computationally less complex; the emergent & derived knowledge is obtained by applying sophisticated computational and statistical algorithms on the data collected from users.

3. Web 2.0

During last few years the Web has seen such a transformational change that it is now popularly referred by new terms like Web 2.0. Pioneered by Dale Dougherty at O’Reilly, Web 2.0 is identified by following seven key principles: (a) the web as platform; (b) harnessing collective intelligence; (c) data is the next intel inside; (d) the perpetual beta; (e) lightweight programming models; (f) software above the level of a single device; and (g) rich user experiences [7]. Figure 1 contrasts the key features of Web 2.0 with conventional Web (Web 1.0). Wikipedia, Youtube, Amazon, Blogspot, RSS, del.icio.us, Digg, Facebook, Myspace, LinkedIn, Google services are few representative applications of Web 2.0.

Wiki’s are websites that allow people to contribute or edit content on them. The most famous Wiki is of course Wikipedia, which is an online encyclopedia started in 2001 and now having over 2.5 million articles in English alone. While Youtube is an invaluable collection of user posted videos, Amazon is an online showcase of product repository. Both Youtube and Amazon use user transaction histories to provide better and personalized services. For example suggestions about related videos and related books respectively are produced not by static categorization but by monitoring and recording user browsing history. Blogs are online journals which provide for free – form writing, with entries appearing in the most-recent-first manner. Blogs tend to be written in a personal, conversational style and provides the readers to post comment on them and to link to them in their blog posts. RSS technology allows subscribing to Blogs and to many other news services. del.icio.us is collaborative bookmarking and tagging technique (popularly referred as folksonomy). Digg allows voting by community on everything submitted. As people read articles or blogposts they can give their votes in form of digs which get recorded on dig servers. Myspace, Facebook and LinkedIn are all social networking sites that allow people to connect and interact with each other. People joining a social network usually create a profile and then build a network by connecting to friends and contacts in the network. Google’s bundle of services (search, map, Gmail style intelligent address book etc.) are another set of popular applications of Web 2.0.

Web 2.0 in essence is all about making it participative by putting user at the centre and building user centric applications rather than being restricted to content centric applications. One has to understand that it is the data obtained from user interactions that gives an application its value. For example it may be easy to design an entirely new application similar to Wikipedia, Amazon, Flickr, Youtube or Google but it can in no way replicate them in usage & popularity. It is the tremendous amount of valuable data collected by both explicit and implicit contribution of billions of users over a long period of time, which gives these applications their worth. Web 2.0 is hence data and software combined. Users are now not only consuming services but are also contributing to improve the applications thereby becoming co-developers. ‘Release early and release often’ has now taken the form of ‘the perpetual beta’, i.e., applications are developed in an open source manner and are continuously modified to incorporate positive contribution from users. As the number and variety of users of an application
grows it starts becoming better.

Web 2.0 thus calls for following core competencies in Web 2.0 companies: (a) services, not packaged software, with cost-effective scalability, (b) control over unique, hard-to-recreate data sources that get richer as more people use them, (c) trusting users co-developers, (d) harnessing richer as more people use them, (c) trusting services, not packaged software, with cost-competencies in Web 2.0 companies: (a) grows it starts becoming better.

4. Collective Web Intelligence

There are primarily two approaches of generating web intelligence, namely content-based and collaborative-based, depending on the source of information exploited. Content-based approach uses the information within the content on the site itself. The content on the web could be an article, picture, video, blog, message etc. Each item has some metadata associated with it. This metadata may be professionally defined attributes (such as make, model & price for an automobile), user generated tags, popularity rankings, ratings and a classification or categorization of the item into some known groups. This metadata is often organized as set of attributes which qualify the item. Quantifying the information into a proper and usable form is the key to content-based approach. Collaborative-based approach, on the other hand, uses the information obtained from monitoring and measuring user interactions with the application. User transaction history, contents viewed by him, path followed by him in locating some content, feedback to polls and questions, rating, voting and tagging all are useful for intelligence. A user’s profile sometimes itself becomes valuable information. For example some content on a specific topic frequently viewed by users in a particular age group (say teenagers) can be recommended to other users in the same age group.

To derive and use collective intelligence on the Web, following three things have to be there: (a) Users interacting with the application as well as with each other; (b) aggregating whatever is learned from users; and (c) using the aggregated information to recommend relevant content and provide personalized services to users [8]. The information provided by users of web applications may result into three different intelligences. First is through explicit information provided by the users (in form of reviews, tags, bookmarks and recommendations etc.). Second is through implicit information that a user provides typically in an unstructured format (information contained in blogs, wikis and communities etc.). The third form is through derived information, which is obtained by monitoring and analyzing the data provided by the users.

A positive review or a recommendation about an application or content by a user (possibly informed or influential) has a great impact on other users of similar type. Similarly tags, whether generated by web editors or by a collaborative user tagging system, help users in searching the desired data and improve navigation of the content. Del.icio.us is one popular tag cloud generating application. Voting on content by a community also helps in involving and obtaining useful information from the user and also helps in sharing, discovering and promoting important news. Digg is a wonderful example in hand. All these examples are cases of using users’ explicit comments or reviews about some content to find and recommend relevant content for other users.

Relevant and useful information also appear in user contributions in unstructured form like reviews, blog posts, messages and forums etc. Blogs are becoming highly influential and are playing significant role in opinion formation on the social web. This is quite evident from the fact that the blogosphere comprised of about 112 million blogs as on August 2008 [9]. Almost one blog post is submitted every second. Figure 2 reports the weblog growth scenario reported by Technorati. The ease to publish and free form writing style allows people to express their opinions, ideas, experiences, thoughts and wishes in a relatively informal manner. Blog sites now often serve as repository of valuable information and opinion about virtually every topic of interest. A number of efforts are now going on to mine knowledge available in blog posts.

The third form of intelligence is the one which is derived from by monitoring and recording user browsing and transaction histories and then subjecting them to techniques like data mining, clustering, predictive analysis etc. For example, rating information about an item by a group of users can be used to answer two questions: what are the other items related to this item (using the information that what are the other items viewed by the users who have rated this item and then aggregating this for a number of users) and who are the users similar to a particular user (using the information who are the users interested in the same set of items viewed by this user). Cosine and Correlation based similarity computations can be used to get this information. Amazon’s relevant book displays, Youtube’s similar videos are both examples of this type. They both keep track of user interactions with the site, for example keeping record of the list of books a user of a particular type has viewed, and use it to suggest meaningful results and recommendations to other users.

Appropriate data structures are necessary for storing the quantified information about items and users. Fortunately research in information retrieval has already given such models and tools. Term frequency and Inverse document frequency help in extracting information from otherwise unstructured text. User-item matrix and other statistical measures are used to store user information [10]. With developments towards the semantic Web [11] [12], the collected data can be used to extract structured data from the unstructured data. In semantic Web, there can be thus three approaches to move to next level of collective knowledge systems: (a) to expose the structured data that is already in the databases used to generate

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>133 million blog records indexed by Technorati since 2002</td>
<td></td>
</tr>
<tr>
<td>7.4 million blogs posted in last 120 days</td>
<td></td>
</tr>
<tr>
<td>1.5 million blogs posted in last 7 days</td>
<td></td>
</tr>
<tr>
<td>900,000 blog posts in 24 hours</td>
<td></td>
</tr>
<tr>
<td>76,000 blogs with Technorati Authority of 50+</td>
<td></td>
</tr>
<tr>
<td>Top 100 blogs by Technorati Authority</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 2: Key statistics about the state of Blogosphere as in March 2009. (courtesy www.technorati.com)
5. Conclusion

Collective Intelligence, the new form of intelligence has not only demonstrated that social behaviours (in addition to evolutionary) can be used for formulating problem solving techniques to solve complex optimization problems (as evident from Swarm Intelligence techniques) but also the fact that it can play the pivotal role in transforming the Web. Web is now one of the most important tools and playground for collective intelligence. At one end it has become a platform for collective knowledge of billions of users (through applications like Wikipedia); and at the same time a number of techniques are being used to create new knowledge from the user posted content on the Web. We now have web services and applications, which provide more personalized service, suggest valuable and highly relevant content, and generate new personalized service, suggest valuable and applications, which provide more

References

Business Models


Business model design template: Nine building blocks and their relationships, Osterwalder 2004

Many different business conceptualizations exist; Osterwalder’s work and thesis (2010, 2004) propose a single reference model based on the similarities of a wide range of business model conceptualizations. With his business model design template, an enterprise can easily describe their business model

• Infrastructure
  o Key Activities: The activities necessary to execute a company’s business model.
  o Key Resources: The resources that are necessary to create value for the customer.
  o Partner Network: The business alliances which complement other aspects of the business model.

• Offering
  o Value Proposition: The products and services a business offers. Quoting Osterwalder (2004), a value proposition “is an overall view of products and services that together represent value for a specific customer segment. It describes the way a firm differentiates itself from its competitors and is the reason why customers buy from a certain firm and not from another.”

• Customers
  o Customer Segments: The target audience for a business’ products and services.
  o Channels: The means by which a company delivers products and services to customers. This includes the company’s marketing and distribution strategy.
  o Customer Relationship: The links a company establishes between itself and its different customer segments. The process of managing customer relationships is referred to as customer relationship management.

• Finances
  o Cost Structure: The monetary consequences of the means employed in the business model. A company’s DOC.
  o Revenue Streams: The way a company makes money through a variety of revenue flows. A company’s income.
1.0 Introduction
There is a growing list of ICT devices that are now allowing us to interact with each other, as if all are in same room, while freely moving anywhere. This experience is getting better day by day; impact of it on eLearning is easy to visualize. Adoption of e-Learning in higher technical education in USA is growing at a healthy rate. Indian educational setup, plagued with various constraints including shortage of quality faculty resources has great opportunities to benefit from this technology.

Deployment of e-Learning is not a “one size fits all” solution. There are only a handful premier schools (IITs, a few leading private schools) that get brighter students and also have more resources at their disposal. For them, the dominant driver for deployment of technology may not be faculty issue. Historically, only a small percentage of the graduates of these colleges have joined work force in India. The Indian industry has been predominantly depending on Tier-2 and 3 colleges where faculty shortage has been a very serious concern. Over and above there are many other factors that impact quality of education delivery. Could deployment of e-Learning in these colleges be of help [4]?

This paper presents experience from an experiment where e-Learning was blended with traditional approach to improve quality of education in a constrained educational ecosystem. This deployment of e-Learning is more than mere hosting of course material and for supporting communication (for example email, assignments) between a teacher and students. Deployment of e-Learning in many leading commercial organisations includes assessment of learners.

A large number of engineering colleges in our country suffer from resource constraint including serious shortage of good quality faculty. This is where e-Learning could be of great help. This paper shares the experience of blending the e-Learning through “brick (classroom) and click (elearning)” of a theory and a lab course in a typical engineering college. Open source software Moodle was used for this purpose and extensive use made of its quiz and log module for reinforcement of teaching. The limited experiment suggests that there are many nontechnical challenges that need addressing for any meaningful benefit from e-Learning.

**Keywords:** eLearning, Technical education, Implementation Perspective, Brick & Click, Moodle

N K Mehta**

---

This was an invited lecture at ConFER10, held at JIET, Guna, India.

**Present Address:** CSE Dept. Amruta Institute of Engineering & Management Sciences, Bidadi, Bangalore 560109, India, email: docmehta@yahoo.com

Impact of eLearning in education and training is visible, specially overseas, in the form of anytime – anywhere learning and educational programs addressing students in territories beyond their traditional zone. New colleges, primarily offering technical and science programs have embraced eLearning in a big way in USA.

Though not that entrenched, many colleges and institutes in India have made progress in deployment of eLearning for supplementing traditional “chalk and talk” approach. Most of it is in the form of web hosting of course material and for supporting communication (for example email, assignments) between a teacher and students. Deployment of eLearning in many leading commercial organisations includes assessment of learners.

A large number of engineering colleges in our country suffer from resource constraint including serious shortage of good quality faculty. This is where e-Learning could be of great help. This paper shares the experience of blending the eLearning through “brick (classroom) and click (elearning)” of a theory and a lab course in a typical engineering college. Open source software Moodle was used for this purpose and extensive use made of its quiz and log module for reinforcement of teaching. The limited experiment suggests that there are many nontechnical challenges that need addressing for any meaningful benefit from e-Learning.
image capture & display, all at a fraction of cost and in convenient form and size give us tremendous flexibility in movement without fearing much loss of touch with others. At the same time various developments in business scenario have fuelled globalisation. Technical developments have only added to the pace of globalisation. Consequences of these, reinforce the need for rapid upgrade of knowledge base of employees, continuous cost reduction, faster introduction of new products and services etc. The need for frequent update of skills and knowledge is not just true during employment period or for job. There is need of “life–long learning” as life style and products change take place. E–learning is seen as an effective and less expensive solution to meet the continuous training needs of employees often separated by time and distance [5].

Educational Institutions have not been far behind in exploring e–Learning in their domain as it holds promise for some of the strategic concerns that institutions have, for example cost containment of educational delivery, reaching out to student population that cannot attend regular classes. Looking from the learner’s perspective, e–Learning opens up new variants for learning. It can make learning more effective and more convenient. Technology can simulate a range of conditions, immerse people in virtual environments, and provide safe practice opportunities as in the case of aircraft or driving simulators. Technology allows us to learn at our own pace and place, access information in personalized order and as often as desired. Unlike their western counterparts, Indian students are not that communicative in the classroom; they do not ask questions. However, the same students are comfortable to ask questions in various online forums or share their feelings in social networking sites. As they are not challenged or watched in the electronic media, Indian students may sometime feel more comfortable to deal with an electronic instructor. Technology in itself may not guarantee better learning, however, when effectively deployed, it can help focus attention while attracting and maintaining a learner’s interest.

A recent survey on the state of online learning in US higher education [1] shows that

- some courses are being taken by students completely in online mode at undergraduate level
- even students in post–graduate and research programs are using e–learning
- there are quite a few educational programs which are being offered completely in online mode.

There is no such thing as universal or common technology solution for learning. Some educational programs lend themselves better to e–learning than the others. Technical programs that are at undergraduate level have larger deployment of e–Learning than MBA programs [3]. Different kinds of learning goals demand differing strategies, tools, and resources.

3.0 e–Learning

e–Learning” or electronic learning refers to a set of technologies that facilitates learning using electronic mediums primarily Internet based and where learners are on different time and/or distance coordinate from instructor’s.

3.1 eLearning Technology Set

The Table 1 appearing below shows a number of technologies which get included in the eLearning set. Key software that helps in learning is Learning Management System (LMS). LMS has two broad groupings, one dealing with delivery, tracking and managing training / learning ; second dealing with authoring, editing and organisation of eLearning contents. Open source software like Moodle, Sakai, Claroline and proprietary ones like Blackboard, webCT are examples of a LMS. These systems have modules for announcement of course details, calendar, assignments, notification to students, quizes that provide great convenience to an instructor. Interactions among students and a teacher is facilitated by a collaboration / groupware software. Thus there are enough components in eLearning set to simulate a class room setting.

Table 1: eLearning set

- A computer with network, primarily internet as a delivery medium and supporting
  - Learning Management System
  - Net meeting, threaded discussions, Yahoo / MSN / Google groups
  - Blogs, discussion forums
  - Web cams / WebEX
  - Wikis
  - Email / email list
  - Videoconferencing
  - Podcast / mobiles / video presentations
  - Electronic Books
  - DVD, CDROM etc.

Though eLearning is largely dependent on networks and computers it is evolving to encompass other mobile technologies that are commonly carried on person (e.g. cell phones, PDAs). The advantages of eLearning often cited in literature from learner’s and institutions’ perspective are mentioned in Table – 2 and 3.

Table 2: Advantages of eLearning from learner’s perspective

- Learning at own pace and time with freedom of location
- Revision as often as desired
- Greater enforcement of discipline in study than in the traditional class where workload is often bunched around tests and writing assignments.
- More rigorous tracking of student’s progress and completion of assignments
- Better preparation and involvement. A student cannot be a silent participant hiding at the back. Comments in the chats and discussion forums on the website show how actively one is engaged in the assignments.
- Also, better focus and understanding due to threaded discussions.
- No inhibition in sharing thoughts – do not have to worry who is observing or making faces

Table 3: Advantages of eLearning from the school’s perspective

- Education delivery not limited to just class hours and visiting hours
- Possible to attract students from outside the traditional service area
- Can grow continuing and /or professional education
- Can increase the diversity of student body
- Reinforcement channel to assist weaker students (beyond regular class hours)
- More effective Alumni / donor outreach Opportunity to reduce / contain cost of operation Higher utilization of infrastructure possible leading to higher throughput and cost reduction

3.2 Approaches to Educational Delivery deploying eLearning

Depending on the extent of usage of eLearning, nature of the education delivery gets classified in different categories. Lectures in class room setting can be broadcast over video or webcam either in live mode (i.e. real time) or could be stored and accessed at some other time of convenience. Interaction component of class room setting can be supported using mail, blog, groupware like Yahoo Group while real time collaboration is achievable using softwares like chat, Adobe connect.

The “traditional approach” also called ChalkandTalk is now often seen supported by groupware and hosting software that
support administrative tasks, for example display of course related material - syllabus, assignments, announcements, submissions. Other extreme, called distance leaning, is called “Online Learning” where students do not meet their teacher in any class room setting and are fully supported for lectures, assessment and administrative tasks using various eLearning software components. In between these two extremes lies "Hybrid or Blended" approach where class room learning and online learning get mixed in various forms and proportion. There are many examples in India itself where a teacher takes class in main center and the lecture is broadcast in real time to students in studios in other cities. There are also examples where a portion of course is supposed to be achieved completely online and for rest, presence in class room is desired. A number of factors influence selection of a particular approach; the crucial ones being program nature, regulatory framework that governs launching of different courses and conduction of existing ones, age of institution and financial health. Therefore adoption of elearning in institutions is not uniform in pace and shape.

4.0 Environment of Technical Colleges in India

Most engineering colleges of India, affiliated to state technology universities and private universities operate in educational ecosystem where:
- not many students can afford laptops / desktops with Internet connection
- classes lectures during a semester are packed typically from 8:30am to 3:30pm every working day
- many students spend substantial amount of time in commuting between home and college; this is specially true in a metro city
- a large percentage of students get classified as average in learning ability and intelligence
- many of them come from non-English medium schools
- class sizes large, vary between 55 and 70 students
- only a few students display interest in acquiring additional knowledge and spend extra time for this purpose
- colleges make minimal investments in IT infrastructure; most of them have inadequate system administration support
- lastly, faculty issues are well known.

University and college expect students of regular program to attend certain minimum number of days of college lectures and lab classes to be eligible to appear in university examinations.

In such an ecosystem it is indeed a big challenge for college and teachers to make any substantial improvement in quality of education. At the same time, Indian industry depends on supply of technical workforce from better of this lot. Large recruitment in IT industry over last 78 years supports this fact.

Progressive universities like VTU have made effort to beam lectures via satellite. Under a National Mission IITs and IISc are packaging lectures for delivery over web. The draw back in both the cases and as was also the case in past with UGC broadcasts, a learner, if attending, can remain a passive object in these video sessions.

Our environment is different from developed countries - where students have access to various technology gadgets (laptops, iPods etc) from early age, where they work to support their studies, hence have limited time for face to face interaction in college. Students of our colleges with limited resources can hardly hope for “Learning at own pace and time with freedom of location”.

5.0 Experimentation of Blended Approach

5.1 The Brick and Click (B&C) Approach

In author’s view elearning in some suitable form is essential for improving quality of education in technical colleges where faculty supply, in particular, has not kept pace with the expansion in educational system. However, this eLearning solution, to work within constrained educational ecosystem needs suitable tailoring. It cannot ride on “any time, any where” advantage claimed most of the time in literature. Moreover, it needs to ensure more effective use of time in college where computing resources are available to all students. The approach should be workable with large class size. It should provide opportunity to students to revise a topic as many times as they like and as fast or slow as desired till hopefully understood. In a large class with limited sessions, a teacher can repeat explanation one or two more times at the most if a student fails to understand a concept or topic.

Most subjects in the undergraduate engineering education are foundation courses in different engineering topics. These introduce new terminologies, concepts and simple applications to students. Students accumulate knowledge by memorizing new terms and understanding the related concepts. It is felt that an approach that assists in this exercise helps in learning. The “Chalk and Talk” approach fails to meet the goal of effective learning in large size classes as students differ on assimilation rate. Also due to limited time on hand during normal semester, it is not easy to administer frequent tests to understand and monitor progress of learning.

Therefore, a blended model, brick (classroom) and click (elearning) should be more effective where eLearning overcomes the difficulties in traditional approach on time constraint and differing assimilation rate. ELearning plays supplemental role and not a substitution.

Subsequent sections describe the B&C approach that recognizes the constraint of educational ecosystem and also the nature of course to make selective deployment of functionalities of a eLearning software in this experiment at AleMS. It is a typical engineering college in India and one of the 170 odd colleges affiliated to VTU – the technology university in Karnataka.

5.2 Selection of eLearning Software in AleMS

5.2.1 Selection Factors

Selection of eLearning software was driven by a few key factors, given below.

- Affordability – this factor is very important as colleges have limited IT budget;
- Availability of support – most colleges have very limited in house system administration capabilities. A system like Moodle demands familiarity with a number of software (including Apache, PHP) that are not part of normal curriculum. Hence it is imperative to select an eLearning software where good technical support is assured.
- Fit within college IT environment - For the reasons mentioned before it is essential that the problem of licenses and support is not compounded by adding variety in software environment;
- Ease of use - for administrator, teachers and students.
- Tracking of learning
- Setup demand – time and effort required to set it up for use should be small.

Considering above factors, the search zeroed on Moodle [2].

5.2.2 Moodle

Moodle is an open source eLearning software that works on LAMP (Linux, Apache, MySQL and PHP) platform. It has both course management and learning management features. Students need only a standard browser to access Moodle, be it on internet or college intranet. Moodle is made available in easy to install package. It gets installed very conveniently using Synaptic Package Manager on a Ubuntu server. It also has a very large user base and is supported by a very large active community. This is a big comfort in seeking
solutions to problems during setup and use. Moodle GUI provides very convenient navigation to students, teachers and administrator. Features of Moodle can be broadly divided into two groups: one related to course creation and management; second related to managing learning (Learners’ activities). A brief description of major features under the two categories is mentioned in Annexure [6]. As one would notice many of these features are useful for exchange of information outside classroom. It focuses on tools for discussion and sharing artifacts, that support learning pedagogy “learners learn best when they collaboratively create shared artifacts with shared meanings”.

Moodle also has many useful features for managing learners in a variety of ways. These provide help to administrator and teachers to control access and monitor progress of students and course.

5.3 College IT environment

AleMS has opted for open source platform. Most computers in Lab and office run on Ubuntu with OpenOffice, and are networked with a server which also uses Ubuntu OS. Moodle is installed on the server. Access to Moodle has been made available only on college intranet.

5.4 B&C Experiment

An attempt was made to adopt B&C approach in teaching of a computer science subject and associated lab during August-December 2009. The subject is 3 semester course on Data Structure (DS), that involves about 4552 class room contact hours and coverage of 15 programming assignments over about 3.5 months. The selection of this combination of subject was intentional for experimentation with eLearning. DS course in 3 semester is a foundation course to expose students to basic concepts, vocabulary, and foundational ideas. The companion Lab course helps in applying the ideas introduced in the theory course.

Theory class sessions made use of electronic presentations prepared using OpenOffice (equivalent of Powerpoint). Same presentations were loaded as resources on Moodle for different topics. Instructions for lab exercises were also loaded as resources. During Lab classes students were insisted upon to refer to instructions on Moodle before proceeding with programming. They were also encouraged to refer to slides of related theory topic.

It took sometime for students to adjust to this changed style of conduction of lab sessions. Many skipped referring to material on Moodle and attempted programming in usual style prevalent in most technical colleges. The better students were happy and comfortable to find material easily available, right in front of them on their monitor for reading at their pace.

In order to force every student to study on their own, the live Log feature of Moodle came handy. It was used to monitor who were yet to access the instruction pages. Students soon realised that they could not just pass away time; their Moodle access were visible to instructor without him/her watching over the shoulder. Soon, most got into the habit of reading Lab instruction on Moodle. They were instructed not to proceed with programming until they read the background information and instructions and attempted desk work as directed. This helped in building comfort in use of online material however it was not an assurance of their understanding of the concepts and methods of the topic.

Soon, quiz questions related to lab session and topic were introduced and students were asked to attempt these before proceeding with programming. Moodle provided online progress on quiz questions to instructor, and students also could see their score instantaneously. As quiz module was set to randomly arrange questions and answers, students found little help in peeping over neighbour’s monitor. This forced students to read and understand the online material seriously. Those who got low scores in quiz were discouraged to proceed with programming. It was satisfying to see many students coming during break time to access the online material and at times downloading the material for reading at home. Hostelers had advantage that they could access Moodle even after college hours. This change would not have taken place if Log and quiz feature were not there and were not suitably blended in teaching sessions.

During the Moodle access, some students discovered the mail feature and used it to raise their doubts to instructor. Now they did not have to worry of reaction of their class mates when asking question. It is worth mentioning that during semester end internal lab examination, the quiz feature was very handy substitute for viva. Now, of course, students were allowed only one attempt. There was another advantage of quiz module as weaker students could be asked to repeat attempts and forced to learn before finalizing their marks.

5.5 Content creation

Quiz questions of true false, multiple choice, short answer, matching question type allows objective evaluation and scores become available instantaneously on Moodle. This feature is very handy when dealing with a large size class and where quite a few students need reinforcement of subject matter.

Most questions in university exams are of essay type (open ended) so also in viva during lab exams. While Moodle provides submission support and manual grading of essay questions, it is felt that it is easier to evaluate answers to essay questions in hard copy form. Collection of answer copies is not an issue in a fulltime college program. In parallel, however, an attempt was made to explode some essay questions into objective type of questions for posting on Moodle. This was not a straight forward exercise.

Resource module was found more convenient as compared to Lesson module for posting subject material. The material could be developed separately or downloaded from web and uploaded for bringing content into a course. Sometimes the material was created using Moodle’s text editor. The resources could be created and uploaded in any order. Each of these is a standalone object. Calendar facility was used often to announce course related events and campus events for example, submission dates, exam dates, college holidays. DS subject was announced with enrollment key to limit access to students. Teachers and students were manually enrolled or removed from a course.

The DS subject is common with ISE branch and is offered in the same semester, however the teaching approach in ISE class remained unchanged. Students of ISE were , however, allowed to enroll on Moodle for DS subject. Log facility allowed teacher and administrator to watch the interest level of ISE students. Log feature was found very useful feature of Moodle to understand learner activity on different dates and various activities.

eLearning platforms including Moodle provide many other bells and whistles which can make learning more enjoyable and effective; however the ecosystem mentioned earlier does not permit many of those to be exploited.

The key aspects of the approach attempted can be summarized as follows:

− Lab classes used to drive the learning by leveraging Moodle. This addressed to large extent constraint on time and computer availability for eLearning.
− “Chalk and talk” is still the predominant method for course delivery, however, class lectures were supported by epresentations. Same were posted on Moodle for reference by students as per their convenience. Use of epresentations in class has brought its own advantages. The significant one being students paying more attention to understand...
than notebooks become more affordable and have large battery backup or access to convenient power supply in class, students will probably put their notes directly on their copy of presentation material.

- Use of live log during Lab session to understand if weaker students made efforts or not in accessing lab instructions and quizzes before attempting lab exercise;
- Use of Log reports to understand who accessing what and when and for how long;
- Moodle support useful for preparing for viva for lab external exams; students could be made to revise lessons a number of times, with lesser danger that they would be mugging answers as Moodle can be set to shuffles questions and answers.
- Analysis of quiz question helpful in understanding what needs to be further stressed or clarified.

It is essential to appreciate that:

- this approach demands very high involvement of teacher during lab session for enforcing the desired discipline;
- this approach demands large effort outside class presence in preparation of quizzes and lessons and in other activities related to Moodle;
- creating suitable quizzes and selecting the right variety (i.e. true/false, multiple choice etc) is a difficult part; more so conversion of essay type of questions
- day scholars remain at some disadvantage, they could only download course material and take home for reading but not the quizes. Access of Moodle on Internet has infrastructural demand for college and students.

As of now, it is difficult to say, in concrete measures, the benefits of B&G approach that accrued and to what extent it achieved the goals of the experiment. At the end of the semester, however, it was observed that:

- a larger percentage of students were comfortable in programming DS exercises,
- faculty spent proportionately less time in reexamination
- lab could be managed with lesser faculty effort without compromising on the attention and quality of instructions
- weaker students could be given opportunity for more attempts as against giving grace marks
- students were made to prepare better and harder in studies

- students were more comfortable in reading and understanding material online.

Results of university examinations are awaited.

6.0 Key Success Factors

Based on the experiment it is felt that for adoption of this hybrid approach in technical education in a setting similar to that of AleMS, (please revisit section 4.0) critical requirements are:

1. Suitable IT infrastructure
   - Class rooms should be equipped with DLP (digital projector) so that course material put on Moodle is same as used for supporting class lectures. This avoids confusion in a student’s mind in correlating class notes with content on Moodle.
   - Students should have easy access to systems during college hours. It is easy to extend access to all during break times and extended period. This is a very crucial aspect else there is no sense in putting content and quizzes on Moodle.
   - Also faculty should have easy access to computing resources (laptop, scanner) for content creation and course administration.

2. Course planning and administration
   - Where theory subjects have associated computer labs, access to system for eLearning can be easily planned and integrated in teaching, by careful alignment of theory topics and lab experiments.
   - For subjects where there is no associated computer lab, it is essential to find a slot in timetable (or schedule theory periods suitably) where students can get access to system on regular basis.
   - It is extremely essential to use some Moodle data (e.g. quiz score) for course administration and/or grading the performance of students in the subject. This helps in creating pressure on students to encourage eLearning. Once they become familiar and notice the advantage, system becomes self supportive.

3. Content creation
   - Quality of course material and quizzes on Moodle should be such that it generates interest and is found useful by students.

4. Faculty commitment
   - Allocation of courses and responsibilities to a faculty should be such that it gives him/her sufficient time to prepare material for eLearning and administering the course on Moodle. First cycle of a course puts very high demand on time. Next two cycles are not likely to reduce substantially as experience is pooled back to refine the course content and quizzes.

As a consequence, it is advisable to take up those subjects first for eLearning effort which are expected to be offered on regular basis.

- Faculty should have patience and interest in examining essay type and open ended questions for conversion into suitable quiz questions that could get evaluated objectively by the system itself.
- Also, faculty should make judicious selection of suitable form of quiz question.

This limited experiment shows that there are many non technical challenges that also need addressing for successful implementation of eLearning.

7.0 Areas of Investigation

This limited experiment suggests seeking answers to some related issues for enhancing the scope of eLearning. These are:

- What could be other variations for educating lesser privileged students in technical education, within the crucial constraints of time, hardware accessibility and faculty shortage? This may be unique problem in India where the federal government has directed institutes to admit students from socially backward sections with lower cutoff and under reserve quota. Same is the case with diploma holders seeking lateral entry in 3rd semester of undergraduate engineering program.
- How colleges can collaborate in building quiz bank quickly?
- How do we motivate teachers to embrace elearning? How should faculty evaluation standards change so that professional growth (not just within the college) is not impacted because of diversion of effort in eLearning initiative
- Certain subjects e.g. Maths, Chemistry require entry of special characters, equations and diagrams and some animation. These do not get conveniently incorporated in contents and objective quizzes. What are good work around?

8.0 Closing Remarks

Due to constraints of ecosystem within which AleMS operates, the approach and scope for implementation of eLearning software was suitably modified without
losing the main focus of improving the quality of education delivery during "college time and in college". Stakeholders can expand the system boundary, some parts with ease and suitable motivation. Autonomous colleges (even within state university setup) have more freedom in curriculum planning and students’ evaluation. Such colleges with more resources should be able to implement eLearning software like Moodle in greater breadth and depth and gain substantial improvement in B&C approach for increasing quality of education imparted. Technology changes are favourable for implementation of blended approach; for example, price of notebooks is now within the reach of larger masses. Factors that influence success of blended approach have been identified in the paper. These are applicable in any variation of the B&C approach. Nontechnical challenges should not be underestimated for deriving true benefits.

References:
6. Using Moodle by J Cole and H Foster, O’Reilly publications, Nov. 2007

Annexure

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>Feature / Module</th>
<th>Brief details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lesson</td>
<td>For delivery of lesson pages and testing understanding of learner to decide progression to next topic or revision of earlier ones</td>
</tr>
<tr>
<td>2</td>
<td>Quiz</td>
<td>To build and administer various forms of assessments</td>
</tr>
<tr>
<td>3</td>
<td>Resources</td>
<td>For bringing content of a course; Course content can be developed separately and then uploaded easily on system</td>
</tr>
<tr>
<td>4</td>
<td>Assignment</td>
<td>For posting assignments; learners can post their submissions, Often used feature specially in nonresidential MBA programs</td>
</tr>
<tr>
<td>5</td>
<td>Chat</td>
<td>For realtime synchronous communication (discussion) by learners</td>
</tr>
<tr>
<td>6</td>
<td>Dialogue</td>
<td>For onetoone asynchronous communications</td>
</tr>
<tr>
<td>7</td>
<td>Choice</td>
<td>To collect quick feedback (as in a poll) on a question with a number of choices</td>
</tr>
<tr>
<td>8</td>
<td>Forums</td>
<td>For threaded discussions on shared topics – helps in evolving understanding of the matter</td>
</tr>
<tr>
<td>9</td>
<td>Glossary</td>
<td>For creating and maintaining glossary of terms used in a course.</td>
</tr>
<tr>
<td>10</td>
<td>Workshop</td>
<td>Learners can assess each other’s project</td>
</tr>
</tbody>
</table>

Learning Management Features

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>Feature / Module</th>
<th>Brief details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Participants information</td>
<td>For capture of basic student data including photo</td>
</tr>
<tr>
<td>2</td>
<td>Group formations</td>
<td>For creating group memberships and defining interactions</td>
</tr>
<tr>
<td>3</td>
<td>Calendar</td>
<td>For posting calendar of events at college, subject and individual level</td>
</tr>
<tr>
<td>4</td>
<td>Administration</td>
<td>For role allocation, enrollment, authentication, deallocation, course, backup/restore, language selection etc.,</td>
</tr>
<tr>
<td>5</td>
<td>Grades</td>
<td>For viewing grades of enrolled students on different components</td>
</tr>
<tr>
<td>6</td>
<td>Logs</td>
<td>For monitoring of various activities of learning</td>
</tr>
<tr>
<td>7</td>
<td>Files</td>
<td>For managing course resources within a file area</td>
</tr>
<tr>
<td>8</td>
<td>Enrollment keys</td>
<td>For controlled access to a course</td>
</tr>
<tr>
<td>9</td>
<td>Email notification</td>
<td>For notification of postings</td>
</tr>
</tbody>
</table>

About the Author

Dr Mehta, completed his BE from GEC, Jabalpur in 1971, Post graduation from NITIE Mumbai and PhD from Lehigh Univ., USA. He worked in various senior roles in IT industry including Resident Manager, TCS, Bangalore, Chief Operating Office of Xansa (now called Steria). A member of CSI since 1976, he has contributed regularly to CSI communications. He is a recipient of Kewal Dube Award of CSI. Now settled in Bangalore, he spends time as a consultant and a visiting faculty to engineering and management schools.
IT-Enabled Supply Chain Management using Decision Support Systems

Prashant R Nair* & O A Balasubramaniam**

*Vice-Chairman (Information Technology), Amrita Vishwa Vidyapeetham (University), Ettimadai (P.O.) Coimbatore - 641 105. Tamilnadu, India. e-mail: prashant@amrita.edu

**Vice President - IT, Roots Industries Ltd, RKG Industrial Estate, Ganapathy, Coimbatore 641 006. Tamilnadu, India. e-mail: oab@roots.co.in

Increasing competitions in global markets, shortened product life cycles and heightened customer expectations have forced most companies to invest in and focus attention on their supply chains. In Supply Chain Management (SCM), there is always a likelihood of having conflicts among stakeholders for a certain decision-making process. Conflict resolution has become very important in this age of globalization, turbulence and increased competition. Decision Support Systems (DSS) have emerged as a powerful tool for such situations, whereby they can be designed to provide analysis and comprehension of complex supply chains effectively.

DSS often enable supply chain processes and activities at both strategic and tactical levels such as demand planning, inventory planning, sales forecasting, logistics management, capacity planning, and production planning. Inspite of the wide-ranging benefits, it has been observed that deployment of IT-enabled supply chains using DSS has not been widespread.

This paper reviews the status quo with respect to such current implementations of DSS for creating IT-enabled SCM. It also explores strategies to enhance the use of DSS considering the fact that such systems are very complex and difficult to implement. The role of IT tools like DSS to enable SCM is highlighted by addressing various success stories of companies. There is also ample scope for integration of web services, software agents and DSS for SCM to provide value for enterprises and stay competitive in today’s global economy.

KEY WORDS: Collaborative Forecasting and Replenishment, Decision Support Systems, Demand Planning, Enterprise System, Forecasting, Supply Chain Management, Web-Based Decision Support Systems

1. Introduction to Decision Support Systems

Decision Support Systems (DSS) are a specific class of computerized information systems that supports business and organizational decision-making activities. A properly-designed DSS is an interactive software-based system intended to help decision-makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Typical information that a decision support application might gather and present would be:
- an inventory of all of your current information assets (including legacy and relational data sources, cubes, data warehouses, and data marts),
- comparative sales figures between one week and the next,
- projected revenue figures based on new product sales assumptions;
- the consequences of different decision alternatives, given past experience in a context that is described.

As with the definition, there is no universally-accepted taxonomy of DSS either. However one of the popular classification schemes is as follows (Power et al 1997):
- A model-driven DSS emphasizes access to and manipulation of a statistical, financial, optimization, or simulation model. Model-driven DSS use data and parameters provided by users to assist decision makers in analyzing a situation;
DSS could be designed to support decision-making those early days, it was recognized that and management application domain. From the field of DSS beyond the initial business applications. These actions also expanded that resulted in expanding the scope of DSS occurred in universities and organizations associated with building and studying DSS.

A knowledge-driven DSS provides
- Emphasizes communication, collaboration and shared decision-making support

A communication-driven DSS supports more than one person working on a shared task; examples include integrated tools like Microsoft’s NetMeeting or Groove.
- Emphasizes access to and manipulation of a time-series of internal company data and sometimes external data

A data-driven DSS or data-oriented DSS emphasizes access to and manipulation of a time series of internal company data and, sometimes, external data.
- Emphasizes retrieval and management of unstructured documents

A document-driven DSS manages, retrieves, and manipulates unstructured information in a variety of electronic formats.
- Emphasizes retrieval and management of unstructured documents

A knowledge-driven DSS provides specialized problem-solving expertise stored as facts, rules, procedures, or in similar structures

A model-driven DSS emphasizes access to and manipulation of a model, for example, statistical, financial, optimization and/or simulation models.

Beginning in about 1980 many activities associated with building and studying DSS occurred in universities and organizations that resulted in expanding the scope of DSS applications. These actions also expanded the field of DSS beyond the initial business and management application domain. From those early days, it was recognized that DSS could be designed to support decision-makers at any level in an organization. Also, DSS could support operations decision making, financial management and strategic decision-making.

Some of the typical application domains of DSS include:
- One example is the Clinical DSS for medical diagnosis. Other examples include a bank loan officer verifying the credit of a loan applicant or an engineering firm that has bids on several projects and wants to know if they can be competitive with their costs.

DSS is extensively used in business and management. Executive dashboard and other business performance software allow faster decision making, identification of negative trends, and better allocation of business resources.

A growing area of DSS application, concepts, principles, and techniques is in agricultural production, marketing for sustainable development. For example, the Decision Support System for Agrotechnology Transfer (DSSAT4) package, developed through financial support of United States Agency for International Development (USAID) during the 80’s and 90’s, has allowed rapid assessment of several agricultural production systems around the world to facilitate decision-making at the farm and policy levels. There are, however, many constraints to the successful adoption on DSS in agriculture.

A specific example concerns the Canadian National (CN) Railway system, which tests its equipment on a regular basis using a DSS. A problem faced by any railroad is worn-out or defective rails, which can result in hundreds of derailments per year. Under a DSS, CN managed to decrease the incidence of derailments at the same time other companies were experiencing an increase.

DSS has many applications that have already been spoken about. However, it can be used in any field where organization is necessary. Additionally, a DSS can be designed to help make decisions on the ever fluctuating stock market, or deciding on market segmentation of a new product.

2. Information Value Chain

Enterprises need right information at the right time to make the right decision. The Information Value Chain (IVC) is an integrated framework that bridges the processes, organisations and technologies necessary to manage, analyse and use information.

Good decision making processes require both good data and information. The role of model-based decision making is gaining increasing acceptance as organizations try to gain a competitive edge. The progress in information systems development has led to a natural coupling between the data modeling, symbolic modeling and what-if analysis phases of a DSS (Nikitas et al 2000).

Data are refined into information following their day-to-day collection and subsequent analysis or processing. By repeatedly instantiating models by data, metadata, and information, and analyzing the results we create knowledge. Knowledge and information are used to aid decision-making. Data, information, and knowledge are three major components of IVC (Porter 1985). The DSS process is represented as an IVC in Figure 2 (Kim 2000).

In Fig. 2, transactional databases consist of input databases and parameters. Analytic databases contain analytic tools and interfaces contain the presentation mechanism. The input databases and parameters, the analytical tools, and the
presentation mechanism are three major components of a DSS. The input data is a form of database with the basic information needed for decision-making. This can be a PC-based database extract designed for the specific problem, a data warehouse with an accumulation of a company's transactions, or distributed databases accessed through a network. It is possible to add certain parameters and rules, such as the desired service level and hard-coded restrictions.

The analytical tools employed are operations research and artificial intelligence-based algorithms, cost calculators, simulation, flow analysis, and other embedded logic procedures. The data analysis usually involves embedded knowledge of the problem while also allowing the user to fine-tune certain parameters.

Presentation tools can be used to display the results of DSS analysis. However, the output contains too much information, such as lists and tables, which may be too difficult for the decision maker to absorb. Therefore, various data visualization techniques are employed to enable the user to comprehend the vast quantity of output data.

Database modelling, decision modelling, and model investigation are three important and logical steps in the decision-making process; these steps also encapsulate the interaction between information systems and decision modelling. In recent years model-based reasoning has gained popularity and acceptance as a tool for decision making. As a consequence, using models has become synonymous with rational decision making. In the present context it is easily seen that data modelling and decision modelling closely interact with each other.

The steps of this decision process are summarised below:

- **Data modelling** refers to the "structured" extraction and categorisation of recorded facts, internal and external to the organisation. Data modelling provides the decision maker with information about the decision problem at hand.

- **Decision modelling** refers to the development of a (set of) model(s) which is used as a decision-making tool. Thus a decision model may be a prescriptive or normative representation of a problem used by a rational decision maker.

- **Model analysis and investigation** refers to the instantiation of the model(s) with data, as well as the process of adapting the model parameters to investigate the results (outcomes) of alternative decisions produced by the model (Koutsoikis et al. 1999).

Typically, data modelling involves defining relationships between data items leading to a relational data model, or identifying categories that are then used to define multidimensional tables, leading to a multidimensional data model. Decision modelling involves the development of models that are used for decision making. Traditionally the term "decision model" was restricted to linear, non-linear, or discrete optimisation models. However, in our perspective, simulation, cluster analysis, forecasting, data mining, and other analytic models are equally appropriate for decision making. Model analysis and investigation involve a descriptive analysis of the results; this in turn leads to insight, or knowledge in respect of a given decision problem.

3. **DSS Usage in SCM Process**

In SCM, there are possibilities of having disagreements among interested parties. DSS have emerged as a powerful tool for such resolving these differences.

A vertically integrated manufacturing enterprise has to deal with forecasting, planning and order scheduling tasks at multiple levels within the organization. A disturbance like the cancellation of a big order by a customer and changes in customer order positions will have ramifications at many levels. Likewise inventory positions and raw material availability are always in a state of change.

Informal systems are needed to correct such dynamic issues in supply chains (Reyes et al. 2005). DSS fits the bill perfectly. Most SCM problems are not rigid and well defined. They require the flexibility, intuition, and wisdom of people to manage systems effectively. They find application for such semi-structured business problems.

DSS often enable business processes such as demand planning, inventory planning, sales forecasting, logistics management, capacity planning, and production planning (Joyce 2005). These systems also have the ability to create optimal and feasible operational plans that consider defined constraints and conflicting objectives. DSS also aids enterprises in improving production flexibility, cost and quality. Strategic planning of the supply chain is also an important decision problem determining the long-term survival and prosperity of companies in the manufacturing, retail, and other industrial sectors (Nikitas et al 2000).

Data from a shipping bill from Sony manufacturing plant in Penang (Malaysia) and near real-time location information from GE VeriWise automatic identification system used by the logistics provider, Schneider Corporation, for track and trace purposes, may offer an estimated arrival time for the goods from Sony to its US distributor Merisol after US customs clearance in Long Beach, California. This information may generate an alert or advice to the retail store that the Sony Playstation Portable 3 (PSP3) devices may not be on the shelves of the Circuit City store in Watertown, Massachusetts for the 4th of July sales event (Salvo 2010).

Baan, a leading ERP vendor unveiled an application, Baan Enterprise Decision Manager for aiding corporate decision-making. Major retailers like Walmart, Sara Lee, Roebuck have increasingly started using Collaborative Forecasting and Replenishment (CFAR) which uses DSS for jointly developing forecasts. GAF Materials Corp, the largest manufacturer of asphalt-based roofing materials in the US, uses a freight-management DSS (Lee et al, 1999).

The U.S. Marine Corps (USMC) needed an application that allowed Marine Command staff to import, manipulate, and analyze terrain data relative to their operations. Road maintenance supervisors evaluated a Maintenance Decision Support System (MDSS) during the winter of 2003 in Central Iowa. DSS are used for traffic air traffic monitoring. Also, a DSS is used by staff to facilitate manpower planning for the U.S. Marines. Military analysts use a Financial Data Mart at the Military Sealift Command at the Navy Yard in Washington, D.C. A huge success story is TIAA-CREF’s DSS for more than 160 billion US dollars of daily equity investment. This on-line system supports portfolio managers of the world’s largest pension fund with over 250 billion USD in assets.

Researchers at the IBM T.J. Watson research centre have proposed DSS applications for SCM as follows (Goodwin et al 1999):

- **Decision Support for what to sell** - At any moment, manufacturer may have some product inventory in stock and some unfulfilled orders or forecast orders. It may be advantageous to offer some of the inventory for sale, especially those items which are not committed to customer orders or forecasts, or which cannot be profitably reworked to meet a customer order or forecast. In addition, a manufacturer
has the capacity to produce product in the future. It may be advantageous to offer some capacity for sale, especially capacity that is not already committed to customer orders or forecasts. The decision is a complex tradeoff between maintaining flexibility in being able to use capacity for the most profitable types of production and in making sure capacity does not go unused. This is similar to the airline yield problem where seats on plane are sold with various restrictions at various times for different prices. Manufacturers have the added complication that all or part of an order can be outsourced even after it is sold, if it becomes more cost efficient. A decision-support system for deciding what to sell must make recommendations about what types of inventory and capacity to offer, to whom, for what price and with what restrictions at what time.

- Decision Support for what to buy
  - In addition to its own inventory, a manufacturer will have access to inventory being offered for sale on the Internet (e-inventory), as well as some unfulfilled orders or forecast orders. It may be advantageous to buy some of the inventory or capacity for sale, especially those items which can be profitably used to satisfy customer orders or forecasts, or which would be difficult to make because of production constraints. In addition, over the Internet a manufacturer will be able to purchase other manufacturers’ capacity to produce product in the future (capacity).

- Decision Support for what to promote
  - In addition to offering raw capacity for sale, a manufacturer can ‘push’ sales of products which are both advantageous to make and desirable to customers. Since raw capacity can be used to make many different items, each promotion should be limited to items of particular interest to an individual customer.

However the human element is very critical in such implementations. SCM problems are not so rigid and well defined that they can be delegated entirely to computers. Instead, in almost every case, the flexibility, intuition, and wisdom that is a unique characteristic of humans is essential to manage the systems effectively.

Inspite of the wide-ranging benefits of using DSS for SCM processes and activities, it has been observed that deployment of DSS for SCM processes is not very extensive and far-reaching. DSS crosses functional boundaries by aggregating data, rules and policies. Often there are conflicting objectives between various functional areas of an enterprise. Apart from this problem in implementing complex DSS systems in SCM, there is always the fear of facing user resistance to its implementation.

According to Turban and Aronson (2001), information systems that include Artificial Intelligence are difficult to implement because they tend to change the way organizations operate. Often DSS, ERP and tertiary enterprise systems behave in the same way. The difference between ERP and DSS is that DSS generally include complicated algorithms or mathematical models that allow the system to generate operational business plans like forecasts, inventory reports, capacity plans and production schedules. These algorithms often take advantage of solvers, which are not found in ERP systems. ERP systems traditionally collect, collate, distribute and manipulate huge piles of data.

DSS are finding applications in several business activities of the supply chain like logistics management, inventory management, operational and demand planning, transportation planning, materials planning etc. (Simchi-Levi et al 2003)

We propose a classification scheme for DSS for SCM so as to group SCM activities and business processes with respect to

- **Demand Planning** - Demand planning determines accurate forecasts based on past data, understanding of customers’ buying patterns and behavior. Collaboration with buyers and suppliers by usage of web services has enhanced this activity.

- **Distribution planning and scheduling** - Building the sales and distribution channels, selection of the channel intermediaries, inventory planning, e-procurement are some of the decision areas.

- **Transportation planning and scheduling** - Transportation, fleet and warehouse management, inventory management etc are the decision areas DSS can be built for SCM activities, which may be classified into demand planning, supply planning, and manufacturing planning and scheduling (Kim 2000).

Supply planning efficiently allocates logistics resources to meet demand. This includes strategic supply chain planning, inventory planning, distribution planning, collaborative procurement & transportation planning. Manufacturing planning and scheduling efficiently allocate manufacturing resources to meet demand. This includes the traditional Material Requirements Planning (MRP) systems that schedule and maintain priorities and order for purchased and manufactured parts. It also include systems for quoting lead times to customers

### 3.1 Demand Planning

Demand forecasts play an important role in many supply chain decisions developing accurate forecasts is critical for the efficiency of the entire supply chain. Therefore forecasting has become an important DSS area, and collaborative tools and standards as well as other more classical tools are being developed to assist the process.

Forecasts are made using various statistical techniques that take into account the history of the item, stability of demand, and other product-specific data. Demand planning can go beyond a single enterprise to a collaborative effort among different companies.

There are two processes here (Simchi-Levi et al 2003):

- Demand forecast: a process in which historical demand data are used to develop long-term estimates of expected demand.
- Demand shaping: a process in which the firm determines the impact of various marketing plans such as promotion, pricing discounts, rebates, new product introduction, and product withdrawal on demand forecasts.

### 3.2 Supply Planning

3.2.1 Logistics network design

Network design involves the determination of warehouse and factory locations, and the assignment of retailers or customers to warehouses. Typical input data include candidate locations, transportation costs, aggregate demand forecasts, and so on. Heuristic or optimal algorithms are used to suggest network designs.

3.2.2 Inventory deployment

Even when the firm does not wish to modify its logistics network, decisions must be made about what inventory to keep in which warehouses and at what times. This is the inventory deployment decision. Here, transportation costs, demand forecasts, and inventory holding are used to determine the levels of inventory to keep in each location in each period. DSS may use optimal or heuristic algorithms to generate suggested policies.

3.2.3 Sales and marketing region assignment

Sales region need to be assigned in a way that keeps both the customers and the sales representatives happy while sales
are maximized. A DSS for sales region assignment typically uses customer location and demand forecasts as input, and designs sales regions based on inputs given by the sales people.

### 3.2.4 Distribution Resource Planning (DRP)

Optimal routes and inventory policies for a set of warehouses and retailers are determined. Given warehouse and retailer locations, transportation costs, and demand forecasts for each retail outlet, this DSS utilizes analytical techniques to determine policies that will achieve high levels of customer service at minimal cost.

### 3.3 Manufacturing Planning and Scheduling

#### 3.3.1 Material requirements planning (MRP)

MRP systems use a bill of materials, inventory positions and lead times to plan when manufacturing of a particular product should begin. Although these DSS typically do not use sophisticated mathematical approaches, they are very popular in industry. These DSS can serve as a good example of why the decision maker should use only the output of a DSS as a possible problem solution. Often MRP systems propose impossible schedules because they typically do not take production capacities into account. It is up to the decision maker to modify the plan in such a way that it becomes a feasible schedule without becoming too expensive.

#### 3.3.2 Inventory management

When a facility holds many different items in inventory, managing that inventory can be extremely difficult. An inventory management DSS uses transportation and holding cost information, along with lead times and projected demand, to propose inventory policies that help the decision maker achieve some combination of low cost and high customer service.

The objective is to use transportation and inventory holding costs, demand forecasts and forecast error, and service levels to determine the levels of inventory, in particular, safety stock levels, to keep in each location in each period. A heuristic algorithm is used for developing such policies (Simchi-Levi et al 2003).

#### 3.3.3 Production location assignment/ facility deployment.

Many manufacturers have a network of production facilities, each of which can manufacture a particular product or components of a particular product. A facility deployment DSS takes production costs, lead times, transportation costs, and demand forecasts as input, and suggest possible assignment of products or components to manufacturing facilities. These DSS often use some combination of artificial intelligence and mathematically based techniques.

#### 3.3.4 Fleet planning

Fleet planning typically involves not only the dispatching of a company’s own fleet but also decisions regarding selection of a commercial carrier on certain routes. Since rate structures can often be very complex, and speed and reliability may a difficult problem. In addition, input data such as rate structures need to be frequently updated.

#### 3.3.5 Lead time quotation

In many manufacturing operations, sales representatives commonly take orders over the phone and thus are able to immediately quote delivery lead times. In the past, sales representatives often quoted long lead times to ensure that these lead times could be met. Lead times quotation DSS allow the quotation of shorter lead times by determining exactly how long a particular order will take to deliver. This is done by taking current production schedules, manufacturing times, and delivery times into account. Typically, the sales representative still needs to use own judgment about the importance of an order. If a customer is not regarded as significant as certain others, it might be worthwhile for the sales representative to quote a later due date than the DSS suggests. This allows enough time to quote shorter lead times for future orders.

#### 3.3.6 Production scheduling

Given a series of products to make, information about their production processes, and due dates for the product, production scheduling DSS propose manufacturing sequences and schedules. A production scheduling DSS can use artificial intelligence and mathematical and simulation techniques to develop schedules. Artificial intelligence-based production schedules typically involve rules that were previously used by the human schedulers who scheduled the particular process in question. Optimization-based scheduling system use algorithms to develop schedules that maximize or minimize some set of objectives. Finally, simulation-based scheduling systems typically allow user to select a simple set of scheduling rules and test them in the simulation system.

#### 3.3.7 Workforce scheduling

Given production (service) schedule, information on labour costs, and a set of work rules, a workforce scheduling DSS proposes a number of possible employee schedule to ensure that the necessary labour is available at all times and at the lowest possible cost. Often these systems have to take complicated union rules into account.

### 3.4 Selecting the DSS

For each of the supply chain problems and issues listed above, DSS are available in many configurations, platforms, and price ranges. DSS platforms have evolved in the last 15 years from relatively inflexible mainframe systems, to isolated PC tools, to client/server processes; lately, there is a new breed of high-performance and extensible enterprise decisions support applications. These systems come in a wide range of pricing from PC systems costing several thousand dollars to company-wide installations costing a few million dollars.

When evaluating a particular DSS, the following issues need to be considered (Sagbanusa 2006):

- The scope of the problem addressed by the decision maker, including the planning horizon.
- The data required by the DSS.
- Analysis requirements, including accuracy of the model, ability to quantify performance measures, desired analytical tools that is, optimization, heuristics, simulation, financial calculation requirements, and computational speed needed.
- The system’s ability to generate a variety of solutions so that the user can select the most appropriate one, typically based on issues that cannot be quantified.
- The presentation requirements, including issues such as user-friendliness, graphic interface, geographic abilities, tables, reports, and so on.
- Compatibility and integration with existing systems.
- Hardware and software system requirements, including platform requirements, flexibility to changes, user interfaces, and technical support available.
- The overall price, including the basic model, customization, and long-term upgrades.
- Complementary systems

However, inspite of the fact that there are several application areas which could deliver huge benefits and value for stakeholders, it has been observed that we have only scratched the surface. Existing implementations are not wide spread because of several
problems like complexity, resistance to change by user, customization needs, diverse platforms etc. Recently, distributed software agents and web services integrated with DSS approaches are proposed to overcome this problem.

4. Web-Based DSS

Web-based DSS refers to DSS in which the entire application is implemented using Web technologies including a Web server, HTML, CGI, and possibly database products like Oracle 9i or SQL server; Web-enabled means key parts of an application like a database remain on a legacy system, but the application can be accessed from a Web technology component and displayed in a browser.

Kogan, Sudit and Vasarhelyi (1997) explain that recent developments in Internet Technologies have a profound effect on DSS especially for managing accounting and finance.

There are various tools in the web that measure web site hits. Online discussion forums and chat can report trends and opinions on a variety of topics including product information and customer feedbacks. Web site hits are now used as a pointer to the popularity or interest generated on a product.

Customer Decision Support Systems (CDSS), a system that can connect an enterprise to its existing or potential customers, providing support for some part of the decision-making process. Using web services and the Internet, the customer can log his feedback. Chrysler Corporation, one of the largest automakers used such a system. The World Wide Web-based Do All system lets users view everything from vehicle ID numbers and parts lists to quality and warranty data. (Lee et al 1999).

IBM’s WebFocus, is a web-based business intelligence tool with DSS capabilities.

5. Enterprise Implementations of DSS in SCM

5.1 Proctor and Gamble – Usage of DSS in Production Planning and siting

Procter & Gamble (P&G) uses @RISK and PrecisionTree World-Wide for decision support. P&G has been using @RISK since 1993 for modeling production siting decisions. The company was evaluating some cross-border siting options, and these decisions required them to take into account not only uncertainties involving the capital and cost aspects of plant location but fluctuations in exchange rates as well. The company has since come to rely on @RISK for its “entire range of investment decisions” including new products, extensions of product lines, geographical expansions into new countries, manufacturing savings projects, and production siting.

More recently P&G have been working with PrecisionTree. Its attraction is its capacity to value complex decisions, which often involve multiple, sequential decision steps. They find it particularly valuable in evaluating “real options”. The company considered using financial option calculators to analyze the real options that are embedded in our complex decisions, but it was found that they simply can’t solve for the real option value in projects with multiple, sequential investment decisions. Decision trees are really the only tool that can correctly value multiple sequential decisions where uncertainty is private risk. After a successful test, Procter & Gamble is now in the process of rolling out PrecisionTree to all of its major business units around the world. Business units are evaluating investment options based on their impact on shareholder value, and PrecisionTree helps them make good choices and better decisions. (Proctor 2001)

5.2 CTI – A scheduling success story

In 2001, Gazmuri and Maturana discussed the development and implementation of a DSS designed to produce plant schedules for the appliance company CTI. The study included two separate manufacturing plants. Plant R produced only refrigerators. Plant W produced 25 different types of washing machines, 30 types of stoves, and 45 types of heaters. CTI utilized an 18-month forecast to drive the manufacturing lot planning. The objective of the DSS was to maximize net revenue. Costs were based on setups, inventory, materials, and the workforce. Mixed-integer-programming models were used to create the master plan for each plant. The researchers described in detail how the solution was constructed – PowerBuilder was used as the graphical user interface, a commercial RDMS was used for storing data, CPLEX was used as the solver, and Windows served as the operating system.

Gazmuri and Maturana (2001) reported that the development team worked on the solution between 1994 and 1999, a span of six years. The development team created six versions of the planning application in that period. The researchers provided three factors that made the team successful:

- the development team’s relationship with the business users
- the quick responses provided by the development team,
- the strong support from management.

They went on to explain that their success was due to having many resources and enough time, which is not normally how software and consulting firms position DSS into manufacturing companies.

5.3 Other implementations

- Frito-Lay, Inc.: Price, advertising, and promotion selection
- Burlington Coat Factory: Store location and inventory mix
- Keycorp: Targeting direct mail marketing customers
- National Gypsum: Corporate planning and forecasting
- Texas Oil and Gas Corporation: Evaluation of potential drilling sites
- United Airlines: Flight scheduling, passenger demand forecasting

6. Conclusion

Supply Chain is a very complex network connecting various suppliers, customers, manufacturers and enterprises. Typically it generates issues which require conflict resolution and consensual decision-making. DSS in one such IT tool that addresses these problems and provides solutions for semi-structured business problems.

DSS has been integrated into many activities and business processes of the supply chain like logistics management, inventory management, sales and distribution planning, materials and production planning. Various DSS implementations and deployments in SCM tasks like transportation planning, manpower planning, customer engagement, production support etc are studied.

However, considering the potential benefits, existing implementations are not wide spread because of several problems like complexity, resistance to change by user, customization needs, diverse platforms etc. Recently, distributed software agents and web services integrated with DSS approaches are proposed to overcome this problem. More deployments of IT-enabled supply chains using DSS by enterprises are needed.

7. References

- Decision Support System developed to aid in Florida’s highway planning, http://www.cutr.usf.edu/pubs/news_leT/articles/spring97/sp97_6.htm
- Garbato, D. “Apparel Vendors link a global chain: Worldwide sourcing, long
cycles and seasonality make apparel one of the most challenging areas for supply chain management”, Retrieved from http://www.bobbin.com/


- Kim, Jung Ho (2000), “Survey of DSS for Supply Chain Management”, Archives of Department of Industrial Engineering, POSTECH, IME Lab, Korea


- Power, D. J. and C. L. Fletcher, “University of Northern Iowa Dining Services uses FoodPro®”, at URL DSSResources.COM.


- Salvo, Joseph (2010), GE Global Research, personal communication www.trailerservices.com downloaded on 2 March 2010


---

**Computer Society of India**

**Call for Web Articles**

Computer Society of India is launching its Web Publication of high quality articles for knowledge portal of CSI. The articles should cover all aspects of computing, information and communication technologies that should be of interests to the reader’s at large fraternity of CSI and around. An exhaustive list of topics shall be displayed at knowledge portal of CSI that shall vary/ expand time to time.

The articles may be long (3500-4000 words) or short (1500-2000 words) authored in the original text (plagiarism is strictly prohibited). The articles shall be thoroughly (blind) reviewed by experts and the selected ones shall be published on the knowledge portal of www.csi-india.org. The papers may be submitted in the following categories.

**Research Papers**: These papers are expected to cover the consolidation of basic concepts to advancements in the area of interests to the younger group of readers.

**Industry Papers**: These papers are called from the industry practitioners that cover the latest techniques developed of solving the problems and interesting results obtained.

**Paper with Case Studies**: These papers should cover a specific aspect of a technology/ service/ application development using ICT for knowledge sharing.

**Survey/ Tutorial Papers**: These papers are expected to cover the consolidation of basic concepts to advancements in the area of interests to the younger group of readers.

**How to submit the articles**: The articles may be submitted may be sent to the Web Publication Chair, Dr. Manohar Chandwani, Fellow, CSI via email wpc@csi-india.org with a cc to chandwani11@rediffmail.com. An online submission facility on CSI knowledge portal shall made available to the authors in the near future.
Health care is the linchpin of a developed society. Healthcare is under constant development by improving safety, efficiency and quality to separate healthcare processes and practices. Due to the vulnerability of treatment processes, it is lucrative to use Information Technology applications for preventing errors and mistakes that humans can easily make. A large benefit of using Information Technology in different operations is that it can improve the patient safety and nursing efficiency and decrease the always notable healthcare expenditure. Health care sector is increasingly leveraging on the usage of technology to improve operational efficiency and gain competitive advantage. Radio frequency identification (RFID) is one such technology that is finding increased usage in healthcare sector. In a health care context, the use of RFID technology can be employed for not only bringing down healthcare costs but also facilitate automating and streamlining patient identification processes in hospitals and use of mobile devices like PDA, smart phones, for design a health care management systems. This paper describes the use of RFID technology in Healthcare sector by providing examples of current uses and discussing its suitability for the health-care sector.

**Keywords:** Healthcare, RFID, Patient Safety

**Introduction:**
Governments all over the world are getting increasingly concerned about their ability to meet their social obligations in the health sector. The situation has become critical in light of rapidly increasing costs for medical care, aging population, and lack of government funds. The hospital managers are very concerned about the lack of hospital infrastructure and resources to provide a satisfactory level of service. Equally concerned are the government administrators who have limited financial resources to offer healthcare services at subsidized rates. In healthcare, RFID has the potential to achieve improvements in both supply chain productivity and patient safety applications. However, the technology is more likely to be successful if evaluated for closed-system applications, where deployment and subsequent changes are within the control of the individual organization. However, RFID will likely go through a stage where initial enthusiasm is tempered by practical cost-benefit considerations. The outcome will be appropriate deployment of the technology. The market for RFID tags and systems in healthcare will rise rapidly from $90 million in 2006 to $2.1 billion in 2016.

**Technical Infrastructure:**
Radio-Frequency Identification (RFID) is applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. The RFID tag is classified into two types:-

1. **Active RFID tags** have their own power source. The advantage of these tags is that the reader can be much farther away and still get the signal.
2. **Passive RFID tags** do not require batteries, and can be much smaller and have a virtually unlimited life span.

A Radio-Frequency Identification system has three parts:
1. A scanning antenna
2. A transceiver with a decoder to interpret the data
3. A transponder - the RFID tag - that has been programmed with information.

An antenna is used for receiving and transmitting the signal. The chip typically is capable of carrying 2,000 bytes of data or less. The integrated circuit is used for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions.
Application of RFID in Healthcare Sector

In a hospital environment, the patient safety is critically important. RFID technology seems to offer some kind of a resolution as it is used to manage hospital patients, medications, medical processes, medical supply usage and outpatient compliance. RFID tags may be used in the HealthCare world to limit access to patient records. According to rules and regulations only certain individuals on staff at hospitals and doctor’s offices are permitted to review or discuss a patient’s records. Ironically, some users are against RFID devices find themselves rallying against them because of the possible privacy infringements that could occur. The use of these RFID devices in this particular situation could protect patient’s privacy. RFID technology thus can save many lives and prevent harmful situations. The use of RFID pharmaceutical labeling will prevent theft, track and dangerous drugs.

1. Use of RFID in operation rooms: Once a patient arrives at an Operating Room, RFID helps to identify and scan the patient’s ID and automatically display info about his scheduled operation.
2. Neonatal unit: RFID is used to protect against abductions in maternity, pediatric units. RFID tag can be placed on the arm of the infants or the umbilical cord of the neonatal.
3. Infection Control: RFID system assures that doctors and nurses are attending the right patient. RFID requires fewer physical contacts, enhanced pace and reduces the chances of nosocomial infections.
4. Person Based Systems (Biometrics): RFID is efficient in performing Individual identification by recognizing Face, Handwriting, Speech, Physical Patterns and Gait of a person.
5. Medical Billing: Even today, a lot of data has to be entered manually to generate the bill once a patient is ready to leave the hospital. RFID based system will keep records of each billable element/procedure used for the patient. Billing will be more accurate and easier.
6. Inventory Management: Before starting the operation it ensures that all the required equipment is present. Once the operation starts, it keeps scanning drugs and accessories being used. After the operation ends it scans all equipment to ensure that everything is rightly placed.
7. Asset Management Tools: Unique identification of all surgical instruments with RFID makes tracking and recording of instruments used in respective operations. It helps to determine which instrument to sterile or discard. All blood is identified by donor as well as blood type. Records need to be kept especially when blood is turned into other products like plasma, when several bloods may be merged.
8. Security, Safety & Access Control: Patient identification is confirmed based on RFID-enabled wristbands and the information is delivered automatically to the caregivers. RFID system confirms that a caregiver has the correct patient. The system also confirms the correct medication, time, dose, route each time a medication is administered.

Benefits of RFID in Health Care Sector

1. RFID can bring lots of benefits in healthcare in managing or storing various resources like blood samples, drugs and patients.
2. By using active RFID wrist band tags, the patient can be easily tracked across hospital and their movement can be controlled from unwanted/restricted places.
3. In an emergency situation, locating crucial equipment like a ventilation pump could be a challenging task.
which could be easily facilitated by RFID. Moreover, a major number of equipment in hospitals is rented and it becomes very difficult to estimate the usage and maintenance.

**Advantage of RFID in Health Care Sector**

1. All the medical equipment has attached with an RFID tag, it will allow the supervisors in locating the equipments dynamically, stopping theft and reducing time to find assets and increasing utilization of the equipments.
2. RFID will keep records of each billable elements/procedure used for the patient. Billing will become more accurate and easier.
3. It helps to ensure whether all requirements is present before the operation procedure. Once the operation starts, it helps continuous scanning of drugs, accessories being used.
4. RFID prevents unsuitable administration of drugs or therapies and mismatched transfusion of blood. It ensures safety as well as accuracy.
5. In Pharmaceutical sector, an RFID tag provides logistics benefits to manufacturing units and electronic pedigree in distribution units.

**Disadvantage of RFID in Health Care Sector**

1. RFID tag is prone to physical / electrical damage due to environmental conditions. RFID tags are costly compared to barcodes.
2. RFID is not a line-of-sight technology like bar-coding and new security issues will be developed.
3. RFID tags cannot be read well when placed on metal or liquid objects or when these objects are between the reader and the tag. Example: Proximity Issues. While reading multiple tags at the same time, it is possible that some tags will be missed out to store the data.

**Limitation of RFID in Health Care Sector**

1. High frequency devices like MRI devices might drown out the RFID tags and impact of environment like washing with water, boiling for sterilization.
2. RFID tags are susceptible to many of the same data security concerns. Passive tags are considered to be promiscuous – automatically yielding the data to any device that queries the tag, raising concerns about skimming, interception, interference, hacking, cloning, and fraud with potentially profound implications for privacy.
3. The cost of the RFID technology (tags, readers, middleware, consulting, operational process design, troubleshooting, training, etc.) will impact return on investment (ROI) of capital investment of the hospital

**Conclusion:**

RFID is an enabling technology that saves lives, prevents errors, saves costs and increases security. It removes tedious procedures and provides patients with more freedom and dignity. It reduces the amount of personal intervention by staff because it automates procedures such as protecting the disoriented elderly from danger and matching patient to treatment. RFID is now used in smart packaging that records when patients take medication and how much they take and provides prompts to help them comply with instructions. RFID is one of the technologies, the healthcare market should look to implement to promote patient safety and optimize hospital workflow. Each type of RFID system can be tailored to fit the needs of all healthcare programs. Every hospital is encouraged to integrate their existing system with RFID in order to reap the benefits of the evolution of healthcare technology

**Reference:**

3. Patrik Fuhrer and Dominique Guinard, “Building a Smart Hospital using RFID technologies, CBMS 2007”
5. Sector Agusti Solanas and Jordi Castella-Roca, “RFID Technology for the Health Care”

**Errata**

CSI Communications - May 2010 pp 34
e-mail Id of the author is: Antony Satyadas <antony_satyadas@us.ibm.com>
The inconvenience caused is deeply regretted.

Dr. Gopal T V, Honorary Chief Editor
CSI Division II (Software), CSI Coimbatore Chapter and Sri Krishna College of Engineering and Technology, Coimbatore jointly organized a one day divisional seminar on “Recent Trends in Software Testing” at Sri Krishna College of Engineering and Technology, Coimbatore on 26th March 2010.

Dr. S. Subramanian, Principal SKCET and Chairman Div III CSI, in his presidential address, emphasized the importance of software testing and the potential employment avenues in this area for the student community. Mr. Ranga Rajagopal, Chairman CSI Coimbatore Chapter spoke about the seminar and its significance in the present context. The chief guest of the function Dr.S.Subramanyan, Advisor, Sri Krishna and VLB institutions presented the need of software testing and how lack of testing leads to social problems and financial losses.

The seminar had five interesting and informative invited lecture sessions. More than 250 delegates from corporate, faculty members, research scholars and students participated and benefited by this seminar.

In the first session on the trends in software testing, Mr. K R Jayakumar, Founder, & Head, Amity Soft, Chennai briefed about evolution of software testing, requirements, product and process risks, technical trends and testing challenges.

Ms. Chandana Pavaluru, Senior Manager of Symphony Services, Bangalore, in the second session dealt with emerging concept of Agile Testing, Agile Methodologies such as Scrum, Extreme Programming (XP), Feature Driven Development (FDD), Lean Software Development and Agile Practices.

In the third session titled, “Soft skills for the hard testing job”, Prof. Gopalasamy Ramesh, consultant and Adjunct Professor, IIIT, Bangalore introduced the soft skills for testing which was highly innovative and elaborative. He also elaborated on requirement specification, architecture, design and documentation.

The fourth session on “Lessons learnt in Software Testing” was given by Mr. Venkatasan Narayanamsamy Vice President, PACE, Polaris Software Lab Ltd, Chennai. His informative speech focused on test metrics, effective test methodologies and the ways of preventing defects followed by discussion.

The concluding session was presented by Dr. G Kousalya, Professor and Head UG, Department of CSE, SKCET. She explained about the tools used for software testing and also about Rational Rose software. Mr. Mahendra Kumar, Vice-Chairman, CSI Coimbatore chapter distributed mementos to the resource persons. The seminar ended with the vote of thanks proposed by Dr. N K Karthikeyan, Professor and Head, CSE (PG), Dept. of CSE, SKCET.
NCVESCOM’10:
National Conference on VLSI, Embedded Systems, Signal Processing and Communication Technologies

Report prepared by: Prof. D Vijendra Babu, AVIT & Mr. H R Mohan, Chairman, Div IV

The Dept. of ECE, Aarupadai Veedu Institute of Technology (AVIT), Vinayaka Missions University organised the third National Conference on VLSI, Embedded Systems, Signal Processing and Communication Technologies (NCVESCOM’10) during April 2nd to 3rd, 2010 at AVIT, Chennai. The conference was co-sponsored by Computer Society of India, Div II (Software) & Div. IV (Communications) along with IEEE Madras Section, IEEE Communication Society, Madras Chapter, IEEE Computer Society, Madras Chapter, Council of Scientific & Industrial research, Tamil Nadu State Council for Science & Technology, Broadcast Engineering Society (India) and IETE Madras Chapter.

The conf. attracted over 180 papers and after a review process, 60 Research papers were selected for presentation at the Conference under the themes of VLSI, Embedded Systems, Signal Processing and Communication Technologies.

At the inauguration on 2nd April, 2010, Prof. D. Vijendra Babu, Head of the Dept. of ECE and co-chair of the conference gathered the gathering. Prof. R. Vijaya Arjunan of the Dept. of ECE and the organizing secretary of the conference briefed about the conference. Dr. N. R. Alamelu, Principal and Chairperson of the Conference delivered the Presidential address.

Dr. P. Swaminathan, Head, Electronics and Instrumentation Division, Indira Gandhi Centre for Atomic Research, Kalpakkam was the chief guest of the conference. After the formal inauguration of the conference, in his keynote address, Dr. Swaminathan highlighted the importance of the signal processing and communications in managing the operations of the nuclear reactor installations. He added that IGCAR and other nuclear establishments attract qualified engineers from all the branches of engineering for a bright career as the country is going in for nuclear power generation in a large scale.

Mr. R. Vidyasagar, Chief Engineer, All India Radio & Doordarshan, South Zone was the Guest of Honor and while delivering his special address he recalled the tremendous developments that had taken place in the broadcasting industry and the role of various technologies.

Mr. H R Mohan, Chairman IEEE Computer Society, Madras Chapter, Chairman Div. IV of CSI and Associate Vice President (Systems), The Hindu released the conference proceedings both in Print and Electronic form. In his address, Mr. Mohan after highlighting the rapid developments in the areas of the conf. interest and their impact on the society, emphasized the need for such conferences where researchers could share their experiences with the world.

Prof. P Subramanian, Dept. of ECE and programme coordinator of the conference proposed the formal vote of thanks.

This two days conference apart from the paper presentations in four tracks had the following invited talks which were appreciated by the participants numbering around 200 comprising of industry professionals, academic faculty, researchers and students.

1. “Sensor Networks” by Dr. P Swaminathan, Head, Electronics and Instrumentation Division, IGCAR, Kalpakkam.
2. “Speech & Image Processing - An Overview” by Dr. P Jaganathan, Deputy Registrar (Education), Vinayaka Missions University.
3. “Entropy and its Applications” by Dr. K Gunavathi, Professor, PSG College of Technology, Coimbatore.

The authors of the Best Paper in each track were awarded with a cash prize of Rs.1000 and merit certificate.

For copies of the conference proceedings, pl. contact Prof. D. Vijendra Babu at dvijendrababu@gmail.com
The Bharati Vidyapeeth’s Institute of Computer Applications and Management (BVICAM), New Delhi, in collaboration with Computer Society of India (CSI), Delhi Chapter, Guru Gobind Singh Indraprastha University (GGSIPU), Delhi and Institution of Electronics and Telecommunications Engineers (IETE), Delhi Centre organized 4th National Conference on “Computing for Nation Development” during 25th–26th February, 2010 followed by 3rd National Students’ Convention; NSC – 2010 on 27th February, 2010.

The overwhelming response received for INDIACom(s) from participants from all over the country and overseas, year after year since 2007, shows its deep penetration and well acceptance amongst the researchers and technocrats all across the country. This fourth edition of the conference declared as INDIACom – 2010 received over 500 papers from all across the country including 15 papers from overseas researchers. After a series of tough review exercises, 353 papers were recommended to be accepted for presentation in INDIACom – 2010 in various groups during the two days under four parallel tracks in sixteen sessions. Out of these 353 papers, a set of 142 papers were further recommended for publication in the hard copy of the Pre-Conference Proceedings having both ISSN and ISBN serials. Out of these 142 papers, 114 full papers and 28 extended abstracts have been published. All 353 paper have also been published in the soft copy of the Conference Proceedings. These papers represent wide variety of research topics in all the emerging areas besides traditional and core computational areas.

Dr. Ashoke Ghosh, President, Delivery Services, Grapceity India, Noida, was the Chief Guest. During his Inaugural Address, he highlighted the role of Information and Communication Technologies in the rural development. He discussed many live applications like telemedicine, e-logistics and e-communication, corruption free e-services, e-farming, etc. for bringing the technology closer to the 70% of the rural India and thereby helping them to join the mainstream. Prof. D K Bandyopadhaya, Vice Chancellor, GGSIP University, Delhi, presided over the Inaugural Session. He was of the opinion that the younger generation of researchers have tremendous potential to take up the challenging applications for a huge country like India. The chief convener of the conference, Prof. M N Hoda, Chairman, CSI Delhi Chapter and Director, BVICAM said that we must take IT to each and every section of the society, including for the better employment and the health of the people from rural India. He emphasized upon the fact that in order to make India as a developed nation, it is vital to take care of the issues of the rural India and ensure the penetration of Information and Communication Technologies (ICTs) into the day to day lives of the 70% rural population of the country and bring the technology closer to these unreached section of the society. Prof. A K Saini, Past Chairman, CSI Delhi Chapter, has pointed out that significant number of activities have been taken up by CSI Delhi Chapter in the current year. Col. Balraj Anand, Chairman, IETE, Delhi Centre has discussed about
the timeliness and significance of the theme “Computing For Nation Development”.

During the Inaugural Session, Proceedings of the Conference; INDIACom - 2010 and 3rd National Students’ Convention; NSC - 2010 with ISSN and ISRN serials; both hard and soft copies were released. The 3rd issue of the BIJIT; the BVICAM’s International Journal of Information Technology, was also released on this occasion. Guests also released a book on “GRAIN IN BRICS - Emerging technologies in emerging economies” authored by Prof. S.A.M. Rizvi and Prof. Halima Rizvi from Jamia Millia Islamia. Prof. N. D. Kaushika, Principal, BVCOE, presented a brief report of Bharati Vidyapeeth, Delhi. Mrs. Anu Kiran Jain, Convener, INDIACom - 2010 presented vote of thanks.

There were two panel discussions on the theme “Computing For Nation Development”. During concluding session, 10 point agenda was formulated, which would be submitted to the Ministry of Communications and Information Technology, Government of India and Planning Commission.

The first track titled Digital World was mainly focused on how different aspects and wings of IT can be useful for the development of the country. It comprised of presentations over the newly evolving facets of computing that could be a boon for the overall national development. The presentations covered IT for Education, Health and Development, Sustainable Agricultural Development, Environmental Sustainability, Crisis Prevention and Recovery, Disaster Management, and E-Governance to name a few. The respective sessions for the track were chaired by Prof. K. Nayak, Director, IIBM, Patna, Mr. Shiv Kumar, DGM, NICSI, New Delhi, Prof. P.C. Saxena, JNU, New Delhi and Dr. Vijay Nehra, Head, SCS, BPSMV, Sonipat.

The second track titled Web Technologies, Computer Networks and Information Security was aimed at exploring the current trends and activities being employed to strengthen the security over networks and the usage of the web to empower and catalyze education and e-learning. It focused on the evolution of web applications towards the development of improved Flooding Protocol for wireless sensor networks, next generation Internet, and handling security issues in WMAN based on IEE standards with advanced approach. The respective sessions for the track were chaired by Dr. D.K. Lobiyal, JNU, New Delhi, Prof. M. N. Doja, JMI, New Delhi, Dr. S. K. Muttoo, University of Delhi, Delhi and Prof. Sunder Lal, PVC, Agra University, Agra.

Databases, Software Engineering and Enterprise Resource Planning was the talk of the third track as innovative concepts and ideas poured in from the participants on the measures of software engineering and the importance of ERP. The respective sessions for the track were chaired by Dr. M. U. Bokhari, AMU, Aligarh, Dr. Vasudha Bhatnagar, University of Delhi, Prof. P.K. Kapur, University of Delhi and Prof. R.S. Chilir, MD University, Rohtak.

The fourth and the last track talked about yet a futuristic topic titled, High Performance Computing, to enable effective and most cost efficient computing for real time systems in the coming years. The track comprised of latest emerging fields of Knowledge Management, Artificial Neural Networks, Expert System Innovations, Data Mining, Business Intelligence, Bioinformatics and Image Processing, etc. The respective sessions for the track were chaired by Prof. S.A.M. Rizvi, JMI, New Delhi, Prof. Sufiyan Beg, Head, Computer Engg, JMI, New Delhi, Dr. Ajay Gupta, Director, Comuter Centre, University of Delhi and Prof. Dharmendra Kumar, Dean, Faculty of Engineering and Technology, Guru Jambeshwar University of Science and Technology, Hisar.

Along with the presentations and invited talks, two panel discussions on the topic “Computing For Nation Development” were also conducted. The first panel discussion was moderated by Prof. A. K. Saini, Professor of IT, USMS, GGSSIP University, and immediate Past Chairman, CSI, Delhi Chapter. The panelists were Justice Talwant Singh, Addl. Dist & Sessions Judge, Delhi, Mr. Sanjay Sharma, Project Head, TCS, Mr. I. P. Singh, Scientists, CSIR and Mr. R. K. Vyas, University of Delhi, Delhi and RSC, CSI. The HR summit was focussed to discuss on the theme “Role of the Campus in Building Better Human Resources”. The summit was moderated by Prof. D. P. Goyal, Professor of IT at MDI Gurgaon. The panelist for the same included Mrs. Kavita Ahuja, Aricent Technologies, Mr. Sanjay Sharma, TCS, Mr. Praveesh Raja Jindal, Prof. Alok Basu, TPO, BVCOE, New Delhi.

The second day of INDIACom - 2010 i.e. the 26th February, 2010, witnessed another round of knowledge soaked with panel discussion moderated by Dr. Rajesh Narang, Chief Technology Office, Ministry of Communications and IT, and Director, National Institute of Smart Governance, Govt. of India. The panel of speakers comprised Prof. B.V. Ramana Reddy, Dean, USIT, GGSSIP University, Delhi, Mr. Madan Mohan, Advisor, Planning Commission, Govt. of India, Mr. Rajat Khare, MD, Appin Knowledge Solutions, New Delhi, Mr. V. K. Gupta, Hony. Secretary, IET, Delhi Network and Mr. P. K. Shali, Director, Engineering Council of India, Delhi. Speakers illustrated the impact of ICT on education. They pointed out how faculty development programme in educational institutions.

Finally, post the panel discussion a Valedictory Session was organized to mark the end of the two-day long conference. Prof. M. N. Hoda, Chief Convener, announced that INDIACom – 2011 will be organized during 10th - 11th March, 2011 followed by NSC-11 on 12th March, 2011 on a much bigger scale in which the follow up actions of INDIACom-2010 will also be discussed.

On the 27th February, 2010, the 3rd National Students’ Convention (NSC - 2010) was organized. This event was a part of the ongoing INDIACom – 2010 and was primarily focused upon providing a platform to the young IT students and scholars. NSC is a mega event which is a depiction of youth, its ebullience and its channelized synergy. Besides paper presentation, NSC also played host to a volley of cultural and technical events, including the Debate Competition, the Quiz, The On-the-Spot Programming Challenge, Cryptography, Treasure Hunt, the Group Dance Competition, LAN Gaming, the Add-Making contest and the Sudoku challenge.

All the competitions received tremendous response in terms of participation. More than 500 students nationwide showed interest in participating and winning various events at the NSC-2010. The teams who won the prizes were from amongst the Institutions of International repute like IIT Roorkee, NITs, Delhi College of Engineering, University of Delhi, Jamia Millia Islamia, etc.

The NVCS played perfect host to conduct the NCS-2010 extremely flawlessly, and hence it proved to be an exhilarating experience for all those attending the event and a rather satisfying one for those who organized it, because it was much more successful and larger than as anticipated. Data Quest and GIS Development were the media partners for the Conference.
The first international conference of IFIP on Bioinformatics was held in the premises of Sardar Vallabhbhai Patel National Institute of Technology during March 25-28th, 2010. The conference was inaugurated by Prof. Thrimurty, president of Computer society of India (CSI) and valedictory address was given by Mr Lalit Sawhney Former President CSI & Vice president IFIP. During the inaugural address, president CSI also announced the formation of a SIG on “Bioinformatics” under CSI with Dr. Pardasani as its first chair, Dr. Neeru Adlakha as secretary with other prominent professors & scientists as members.

The organizing committee was chaired by Prof M. N. Mehta with Dr. Neeru Adlakha as organizing Secretary and Prof. K R Pardasani, chairman of the proposed workgroup as chairman of Technical committee and Dr. R K Datta as chairman of International Advisory Committee.

The conference was launched during 25-28th March 2010 and the website was launched with the linkup to the website of SVNIT. The technical sessions had two prong approach. On one side a number of experts in various facets of bioinformatics were invited to address the participants and on the other side the papers from the active research workers were invited for presentation.

20 experts which include eight Foreign experts consented to address the participants. The list of invited speakers is given below

1. Dr. R K Datta, India
2. Prof. V P Saxena, India
3. Dr. Mamoru Kato, New York, USA.
4. Dr. Rolf P Wurtz, Bochum, Germany.
5. Dr. Siu Ming Yiu, Hong Kong.
6. Dr. Milan Stehlik, Austria
7. Dr. Philipp Keugler, Germany
8. Dr. Maja Hadjic, Australia
9. Dr. B Mohanty, Singapore
10. Dr. Hasan Ogul, Turkey
11. Dr. K R Pardasani, India
12. Dr. Gulshan Wadhwa, India
13. Dr. Karmeshu, JNU, India
14. Dr. Rajni Joshi, India
15. Dr. Dwijendra Gupta, India
16. Dr. B Chandra, India
17. Dr. T R Sharma, ICAR, India
18. Dr. Dharminder Kumar, India
19. Dr. V K Katiyar, India
20. Dr. M N Mehta, India

There were over 400 papers received out of which 228 papers were selected for presentation both orally as well as through poster. 27 papers for young scientist award were presented in oral sessions and 07 papers were presented in poster sessions for Young scientists award.

The inaugural ceremony was celebrated with great pomp and show. Besides the Director Prof. P.D. Porey (Director SVNIT), Dr. Thrimurty President CSI addressed and formally inaugurated the conference as well as launched a new CSI SIG on “Bioinformatics”

Dr. Neeru Adlakha gave brief report on the conference with welcome address by Dr. M N Mehta. Mr. H A Parmar, Registrar of institute spoke about facilities. The participants also had blessings and information from Dr. Kamal Raj Pardasani, Dr. R K Datta and Dr. A K Shukla. The number of participants who attended the conference were about 400. The next 3 days were divided into keynote and invited talk in the morning and contributed papers after lunch . About 200 papers were presented in oral and poster sessions.

Cultural program and Entertainment
After hectic academic activities through out the day the organizing committee treated the participants in evening with novel entertainment program.

Special Interest Group Members
In the background there was a meeting with the
experts from abroad and some invited speakers from India to get their views & support for the workshop on bioinformatics. The summary of the meeting is given as annexure to this note.

Valedictory Session

On the 28th at Valedictory session was held with Mr Lalit Sawhney, Vice President IFIP as chief guest and Dr. R K Datta as guest of honour. Dr. P D Porey presided over the function. After the input by the organization and technical Committee feedback was taken from the participants. All the participants, Indian and foreigners were anonymous stating that the conference was an unqualified success in terms of technical contents, hospitality and other facilities provided to the participants and there were applauds by the participants to the Director, organizers and Staff of the Institution and thus the conference was concluded.

Six students were given awards from IFIP. Mr. Lalit Sawhney gave special memento to Director and organizing committee members on behalf of IFIP.

Annexure
Meeting of the Proposed Workgroup Governing Council of Bioinformatics.

Meeting was conducted at the Faculty Guest House of SVNIT where the following members were present.
1. Yiu Siu Ming, University of Hong Kong
2. Rolf Wurtz, Germany
3. Milan Stehlik, Johannes Kepler University, Austria
4. Mamoru Kato, Cold Spring Harbor Laboratory, USA
5. Dr. Hasan Oogul, Turkey

Eventually, they build several different aircraft, but give them all the same name. Some passengers actually reach their destinations. All passengers believe they got there.

Mach Airline
There is no airplane. The passengers gather and shout for an airplane, then wait and wait and wait. A bunch of people come, each carrying a piece of the plane. These people all go out on the runway and put the plane together piece by piece, arguing constantly about what kind of plane they're building. The plane finally takes off, leaving the passengers on the ground waiting and waiting and waiting. After the plane lands, the pilot telephones the passengers at the departing airport to inform them that they have arrived.

Newton Airline
After buying your ticket 18 months in advance, you finally get to board the plane. Upon boarding the plane, you are asked your name. After 46 times, the crew member recognizes your name and then you are allowed to take your seat. As you are getting ready to take your seat, the steward announces that you have to repeat the boarding process because they are out of room and need to recount to make sure they can take more passengers.

VMS Airline
The passengers all gather in the hangar, watching hundreds of technicians check the flight systems on this immense, luxury aircraft. This plane has at least 10 engines and seats over 1,000 passengers. All the passengers scramble aboard, as do the necessary complement of 200 technicians. The pilot takes his place up in the glass cockpit. He guns the engines, only to realize that the plane is too big to get through the hangar doors.
ICoAC 2010:
2nd International Conference on Advanced Computing
14-16 December, 2010 at Chennai, India

Organised by: Dept. of Information Technology, Anna University Chennai, MIT Campus and IEEE Madras Section

Supported by: Computer Society of India Div. IV & Chennai Chapter
IEEE Computer Society, Madras Chapter
Centre for Development of Advanced Computing (CDAC)
University Grants Commission (UGC)

The objective of ICoAC-2010 is to provide a forum for International Community to discuss and debate on the developments in the cutting-edge technological computing areas. The conference will feature peer-reviewed technical papers presentation with short papers and posters, tutorials, student paper presentation and stimulating keynote talks from experts ion the filed such as

• Prof. Ian T. Foster, Argonne National Laboratory, USA
• Prof. Rajkumar Buyya, CLOUDS Laboratory, University of Melbourne, Australia
• Prof. Ruppa Tulsi Ram, University of Manitoba, Canada
• Dr. Sasanka Prabhala, User Experience Group, Intel Corporation, USA

Papers are invited in the following areas (but not limited to): Cloud Computing; Grid Computing; Mobile Computing; Enterprise Computing; Pervasive Computing; Soft Computing; Nano Computing; Applications in Science, Engineering and Humanities.

Paper should be prepared in two column IEEE format. All papers will be peer reviewed. Extended version of a few selected research papers will be published as a special issue in the International Journal of Parallel, Emergent and Distributed Systems (IJPEDS)

Important dates:
Last date for paper submission : 30.06.2010
Notification of acceptance : 30.08.2010
Last date for Tutorial Submission : July 30, 2010

For details, please contact:
Dr. S Thamarai Selvi
Convener ICoAC 2010, Professor, Dept. of Information Technology, MIT Campus, Anna University Chennai, Chrompet, Chennai 600044, India. Phone: 91-44-22516319 / 22516015.
Email: thamaraiselvis@gmail.com OR stselvi@annauniv.edu OR

Mr. H R Mohan, Chair Div. IV, CSI at hrmohan@gmail.com
Website: www.annauniv.edu/icac2010
Call for Volunteers to strengthen the CSI Special Interest Groups and international collaboration with IFIP, IEEE and other international societies

Prelude: As the first and the largest IT professional society of India, the CSI has a crucial role to play at the national and international level. The founders of CSI had a holistic vision for the society and its members to eventually become a springboard for innovation and creativity in IT usage and development.

In the last 45 years, the CSI has made a tremendous impact in every sphere of Indian society - be it in the business, industry, government, academia, research and consultancy. The effective functioning and growth oriented organization of the CSI has made it possible to reach out to different geographical regions of India.

On the other hand, the technical divisions along with the constituent special interest groups have been providing the technological leadership to the members of the society. Since its inception, the CSI has been playing the leading roles in the international collaboration among the professional societies.

Aim and Objectives: To consolidate the above achievements and take forward the technology development agenda of CSI, we request our members to volunteer their services in the following ways:

1. Form new Special Interest Groups (SIGs) in emerging technological domains with a focus on solving the issues and concerns about globalization and inclusive growth.
2. Contribute in the CSI Special Interest Groups as member, event organizer, technical reviewer , knowledge capturing and making available to all members and industry etc.
3. Contribute in the activities of IFIP Technical Committees and highlight the India-specific technological needs through participation and contribution in the IFIP programmes and activities in India and abroad.
4. Contribute in the collaborative programmes of CSI and is partner societies e.g. IEEE, BCS etc. Also, participate and contribute in the continuing education programmes offered jointly by CSI and its partner societies.

Submission of Proposals: This call is being issued for inviting fresh proposals as well as strengthening the existing entities. Outline about SIGs and a list of new expected topics can be found under DIVISION & SIGs listed on CSI KM portal www.csi-india.org.

More details about IFIP, IEEE and BCS can be seen at the respective websites of these organizations.

The conveners of existing CSI SIGs and CSI representatives in IFIP Technical committees are especially requested to submit the activities reports and current status of the respective entities covering following points:

CSI SIG Conveners:
- Activities Report for the last two years
- Action plan for the 2010-11
- A brief note on the SIG’s outcomes e.g. helping Research and promoting knowledge in this domain
- A brief note on ny significant contributions/ achievement of the SIG e.g. helping CSI in enhancing its brand image and adding more value to members
- A brief note on the National/International conferences planned and corpus generated for Chapters and HQ.

CSI Representatives in IFIP Technical Committees:
- What did you set out to achieve as an IFIP TC Representative and as a global ambassador representing Indian technical community?
- What were the activities of your IFIP TC during the last year, and how you were able to contribute / participate?
- What is action plan for 2010-11, and any constraints that you faced/face?
- How can your involvement benefit Indian academicians, researchers and professionals? E.g. May be we could have more of our members to participate in IFIP Working Groups or other events, and/or bring more of these activities to India.

The interested members may please forward their profiles, past achievements, carrying out similar or equivalent volunteering activities and statements of intent to (a) hq.sig@csi-india.org for volunteering in CSI SIGs, (b) hq_IFIP@csi-india.org for volunteering in IFIP TCs and (c) hq_IEEE@csi-india.org for volunteering in IEEE, IEEECS and BCS joint programs and promotions.

Submission Deadline: The last date for all the submissions as above is 15th June 2010.

Mr. M D Agrawal  
Vice-President, CSI

Prof. H R Vishwakarma  
Honorary Secretary, CSI
Mr. Satish Doshi, Fellow, CSI and Founder Of Sampoorna Computer People Group, left for his heavenly Abode on 26th April 2010.

The Computer Society of India (CSI) conferred the award of Fellowship on Satish Doshi, managing director and CIO, Sampoorna Group, for his significant contributions in the field of IT, and services to the CSI. The presentation ceremony was held recently at CSI 2002—the 37th annual convention at the Indian Institute of Science Campus, Bangalore.

Doshi was a member of CSI National ExecCom as honorary treasurer (1994-96), as regional vice president (West) 1996-2000 and chairman nominations committee (2000-2001). He has actively participated in amending the constitution and bye-laws of CSI.

Satish Doshi did his BE and MMS from BITS, Pilani. He has worked with ABC Consultants, IDM, Computer Point and Datamatics. In 1990, he founded Sampoorna Computer People, a specialist computer recruitment company.

To

Mrs. Satish Doshi
Mumbai
Dear Madam,

We in CSI, are deeply shocked to know about sad and untimely demise of our very close associate from the fraternity of CSI, Dear Satishbhai Doshi. The shocking news is still unbelievable. We wish it was not true!

Mr. Satish Doshi was a devoted solution provider in whatever capacity he was associated with CSI!

He was Vice President (WR) and guided several CSI chapters. As EXECOM member, he had contributed on many projects like byelaws amendments, electronic voting, etc.

Shri Satishbhai had been Hon. Treasurer CSI. He was very methodical and meticulous. He brought out Chapter Accounting Manual during his tenure as Hon. Treasurer.

He had been a grass root worker of CSI and contributed significantly in many activities. He had been a great support to many in CSI. Shri Satishbhai has been a mentor to many.

Shri Satish Doshi played a significant role in setting up an online election process.

What ever assignment was given to him, he performed to his best ability and to satisfaction of all! A real Gem for all of us!

His role in setting up of Sampoorna Computers in early years for IT Professionals’ recruitment, shows his visionary thought process.

CSI and IT Community at large will miss him very badly. CSI has lost a willing worker and a Fellow! May his soul rest in peace!

We pray to God to give peace to the departed soul and courage to you and all family members to bear this irreparable loss.

Heartfelt condolences.

Prof. P. Thrimurthy
President, Computer Society of India

We would remember him for his relentless contribution to CSI at many-many fronts. He has left a legacy for all of us. He was great friend and highly sincere person.

Let us pray to almighty for giving peace and strength to his beloved family.

M D Agrawal
Vice President

It is very shocking to know about Shri Satish Doshi ji’s demise. His contributions are enumerable to IT community and esp to CSI and its members. May his soul rest in peace. We pray to the Almighty to give strength and courage to his family to bear this loss.

H R Vishwakarma
Hon. Secretary

I am deeply saddened by the news regarding the passing away of Satish Doshi. He was a very dedicated member of the CSI and would be greatly missed by his many friends and admirers in the CSI family.

May his soul rest in peace. I also pray that the Almighty would grant the bereaved family the much needed strength to bear this loss.

Brig S V S Chowdhry (Retd.)
Past President CSI

It is shocking news to learn about the sad demise of our very close associate from the fraternity of CSI, Dear Satish Doshi.

We worked together in various capacities, especially in N.C. He played a significant role in setting up an online election process.

Our heart felt condolence to the family member with deep desire to be available for any help we can render. Heartfelt condolences.

Rattan Datta & family.
Past President, CSI

I am deeply shocked to know about sad and untimely demise of Mr Satish Doshi. I had a very long association of working in CSI with Mr Doshi. During my CSI President ship in 1994-96, he had been Hon. Treasurer. He was very methodical and meticulous.
First time in CSI, he brought out Chapter Accounting Manual during his Hon. treasureership. I distinctly remember visiting his home in Mumbai with Mr Lalit Sawhney (VP, CSI at that time) and Mr M R Datar (Hon. Secretary, CSI at that time) for dinner when I met Mrs Doshi and his son and daughter. As both of us were alumni of BITS Pilani, we used to talk about BITS activities also. We had been in contact after wards also but not that frequently. I was not aware about his serious illness. His role in setting up of Sampoorna Computers in early years for IT Professionals’ recruitment shows his visionary thought process. He had been a grass root worker of CSI and contributed significantly in many activities. He had been a great support to me during my President ship. I, CSI and IT Community at large will miss him very badly. I am shocked to here the sad news. Satish has been a guiding light for CSI...

It is indeed shocking to learn about the very sad and untimely demise of Mr. Satish Doshi. I had an occasion to work with him on some of the CSI work and always found him very energetic, clear conscious and systematic person. It is a great loss for the CSI community. I wish and pray the almighty to give courage to his bereaved family to bear with this tragic loss.

Dr. J R Arora, Fellow, CSI

It is a shocking news to note that Satish Doshi has passed away.

I was not aware of his sufferings from Cancer. He actively participated in no. of reforms in CSI. We will really miss him.

Let me pray his soul to rest in peace and also pray HIS ALMIGHTY to provide enough courage to his family members to overcome this situation.

H R Mohan
Chairman, Div.IV, CSI & Fellow CSI

It is a shocking news to note that Satish Doshi has passed away.

I was not aware of his sufferings from Cancer. He actively participated in no. of reforms in CSI. We will really miss him.

Let me pray his soul to rest in peace and also pray HIS ALMIGHTY to provide enough courage to his family members to overcome this situation.

H R Mohan
Chairman, Div.IV, CSI & Fellow CSI

It is indeed shocking to know about the untimely death of Mr Satish Doshi who helped to shape the life of so many IT aspirants through his Sampoorna - People. It is a great loss to computer community. Let his soul rest in peace.

We convey our heartfelt condolences to the bereaved family and pray to God to give them enough courage to lead a peaceful life in future.

I request the MC of CSI to bring a special page, expressing condolences and messages of members, in the next Edition of CSI Communications

May his soul rest in peace.

Dr. R Srinivasan
Past President CSI

It was with great grief that we heard the news about Satish leaving us today.

MD Agarwal has been keeping us briefed about his illness the last 2 years and we have been hoping that god will help him survive, and be with us for a long time. But I suppose even god could not let him suffer so long.

Satish has been a dear friend for more than 25 years, and I really got the opportunity to know him well in CSI. We worked closely through the process of the Constitution Review, so many CSI Elections / nominations, and so many other important and different areas like providing in the constitution for setting up SIGs, and fighting so many battles together.

I also saw him take on a new business and grow it into Sampoorna, the great IT recruitment and search business, and also set up ERA.

All his friends will remember his smiling face and remember him for a long, long time.

I and Jayshree offer our deepest condolences and sincerely hope that you will be able to bear the loss and carry on the work that he started off in Sampoorna.

Lalit Sawhney
Past President CSI

It is really shocking to know about the untimely death of Mr. Satish Doshi. I had an occasion to work with him on some of the CSI work and always found him very energetic, clear conscious and systematic person. It is a great loss for the CSI community. I wish and pray the almighty to give courage to his bereaved family to bear with this tragic loss.

Dr. C R Chakravarthy
Immd. Past Divisional Chairman, CSI-BC.

It is a very sad news & a great loss to CSI as a whole. My condolence to Mr. Doshi’s family.

Sanjay Mohapatra

I am shocked to here this news. He must be quite young, I knew him personally and it is a great loss to CSI and the computer profession. May his soul rest in peace. My personal regards.

Shyam Agrawal
Fellow CSI
ALLAHABAD

The Chapter organised Lecture programme on “Cyber Crimes, E-Governance & Cyber Security” on Saturday April 17, 2010 at Hotel Milan Palace, Allahabad. Mr. D K Dwivedi, Past Chairman, CSI Allahabad Chapter welcomed the Chief Guest, distinguished speaker and other participants at the beginning of the programme. While briefly introducing the topic, he expressed the need for spreading mass awareness amongst the Computer professionals and users with regard to various Cyber Crimes and take appropriate security measures to safeguard the data & information stored in Servers & Systems at their workplace and homes.

Mr. T Usmani, General Manager, ITI presented bouquet to Hon’ble Mr. Justice Rajesh Tandon, Chairperson, Cyber Appellate Tribunal, New Delhi, Chief Guest of the occasion and Mr. M.Y. Khan, DGM, ITI presented bouquet to Dr. Gulshan Rai, Director General, Indian Computer Emergency Response Team (CERT-In), Department of Information Technology, Ministry of Communications & Information Technology, New Delhi.

Dr. Gulshan Rai delivered very exhaustive presentation about the set up of CERT-In, its activities & role in securing Indian Cyber space by Countering Cyber Attacks/ Cyber Terrorism and implementing a Crisis Management Plan across Government and critical Sector in the country. Some well known cases of Cyber attacks which affected the Critical Sectors in India & other countries were also discussed. Interactive Session started after the presentation and the queries of the audience on various areas affected by Cyber-Crimes were discussed.

Hon’ble Mr. Justice Rajesh Tandon, Chairperson, Cyber Appellate Tribunal, New Delhi elaborated various provisions of Information Technology Act 2000 and subsequent amendments of the Act such as legal recognition of the Digital Signatures, Authentication of digital records & E-Governance, provisions for adjudication of the Crimes and penalties associated with different types of cyber crimes. Various Cyber disputes pending & decided before Courts in India & other countries were also discussed.

Prof. (Dr.) K K Bhutani, Fellow, CSI presented memento to the Chief Guest. Large number of participants from academia, industry including office bearers and members of the CSI Allahabad Chapter attended the programme.

Prof. J N Tripathi, Hony. Secretary of the Chapter delivered vote of thanks.

BANGALORE

Technical Education Outreach (Rural Program) in Sargur, HD Kote (200Km from Bangalore) on 14 & 15 November 2009. This programme was jointly held by Computer Society of India (CSI) Bangalore Chapter, IBM, Eduworks and Swami Vivekananda Youth Movement (SVYM), an NGO based in Sargur. The venue for the event was the SVYM School of Excellence in Sargur.

The event consisted of Fun Science experiments (Students & Teachers), Robot programming (Students & Teachers), and Activity based teaching (Teachers).

58 Students (8th and 9th class) and 10 teachers from 11 government schools from nearby villages had come there with their hearts brimming with enthusiasm and curiosity for the student activity. 40 teachers from 15 schools took part in the teacher training activity.

BaluSabha Raman Guruswamy from CSI, Bangalore Chapter co-ordinated the programme while Yashaswini & Sheeba from Eduworks conducted the teacher-training program.

Fun Science experiments: The motto of this session was to make learning science easy for the students by doing practical experiments using daily household items. This not only makes learning fast but also keeps it in a student’s memory for a long time. Three science experiments were demonstrated and then the students performed using the kits provided.

Robot programming: The students were grouped in teams of 5 to 6 members. The students were quick to grasp and it took only an hour for them to run their first personally programmed robot. All the teams were successful in programming the robot to traverse ‘I’ using the Lego robotic kit.

During the second half of the session, the teams competed in manoeuvring the robots in a maze. The challenge was to traverse a maze from the start to the destination without hitting the obstacles in between and the best teams won prizes. The enthusiasm was contagious and the teachers also formed an impromptu team and competed in the maze competition.

Activity based teaching: Eduworks (and sponsored by CSI Bangalore Chapter Managing Committee member Yeshasvini)
trained the teachers for practical coaching of the students on the second day in a parallel session. Teachers learnt the importance and techniques of activity-based teaching and developing session plan.

Valedictory: Dr. Seetharam, President, SVYM was the chief guest at the valedictory function. The prizes for three best teams of the maze competition were announced based on their accuracy, consistency and speed of programming. CSI Bangalore Chapter donated an educational kit consisting of four science and maths CDs (sponsored by CSI-BC MC member Appa Rao) to every participating school.

The Chapter appreciates help given by M/s. IBM and also Mr. Balasubba Raman Guruswamy from CSI. Bangalore Chapter coordinated the programme while Ms. Yashaswini & Sheeba from M/s. Eduworks conducted the teacher-training program in a successful manner.

COIMBATORE

The Chapter has launched a rural development project on the occasion of its Silver Jubilee. This project envisages providing IT Infrastructure and Education for Rural Schools within the jurisdiction of the chapter with the co-operation of industry and academic institutions.

Initially this rural development project has been launched at Government High School at Arasampalayam on the occasion of CSI Day on 6th March 2010. LMW, one of the leading corporates, in Coimbatore has provided the IT infrastructure and the CSI student branch of DJ Academy for Managerial Excellence has volunteered to impart the training. The program was formally launched by the Chairman of the chapter along with other office bearers and officials of LMW and DJ Academy. “This is a golden opportunity being provided to the students of this rural school to help them compete with children having such facilities” says Mrs. Vijayalakshmi, the Headmistress of the school. The project was also launched at Govt. Primary Schools at Muruganpathy and Chinnampathy by the District Revenue Officer Mr. S. Moorthy. The IT infrastructure for these schools was donated by Seyyone Software Solutions P. Ltd. The training at these schools will be coordinated by the CSI student branch of Amrita Vishwa Vidhyapeetam.

With over 30 student branches in the region, CSI Coimbatore chapter hopes to expand this project to different parts of the city and neighboring areas. In fact, this project could serve as a unique model of industry-institute collaboration with CSI acting as the driver and facilitator.

DELHI

The Chapter organized a Four Days extensive Workshop on “Lean Six Sigma Green Belt Workshop” in association with KINDUZ Consulting and Bharati Vidyapeeth’s Institute of Computer Applications and Management (BVICAM), New Delhi. KINDUZ Consulting (http://www.kinduz.com/) is a niche consulting firm that delivers focused ‘Business Improvements’, with ‘Business Results’ for its customers. Headquartered in India, with branches in Germany, U.S.A. and Canada, KINDUZ has completed over strategic consulting assignments with many companies like GlaxoSmithKline, GVK BIO, BGK Engineering, Akruthi Infratech, Harshini Infra, etc.

The Chapter organized an Evening Symposium on “Cloud Computing” on 23rd March, 2010 at India International Centre Annexe, Lodhi Road, New Delhi. Prof. M N Hoda, Chairman, CSI DC has briefed the audience about the new initiatives and activities of the Delhi Chapter. He requested the members to constantly visit the website of Delhi Chapter www.csidelhi.org for the latest information about the activities of Delhi Chapter.

There were three technical talks in the symposium. Mr. Bijoy Singhal, Developer Evangelist, Microsoft India, has given a detailed presentation on “Demystifying the Cloud – A Brief Introduction to the What, the Why and the How”. His presentation helped the participants to understand that how Cloud Computing as a whole can transform day to day applications. Dr. Rajesh Narang, Chief Technology Officer, DIT, MC&IT and Director, National Institute of
Smart Governance, Govt. of India, New Delhi, has given a detailed presentation on “Cloud Computing - A Way to Accelerate the IT Applications”. Mr. Vikas Arora, Group Director, Cloud Services, Microsoft India, gave his presentation on “Platform as a Service: Its’ Role and Key Considerations in Cloud Computing”. It was a detailed session on understanding the concept that how Cloud Computing can really be beneficial for IT users in particular and others in general.

Prof. A. K. Saini, Immediate Past Chairman, CSI DC, Mr. Manoj Sethi, Hon. Secretary, CSI DC and Mr. R. K. Vyas, Regional Students Co-ordinator, R-I, introduced the eminent speakers. Mr. S. D. Sharma, Hon. Treasurer, CSI Delhi Chapter, presented vote of thanks.

The Symposium was attended by very senior members of CSI Delhi Chapter and was well received by the participants.

**GNIT, GHAZIABAD**

A National Conference on “Innovation & Entrepreneurship In Information and Communication Technology” was jointly organized By the Computer Society Of India -Ghaziabad Chapter, GNIT Girls Institute of Technology & GNIT Group Of Institutions at GNIT Girls Institute of Technology on 12-13 March, 2010. The Conference was Sponsored By the Department of Science and Technology, Government Of India.

The Inauguration of the conference was done with lighting of lamp by the Chief Guest Prof: S K KAK, Vice-Chancellor C.C.S University Meerut. Prof: S K Jain MHRD IPR Chair Professor & Chairman Of Economics & Entrepreneurs Group IIT Delhi.

Elaborating on the purpose of the conference Prof (Dr) A K Pandey Conference Chairman stressed the need for innovation & entrepreneurial Ventures as a way forward towards solving the unemployment problem and taking the nation among the developed nations. Prof S K Jain in his Keynote Address said that all MNCs follow the strategy of out-sourcing in order to Cut down the cost. Thus there is wide scope for entrepreneurship. He further said that 80% of the Patents are not able to complete their term of 20 years. Prof S.K Kak in his Inaugural Address emphasized on the need for open environment, free mind & Innovation and it should begin at school level itself so that students can get used to thinking in that way.

Session I on “Innovation in ICT industry- Past, Present and Future” was chaired and addressed by Mr. Ashwin Raguraman, Head, Innovation Initiative, NASSCOM, New Delhi. In his talk Mr. Raguraman said Invention is important but “how invention is applied” is more important. He defined innovation as “Fresh thinking to create product to create values”. Mr. Apoorva Raj Sharma, GM, Amity Technology Business Incubator, Noida stressed need of incubation center in an academic institution. The intellectual capital present in an academic institute is asset and can prove to be a catalyst in an innovation process and through incubation center the ideas can be converted in to startups.

Session II on “Innovation Skills and Entrepreneurship Skills” was marked by presentation of papers by the delegates from academics, industries as well as researcher and students. The paper presentation covered various aspects like emerging trends in ICT, rural India as a potential IT market and the impact of science, technology and innovation on economic and political powers of the country, etc. Dr. Subash Goyal, Chairman, ASSOCHAM’s Expert Committee and Chairman of Civil Aviation and Tourism, ICCI said that the key to be a successful entrepreneur is hard work but it has to be “Smart Hard Work”. Successful enterprises must focus on value of time and passion towards achieving his ambition as the stairs to reach the success, he said.

Session III on “Innovation and Entrepreneurship Centric Teaching -Learning process was chaired by Dr. Om Vikas, Advisor, C-DAC, Noida and former Director, IIITM, Gwalior, and Co-Chaired by Mr. Vijay Rastogi, Senior Manager, CSC and Secretary, CSI Ghaziabad Chapter. The session constituted of Young IT Contest paper presentations in two categories: Professionals and Students category. The evaluation committee was comprised of Dr Om Vikas, Dr Rajeev Agrawal, Vijay Rastogi, Prof Abhay Bansal and Prof K K Gupta. Each presentation was followed by an interactive session. Talking about “Innovation and Entrepreneurship centric teaching - learning process” Dr. Om Vikas said that there is a need for inclusive innovation which includes both structured and unstructured innovations. This requires charging mindset and promoting scientific temper of people at school and college level and in various sectors of the economy. He said Entrepreneurship exploits change as an opportunity to create new business/service. He also said that Innovation in education is key factor exponentially influencing the overall growth of the country.

Session IV & V on Business Plan, Incubator, IPR, and Venture capital was combined under the logistics needs of creating an enterprise. The session was chaired by Mr. R. Saha, Director, TIFAC, Department of Science & Technology, Government of India. Prof Vinod Gupta, Director, (PIS) NIESBUD, Noida focused on how a business plan can be developed and what is needed for preparing a business plan. Mr. S. R. Mustaffa, Manager, STEP, JSSATE, Noida, dwelling on role of incubation centers in the development of new business units said that the a successful business unit is not show of one man army but of the whole team members of the business. Mr. K G Alai, Chief General Manager (Northern Region) talked about the importance of finance for the new and developing entrepreneur and he initiatives of SIDBI for promotion of SMSE.

Dr. A K Garg, Additional Director, Department of Information Technology, Government of India enlightened the audiences about Intellectual Property Right and the importance of strategically protecting the intellectual property rights. Mr. R Saha in his concluding remarks made the audience and students aware about the new dimensions of IPR, how the Intellectual Property Right can be protected and what are the procedures to apply for these rights. The session concluded with the presentation of awards for Young IT Professional Awards. In student category, the awards were won by students of IIIT Allahabad (Human Computer Interface using devanagari character Recognition), JSS Noida (Automated system for subjective Examination system: Market-oriented vision, opportunities and challenges) and IIIT, Amethi (MEDAVI : A Software tool for interactively visualizing medical data). In all 92 delegates from various engineering and management institutes and 150 faculties and students of nearby institutes attended the conference on both the days. The conference concluded with the vote of thanks proposed by Shri Vijay Rastogi. This was followed by presentation of Certificates to the participants.
K L University in association with Koneru chapter has organized a workshop on “Lean Six Sigma” for White Belt Certification to faculty members on April 5th 2010 at peacock hall of K L University campus.

The objective of the workshop is to encourage Six Sigma and its support on implementing six sigma practices in academic system covering the main areas of research, consultancy and administration and to improve quality in training programmes & technology usage, to reduce cost through optimum utilization of infrastructure, to improve satisfaction of meritorious students. More than 50 participants including CSI members of Koneru chapter and senior faculty of KLU have participated in the workshop. In the morning session Sri Pavan K, CEO KINDUZ Consulting has delivered various case studies significant to some processes in academic systems like result analysis, admissions and research & development. The afternoon session conducted by Dr. D Prasada Rao, Director Business School AMITY University covering six sigma practices in real time case scenarios.

Sri K Satyanarayana Chancellor of K L University was the chief guest and asked the participants to know the importance of six sigma practices in applying successfully in all the directions of academic system. Sri K Havish Proc chancellor & Dr. G L Datta Vice chancellor of KLU have spoken about the theme of the workshop. Dr. P Thrimurthy President CSI has chaired the workshop. Mr. K Raja Sekhar, Chair Chairman has proposed the vote of thanks.

MUMBAI

The Chapter organized the inauguration of the newly renovated chapter office at the hands of Mr. Raj Sarafji, Chairman, Zenith Computers Ltd. on Tuesday 4th May, 2010 at Mumbai.

After lighting of traditional lamp by the dignitaries present and breaking of auspicious coconut by Mr. M D Agrawal CSI Fellow & Vice president of CSI, Mr. Raj Saraf the chief Guest cut the ribbon and all present entered the renovated premises.

Dr. Vishnu Kanhere, Vice-Chairman and Chairman Elect, CSI Mumbai Chapter welcomed all the members and invitees and also expressed thanks and gratitude to Mr. Raj Saraf, for accepting the invite for the function. As a prominent leader of the Industry and a pillar of strength and support of Mumbai Chapter his presence was a source of great encouragement and inspiration to the Chapter Team and members. Dr. Kanhere also pointed out the painstaking efforts spanning over several months of Mr. Rajiv Gerela Immediate Past Chairman and Mr. Ravi Eppaturi, Mr. Ron Dumasia, Past Chairman and Mr. Ravi Raman, Chairman in this achievement. He also promised the HQ of continuous support of Mumbai Chapter in all his initiative.

Mr. Raj Saraf, the Honorable Chief Guest, in his speech highlighted the prime position of Mumbai Chapter in CSI and expressed satisfaction at the performance of the chapter. He appreciated the renovated premises, which would attract even the multinational and leading software companies in the vicinity to use the facilities. He also reminded the team of the responsibility cast on them and urged them to rise to the occasion by delivering value to members.

Mr. M D Agrawal Vice President CSI recalled the efforts of Late Mr. Satish Doshi a senior Fellow member and mentor of the chapter in spearheading the quest for premises for the chapter, which was fulfilled with the efforts of Mr. Saurabh Sonawala, Treasurer of CSI. Mr. Agrawal assured the Chapter team and the members present of full support from the HQ, but also reminded them to do more programs and activities with the improved facilities.

Mr. Saurabh Sonawala recollected the days when they had to scout around for an appropriate place fitting the budget for independent chapter premises. He reiterated support to the Chapter but also called upon the Chapter, being the largest and most active one to rise to the occasion to support the HQ when required and serve as a role model for others to follow.

The members present observed a minute’s silence as a mark of respect to the memory of the Late Mr. Satish Doshi, whose death...
only about a week back had lent a sad note to the occasion.

Mr. Ravi Eppaturi MC Member of Mumbai Chapter while presenting his vote of thanks to the Chief Guest Invitees, Chapter & HQ team, chapter office staff Mr. Venkat Iyer and Mr. Harshvardhan Mane and Members present, also recognized the excellent interior renovation job done by Mr. Vijay Patel of Vijay Interiors in a record time. He assured all that with the renovated facilities Mumbai chapter will continue to organize lot more activities which will benefit the Individual members as well as Institutions.

- **SRIJI COLLEGE, MADDIRALAPADU, ONGOLE**
  The chapter and Sriji College jointly organized a workshop on Industry-Employability on 6th April, 2010 to help the students choose the right carrier path that matches their aptitude, attitude and aspirations.

  Title : Prof. Thrimurthy, President, Computer Society of India chaired the inaugural session of work-shop. Mr. Pavan Kota, C.E.O, Kinduz consultancy, providing guidelines to improve corporate skills.

  Prof. Thrimurthy, chaired the inaugural session of workshop. While addressing he expressed his conviction that professional institutions have to keep the various academic needs of students and specific requirements of personality development in view and they need to carry out orientation programs to develop communication skills and required corporate skills of students.

  Prof. Thrimurthy opined that ever growing usage of e-governance applications and stressed the need for providing quality education with enriched technical values to tackle with the problem of employability, which the present students are facing.

  Mr. Pavan Kota, C.E.O, Kinduz consultancy, was the resource person for the work-shop. He trained the students to experiment and compile different styles of resume. He provided guidance on various self-concept and personality development issues and to improve various corporate skills such as Carrier counseling and Personality development

  Principal P. Kishan Kumar, while addressing the students in the inaugural session, said that, “students here are found to be generally diligent and only need to be oriented towards successful carriers by restricting their attitudes and improving their confidence levels”.

  This event was sponsored by SRIJI COLLEGE, Maddiralapadu. Mr. P. Kishan Kumar, Principal, Mr. P. Ajith, head, department of Computer Science, Mrs. M. Yashodhara, Lecturer, department of Computer Science and other staff of Sriji College extended excellent support in conducting the event.

- **TIRUCHIRAPALLI**

  About 60 Members Participated & got Benefitted from the lecture on e-security. Mr. K Sankaran, Hon. Secretary IEI – TLC welcomed the gathering. Mr. K Ramadoss, Senior most member & former GM/BHEL/Tiruchirapalli & Mr. N Kuppusami, Chapter Secretary presented the momento on behalf of the participating Institutions.

  Mr. R Selvaraj, Immd. Past Chapter Secretary proposed the vote of thanks.

  **TIRUCHIRAPALLI:** Mr. T Jegannathan delivering the lecture on “Six Sigma Concepts & Methodologis” 

  About 55 Members Participated & got Benefitted from the lecture.

  Er N. Sridhar, Hon. Jt Secretary IEI –TLC welcomed the gathering. Er K. Ramadoss,Senior most member & former GM/BHEL/ Tiruchirapalli introduced the speaker to the audience & presented the momento on behalf of IEI-TLC.

  Er R. Selvaraj, Immd. Past Secretary,CSI Tiruchirapalli Chapter presented the momento on behalf of CSI TRY chapter & Proposed the vote of thanks.

**STUDENT Branches**

- **AMSSOI**

  The third Prof. R Narasimhan Commemoration Lecture was organized on 31st March, 2010 in the Seminar Hall, Andhra Mahila Sabha School of Informatics (AMSSOI). The session started with a brief introduction of Prof. R Narasimhan, the doyen of Indian computer science and Artificial Intelligence, one of his research areas, by the students of MCA, AMSSOI.

  The Chief Guest, Dr. Syeda Sameen Fatima, Professor, Dept. of CSE, Osmania University delivered an interesting and instructive lecture on “AI A Multidisciplinary Field – With Historical Perspective”.

  The lecture started with a brain teasing puzzle testing the intelligence of the audience thereby gradually understanding what intelligence is. AI was further described as a multidisciplinary field as
its application areas are widespread including game playing – chess, theorem proving, expert systems, machine learning, natural language processing, speech processing, vision, robotics, etc.

Prof. Kesav Nori, Visiting Professor, IIT- H and a student of Prof. Narasimham gave his valuable remarks and shared his memories. He described Prof. Narasimhan as a scholar correct to a fault, a strong researcher who made the country proud and helped others to grow. He also mentioned that Knowledge is not gathering information but understanding information.

After interaction with the assemblage the session concluded with an announcement of the 5th AGM of the Branch preceded by Chairman’s Lecture that would be held in the month of April, 2010 and vote of thanks by Ms B Kusuma Devi, Secretary, CSI-AMSSOI Student Branch. She expressed her gratitude to Prof. DVR Vithal for donating Rs.1,000/- towards the lecture, Prof. P Premchand, Dean, Faculty of Informatics, Osmania University and Prof. Putcha V Narasimham, Director, AMSSOI for their presence.

Dr. Gurpal Singh, HoD, CSE & IT welcomed the delegates and explained about the theme of the conference.

Delivering his keynote address on the occasion, Mr. Yogesh Kochhar, Director, Public Sector Business Development India, Microsoft Corp., emphasized the need for using the ICT for developing innovative applications for rural masses where the actual India is living.

Also present on the occasion was Dr. Amarprrapat Singh, HOD, Department of CEC, SLIET, Longowal who delivered invited talk on virtual reality in the inaugural session.

Eminent scientist Mr. Jagdish Chabra, of CSIO, chaired the Image Processing session and provided the presenters with his valuable inputs.

Earlier, while welcoming the delegates, Dr. M S Grewal, Principal, BBSBEC, said that such conferences provide young researchers a platform to share the work they have done, with other fellow researchers. Dr. Grewal also thanked Mr. Yogesh Kochhar, Dr. Amarprrapat Singh, and Mr. Jagdish Chabra, for taking out some time from their busy schedule to be present at the conference.

Conveners of the conference Prof. Baljit Singh and Prof. Kanwalvir Singh Dhindsa, and Prof. Satwinder Singh, Organizing Secretary, also thanked the delegates and participants.

The branch organized a Cyberfest “Inovaz 2010” on 31st March and 1st April 2010 at Charotar University of Science and technology (CHARUSAT), Changa. The event was jointly organized by students and faculty members of U & P U Patel Department of Computer Engineering and Department of IT. “Inovaz” stands for “Ideas nourishing versatility and zest”. The main motto of the event was to cover all aspects of technical proficiency with an innovative perspective.
It was inaugurated by Prof. S G Shah, the Regional Vice President of CSI, Region III & Dy. Director, CHARUSAT, and Dr. M.C. Patel, the PROVOST of CHARUSAT, Changa and Dr. S P Kosta, Director of CHARUSAT, Changa. More than 700 enthusiastic students from various colleges of country participated in different technical and non-technical events.

The major technical events organized were Project Presentation-Coding, Network Challenge, Technical Treasure hunt, Encryption; Query processing, Web development, Hardware encounter. It also had bunch of non technical and fun booming events like quiz, movie making, photography, logo designing, LAN gaming and mixed bags.

In addition to the competitions, several workshops were organized for enhancing knowledge of students. Red-Hat Linux workshop was conducted by team from ElectroMech Infosys (Ambassador of Fedora under the Gujarat region).

Microsoft “DreamSparkYatra” a workshop comprising of sessions on cutting edge Microsoft Technologies like Visual Studio-2010, Microsoft Gaming using XNA Studio, along with the Windows 7, Windows Server 2008. Workshop was organized by Microsoft Student Partners (MSP) of Gujarat region.

Workshop called “DeskTransform” was organized for the complete Windows platform based desktop customization for Computer Rookies. This is for styling and designing of desktop of Windows VISTA, XP, and Se7en (A to Z). This workshop was organized by Sofmynd Solutions, Vadodara.

Workshop on 2D-3D Animation, Web animation, Cartooning, Corporate presentation. Workshop was delivered by IMAGE institute, Vadodara.

At the end of the event followed the prize distribution and valedictory ceremony. The event was successfully conducted with the joint efforts of students and faculty members under the guidance of Dr. Y P Kosta, Dean of Faculty of Technology and Engineering (CITC), CHARUSAT, Prof. Amit Ganatra, Head of Computer Engineering Department, Prof. Amit Thakkar Head of IT and Prof Ashwin Makwana, Student Counselor of the branch, Charotar Institute of Technology, Changa.

**DAVIET, JALANDHAR**

The branch has organized a 3-Day State Level Workshop on Learning Effective Document Writing using LaTeX from April 8th, 2010 to April 10th, 2010. This workshop was organized in association with Open Source University Meetup (OSUM) to promote the use of Open Source Softwares. The main objective of this workshop aims to facilitate participants to use modern tools & techniques for medium-to-large technical or scientific document writing. The workshop has provided hand on practical experience on LaTeX, a tool that is widely accepted for typesetting & document preparation, text book editing and especially for research paper writing for Journals etc.

Mr. D Venu Gopal from Banaras Hindu University, Banaras is the Resource Person for this 3 Day workshop.

More than 50 participants from various Universities/Institutes like NIT Jalandhar, Punjabi University Patiala, Punjab University Chandigarh, GNDEC Ludhiana, BCET Gurdaspur and many more have participated in this workshop.

Prof. C. L. Kochher, Regional Director (Engg. Colleges), DAV Colleges Managing Committee, New Delhi & Chief Guest of the Workshop stated that this workshop is one of its first kinds in the state of Punjab and he also appreciated the efforts made by the CSI Student Branch & IT department.

Dr. A. S. Arora, Principal & Patron of the workshop highlighted the importance of this workshop and assured that all the participants will be benefited from this workshop.

Mr. Dinesh Kumar, SBC, CSI DAVIET Student Branch & Convener of the workshop welcomed the Resource Person by highlighting his achievements among the audience.

Gyan Ganga Institute of Technology and Management, Bhopal organized a three-day Tech Fest named “ERUDITION-2010” from 12th – 14th April 2010. Mr. Kaushik Chatterjee, Vice President of HCL Info Systems Ltd., inaugurated the Technical fest. He addressed the gathering by appreciating the efforts of students for organizing such a fest and guided them about the currents trends and demands of the corporate world.

The tech Fest featured many events like Paper Presentation, Technical / Programming Quiz, Software / Hardware Exhibition, Expert Lectures, Web Site designing and many more which were organized by students chapter - CSI. Every event received overwhelming response from various colleges of Madhya Pradesh.

More than 25 review and research papers were presented. Papers on Biometrics, Sixth Sense, and Web Site Defacement were awarded first, second and third prizes respectively. Software on the game SUDOKU was given the best software award. Top three web site designers were also awarded. Prof. Deepak Singh Tomer, from NIT Bhopal delivered expert lecture on Information Security and Ethical hacking in which he gave live demonstration of ethical hacking while explaining various concepts of N/W Security.

The fest concluded with prize distribution ceremony in the presence of Er. Mahesh Shukla, General Manager, BSNL, who also gave a presentation on Number Portability system for Mobile Numbers. Guest of Honor, Mr. V K Jain honored Sr. Engineers of Madhya Pradesh, which included Dr. P P Khare, Chapter Chairman.

**K R NAGAR, KOVILPATTI**

The Branch organized a marketing contest on 07.04.10 for II, III Year IT & CSE students at the college premises.

Dr. K Ramar, HOD/CSE presided over the function and motivated the students to improve their communication and marketing skills.

Ms. J Anitha, CSI Students’ Counselor and lecturer of CSE department welcomed the gathering. Nearly 14 students (7 teams) were participated.

The students eagerly participated and enjoyed the contest on showing their skills and abilities.

**MEPCO SCHLENK ENGINEERING COLLEGE, BANGALORE**

The branch associated with CSI Trichy Chapter, organized the CSI Region VII Students’ convention EAGNA’10 on 6th March, 2010.
2010. Mr. R Shenbagaraj, Branch counselor of CSI Students’ chapter, Mepco Schlenk engineering college welcomed the aspirants so as to persuade, to convert and to compel. Then the chairperson Mr. Varun Pattiah presented the annual report of CSI. It was followed by the message of Mr. Aswin James Christy, co-chairperson through which EAGNA ’10 was introduced to the gathering. Dr. S Balakrishnan, Principal, delivered the presidential address. Dr. G Chandrasekhar, Director of MCA department, founder branch counselor of CSI of Mepco Schlenk Engineering College and Life member of CSI garlanded Mr. S Ramanathan, Region VII Vice President of CSI. Dr. T Revathy, Head of the department, Information Technology presented memento to the chief guest. The chief guest introduced souvenir to the principal in front of the gathering.

MEPCO SCHLENK ENGINEERING COLLEGE, BANGALORE: Inaugural address by Mr. S Ramanathan RVP-VII.

Around 200 students attended the workshop on Mozilla add on development. More than thirty papers related to Electronics and communication and Computer Science engineering and Information technology were presented. There were about thirty six participants for project presentation. The interesting event, Gaming was attended by twenty four teams. The participants attended other events like Circuit de-bugging, Logistics, Line follower, Pentathlon, Quiz, Online games and Best Manager to flaunt their skills from twenty different colleges. Their fiery paths were quenched by prizes at the end of the convention.

PERIYAR NAGAR, VALLAM THANJAVUR

As a part of CSI student branch activity, a paper presentation contest was held on 22/07/2009 to test the students’ technical knowledge in the chosen topics. Around 10 teams from pre-final year participated and presented their papers. Final year coordinators organized the event.

TCE, MADURAI: Students Presenting a Paper on Robotics

It was a rare occasion for the students’ to develop their skills in presenting papers and to clarify queries instantaneously.

As a part of student branch activity, a puzzle contest was held on 27/08/2009 to test the ingenuity of the students. Around 20 teams from second year and pre-final year. Final year coordinators organized the event.

As a part of CSI student branch activity, a Programming contest in C language was conducted to test the students in their programming skills. The event was held in two rounds. The preliminary round, full of objective type questions, was held on 20/8/2009 while the final round, a practical one was conducted on 11/9/2009. Around 30 CSI members from second and pre-final year participated.

THIAGARAJAR COLLEGE OF ENGINEERING, TCE, MADURAI

One Day workshop on “Fuzzy Logic and Its Applications” was jointly organized by the Department of Computer Science and Applications, Periyar Maniammai University, Vallam, Thanjavur and Computer Society of India, Thanjavur Chapter on 22nd March 2010. In the Inaugural Function Prof. J Jeyachidra, Head, Department of Computer Science and Applications has given a welcome address. Dr. N. Ramachandran, Hon’ble Vice Chancellor, Periyar Maniammai University in his inaugural address, briefed about the importance of Fuzzy Logic Applications in all Engineering and Science disciplines. Dr. R. Kandaswamy, Dean-Academics, Periyar Maniammai University has given a felicitation address in which he stated that the role of Fuzzy Logic in our day-to-day life. In the first session of the workshop, Dr. S Swamynathan, Assistant Professor, Department of Computer Science and Engineering, Anna University, Chennai, explained the Artificial Intelligence and its Applications in Fuzzy Logic. In the second session, Dr. P Balasubramaniam, Head, Department of Mathematics, Gandhigram Rural University, Dindigul, spoke about the basic Fuzzy Logic theory, it concepts and its related research area. At the end of the programme, Prof. V Arumugham, Chairman, Computer Society of India, Thanjavur Chapter and Principal, Kings College of Engineering, delivered the valedictory address and distributed the certificates to the participants. Prof. K Sethurajan, Assistant Professor(SS) of MCA Department and Secretary, Computer Society of India, Thanjavur Chapter delivered a vote of thanks.

74 enthusiastic Research Scholars, staff and interested students from various disciplines were benefited through this Programme.
Computer Society of India

Invites proposals from universities/institutes for hosting and organizing National/Regional/State-level Student Conventions

Prelude: As India's largest and one of the world's earliest IT professional organizations, the CSI has always aimed at promoting education and research activities through conventions, seminars and workshops. The Indian Education System has seen a phenomenal growth in terms of quantity and quality — making it the third largest education system in the world after US and China. It is also having the potential to become the best education system with strong relationships among education, research and industry sectors. It is noteworthy that every Indian state and region/territory occupies a unique position in terms of its vision and mission, roadmap, growth potential, infrastructural and human resources, grass-root level ICT needs, frameworks and policies for governance of public and private sector.

National Student Conventions have been annual events of Computer Society since the year 1985. The State of Karnataka is leading far ahead with other Indian states by hosting CSI Karnataka State Conventions every year since 1987. The States of Tamil Nadu, Madhya Pradesh and Kerala recently launched its CSI State Student Convention in Jan 2009, Feb 2010 and Feb 2010 respectively. The concerted efforts of team of National/Regional Students Coordinators and CSI student branches resulted in hosting a record number of Student Conventions since the year 2006-2007 across India and further growth oriented actions plans are in the pipeline.

For the academic year 2010-11, the following National/Regional/State Student Conventions have been planned:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Convention</th>
<th>Host Chapter and Dates</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1st Goa Student Convention</td>
<td>Goa Univ. and CSI Goa Chapter, 16th August 2010</td>
<td>Mr. Santosh Katam, E-mail: <a href="mailto:katam@goa.goa.nic.in">katam@goa.goa.nic.in</a></td>
</tr>
<tr>
<td>2.</td>
<td>Region-VI Student Convention</td>
<td>MIT Pune and CSI Pune Chapter, 4-5 Sept' 2010</td>
<td>Prof. S S Sane, E-mail: <a href="mailto:ssane65@yahoo.com">ssane65@yahoo.com</a>;</td>
</tr>
<tr>
<td>3.</td>
<td>26th National Student Convention</td>
<td>CSI Trivendrum Chapter 8-10 October 2010</td>
<td>Ms Mini Ulanat, E-mail: <a href="mailto:mini.ulanat@gmail.com">mini.ulanat@gmail.com</a></td>
</tr>
<tr>
<td>4.</td>
<td>24th Karnataka Student Convention</td>
<td>SJCE Mysore and CSI-BC 22-23 October 2010</td>
<td>Prof. B.G. Sangameshvara, E-mail: <a href="mailto:bg.bgsangam@yahoo.com">bg.bgsangam@yahoo.com</a></td>
</tr>
</tbody>
</table>

In pursuit with the above, the proposals from CSI chapters, student branches, member institution and other potential host institutes are invited for organizing the national/regional/state student conventions.

Aim and Objectives
- To facilitate interaction and collaboration of students with eminent academicians, researchers and practitioners
- To enrich participants through technical paper presentations, tutorials, workshops and exhibitions
- To show case state/territory-specific education/research competence and identify growth areas
- To promote innovation through presentation excellence awards for path-breaking projects
- To prepare 'GenNext IT Professionals' through workshops, career guidance and entrepreneurship support

Expected Outcome
- Benchmarks, capability assessment, gap analysis, and recommendations to realize the specific visions
- Publication of research studies (ICT penetration, technological innovation, diffusion & adaptation), domain specific state-of-the-art technical reports and case studies of education/research initiatives
- Frameworks, Guidelines and Best Practices for research collaboration among government, industry and academia
- Identification of potential ideas and innovations of faculty, researchers and students for business incubation

Indicative Tracks and Themes for Conventions

<table>
<thead>
<tr>
<th>Technology</th>
<th>Processes &amp; Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Languages, Operating Systems, DBMS, Software Engineering</td>
<td>SWOT Analysis, Road Mapping, Process Capability Assessment &amp; Gap Analysis, Org, Processes &amp; Frameworks, Process Re-engi, Accreditation, Quality Management, Knowledge Management</td>
</tr>
<tr>
<td>Computer &amp; Communication Networks, Multimedia &amp; Internet, Hardware/Embedded Systems, Mobile Computing</td>
<td></td>
</tr>
<tr>
<td>Vertical Applications</td>
<td>Inter-disciplinary Applications</td>
</tr>
<tr>
<td>Enforcement, Healthcare, Agriculture, Manufacturing, Transport, Energy,</td>
<td></td>
</tr>
<tr>
<td>Telecom, Defence, Aerospace, Automotive</td>
<td></td>
</tr>
</tbody>
</table>

For further details, please write to nsc@csi-india.org with cc to hrishwa@yahoo.com

Prof. H R Vishwakarma
Hon. Secretary
Computer Society of India
E-mail: secretary@csi-india.org
May 2010

NCOSFT-10: National Conference on Software Engineering
Date: 24-25, May 2010 at Cochin
Organized by: Dept. of Computer Science, Cochin University of Science & Technology in association with CSI Div II on Software and Cochin Chapter.
For details contact: Ms. Mini Ulanat, Conf. Coordinator at ncsoft10@gmail.com OR mini_u@cusat.ac.in (M) 0 98472 89382 OR Dr. T V Gopal, Chair, Div II at gopal@annauniv.edu

Seminar on Enterprise Resource Planning
Date: 29th May 2010
Organized by: CSI Bangalore Chapter
For details contact: csi_bc@yahoo.com, Ph 080-22862215, 22860461

June 2010

Sharing Summing 2010
Host: CSI - SIGeGov and DIT, Government of Madhya Pradesh
Date: 5-6, June 2010.
For details contact: Dr. Ashok Agarwal CSI-SIGeGOV Chairman Email: agarwalashok.k@gmail.com, Tel: 91-9848053024, K. Govinda Rao, E-mail: k_govinda_r@yahoo.co.in Tel: 91-9440077277.

ICAET-10: International Conference on Advances and Emerging Trends in Computing Technologies
Date: 21 - 24, Jun 2010 at Chennai, India,
Organised by: School of Computer Science & Engineering, SRM University in association with University of Arkansas, Little Rock, USA, Div. II & Div IV, Computer Society of India, IEEE Computer Society, Madras Chapter.
For details contact: Dr. S. Chellaiah, Conference Chair ICAET-10 at icaet10@srmuniv.ac.in OR Mr. H R Mohan, Chair, Div IV at hrmohan@gmail.com Website: http://www.srmuniv.ac.in/events.php?page=icaet10

August 2010

DCMC-10: Divisional Conference on Mobile Computing
Date: 11-12, August 2010 at Chennai
Organised by: Dept. of CSE & TIFAC CORE, Velammal Engineering College, Chennai in association with Computer Society of India, Div. IV on Communications & Chennai Chapter.
For details contact: Prof. B. Rajalakshmi, Convener, DCMC-10 at vedcmcm10@gmail.com :: at Tel.: 044 - 26590579 OR Mr. H R Mohan, Chair Div IV at hrmohan@gmail.com Website: www.velammal.org

1st CSI Goa State Student Convention
Date: 16 August 2010
Hosted by: Goa University Organised by: CSI Goa Chapter
For details contact: shekhar_sahasrabudhe@presistent.co.in;

September 2010

CSI Region-VI Student Convention
Date: 4-5 September 2010
Hosted by: MIT Pune Organised by: CSI Pune Chapter
For details contact: shekhar_sahasrabudhe@presistent.co.in;

DWDM-2010: 2nd National Conference on “Applications and Trends in Data Warehousing, Data Mining and Data Modeling”
Date: 24-25 September 2010
Hosted by: Thapar University, Patiala
Organised by: CSI Region-I, Division-III and Chandigarh Chapter
For details contact: Dr. R K Sharma at doaa@thapar.edu,

Dr. Harish Kumar at harsh32us@yahoo.com

October 2010

The 26th National Student Convention
Date: 8-10 October 2010
Hosted by: Mar Baselios College of Engineering and Technology, Trivandrum
Organized by: CSI Trivandrum Chapter
For details contact: Mr. Srinivasan Ravindran, E-mail: srini@onevisysys
Ms. Mini Ulanat, E-mail: mini.ulanat@gmail.com

24th CSI Karnataka Student Convention
Date: 22-23 October 2010
Hosted by: SICE Mysore Organized by: CSI Bangalore Chapter
For details contact: B G Sangameshwar, bg.bgsangam@yahoo.com, Tel.: 0821-2548285, csi_bc@yahoo.com, Tel.: 080-22862215, 22860461

November 2010

5th CSI National Conference on IT for Defence
Date: 12-13 November 2010
Host: CSI Bangalore Chapter Organized by: Patna Chapter
For details contact: Prof. A K Nayak

45th Annual Convention
Date: 25-27 Nov. 2010, Mumbai
Venue: Mumbai Host: CSI Mumbai Chapter
For details contact: www.csi-2010.org

December 2010

ICoAC 2010: 2nd International Conference on Advanced Computing
Organised by: Dept. of Information Technology, Anna University Chennai, MIT Campus and IEEE Madras Section and Supported by Computer Society of India Div IV & Chennai Chapter, IEEE Computer Society, Madras Chapter, Centre for Development of Advanced Computing (CDAC) and University Grants Commission (UGC)
For details contact: Dr. S. Thamarai Selvi, Professor, Dept. of Information Technology, MIT Campus, Anna University Chennai, Chengpet, Chennai 600044, India. Phone: 91-44-22516319 / 22516015. Email: thamaraiselvis@gmail.com OR Mr. H R Mohan, Chair Div IV at hrmohan@gmail.com Website: www.annauniv.edu/ica2010

COMAD-2010 International Conference on Management of Data
Date: 8-10 December 2010
Hosted by: VNIT, Nagpur, Maharashtra
Organized by: CSI Division III, SIG-Data, Region VI and Nagpur Chapter
For details contact: Prof. Deshpande, psdeshpande@cse.vnit.ac.in

January 2011

International Conference on Signal and Image Processing
Date: 15-17 December 2010
Hosted by: RMD Engg College, Chennai
Organized by: CSI Chennai Chapter, IEEE Computer Society Madras Chapter
For details contact: Dr. RM Suresh (rmsuresh@hotmail.com) and HR Mohan (hrmohan@gmail.com)

International Conference on Software Quality
Date: 20-22, January 2011
Hosted by: CSI Division II, Region-V and Bangalore Chapter
For details contact: Dr.Anirban Basu, anirbanbasu@qualityplusindia.com

ConfER-2011: The 4th National Conference on Education & Research
Date: 23-24 January 2011
Hosted by: Shambhunath Institute of Engineering & Technology, Allahabad
Organized by: CSI Division V, Region-I and Allahabad Chapter
For details contact:
Prof. J P Mishra (e-mail: dean_tpo1948@yahoo.com), Mr. Zafar Aslam (e-mail: zafar.aslam@cmcltd.com)

M D Agrawal

M D Agrawal

Vice President & Chair, Conference Committee, CSI