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# **OITS Bulletin**

**Journal of  
Orissa Information Technology Society**

# OITS Bulletin

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## **PREFACE**

In one of the meetings of Orissa Information Technology Society (OITS), the executive committee decided to bring out a bulletin, "OITS-Bulletin" to be first released during CIT 2003. Also the committee was of the opinion that for the present this bulletin may be annual, and be published preferably at the time of CITs. and should contain popular and semi-technical articles. We have invited such articles from different authors. This is just an humble beginning and should grow in time with more participation of oits members.

S.P. Misra  
**Chief Editor**

S.K. Mohanty  
**Editor**

J.R. Hota  
**Executive Editor**

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## Organization of the CITS

**S.P. Misra**

President, OITS

### Genesis: CIT97:

In 1997, with mostly the initiative of Chitta Baral and Suchitra Patnaik, and active support of Pramod Meher, a meeting of many IT professionals took place in Utkal University. The funds for this were collected/donated by chitta baral and suchitra patnaik in cash and kind. Pramod Meher got the support of many local institutions to support e.g. lunch or some extra support. On 22nd december, in a meeting it was decided that (i) we shall form a society called orissa information technology society, and (ii) that we shall have regular meetings for cits every year around 21st to 24th of december for the uplift of level of IT in orissa. Some other details may be seen in [www.oits.org](http://www.oits.org)

We may regard this as a pilot project for cits. In 1998, it was renamed as cit98 instead of icit98 as there was that year another conference with the same initials.

### CIT98: Organized by OITS, and Utkal University

OITS gave a seed money of Rs.10,000/- to P.K. Mishra (kiit), the Finance Chair of cit98 as a very modest seed money from registration of core members. At that time, middle of 1998, OITS had been just registered and this was all the money available with it.

This conference was sponsored by (1) KIIT, Bhubaneswar (Rs.60,000/-); (2) IISIT, Bhubaneswar (Rs.50,000/-); (3) OCA, Bhubaneswar (Rs.25,000/-); (4) AIOL, Bhubaneswar (Rs.25,000/-); (5) NIST,

Berhampur (Rs.25,000/-); (6) SIDBI, Bhubaneswar (Rs.25,000/-); (7) CDAC, Pune (Rs.24,660/-); (8) ORACLE Technology (Rs.19,600/-); (9) Silicon, Bhubaneswar (Rs.15,000/-); (10) RCM, Bhubaneswar (Rs.12,000/-); (11) IBCS, Bhubaneswar (Rs.10,000/-); (12) ITER, Bhubaneswar (Rs.10,000/-); (13) OSEDC, Bhubaneswar (Rs.10,000/-); (14) OEC, Bhubaneswar (Rs.9,500/-).

Amount collected by R N Mohapatra from USA in dollars (Rs.19,900/-; these contributions were by IEDSO, Somanath Behera, T. Mitra, Lalu Mansingh, Manoj Sahoo, Pradeep Lenka).

Registration fees: Rs.1,09,020/-. Of the above, Rs.62,474/- were collected by R N Mohapatra from USA in the form of dollars towards registration.

Hotel expenses: Rs.1,43,524/- including a banquet. Expense for Publication of Proceedings: Rs.77,620/-. Conference kit and printing (excluding proceedings): Rs.91,345/-

Balance: A little more than Rs.1,00,000/- was transferred to OITS including the advance. The account cit98 was closed. Audited account is available.

**Remarks:** The Conference was held in Hotel Prachi. Some other details written after the Conference may be seen in [www.oits.org/icit98](http://www.oits.org/icit98). The sponsorships from outside India and some from inside India were due to the efforts of R N Mohapatra and others, including Laxman Mohanty and S P Misra. The academic program

was due to R N Mohapatra and Amiya K Pujari, under the guidance of L M Patnaik, the general chair. P Meher was the organizing chair.

This conference, de facto the first one of the series, went off with a bang, and the success of the later conferences may be attributed to this beginning. In fact, it had the attendance of about 40 participants from outside India, The full support of P K Mishra of KIIT very much helped for this success.

### **CIT99: Organized by OITS:**

OITS gave an advance of Rs.85,000/- to open the account cit99, to be operated by the finance chair J R Sahu (RRL). The conference was sponsored by

NALCO, Bhubaneswar (Rs.74,175) for Proceedings; (2) CSIR (GoI)(Rs.30,000/ (3) KIIT, Bhubaneswar (Rs.25,000/-); (4) NIST, Berhampur (Rs.10,000/-); (5) CV Raman College, Bhubaneswar (Rs.12,000/-); (6) Others, Bhubaneswar (Rs.7,000/-).

Registration fees were Rs.1,44,414.70/-.

Hotel expenses: Rs.86,040.40/- Expense for Publication of Proceedings: Rs.83,309/- Conference kit (excluding proceedings): Rs.31,000/-

Balance: A little more than Rs.83,233/- was transferred to OITS excluding the advance. The account cit99 was closed. Audited account is available.

**Remarks:** The Conference was held in Swosti. This was the year of the super-cyclone in Orissa and even then it was a success. The sponsorships were effected by Sanghamitra Mohanty (Organising Chair), J R Sahu (Finance Chair) and S P Misra (oits) working as a team. The conference was ably guided by L N Bhuyan, the general

chair. H Mohanty and C Baral as program chairs guided the academic programs with the help of the general chair. The success was also due to P K Mishra (KIIT), and R Ghosh, who helped in the final arrangements. Some other details shall be available in [www.oits.org/cit98](http://www.oits.org/cit98).

### **CIT2000: Organized by OITS and KIIT, Bhubaneswar:**

OITS gave an advance of Rs.60,000/- to open the account cit2000, to be operated by the organising chair P K Mishra of KIIT. The finance chair S K Mohanty for personal reasons suggested this.

This conference was sponsored by (1) KIIT, Bhubaneswar (Rs.1,30,750/-); (2) Lucent Technologies, USA (Rs.63,622/-); (3) CSIR (GoI)(Rs.50,000/-), (4) OSA, USA (N. Tripathy) (Rs.46,000/-, through OITS) (5) ESS, Bhubaneswar (Rs.37,962/-), (6) NIST, Berhampur (Rs.25,000/-); (7) T Daud (Rs.17,275).

Registration fees: Rs.2,04,815/- Lodging and boarding expenses at Hotel and KIIT: Rs.2,52,835/- = Rs.1,92,085/- +Rs.60,750/-. The KIIT expenses include guest house expenses + inaugural dinner.

Expense for Publication of Proceedings: Rs.1,13,755/- Conference kit and printing (excluding proceedings): above Rs.75,000/-

Balance: Rs.1,500/- was transferred to OITS excluding the advance. The account cit2000 was closed. Audited account is available.

**Remarks:** Inauguration was in KIIT and the Conference was in Swosti Plaza. Sponsorships from outside India were mainly with the initiative of Durga Misra, Program Chair. Some more details are available in [www.oits.org/cit2000](http://www.oits.org/cit2000). The academic programs was ably conducted by the program the program chairs

R K Ghosh and D Misra under the guidance of J Misra, general chair. Some other details are available at [www.oits.org/cit2000](http://www.oits.org/cit2000).

### **CIT2001: Organised by OITS, and NIST, Berhampur:**

OITS gave an advance of Rs.20,000/- to the account cit2001.

Sponsors for this conference were (1) Avaya Labs, USA, (2) Satyam computers, India, (3) NJIT, USA, (4) CSIR (GoI), (5) DST (GoI) with a total amount of Rs.2,17,501

Registration fees: Rs.2,36,826

Lodging and boarding expenses: Rs.71,683 (hotel)+Rs.2,26,843, Expense for Publication of Proceedings: Rs.1,70,823, Travel expenses: Rs.84,815

Total expense was Rs.7,60,042, of which NIST contributed Rs.3,05,715. But after the Conference accounts were finalised as above, in 2003 NIST contributed a further amount of Rs.22,000/-, so that the advance of Rs.20,000/- from oits is returned, as well as a balance of Rs.2,000/- is paid to oits as a surplus.

**Remarks:** The Conference was held in NIST Campus, and dinners in Oberoi. The sponsorships from outside India were mainly through the initiative of S Mohapatra (Organising Chair) and D Misra, secretary (overseas), oits.

The laboratories of NIST had a massive loss due to disturbances about a month before the conference. It is to be highly admired that NIST organized a very good conference inspite of that. Chita Das and P K Dash as the general chairs, and Prasant Mohapatra and Arun Pujari as the program chairs organized an excellent academic program, and the number of participants was beyond 200.

### **CIT2002: Organized by OITS:**

OITS gave an advance of Rs.40,000/- to open the account cit2002, to be operated by the finance chair Debasish Jena.

Sponsors for this conference were Avaya Labs, USA (Rs.1,43,948/-) (2) Satyam computer services (Rs.72,585/-), (3) ITER, Bhubaneswar (Rs.25000/-), (4) NIST, Berhampur (Rs.20,000/-), (5) Silicon, Bhubaneswar (Rs.15,000/-), (6) KEC, Bhubaneswar (Rs.15,000/-), (7) IISIT, Bhubaneswar (Rs.15,000/-), (8) KIIT, Bhubaneswar (Rs.15,000/-), (9) School of math, stat, and comp sc (Utkal Univ), Bhubaneswar (Rs.15015/-), S P Misra (for Narayan Misra IT award), Bhubaneswar (Rs.45,000/-).

Registration fees: Rs.1,44,414.70

Hotel expenses: Rs.86,040.40 Expense for Publication of Proceedings: Rs.1,22,319/- Conference kit (excluding proceedings): Rs.39,600/- Cash prizes for awards: Rs.14,000/-

Balance: About Rs.1,95,000/- was transferred to OITS excluding the advance. The account cit2002 was closed. Audited account is available.

**Remarks:** The Conference was held in hotel New Marrion (Old Prachi). The sponsorships from abroad were mainly with the initiative of D Misra, secretary (overseas), oits and Sagar Naik (Program Chair). From inside orissa, S Padhy (Organizing Chair), D Jena (Finance Chair), and S P Misra (oits) worked as a team. The general chair was M R Kintala with the program chairs S Naik and Sridhar Iyer organized an excellent academic program. The special features of this conference were, (I) seven tutorials spread over six Institutions attended by over 500 students, and (ii) three best paper

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awards, two for best papers from among all the papers, and one from the papers from inside Orissa with a separate grant for this purpose. More details are available in [www.oits.org/cit2002](http://www.oits.org/cit2002).

### **CIT2003: Organized by OITS and Silicon School, Bhubaneswar:**

OITS gave an advance of Rs.40,000/- to open the account cit2003, to be operated by the finance chair Nitai Dhal.

**Remarks:** The organization of the Conference is in full swing. Sajal Das (general chair), and Goutam Chakravorty and Sudeshna Sarkar (program chairs) have arranged an excellent academic program. Some special features of this conference (Dec 22<sup>nd</sup> to 25<sup>th</sup>) are (i) organization of two sets of tutorials, one (advanced) and one for the students on 25<sup>th</sup>, (ii) an industry session, (iii) a pre-conference symposium on 21<sup>st</sup>, in addition to continuing the two best paper awards, one from among all the papers, and the other from among papers submitted from Orissa. Laxman Mohanty is the organizing chair. More than 230 papers were submitted, and attendance is likely to be quite large.

Details are available in [www.oits.org/cit2003](http://www.oits.org/cit2003), same as [www.citconference.org](http://www.citconference.org)

### **Special Remarks:**

During cit99, a committee comprising of Jayadev Misra, L N Bhuyan, Chitta Baral, Ratan Ghosh, Hrushikesh Mohanty among others proposed that the cit team for the kth cit may be decided by a steering comprising of the general chair(s), program chairs, of the (k-2)th and (k-3)th cits along with two other co-opted members.

This was passed in the general body of oits held during cit99 on 22nd December, and is being followed. However, the convention has been to associate as many members who have taken an interest in cits as possible, and then arrive at a conclusion, which I think is a healthy convention.

Following this, the announcement for the steering committee Prasant Mohapatra (Steering Chair of cit2003) as the convenor, was circulated among all oits members as well all associated with the previous cits in July, asking for suggesting a venue and the core team for cit2004. There were only two suggestions: (i) H Mohanty suggested that it may be in New York, (ii) Arun Pujari suggested that it may be at Hyderabad.

Many oits members had thought earlier that once in a while cit may be held outside Orissa, and with overwhelming support for Huderabad, it was finally decided by the steering committee that cit2004 may be held at that place as a function of oits, with Arun Pujari and Chitta Baral as the general chairs, who, on our request proceeded with discussing the arrangements. They have assured us that any participant from Orissa will be supported by the organizers regarding both travel and stay for the conference, and with this generous offer I am sure IT community of the State can really benefit a lot.

The success of the cits in the academic field has been due to participation of a large number of professionals, mainly academic, from all over India as well as from outside. This has helped to some extent in raising the level of IT in Orissa at the higher end, but clearly more effort is needed.

## The IT Revolution and Orissa

**Jnana Ranjan Dash,**

Executive Consultant and Technology Visionary, Silicon Valley, California

### THE IT REVOLUTION

First we identified the “Agricultural Revolution” that lasted for 900 years. Then came the “Industrial Revolution” towards the second half of the 19 th . Century with the invention of the steam engine and the internal combustion engine (automobile). That lasted for about 150 years. Starting in 1950 and through the second half of the 20 th . Century, we have identified this period as representing the “Information Revolution”. General wisdom predicts this period to last for 70-80 years and we are past the halfway mark. The follow-on era will become the “Biotechnology Revolution”. Interestingly, each era shrinks in length, meaning the rate of progress accelerates.

So what is the information revolution? Our capacity to store, communicate and transform information has been growing since millennia. Storing information has evolved from flat stones and paper to current magnetic and optical devices. Transporting information has evolved from physical messengers like pigeons, heliograph, telegraph, telephone, radio, TV and now to the Internet. In order to transform information to knowledge and wisdom, we have been using our brain and continue to do so. Computers help perform some repetitive brain tasks faster, but we have a long way to go to mimic how the brain operates. The universality of computers to multiple tasks has made it very useful across wide areas of applications.

Today, IT is proliferating all around us and you cannot ignore it. Modern cars have 40-50 microprocessors inside them to control navigation, fuel injection, braking, suspension, entertainment, climate control and so on. Even the lowly washing machines, color TVs and microwave ovens have chips controlling them. The DVDs, VCDs, MP3 players, TV remote controls, cell phones, digital diaries, ATMs (Automated Teller Machine), cable TV, the Internet, dinosaurs in movies, email and chat, etc. are all products of IT. Hence awareness of the fascinating story of IT is becoming a necessity.

To finish this introduction let me quote two visionaries who are pioneers in the evolution of computers and how they saw the future.

*“One evening I was sitting in the rooms of the Analytical Society at Cambridge, in a kind of dreamy mood, with a table of Logarithms open before me. Another member, coming into the room and seeing me half asleep, called out ‘What are you dreaming about Babbage?’ I said, ‘I am thinking that all these tables may be calculated by machine.”*

– Charles Babbage, (1792-1871)

*“The inside of a computer is as dumb a shell but it goes like mad! It can perform very many millions of simple operations a second and is just like a very fast dumb file clerk. It is only because it is able to do things so fast that we do not notice that it is doing things very stupidly.”*

– Richard Feynman, Physics Nobel Laureate, (1918-1991)

## THE FIRST TWO INFLECTION POINTS

IBM dominated the decade of the 1970's via its breakthrough mainframe technology, the System 370. That dominated the computing landscape for the next 15 years. Then during the 1980's Moore's law dominated (named after Dr. Gordon Moore, founder of Intel, who postulated back in 1965 that microprocessor capacity will double every 18 months) and the wealth creation came out of the fast emerging PC industry. Both Microsoft and Intel dominated this landscape. The 1990's ushered in the era of the Internet, a major inflection point in computing. The Internet followed Metcalf's law (named after Bob Metcalf, father of the Ethernet. which states - the value of a network is directly proportional to the square of the number of users.).

## THE ARRIVAL OF THE INTERNET

Almost every new idea starts as a "bad idea". Then its scope is not well understood at the initial stage. Marconi thought his new radio would be used only for ship-to-shore communication. Invention of the transistor received a tiny mention in the New York Times, which said it "might be used to develop better hearing aids for the deaf." Western Union turned down the chance to buy Alexander Graham Bell's telephone patent for a mere \$100,000. On hindsight the future was "obviously not obvious". In 1949, IBM predicted there would be a market for no more than 10 to 15 computers. In a similar vain, we looked at the Information Superhighway nine years ago. Then came the user-friendly Mosaic front-end to the worldwide web. Suddenly the Internet has become one of the biggest events in the way it is changing the fundamentals in the society and industry.

Professor Paul Romer of the Stanford Business School says, "It isn't so much that we have a new economy, as we have a new understanding of the importance of technology in the economy".

As The Economist said in 1999, "Internet is all about communicating, connecting, and transacting with the outside world. It brings together buyers and sellers in a super-efficient new electronic marketplace".

## TWENTY-FIRST CENTURY AND WHERE ARE WE?

As we stepped into the new millennium, the pundits predict this decade to be the decade of "pervasive computing or real-time computing". Pervasive computing was predicted in a seminal paper by Mark Weiser (chief technologist at Xerox Palo Alto Research Center) back in 1991. He said, "The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it." The essence of that vision was the creation of environments saturated with computing and communicating capability, yet gracefully integrated with human users. Look around today and you see young people in Japan sending instant messages via cell phones, the cell phone has become a personal digital assistant with much information like phone numbers, email, calendar, etc.

At the enterprise level, there is a movement to start exploiting the ubiquitous infrastructure of the Internet to do real-time computing. Real Time Enterprise (RTE) is defined as "Spontaneous Transaction Flow and Information Transparency Throughout the Extended Enterprise Minimizing Latency and Labor". This means enterprises must be able to reduce the time it takes to perform tasks. Anything that takes 4 days to complete must be done in 4 hours - that's reduction of latency

and hence cost. Given the economic pressures of the times, being competitive is key. Dell computers is an example of being a leader in two key concepts – Zero-latency and Straight-Through-Processing. When one orders a Dell PC over the Internet, the elapsed time between the order and the arrival of the brand new PC at your doorstep is 48 hours! That is how they can keep the cost down and beat their competition. It is a pioneer in efficient supply chain management and distribution.

The general consensus is that we will see more wealth creation over the next ten years compared to the last ten years.

### **ORISSA'S PART IN THE IT REVOLUTION**

India has emerged as a leader in this century for IT services and outsourcing. The vast resources of technical skills combined with our English language skills make India an attractive place for outsourcing and IT services. Many large companies are using India for software development and maintenance work. Business Process Outsourcing is also getting to be a hot item. Large companies want to outsource their entire business process such as accounting, order processing, patient record management, trade reconciliation, to India for savings in cost as well as improving efficiency. Banaglore and Hyderabad have become key hubs for such activities. Mainly due to the aggressive marketing by their political leaders. There is a second-tier of cities now vying for such investments and they are Trivandrum (kerala), Kolkata, Chennai, Pune, Chandigarh, and of course our own Bhubaneswar.

Bhubaneswar has been named a software city during the 1980's with the establishment of

the STP (Software Technology Park). Then nothing much happened during the boom years of the late 1990s when other cities just flourished, most notably our neighboring state of Andhra and it's city of Hyderabad. Bhubaneswar has many distinct advantages to be a leader in this space for the eastern zone in India. But nothing happens by itself. An aggressive push by the state's political and bureaucratic leaders can bring much-needed excitement and attract investments to the city.

An attempt was made in January, 2003 by this author to bring together various leaders in the IT industry plus the government to discuss and work out a plan for promoting IT in Orissa. A group called BIG (Bhubaneswar IT Group) was formed for continuity in carrying out the plan of action. This effort was lauded by the state's chief minister and key bureaucrats. Let us hope that the progress continues, specially in promoting Bhubaneswar's image as an attractive IT hub. Actions could include the following:

- Email campaign from the chief minister's office to invite CEO's to visit Bhubaneswar,
- Presenting Orissa at national forums such as Nasscom,
- Going on a roadshow to promote why Bhubaneswar is attractive for investments,
- Providing incentives to Indian and foreign companies to establish their new centers in Bhubaneswar,
- Opening a TiE (The Indus Entrepreneurs) chapter in Bhubaneswar similar to chapters in many parts of the world

It is time to use the BIG structure and also groups such as OITS to promote the growth of

IT in Orissa, that will benefit the state's economy and employment for the youth. It will also trigger the new generation to compete both nationally and internationally in the emerging world of Information Technology. Everyone must take responsibility and the state's political leadership must be the catalytic agent much like what the leadership in Karnataka, Andhra, West Bengal, and Kerala are doing.

### FINAL COMMENTS

We have briefly described the Information age and how the IT revolution has shaped up so far. As we enter this new century and millennium, IT takes the front seat and is shaping

everything we do, both personally and collectively in an enterprise, be it the government, manufacturing banking, education, health care, transportation, etc. Computer literacy is a must for today's and the future generation. India is playing a key leadership part in the world in this area. Orissa must step up to exploit this and stay ahead. IT may not prevent a cyclone or a flood, but it can enable rapid relief operation and efficient distribution. As someone said, "technology is a great leveler" meaning it narrows the gap between the have's and the have-not's much like what the telephone has done to India and other developing countries.

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**About the author** - Jnana Ranjan Dash is from Orissa and has lived abroad for 33 years. A graduate of REC, Rourkela he went for higher studies in 1970. He played key roles at IBM (16 years) and Oracle (10 years) in planning, architecting, and developing database software products that dominate the marketplace today. Currently, he is an executive consultant, guiding several new companies in the Silicon Valley. He is a consulting Chief Technology Officer (CTO) of KnowNow, a real-time event management software start-up. He sits on several Boards of Directors also.

## Development of E-Governance Solutions

✓A. K. Pujari

Ex-Chief Executive,  
Orissa Computer Application Centre, Bhubaneswar

### Abstract

In a vast country like India majority of the population and business depend upon government programs, information and services. Usually most of the government processes for providing information and services to business (G to B) and to the community (G to C) involve time consuming and tedious activities. In traditional methods, the majority of the target beneficiaries find it difficult to know the source of required information, which may not be available or may not be usable. The decision makers also find it difficult to filter out information from huge amounts of incomplete, inconsistent and unstructured data collected at different times in different formats from different sources. Decisions have to be taken based on these data in an environment which may involve complex human and political dimensions, lack of financial resources and inadequate staff. Therefore E-government solutions have assumed much importance with the central and state governments to provide an efficient, effective and transparent government. Though e-governance is viewed essentially as process driven and not technology driven, policy makers and administrators should have proper understanding of the basic technology, and evolving standards for the success of e-governance.

**Keywords:** E-governance technology, Internet, kiosks, Indian language content

### Introduction

Government Applications involve huge amount of data collected from various sources for multi dimensional applications. Data collected from a large number of sources such as socio-economic surveys, natural resources, industry, finance, health care, education, rural development, agriculture, land records, forest, water management etc. provide necessary input for governance. Citizen services and other applications involving man, money and materials lead to large number of transactions in dispersed locations. For example Below Poverty Line (BPL) data are required for decisions on health care, poverty alleviation, education, locating schools, industries etc. Data from satellite imageries and weather reports produce information on water, land and forest management, agriculture, fisheries, natural resources etc. Typically different government departments independently collect poorly understood and inconsistent data and prepare reports in different formats. Applications are developed in an isolated manner which do not interoperate with those developed by other departments and other agencies.

E-governance facilitates collection, organization, and delivery of information and services in a more cohesive, consistent and convenient form. E-government is viewed as process driven and not technology driven. However senior administrators and policy

makers should understand the basic technology. It will ensure their deeper involvement and ownership and facilitate process reengineering in the government. In a knowledge based economy capacity building and wider awareness is essential ingredients of e-governance.

### **Objective of E-Governance**

E-government solutions can empower both the government authorities and the common man to bring fundamental changes and reforms in public services. An open and faster flow of information and services to the citizens and intelligent analysis of data leading to quicker decisions are important factors in the functioning of any government. It will bring efficiency in government operations, ensure quality of information systems, reduce cost, enhance tax revenue and introduce transparency and accountability in government services. It will ensure participation of the common man in governance and help in improving their quality of life bridging the digital divide.

### **E-Governance Strategies**

In order to adapt e-governance, many operational and cultural changes along with a change in mindset in the bureaucracy, political leadership as well as in the overall society are necessary. All basic policies, regulations, service delivery mechanisms have to be reengineered. An understanding of the basic technology with issues regarding scalability, interoperability, integration with legacy systems will help the government to flexibly adapt to changing environments. Government has to operate as a single enterprise and follow the best business practices.

The economic liberalization and open door policy of the government of India resulted in complex socio-economic, administrative, political changes with diverse and fluid data relating to governance. However lack of adequate understanding and appreciation of technical issues is one of the important reasons, e-government initiated decisions have not been effectively implemented. There are very few developments in G to B applications. The gap between the good intentions and actions is evident from the long delay in the implementation of various measures including network security infrastructure proposed in the Information Technology ACT 2000 of the government of India. There is need for better awareness among the government authorities about the basic technologies indicated below.

### **Extensive Networking**

Extensive networking is the heart of e-governance. With the liberalization of the Telecom sector in India, there has been impressive trend in the growth on data communication infrastructure both through public and private initiatives. The entire country is getting connected through fiber optic cable which are being extended to the user premises. In the North East Region of the country, government of India has established 487 VSAT based Community Information Centres (CICs) or Kiosks. Kiosks in private and public places such as shopping centres, railway station, libraries etc. will help to provide essential public services to the common man and connect them to the rest of the world. In the earlier years successful creation and use of wide area network infrastructure for on line government processes such as monitoring of general election have

already been demonstrated. A countrywide information highway with a high band width network can go a long way in providing important services to the citizens.

### **Security and privacy**

With wider access to information, security and privacy are critical issues in e-governance. An understanding of the access control and authentication mechanisms, use of PKI and digital signature in web enabled applications, firewalls and VPNs with issues related to framing a security policy for e-governance should be properly understood by the government authorities.

### **Object Oriented Technology**

The Object Oriented (OO) Technology brought in a conceptual revolution in development of computer applications in many areas. It preserves real world meaning in data representation and manipulation during analysis, design and implementation of the system. Using distributed object databases data can be stored, searched, manipulated and analyzed in a more natural, integrated and scientific framework. The extension of the OO principles includes component based developments which allows interoperability and reusability of software in distributed application environment.

### **Web Applications**

The Internet based applications such as e-mails, web sites, news groups, chat rooms provide effective link between government and citizens accessible by any one, at any time and from any where. Government departments and agencies are publishing more and more on line content related to public information and

services in all areas such as tourism, employment, health, education, citizen welfare etc. Self documenting XML, in place of the conventional HTML documents on the Web, integrates metadata to flexibly provide new standard formats, meaningful search of information content and exchange of knowledge. XML messaging can properly manage diverse and changing data and is evolving as a powerful component technology. It has already received support on a broad range of languages and platforms. Initiatives to convert most of the existing data, and applications into XML definition will allow better interoperability and management of diverse data in the government.

### **Data Warehousing and Data Mining**

A data ware house stores large volume of data collected over a period of time from many distributed sources. It compresses large data files and provides a full range of processing tools for meaningfully organizing and projecting real world data in a number of dimensions. Decision makers can easily examine patterns and trends in data and help in effective decision making for business process improvements. Data mining technology helps to examine and analyze voluminous data in new and automated ways. It extracts previously unknown, and potentially useful information from data by finding out relationships and patterns which may remain hidden among data. For example in e-governance applications it can automatically find out factors which may contribute to the increased tax collection, or enhance public satisfaction on government programs; find relations between food habits with diseases, poverty with cultural habits, government

contracts with bureaucratic or political influences etc.

### **Geographic Information Systems (GIS)**

GIS is an important and highly effective tool for decision support, planning in e-governance. In a precise and geo-referenced spatial model, it integrates information on natural resources, population, socio-economic data, transport network, agriculture and irrigation network, locations of schools etc.. It provides analytical visual tools for queries and reports. Web enabled GIS are now increasingly used in many government applications starting from sophisticated planning and decisions making to on line delivery of services to the citizens. Ministry of Tourism, Govt. of India has recently installed GIS enabled kiosks at key points in Delhi. The information provided through touch button kiosks include the mapping of police stations, taxi stands and registered tour operators to be available online.

### **Intelligent User Interface**

The conventional browsing, searching and rigid questionnaire interface to the Web put much restrictions on the users and are not adequate for many web based e-government applications. Development of Intelligent user interfaces with user profiles relaxes many of these constraints. Agents technology based on Artificial Intelligence provides an automated and useful form of decision support in various applications. An intelligent agent is an autonomous and goal oriented problem solver which learns by imitating human actions. Intelligent Agents can learn about users interest, preferences, likes and dislikes through user profiles and interactions. The user delegates

authority to the agent to solve problems on his behalf. The intelligent agent can modify its own behavior with new knowledge based on information incrementally gathered from the user and the environment. Mobile agents can move about on the Internet to solve problems at any site. The Agent technology will be highly useful for reasoning and decision support in applications such as Intelligent Planning System and can incorporate human dimension in decision making.

### **Local Language Support**

More than 75 % of the Indian population live in the rural areas. Only 20 % of the population can fluently speak, read and write in English. Therefore Local language content and communication facility in web enabled information and services is an important requirement of e-governance. The government of India has established Resource Centres on Technology Development in Indian Languages (TDIL) in every state. These centres are developing tools and technologies in respective languages for a variety of applications including word processing, thesaurus, electronic dictionaries, publishing, templates for official communications, database applications, e-mail, web page publishing, OCR, text to speech and speech to text and machine translation etc. in respective regional languages. While ISCII (Indian Standard Code for Information Interchange) has been adopted, applications in UNICODE standards are also being developed in many Indian languages.

### **A Citizen Centric Pilot Project**

Keeping in view the objectives and technologies discussed above, citizen centric projects are being developed in many states in

India. For example a pilot project on “Improving Citizens’ Access to Information” has been sponsored by the Department of Personnel and Training (DoPT), Government of India with financial support from UNDP. It is being implemented by the Computer Application Centre (OCAC), the nodal IT agency and the total solution provider of the Government in the comparatively backward district of Kalahandi in Orissa. Since e-government service requirements are specific to a region and its culture, the programme was started with a need assessment study by a reputed socio-economic research organization with the involvement of the district authorities and local NGOs. Accordingly web enabled application software have been developed and installed in the office of the district collector.

The general information provided through the Kiosks includes both static and dynamic information and services. It includes information regarding the district administration, agriculture, place of tourist interest, health care centres, train and bus timing, market rates of agricultural produces etc. The services to citizens include on line submission and monitoring of grievance petition, on line payment of taxes, on line applications for various certificates such as residential certificate, nationality certificate, nativity certificate, birth and death certificates, legal heir certificate, caste certificate, income certificate etc. The Below Poverty Line database and electoral roll database have been included with facilities for on line search. Many more information and services are to be progressively added based on the feed back from the citizens and government authorities.

For providing citizen centric information and services, it is essential to have efficient back office computerization in all government offices. Projects originally developed in a client-server environment have been dovetailed to the pilot project through a web enabled interface. It includes projects such as Land Information System with database comprising details of ownership of land along with digitized maps and project of the transport department dealing with collection of taxes, registration, renewal, transfer of vehicle ownership, issue of temporary, permanent and national permits, enforcement of motor vehicle acts and rules, issue of driving and conductor licenses etc. The citizens can obtain services from the kiosks avoiding many visits to the district offices. Various tools and technologies developed under the TDIL project have also been integrated. It includes bilingual (Oriya and English) content in XML. A chat server (Vartalipi) and a full fledged Oriya Email Systems (Varta) developed under the TDIL Resource Centre allows the common citizens who do not know English to interact and send e-mail. The kiosks will also be used for delivery of education and e-learning.

Digitized maps with population, road and river networks, land use and socio-economic data etc. have already been created for the district. Management of spatial information, document imaging, data ware housing and data mining to manage the district information will provide user friendly access to the people and effective decision making by the government. The system will in a phased manner add e-commerce oriented applications such as NET banking for co-operative banks with necessary technology for ensuring security, privacy in transactions. It will lead to participation of public sector

enterprises and private business in G to B and B to G transactions in future. With improved infrastructure for security and privacy, more and more G to B applications will also be integrated.

A long term self sustainability of projects with harmony between the common man, entrepreneurs and government officials will be the main criteria of success. The popularity among the citizen will lead to demand for inclusion of more and more information and services. Based on the success of this pilot project it will be replicated in other districts of Orissa leading to an efficient e-governance in the state.

The people and district officials are being sensitized about the technology and programs through periodic training, workshops and study tours. In order to create further awareness on right to information and participation in decision making, it has been decided to create mass media campaign in various forms including short video or audio clips, that could be broadcast over the state television and radio.

### Conclusions

Success in E-governance depends upon many complex issues. The solutions involves process reengineering and effective integration of modern technology. The decision makers and administrators should have a broad knowledge and appreciation of many aspects of e-governance solutions. Awareness of the capabilities and limitations of the advanced

technology among the decision makers on the one hand and regarding the benefits and rights to information among the common citizens are important factors. E-governance must be seen as a highly effective process which needs long term, continuing interest, involvement and support of all concerned for its success. In this paper we have included a case study of a recent e-governance project being attempted as a showcase project in Orissa.

### Acknowledgements

I would like to thank all my colleagues in OCAC for their sincere efforts and teamwork in various e-governance projects. I would also like to thank the government of Orissa, Department of Personnel and Training, and Department of Information Technology, government of India for the support and encouragement.

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## e-Governance Project Execution

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The most important point in e-Governance is citizen participation. To impose and influence government policies and programs, knowledge sharing and creation of Government to the general public interaction in many aspects is a must. Access to information is the right of the citizens of our country. Information plays a vital role in Government for improving prosperity and stability. Information Technology plays an important role to present information through internet to the citizens in all aspects of development and governance. Integration of departments, services, Government to consumer (G to C) and Business to Consumer (B to C) integration increases efficiency, reliability, transparency and scalability to a great extent. Due to lack of transparency in Government, brokers dominate as intermediaries and ordinary people are exploited a lot. e-Governance implementation eliminates middlemen and improves citizen Government interface. Difficult back office functions, document preservation and retrieval, property valuation, accounting and reporting, tax calculation, certified copies relating to various domain areas are easily fetched through e-governance implementation. Due to a new age of information Technology, a new culture is being created. So understanding of nature of information and its impact is a challenge for Government officers and e-Governance experts. New Technology brings speed in knowledge processing in real time environment. In past three decades, drastical

changes occur in politics, science and medicines. As the nature of information changes drastically, Government should be in synchronism with it by changing attitudes and practices in regards to their information resources. The tools utilized for e-governance is the Internet technologies. World Wide Web represents provides connectivity, speed and intangible benefits, radically altering government, business and society's interrelationship. The Internet helps in collecting, storing, and disseminating information and interacting with different interests and getting feedback. The first task in this process is obtaining information and sharing it. Government and non-governmental organizations, business and people have to devise the right kind of interactive modes.

### Improving Processes of Government

e-Government initiatives deal particularly with facilitating the internal workings of the government improving transparency. The primary task includes planning, monitoring and controlling the performance of human and financial resources. Interconnection of agencies, levels and data pool of government to enhance capacity to investigate, develop and implement the strategy and policy that guides government processes will be the next focus of attention. Lastly, transferring power, authority and resources for processes from their existing locus to new locations should be monitored.

### **Connecting Citizens**

These initiatives deal particularly with the relationship between government and citizens from whom the Government should derive its impartiality, or as customers who uses public services. Informing citizens with details of Government activities is necessary as far as practicable. This mainly relates to certain types of accountability by making public servants more accountable for their decisions and actions. Implementation needs considerable effort in reengineering government operations. During post implementation period, the role of civil servants plays a vital role .So smart and dedicated administrators should be trained by eliminating huse cost incured on consultancy with IT Consultants.Increasing the input of citizens into public sector decisions and actions is indispensable . Lastly Improving public services delivered to members of the public along dimensions such as quality, convenience and cost is a must .

### **Developing External Interactions**

Such initiatives deal particularly with the relationship between public agencies and other institutions – other public agencies, private sector companies, non-profit and community organizations. As with citizen connections, these initiatives may well incorporate the process improvements. However, they also include a broader remit

- Working better with business by improving the interaction between government and business.
- Developing communities by building the social and economic capacities and capital of local communities.
- Building partnerships by creating organizational groupings to achieve economic and social objectives.

### **SUGGESTIONS TO IMPROVE INFORMATION SHARING BETWEEN GOVERNMENT AND CITIZENS OF THE COUNTRY**

E-Governance project for all districts can initiate the link between citizens, Government Public Utilities and other information providers. The project will enhance linkages between Government and Citizens and facilitate transfer of the information to the Citizens instantaneously through Single Window Delivery points with multi user and multi location capabilities.

Some of the areas in which the system would provide workable solutions are:

- Land Records
- Portal Development
- Computerization of Directory of Industry
- State Transport Office
- Digitization of District Map & Setting up of GIS for MIS reporting
- District Rural Development Authority
- Setting up of Inter-departmental MIS System
- Arms & Licenses
- Citizens' Database
- Computer Aided Administration of Registration Department
- Video Conferencing Facilities
- Electronic Payment Systems for Electricity Board ,Water Tax,Telephone Bills etc.(e Seva)

The implementation of E-Governance will change how citizens and Government relate to each other, and bring forth new concepts of citizenship, both in terms of needs and responsibilities. The E-Governance offers

integrated government services through a single window concept by re-engineering of Government processes. It provides an unique opportunity for local Governments to provide more effective Government. Some governments have begun making limited forays into the e-commerce market in year 2000 by offering on-line services, payments, registrations, and information. Those that have embraced E-Government initiatives are generally viewing Internet usage as a means of offering convenience for their citizens. The implementation of E-Governance will change how citizens and Government relate to each other, and bring forth new concepts of citizenship, both in terms of needs and responsibilities. It will not just redefine the Government processes (what they do and how they do it), but altering the very essence of democracy (why they do it), as we have known it. The E-Governance begins with a new view of society, and with a different kind of citizen involvement.

Suggestions to improve information sharing between Government and Citizens of the Country can be summed up as

- Quality of citizen to government interaction can be increased by initiating a process of reengineering in administration integrated with the use of information technology
- For smooth functioning of e-governance it is very essential for a government to initiate the local language of the state.
- By Computerizing the existing manual processing to improve the efficiency, standard, quality, accessibility and productivity of the government at lesser costs
- Data, Voice and video transmission , connectivity, video conferencing, FTP, e-

mail, on-line application processing and query and response can reduce the gap between Government and the common citizens

- Better communication and information sharing will facilitate people to work together move effectively resulting in cohesive administration
- Providing a better quality of life to the citizens.
- Providing efficient and cost-effective Government
- Application for jobs and higher education based on the qualifications, capabilities and interests even till remote areas of the Country.
- A synchronism is necessary between rapid change of technology and operational change of government practices.

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## e-Government The Promise of Transformation

Raj Kumar Prasad

e-Government has the potential to transform our nation and serve as a panacea for citizens – only if we allow it to.

The letter “e” is truly fascinating. Whether it is Einstein’s formula  $e = mc^2$  or e-mail, e-commerce or e-government, every “e” seems to have the power to empower people. It is this reality and the role of “e” empowering me across every mile on the path to progress.

But to my dismay, in the past couple of years I have seen that Indian netizens are not willing to use “e” as an empowerment tool – as a tool for development, for growth, for poverty alleviation, for economic growth, for business development, for export growth.

Consider any developed country like the US, UK and European countries, and you will discover that they are using the Internet for development, for business, for services, and much more. Despite the fact that – when we put are minds to it – we are the best at hard work, in sharp brains and in everything to do with IT, we still face problems and cannot compare ourselves with other developed countries in terms of the use of IT and delivery of IT services.

Why? Indians work with the world’s leading IT firms abroad, for foreign universities, for multinational companies, and in many countries and spheres. Everywhere, we are recognised as hard and sincere workers, but not as leaders.

For instance, so much proprietary software is used on the Internet, but is there any Indian

software that is used on the Net? Sure, Indians have played a major role in developing many software products for others – but what have we done for our country?

We have IIT, MDI, IITM, IIM, Indian Institute of Science and the world’s oldest university in Bihar, Nalanda University. Yet, after so many years of independence, we can’t develop any well-known software that is used throughout the world. Why? What is the stumbling block? I leave this to our academia, students and readers to judge.

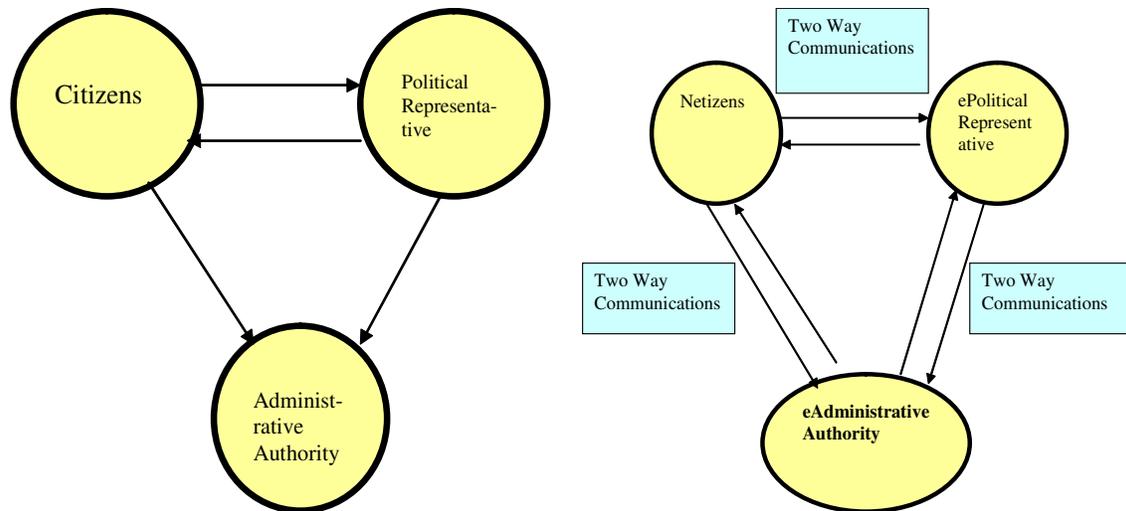
Let us now ensure that these stumbling blocks do not affect our initiatives in e-Government, a worldwide issue among all governments.

Firstly, what is e-Government all about? For whom is it meant? Does it merely signify computerisation? Is much of it that’s happening today merely hype? Can e-Government impact policy, technology, administrative and citizens’ issues?

Let’s first analyse the structure of democracy in the world. A democratic country has three pillars in a broad sense:

- Citizens
- Political Representatives
- Administrative Authority

For their problems and grievances, citizens communicate with a political representative via



the physical mode like a personal meeting, by handing over a letter, or over the phone (infrequently) or through the use of postal services such as a registered letter. A majority of the population in India is based in rural and semi-urban areas because India is an agri-based developing country.

In such a scenario, when citizens have to deal with their political representative, there is a lot of inconvenience and harassment in terms of time, money and the inability to actually have their problems redressed. Even when problems are redressed, the delay in getting things done can be agonising. I have personally had experience of the basic problems people in rural India face because I have spent time in villages and seen just issues first-hand.

Even when citizens do manage to get through the political representative via the physical mode, the busy schedules of the latter may mean they don't have the time or inclination to devote to such problems. When political representatives do make the time, these problems are forwarded to those in the administration and bureaucracy.

Then comes the third pillar in a democracy – the Administrative Authority or Civil Service. When the citizen's file or documents reach here, the citizen then starts following up with the administrative authority for redressal of his grievance. Now begins the truly harrowing part of the experience, when the poor man is made to run from pillar to post. Days turn into weeks, weeks turn into months and months turn into years, with no solution in sight. The harassed citizen is simply given bland assurances that his problem is "under consideration" and will be solved in due course.

Of course, some lucky citizens may get their work done faster if they have the right "contacts" amongst the political or administrative machinery. Or others may manage faster results by greasing palms liberally at every stage. For those who can't manage this, it will mean years of fruitless running around.

In most cases, the hapless citizen either learns to live with his problem or accepts the endless and regular rounds of government offices as his *karma* (fate). Some unfortunate souls

even pass away before their problems come anywhere near redressal.

The reason for this administrative non-functioning is that there are too many hierarchies, with nobody wanting to take a firm decision to get the work done. Everything must be done “through the proper channel” and the buck keeps getting past through various tables, without stopping anywhere!

Thus, red tape has been severely undermining the progress of the country at the macro level and creating unwanted stress and unhappiness for the average citizen at the micro level.

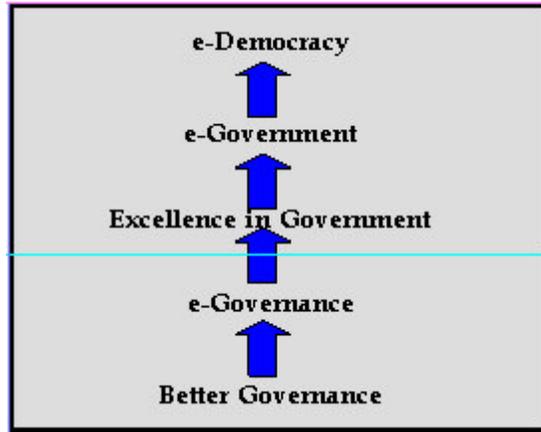
In such a scenario, the citizen seeks timely and hassle-free services. This is where IT comes in. The use of ICT (Information, Communication, Technology) can ensure that citizens’ needs are met in time and their problems redressed speedily.

Thanks to the digital and Internet revolutions, a worldwide transformation is taking place, even in once-tardy government services. This is what e-Government is meant to be all about.

But is e-Government easy to implement? Is it based on citizens’ requirements? Are there any parameters to judge e-Government? Does e-Government require long-term planning and policy? Before we go any further, let’s consider Chart 1:

In order to reach the top, we would first need to consider four main factors:

- A. Strong political will power for transformation
- B. Changed management
- C. Administrative reforms



- D. Two-way communication among all (citizens, political representatives and administrative authority)

In previous models of governance, two-way communication was missing at some point and this was the root cause of most problems and issues. In e-Government, two-way communication will be crucial.

Now consider point A: *Political will power for transformation*. Take states like Karnataka or Andhra Pradesh. How did they pioneer e-Government initiatives? The answer: it was the chief minister’s own initiative in creating and promoting e-Government. In other states, where the political will has been lacking, e-Government has not taken off or even been on the agenda.

Next is *changed management*. This is another very important point. Until and unless there is a change in management or the management’s mindset, no change or progress is possible. This holds particularly true with e-Governance, which can only be successfully implemented through proper management.

Then follows *administrative reforms*. Basically, e-Government is more an administrative issue rather than a technology

issue. Once administrative reforms have been put in place for e-Governance, the momentum of the digital world will take things forward at the right speed.

Last but not the least, *two-way communication*. This is another vital cog in the e-Government wheel. This is one point that seems to be missing in some e-Governance initiatives. For instance, I have personally e-mailed all the IT Secretaries in India and readers will be surprised to know that I have received responses from barely 5 per cent of the Secretaries.

Yet, I think e-mail can be the biggest link for the success of e-Government, rather than mere talk about technology issues and implementation. While the technology is there and the software is there, there is a need to ensure that a citizen receives a satisfactory e-mail response to his queries and grievances.

There might be some loose talk about there being no money for e-Government initiatives. Let me scotch such baseless arguments. Too many

political representatives and state governments have been either misusing or not using funds marked for their area development.

What excuse can there be for the fact that year after year funds allocated to political representatives for area development have been lying idle and wasted? Every MLA, MLC, MP (Lok Sabha) or MP (Rajya Sabha) should ask himself or herself this question.

If each one of them takes the initiative to get an e-Government project going in their respective regions, the Indian scenario will change beyond recognition. The time will then not be far off when India will be called e-India and an MP will be called e-MP. And I will no longer have to spend time writing such write-ups!

But for all this to happen, each one of us needs to take that small step forward. For it's truly said, the journey of miles only begins with the first step.

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# SOFTWARE PROCESS IMPROVEMENT

## A Case Study at Infosys

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### 1. ABSTRACT

The aim of any software developing organization will be to deliver a quality product to the customer with as few a defects as possible. This task can be achieved through combination of two approaches – Process oriented approach and Quantitative control of the process. The first one deals with defining a process for a project to follow and the second one deals with certain techniques used to control various parameters to bring a process under control. Some of the techniques used in Infosys are Causal Analysis (part of Defect prevention activities), SPC (Statistical process Control) technique, etc. These techniques will make a project to define quality goals at the beginning and these goals will be cross checked at regular intervals, action items needed for achieving the set goals are decided. Through this system an early signal can be detected if the process goes out of control. Thus a combination of project management and quantitative management improves the delivered quality. By following this methodology Infosys has already proved that there will be no short cut to process oriented approach. By following a step by step approach, Infosys has proved that a high degree of quality can be achieved at an optimum cost. In this paper the authors have taken up a particular project and have tried to explain various stages involved in executing a project. Also the paper talks of

various tools and review mechanisms being employed during project execution and benefits obtained from this approach.

### 2. INTRODUCTION

It is a general tendency for a programmer to write a code without maintaining any documentation or adhering to any standards. He would like to test his code, fix the bugs and then send it to Production for final implementation. During implementation and warranty period he would be glad to support the application/program; he would like to follow his own style of programming, without providing sufficient commented line and with hardly any concern for someone who might need to go through the code later to change it or, maintain it.

In short, a developer will not like to follow any standard, guidelines and would like to go about programming as per his own way.

The initiators of SPI (Software Process Improvement) hence not only have to deal with process improvement, they also have to deal with resistance to change.

In this article, a detailed description is given as to how we achieved both. However, the authors have focused on quantitative benefits achieved due to SPI. This article also details out a quantitative comparison between results achieved after implementing SPI and

Organization wide norms available for various parameters.

### 3. CASE STUDY

SPI has been implemented in Infosys successfully and it has integrated daily project activities to process related activities. The daily activities have been standardized across similar projects in the organization. The organization has divided projects into several categories. These division is based on life cycle that a project follows. Hence there are Development & re-engineering projects, Maintenance or Object Oriented projects, Package Implementation or Product development projects etc. Based on this project type Life Cycle(LC) stages are defined; for each LC stage again entry and exit criteria are defined. It also defines the participant profile for each stage as well as the activities they have to perform. Besides, to be able to adopt the process with permissible deviations where appropriate, there are tailoring guidelines available for each type of processes, which define under what circumstances what all process aspects can be tailored.

#### 3.1. Project Initiation in Infosys

The Project management activities in Infosys have been depicted in the following figure 1:

As is seen here, each and every project goes through Quantitative/Metrics Analysis. Typically a project would start with project type definition. Then the project would go about estimating the efforts needed to carry out the project. This estimation will be carried out after the scope is frozen for the project. There will be a sign-off from the customer on the requirements and then Project leader (PL) would make an estimation for the scope defined. The estimation

would be based on either Simple, Medium or Complex Classifications of the functions/ programs to be written. The Organization has a vast repository of data from various projects executed earlier. These would form a guideline for estimation. These guideline would be in form of hours of efforts that is required for each component level activity – e.g., we can get an idea about time needed for executing a simple function/program. Also available would be the amount of time needed for various Project Management activities. In this repository (called PDB – Process Database) is also available various templates needed for executing projects. These templates are for various work products that are needed to be delivered to customer e.g., detailed level design, coding, test plan etc. Various technology specific tools like checklists, forms, standards are available for improving productivity; all these are extracted from various project that were executed in Infosys, in the past

Once the PL is ready with all these templates, he proceeds with resource planning and executing the projects. Periodically these projects are audited by Internal auditors to check compliance to project process as defined in Organization wide Project Guidelines.

*Setting the goals – Part of Project Initiation Activities:*

At the start, the project has to set its goals. The goal is set in terms of (I) number of defects that project will deliver to the customer, (ii) no. defects that will be injected in the process per an hour of effort, (iii) Productivity in Function points (FP) per person month of effort that the project expects to deliver. These goals are taken from two sources – 1. Process Data Base (PDB) where projects with same technology and environment the past have put in defect data

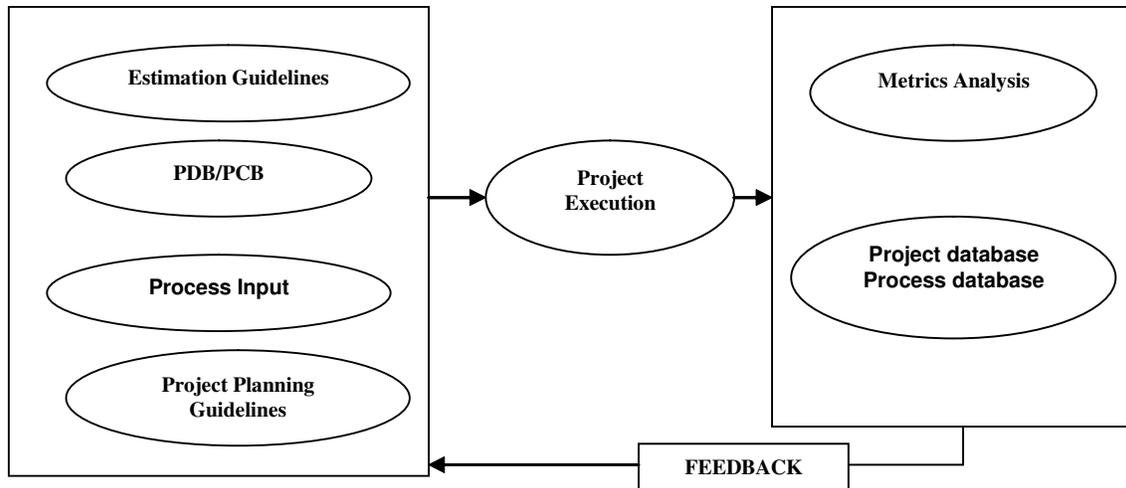


Fig. 1

related to their projects, OR 2. From Process capability Baseline (PCB) where average (and also the range of) value of all process characteristics are stored.

At present Infosys has prepared an in-house tool for setting all these project goals. The goal for a project is thus set either from PDB or PCB. A project can set a goal at a higher or lower than the quality level from PDB or PCB. If data similar to the Technology to be followed by the project is available in PDB, then the projects collects information from PDB or else the goals are set with respect to PCB norms.

(i) *Delivered defects :*

From PDB - If data is being taken from similar projects from PDB,

Estimate for delivered defects = ((No. of delivered defects)\* Effort estimated for the new project)/(Actual Efforts spent for that project).

(OR) From PCB - If PCB norms are used, then

(average value of the delivered defects/

efforts)\*Estimated efforts for the new project)

(ii) *Goal setting for no. of defects to be injected:*

From PDB - (Defects detected /efforts spent)\* Efforts estimated for the project  
(OR) From PCB - (Defect injected density)\* Efforts estimated

(iii) *Productivity:*

From PDB - Take the exact figure from PDB and set that as a productivity goal.  
(OR) From PCB - Take the PCB norm and set that as a project goal.

**3.2. Typical Project Organization Structure**

The project under case study is a Development project and it follows the corresponding Life Cycle(LC). The details are given subsequently in this paper. The project members have been designated as Developer (DV), Module leader (ML) or Project leader (PL).

The Project Organization Structure is given below.

The reporting relationship is depicted through various lines and interpretation of these symbols are as follows:

A straight line indicates reporting hierarchy. Arrow points to the upper level.

———— A straight line indicates reporting hierarchy. Arrow points to the upper level.

- - - - Dotted line indicates a two-way communication channel. Possible channels are:

between two specific roles only (e.g.: none in the current model)

between a specific role and a anyone in a team (e.g. : between PL and DC support team)

between two teams : anyone to anyone (e.g. : between off-shore team and customer team)

The other abbreviations used are:

BE - Back End (Server)

TA - Technical Analyst

PL - Project Leader

ML - Module Leader

SQA - Software Quality Advisor

DP - Defect Prevention

BM - Business Manager

FE - Front End (Client)

BA - Business Analyst

GL - Group Leader

DV - Developer

LC - Life Cycle Stages

CC - Configuration Controller

DM - Delivery Manager

CCD, F&A, E&R, HRD -

Support Services Functions

### 3.3. Project Execution and Tracking

Quantitative techniques used in the project, provide at regular intervals, predicts values of various parameters at various stages of the project. These parameters are decided such that by controlling these parameters, we can not only control the quality level, we can also predict the quality standard. The prediction of quality is done using actual data from the projects or based on past experience from similar projects. As a result at any point of time we can predict whether the concerned project follows process as defined at the start of the project. As a result we can not only cross check deviations from the defined process at various stages, we can also ensure that we get maximum benefits by following predefined process.

We have used many a technique for quantitative measurement ex: Defect Prevention Activities, SPC activity, Causal Analysis, Milestone Analysis - to name a few. These techniques are applied through out the project at defined intervals to check various parameters. These parameters are used for comparing with benchmarked values. These bench marked values are Quality Goals that are set by the project at the initial stage. These goals in turn are derived from defect patterns observed in similar projects executed in the past.

As is evident, the techniques described above become effective depending on how well can we set Quality Goals and hence be able to predict the outcome. Hence collection of defects data is a very important activity. These defect data is not only used to find the pattern at every stage, but also is used to predict the pattern at a future stage and also is used to set quality

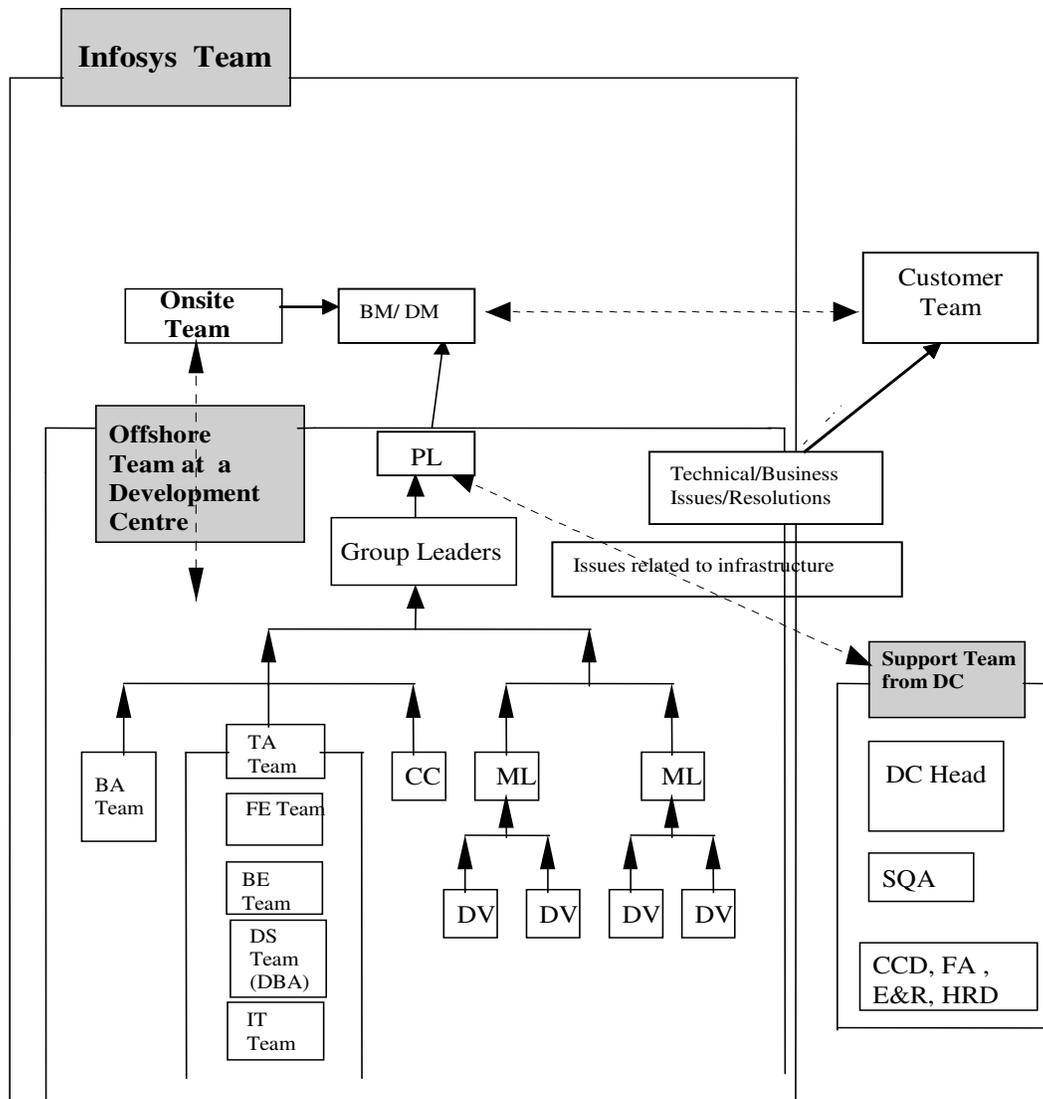


Fig. 2

goals for similar projects later on. Various tools are used to collect these data and stored in a databank for easy accessibility across the organization.

### 3.4. Forms/Tools/Checklists

Checklists, standards and forms are defined at the execution time to smoothen the development process. These forms are either

picked up from the existing database of these forms stored from previous projects or modified to suit the project requirements. An example of such a form is given here.

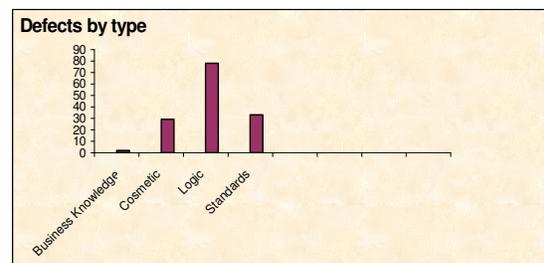
| Sl. No. | Description   | Remarks |
|---------|---|---------|
| 1.      | File name should be <program name>.tp   |         |
| 2.      | Program type should contain - (Add Service, Add Service manager, Trandriver, Dispatcher etc.)   |         |
| 3.      | The Expected result column should contain the output that can be seen.  |         |
| 4.      | All branches of the program should be covered in the test cases.  |         |
| 5.      | The order of the test cases should be such that the first test condition corresponds to the first possible exit in the program and the second corresponds to the next exit and so on. |         |
| 6.      | There should be sufficient test conditions to test the boundary conditions.   |         |
| 7.      | Detail SQL ( corresponding to each test case )to be specified to check the output.  |         |
| 8.      | Follow the template \css\ quality\tpchk.doc   |         |
| 9.      | The points which are not relevant for the test plan should not be deleted and instead specify N/A.  |         |

### 3.5. Defect prevention through defect pattern analysis

To achieve the quality goals that have been set, the process is tuned to achieve the desired goals. The team either uses the existing templates and checklists for various stages of project. These checklists are also continuously updated to suit the project needs. Review stages are defined and

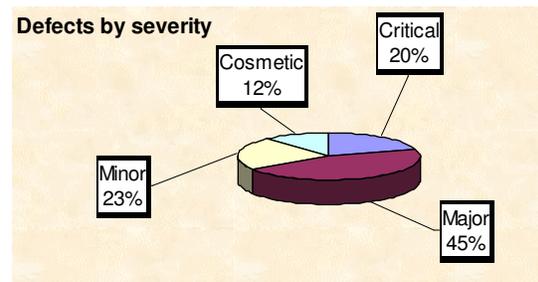
scheduled at various check points. These reviews would highlight project health as would analyze actual results against planned.

A typical milestone report will be used in these reviews. Defects detected during the process are identified and the pattern analyzed. A typical defect analysis by defect type would look like this.



These charts are used to decide the corrective actions needed to keep the project under control.

These two graphs are adopted from a project using PL/1 and VB5.0 language.



### 3.6. Causal Analysis

A causal analysis is done when the project team tries to find root cause of defects (after they analyze defect pattern) and try to come up with solutions. Usually a team is formed – called DP team ( defect prevention team). The members would have identified the defects that happens most of the time. This identification is done after

**OITS-2003**

they have analyzed defect pattern at the milestone analysis level. A meeting is convened where all the DP team members are invited. PL usually co-ordinates this meeting. A brainstorming session follows where the team come up with various action items against these defects. These action items are then piloted in the project and if found to be successful, the project will adopt these guidelines.

*A sample causal analysis report is given here.*

- Project Name  
XXXXXXX
- DP team members  
Developer 1  
Developer 2  
Developer 3  
Team Leader
- Date of analysis  
Jan 19 2000
- Period for which analysis is done

Oct 05 1999 - Dec 31 1999

- List of units (Programs / Functions / Screens/requests) analyzed  
Request#  
1. 991001  
2. 991002  
3. 991003  
4. 991004  
5. 991005  
6. 991101  
7. 991102  
8. 991104
- Total defects found in the programs selected for analysis  
120
- Prepared by  
Team leader  
Jan 21 2000
- Defect Type : Logic
- Number of Defects : 40

| #  | Root Cause                              | Preventive Action                                       | Impact (I) | Cost (C) | Rating (I * C) |                     |
|----|---|---|------------|----------|----------------|---------------------|
| 1. | No Template available for test planning | Identify a Template for Test Planning                   | .25        | .2       | .0500          | <b>Taken up</b>     |
| 2. | Unplanned execution of Tasks            | Scheduling & Tracking to be done using MS Project       | .15        | .15      | .0225          | <b>Taken up</b>     |
| 3. | Improper Knowledge Management           | Develop and Maintain BOK s<br>Organize Regular Seminars | .1         | .1       | .0100          | <b>Taken up</b>     |
| 4. | Initiative & Attitude problems          | Mentoring, Identify mentors for all team members.       | .05        | .15      | .0075          | <b>Not taken up</b> |
| 5. | Poor Communication Skills               | Training on Communication Skills                        | .15        | .05      | .0075          | <b>Not taken up</b> |
| 6. | Lack of Business Knowledge              | Training on Business Domain                             | .1         | .05      | .0050          | <b>Not taken up</b> |
| 7. | Improper Estimation                     | Estimates/Schedules to be verified before accepting     | .1         | .1       | .0100          | <b>Taken up</b>     |
| 8. | LC process not followed                 | Process should be strictly followed                     | .15        | .2       | .0300          | <b>Taken up</b>     |

**Note:** Impact & Cost are measured on a 0 to 1 scale. For Impact, larger the number higher the impact. For Cost, larger the number lesser the cost and easier to implement.

• **Points taken up for action:**

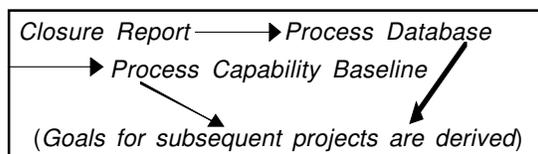
| #  | Preventive Action                                    | Assigned to    | Implementation Date       | Percentage Reduction in defects |
|----|--|----------------|---------------------------|---------------------------------|
| 1. | Identify a Template for Test Planning                | Developer 5    | Feb 11 <sup>th</sup> 2000 | 6%                              |
| 2. | Scheduling & Tracking to be done using MS Project    | Project Leader | Jan 28 <sup>th</sup> 2000 | 4%                              |
| 3. | Develop and Maintain BOK s Organize Regular Seminars | Project leader | Jan 31 <sup>st</sup> 2000 | 4%                              |
| 4. | Review and update Standards                          | Team leader    | As and when required      | 3%                              |
| 5. | Prepare checklist for standards.                     | Team Leader    | Feb 18 <sup>th</sup> 2000 | 3%                              |

**Note:** The action items, 1.Estimates/Schedules to be verified before accepting, and 2.Process should be strictly followed, are something that should have been followed anyway. Irrespective of whatever priority, these should be taken up.

### 3.7. Project Closure

A project is considered closed entirely when all its deliverables as committed to the customer are delivered. Customer would then go about carrying out Acceptance Testing (AT). At this stage project prepares a closure report. Depending on the project type, there are various templates for closure analysis. The report templates captures all related information on various parameters that the project would have set as a quality goals. It also captures reasons to various deviations against set goals. These information are analyzed and then are used to tailor the process definition as well as used to modify PCB norms on a periodic basis.

Causal analysis, Efforts spent in the project, weekly activity data against the concerned project are captured in this report.



### 4. Conclusion

At Infosys the aim is to deliver solutions to the customer with as less defects as possible. Some of the projects even target zero defect delivery. Hence the project has to plan suitable quality control activities, properly execute them and control these activities that most of these defects are controlled 'in-process' .i.e. these defects are rectified before they are delivered to the customer. To meet these, we define procedures, guidelines, templates and checklists. And also we control the results quantitatively.

Through quantitative approach quality goals in quantitative terms are set and then the projects are managed to achieve these goals. This means that there are goals set for various intermediate stages and the projects are managed to achieve these goals.

There has been a tremendous improvement in the quality of deliverables and at present the organization has achieved the highest level in Capability Maturity Model (CMM 5). And at present the organization is working towards not only sustaining level 5, but also taking initiatives in various other directions. A continuous approach ensures that we improve on what ever we have achieved so far. At present an in-house tool is being deployed to capture all data from various tools. This tool will integrate various tools used (ex: DCS, WAR, MSP for planning etc.) and will create a report. The project Leader will be required to give his comments and observations against various activities.

These Software Process Improvement activities have resulted in a tremendous improvement. Most of the projects that have employed these techniques have reported a reduction of 10% in defects delivered to the customer; Productivity has gone up by 20% with corresponding reduction in Cost Of Quality.

## Information and Communication Technology Quarterly Progress Report (April-June 2003)

ICT Team, UNDP - Orissa Hub

### Background

Technological innovation is a major source of growth. Considerable faith is being vested in the capacities of ICT to transform the quality of life by providing new opportunities in the areas of better education, higher standard of health and nutrition, less poverty, a cleaner environment, more equality of opportunity, greater individual freedom, and richer cultural life. Beyond its contribution to prosperity, technology can also contribute to increase democratization of information. Also the use of ICT in the facets of vulnerability reduction and sustainable growth is highly appreciated in the context of applicability of technological innovation in the various human development endeavours. In this context, response and preparedness phases of disaster management cycle has been aptly addressed by our initiatives such as mapping of disaster resource inventory including man, machine, skill and capacity through the portal of ' Indian Disaster Resource Network' and of building disaster inventory by capturing 32 years of data on disaster in the system 'DesInventar'.

Focus of UNDP Orissa ICT Team has been in the following areas:

- Applying technology to help build capacity and bridge the digital divide

- Promotion of citizen-centric Governance
- Farmers capacity building with Agriculture Market Information System
- Broadening the scope of Information and Communications Technologies in disaster management.
- And influencing major changes in public policy

### 1. CAPACITY BUILDING FOR DECENTRALIZATION

#### 1.1. Applying technology to help build capacity and bridge the digital divide

To address the traditional development problems free flow of information act as a powerful force for empowerment. UNITEs<sup>1</sup> programme in Orissa is implementing Information Communication Technology with innovative solutions and approaches for the development of the community. Through the multi-sectoral framework and partnership approach, various activities are being undertaken **to enhance government capacity and public services & strengthen citizen participation, promoting entrepreneurship.** currently, there are around 80 IT kiosks located at various access points in Orissa, to create an information flow network for knowledge sharing between the common man and the

1. UNITEs, the United Nations Information Technology Service, is an initiative that channels the creative energies, skills and solidarity of volunteers around the world to collaborate with people in the South to improve their capacity to make practical use of information and communications technologies (ICT). In key fields like health, education, income generation, gender equity, environment or humanitarian aid, volunteers working under the UNITEs programme are striving to bridge the digital divide, one person at a time. The United Nations Volunteer Programme is coordinating this new, UN ICT volunteer initiative.

government with the partnership of NGOs, CBOs, Youth Clubs, local government in 10 districts of Orissa.

From April to June, the following key activities were undertaken to support the UNITEs initiative as follows:

- Review meeting with the partners of Agro Information Center was conducted in the month of May
- Initiated partnership modalities with Indira Gandhi National Open University (IGNOU) for IT literacy through UNDP IT kiosks.
- Discussion held with Jan Shikshan Sanshtan (Institute of People's Education) for exploring of livelihood options through training of SHGs and making available information to aamagaon.com

#### **(A) TO ENHANCE GOVERNMENT CAPACITY AND PUBLIC SERVICES**

##### **KENDRAPADA DISTRICT**

###### **Activities:**

- a) Preparation of 'Computer Training Module' on various computer applications for the District IT Society which would enhance the skills of district level officers, steno, typist and blocks personnel like Block Development Officers and Village Level Workers
- b) Initiated discussions for setting up of District IT Resource Center with the infrastructural support from MPLAD and technical support from UNDP and District NIC.
- c) Monthly monitoring of Agro Information Center and discussion with their management committees on operational issues.

- d) Co-ordination with all district line departments to get updated information on new schemes.
- e) Motivating government and people about on-line grievance, Internet & e-mail to speed up the existing communication processes.

###### **Achievements:**

- a) Completed computer training programme for District level Officials i.e. District Agriculture Office, Dist Planning Office and Krushi Vikash Kendra on fundamentals of computer applications and e-governance.
- b) Compilation of government developmental projects guidelines on agriculture, pisciculture, and horticulture for content development.
- c) Internet connectivity established at Ardhajori Agro Information Center and Krushi Vikash Kendra.

###### **Future Plan:**

- a) District Information Technology Society will certify computer training certificates for the trainees trained under Agro Info Centers.
- b) 'Computer training for all' - 100% computer literacy for Taras village.
- c) District IT Society to promote revenue generation of Agro information Centers through out-sourcing of computer related jobs of district administration.

##### **CUTTACK DISTRICT**

###### **Activities:**

- a) Meeting with the PRI members to sensitise them about the role of ICT
- b) Discussed with the superintendent of SCB Medical College to train their computer staffs for maintenance of hospital records.

**NUAPADA AND BOLANGIR – WESTERN  
ORISSA DISTRICT**

**Initiatives/Achievements:**

- a) The Lok Utsav, Nuapara (Maraguda Utsav): was observed from 1 st - 2 nd April 2003 at Nuapara. The intersectoral team of UNDP Western Orissa has participated in the exhibition.
- b) External Organisation visit to ICT Kiosks: A team from Action AID (NGO) consisting of one delegate from London Ms. Sigrun Rottmann and their ICT Coordinator Mr. Subrat Rout visited the ICT Kiosks of Bolangir and Nuapara districts. The project concept was demonstrated by the local IT Volunteer, Sarapanch and the Secretary of that panchayat.
- c) Six days computer training of school teachers was conducted in the sub-divisional HQ of Titlagarh of Bolangir district. The participants were block staffs of 3 blocks, 3 teachers of Govt Boys' High School.
- d) Six days Computer training for block staffs was conducted in Agalpur block of Balangir district in the month of June. After the training, now 3 VLWs / clerks are assigned the task of complete computerization of the block.
- e) PRI Members' Training and awareness A drive was taken for Computer literacy of all PRI Members and Secretary of Ghunsar GP of Bolangir district.
- f) Need assessment survey conducted for 2 new kiosks in Jogimunda GP of Bolangir district and Boden block of Nuapara district.

**Future Plan:**

- a) The Complete Computerisation of four GPs of the UNDP supported IT Kiosks.

- b) Six days orientation training on "Schemes and Guidelines and role of ICT" to be conducted for the PRI Members of Bolangir with the support of District Panchayat Office, Balangir.
- c) The training for all District and Block officers to be conducted in Nuapara.

**GANJAM DISTRICT**

**Activities:**

- a) Meeting of IT society for the setting up of more IT-Kiosk in rural area.
- b) Initiated coordination meeting with NGO's/ Youth Club for IT-Kiosk in rural area.
- c) Computer training for District and block officials through the District IT Society.
- d) Technical support by UNDP for "e-grama", e-governance portal of Ganjam District. This portal supports e-mail communication with blocks and districts through internet and intranet facilities and beneficiary details in a centralized database.

**Future Plans:**

- a) Co-ordination with NGO's / CBO's / Youth Clubs for establishment of new IT kiosks
- b) Online application of e-grama portal.
- c) ICT training for PRI members.

**(B) STRENGTHENING CITIZEN  
PARTICIPATION AND  
PROMOTING ENTREPRENEURSHIP**

**KENDRAPADA DISTRICT**

**Activities:**

- a) Liaisoning with the district Krushi Vikash Kendra [District Agriculture Development center] for the training of farmer groups on various off-farm and on-farm activities.
- b) Established a Farmer's School on Rice Development for proper management of fertiliser and pesticides, Bio-Compost to get

more productivity. This school consists of fifty farmers and some of them have planned to form farmers SHG to avail different government schemes which can be replicate in self income generated activities.

- i. Vegetable seed centers have been initiated through Agro Information Center.
- ii. Women SHGs have been formed for mushroom culture and diary farming.
- iii. Phase wise agricultural training on Technical know how for farmers by District Agriculture Department.

**Achievement:**

- Need base agricultural training completed for farmers by KVK Scientists in Kendrapra at Agro Information Centers - **Kondia and Koranda in Rajkanika**, Chanda in Mahakalpada.



**Inauguration of Farmers Field School -  
Taras-Agro Information Center**

**Future Plan:**

- a) Information on various plant-diseases and farming technique like diary, mushroom culture, Honey bee culture, fishery to be developed for farmers and to be circulated in Agro Information centre through Compact Disc.

- b) Linkage of SHGs through Agro Information Centers for the marketing of the produces manufactured by them and intern revenue generated by the Agro Information Centers.
- c) Survey of SHGs around the IT Kiosk and involving them in income-generating project.

**CUTTACK AND JAGATSINGPUR**

**Achievement:**

- Information has been collected on agriculture and ICDS with proper correspondence with the District Social Welfare Officer and Agriculture Officer and plans are to disseminate it through Agro Information Centers to community in Cuttack.
- Organized a meeting with the SHG groups in assistance with the NGOs of Patpur GP, Jagatsinghpur district for mapping of their activities and products.

**1.2 Promotion of citizen-centric Governance  
aamagaon.com**

Aamagaon.com is an initiative towards citizen centric governance. Conceptualized as a citizen interface to government services, the efforts have increased much in scope and reach. A UNDP and CSM Technologies project, aamagaon.com supports online grievances, information about agriculture practices and crop response planning. Several deliberation have also taken place as new initiatives at different forums on the aiding capacity of internet and related technologies in helping alleviating poverty and other developmental efforts by mapping 'self help groups' with an idea to showcase their efforts to the larger audience for community to community interactions and transactions.

**Key Achievements:**

- Initiated discussions with technology partners for developing the module for

registration of 'Self Help Groups' in the portal.

- A combined presentation by UNDP and CSM was made to the district collector Kendrapada on how district administration can help in mapping the SHGs in the district.
- Information collected on different SHG in the districts of Angul and Kendrapada.

**Future Plans:**

- The portal would be developed as a citizen-to-citizen, citizen-to-government and government-to-government facilitator for all the district of Orissa.
- Panchayatiraj Dept has envisaged the ownership of the portal, aamagaon.com by making available information about their several schemes in the rural areas. In addition to that, the department is also keen on using the portal for asset monitoring at different layers of its functioning.

**2. PROMOTING POVERTY ERADICATION AND SUSTAINABLE LIVELIHOODS**

**2.1. Farmers capacity building with Agriculture Market Information System**

The availability of prompt and reliable information about the agriculture market considerably improves the decision making capability of the farmers and strengthens their bargaining power. Information about the current market is disseminated through blackboard display as the Market Committees are able to disseminate information in respect of their own markets only which restricts farmers in taking decisions in marketing their produce as they are unable to gather information on prices prevailing in other markets, The farmers are, therefore, left with no alternative but to dispose of their

produce in the nearest market, even at uneconomic prices. Improvement in the present market information system by linking all-important agricultural produce markets in the state, the State Agricultural Marketing Boards & the extension departments & UNDP, Orissa, OSAM Board is operating through network of the Regulated Market Committee that provide relevant information on availability of commodities, price to enhance the decision making capabilities of rural farmers. Memorandum of Understanding was signed with Nehru Yubak Kendra Sangathan for assisting in set up intelligence network. Orientation programme was organized for 30 NYKS volunteers at UNDP, Orissa Office. Necessary technical support to Orissa State Agriculture Marketing Board in agricultural marketing is provided by UNDP.

**Activities:**

- Follow up Communication to all Dist Collectors, Regulated Market Committee chairmen & RMC secy regarding this new initiative of UNDP & OSAM Board.
- Developing a website [www.osamboard.org](http://www.osamboard.org), formarketing of different agriculture produce
- A review meeting was organized at Orissa State Co-operative Bank's conference hall on 16 th May 2003 for NYKS agro market intelligence volunteers and a monthly status finding meeting was also organized in the same venue on 20th June 2003 with RMC secretaries.
- The performance of volunteers and RMCs were reviewed both in project AGMARKNET of Govt. of India and for OSAM Board's project.
- A guideline for market intelligence network for RMCs is drafted.

- 
- Designing the database & network structure for market information available on OSAM Board and AGMARKNET web site.
  - Training to three RMC secretaries (Kendrapara, Sakhigopal secretaries, Kesinga volunteers) and market intelligence volunteers on computer in addition to 15 RMC and Agri-intelligence Volunteers.
  - A System Requirement Specification has been done for management of market of OSAM Board automation software.
  - Discussion and communication with Assistant Director Live stock for identifying and developing important major live stock markets of Orissa.
  - Participation in state-level KRUSAKA DIWAS celebration at Niali on 4 th & 5 th May 2003, where emphasis on role of ICT in agriculture was made.
  - A commodity chart is prepared and item classification is done for nearly 200 products that will help in installation of the software for agri. marketing
  - Identified 8 major potential markets and daily information aired via E-TV's ANNADATA, daily at 6.30am on all major products.
  - The web site is now in final stage of content development. All required information is compiled and supplied to Software firm for final development.
  - 2 staff of RMC was trained on computer literacy program besides handling the AGMARKNET software on internet.
  - Database Structure on National Atlas is designed to map the potential areas for agriculture produce.
  - Agriculture product classification is done for nearly 200 agriculture products for database software.

#### **Future Plan:**

#### **Achievements:**

- NYKS volunteers are available for market intelligence network in 22 RMCs and providing information of various agriculture produce's price and quantity on websites for almost all dist HQ of Orissa.
- Individual RMCs can now upload information from their RMCs directly to the OSAM Board websites.
- Daily market intelligence reports generated from 32 RMCs and shared through OSAM Board's website and 18 RMCs on AGMARKNET.
- Established internet connection in RMC of Kesinga, Bolangir, Sambalpur, Dumuriput and Kantabanjhi.
- Market information to be published on various print media.
- Completion of commodity profile and sharing of national atlas to enable developing better marketing strategies to the Govt. official / RMCs / Community.
- Formation of marketing group for farmer's sensitization about the role of ICT in various market yards
- Develop a GIS based software on Agriculture Marketing for better decision making
- Providing information on various different economic agriculture practices on website.
- Neighbouring state major markets to be identified and database to be designed for the same.
- A better off-line user friendly Software to be developed in order to enable RMCs uploads data from their centre after the internet connection.

### 3. SUPPORTING VULNERABILITY REDUCTION & ENVIRONMENTAL SUSTAINABILITY RECOVERY

#### 3.1 Broadening the scope of Information and Communication Technologies in disaster management

##### A) INFORMATION AND MONITORING SYSTEM FOR DISASTER MANAGEMENT AND PREPAREDNESS

To reduce the vulnerability in disaster prone area for timely and accurate information about incidence of hazards, ICT plays a significant role. This includes sharing of collated information about the hazard and response in the form of situation and gap analysis report on different sectors with different stakeholder like donors and partner organisations.

##### Key Activities

- Upgrading the UNDP, India Disaster Preparedness and Response Plan for July to September 2003
- Tracing and sharing reports on all India Main Weather Report / Earthquake Report/ Summary of Regional Weather Bulletin on regular basis with stakeholders from government, UN agencies, INGO's, NGOs.
- Setting up of 24 hours Emergency Flood Control Room at UN House II for monitoring disasters in various parts of the country
- Information dissemination and sharing of situation report of events i.e. of Assam and Bihar Flood 2003 with various stakeholders.

##### Future Plan:

- The Control Room Operating Manual is being developed and is in progress.
- The Emergency Contact list updating is in progress.
- To develop a manual for weather tracking, warning and preparedness system;

- To develop templates of emergency information reporting for various disasters (i.e. cyclones, earthquakes, disease outbreaks, hail storms, drought, floods, etc; and
- To upgrade the current online UNDP, India Disaster and Preparedness and Response Plan.
- To develop an Emergency Intranet website specifically for Disaster Information like sharing of Sitreps, tracking disaster related information.
- Mock Drill for the UNDP Disaster Preparedness and Response Plan is to be arranged in the month of September.

##### B) INDIA DISASTER RESOURCE NETWORK

##### One stop source of information on resources available for emergency response

The vulnerability of the living in this subcontinent is a great challenge to the government machinery that gives emphasis to the need for a comprehensive database on availability of resources like equipments and skilled manpower that can be mobilized to respond immediately during emergencies or disaster.

**Ministry of Home Affairs (MHA) in collaboration with United Nation Development Programme (UNDP)** has developed on-line Information system [www.idrn.gov](http://www.idrn.gov) in to systematically build the Indian Disaster Resource Network inventory as an organized Information system for collection and transmission of specific **equipments and expertise database** from district level to state level to provide availability of resources for disaster response. This portal will help disaster managers to identify the location of the resources within less time. All the states have been

included under this programme where State Relief Commissioner been identified as the nodal authority for implementing IDRN except for Orissa and Gujarat -OSDMA and GSDMA have been identified respectively to be the nodal authority. Data are collected at the district level either District Collector or District Emergency Officer are the nodal persons. NIC has issued necessary instruction to all the state and district NIC offices to extend possible help to the district nodal authority for successful implementation of the programme.

#### Key Activities/ Achievement

- **www.idrn.gov** has been registered as government domain and server space been allocated under NIC New Delhi for the database
- All the required files and database has been uploaded into the NIC server, New Delhi during the month April.
- The portal has been certified successfully by NIC and started functioning from mid of April.
- Training and orientation program has been conducted for Nodal officers in Orissa and Delhi.
- Identified and approved the list of equipments, human skill and critical supplies needed for effective disaster response from Ministry of Home Affairs and incorporated in the database.
- Developed module to capture 'skilled human resource' with the existing system.
- Redesigning the data input and various query interfaces for easier accessibility.
- Developed check list report for evaluating the status of each districts data records.
- Designed an option for State Relief Commissioner's Office to upload Situation report of disaster in their state.

- Distributed the data collection format along with instruction page and operational manual to all the districts for collecting the resource inventory available in their corresponding line department.

#### Future Plan:

- Designing of new module for capturing data of State HQ inventory.
- Implementation of web based GIS and linking it to inventory database for easily identify the location where resource are available.
- Implementation an offline application at district level for uploading inventory data at district level to minimize the internet time and maintain their own district resource inventory.

#### C) DESINVENTAR-BUILDING SYSTEMATIC DISASTER INVENTORIES

DesInventar is an initiative to build a historical database of disasters in Orissa, India. A systematic geo-referenced inventory of small, medium and large-scale disasters for the past 32 years has been built. The analysis of the database started shedding new light on the disaster vulnerabilities of Orissa and showing a varied pattern of risks as opposed to the common perception. The database of disaster location, its effects, and its causes will in turn support the generation of Vulnerability indices for the state of Orissa. DesInventar is a system that supports rational decision making for disaster management, and provides an objective basis for vulnerability assessment and prioritizing actions in managing vulnerabilities. It supports the formulation of policies and identification of priorities for disaster prevention and mitigation. This system also facilitates generation of vulnerability indices for a particular geographic location.

### Key Events:

- **DesInventar Workshop held at Kathmandu from 20th - 23rd May 2003**

A three-day hands-on training workshop conducted by Mr. Sujit Mohanty and Ms. Deepa Chavali on DesInventar followed by a round table discussion involving the respective team leaders of the Organizations concerned like National Society for Earthquake Technology (NSET) - Nepal, Kathmandu Metropolitan City (KMC), Nepal Red Cross Society, Ministry of Home Affairs, UNDP, UNSECOORD and National Planning Commission (NPC) was organized at Kathmandu, UNEOC, UN House Pulchowk, Nepal from 20th - 23rd May 2003.

- **DesInventar One Day Workshop (27 th May 2003)**

A one day Sub-regional Workshop conducted by Mr. Sujit Mohanty and Ms. Deepa Chavali was held in UNDP, 55 Lodhi Estate, New Delhi on the theme “**Building Systematic Disaster Inventories in India**”. Topics presented and discussed were:

- Systematic disaster loss databases – corner stone of practical disaster risk information systems.
- Methodological challenges in building and institutionalizing disaster inventory systems – experiences from Latin America.
- Experience of building historical disaster databases in Orissa and steps towards institutionalisation of a disaster inventory system in Orissa.
- Towards a multi-tiered disaster inventory system in India – some ideas Participants were from Ministry of Home Affairs (MHA), Department for International Development (DFID), European Union (EU), Disaster Management Institute-Gujarat (DMI) & NGO’s – Prism (West Bengal), SEEDS,

DMMC – Uttaranchal.

- **DesInventar Workshop held at Delhi from 28 th – 30 th May 2003**

A three-day hands-on training workshop conducted by Mr. Sujit Mohanty and Ms. Deepa Chavali on DesInventar followed by a round table discussion involving the UNDP State teams from Assam, Gujarat, Uttaranchal, Rajasthan, Delhi, Orissa and other members from DMI, OSDMA, SEEDS, Prism & DMMC was organized at UNDP Premises, Defence Colony, New Delhi from 28 th – 30 th May 2003.

### Key achievements:

- 10070 data cards collected from government departments in the last 2 months and being entered into the system for natural disasters;
- First draft of “Orissa Disasters Analysis” from the database to be included in the State Human Development Report (HDR);
- Key analysis on “Disasters in Orissa” will be included as a note in the World Vulnerability Report which will be released soon.

### Future Plans:

- To expand the project into the 17 other program states of UNDP in India, following discussions and meetings;
- To train the IT facilitators in using the software and maintaining the disaster records; and
- To institutionalise the DesInventar software package with the respective State governments for automating their own records and subsequent follow-up.

### 3.2 MIS for tracking Livelihood and Food Security

One of the important aspects of the Office of Special Relief Commissioner (SRC) is to track the parameters of livelihood and Food security

which gives indicator to measure 'Hunger and Malnutrition' details in all the districts of Orissa. The Office of SRC analyzes these individual reports currently received by fax and prepares a consolidated report and sends it to the Chief Secretary in a printed format.

To facilitate the easy retrieval of data and generation of reports a software is being designed for tracking hunger and malnutrition. Health reports sent from different districts on fortnightly basis is being stored in this database for generating report and decision making. Report on death due to malnourishment and district employment statistics can be generated through this system. UNDP has posted on volunteer for the system development at SRC office.

#### **4. OTHER INITIATIVES**

##### **4.1 New policy initiative on ICT for development in Orissa**

UNDP is assisting the Department of Information Technology, Government of Orissa by providing policy advice and consulting services for developing a new ICT Policy. In order to accomplish this, it is undertaking a complete review and analysis of existing national and state vision, policies and regulatory developments.

The methodology includes mapping strategic thrust areas, activities and interests of key stakeholders, and facilitating broad discussions and meetings in the development process by NGOs, various agencies and departments of the Government of Orissa, the private sector, academia, and individuals. In addition to identifying and forming a Working group to provide specific inputs into the draft ICT Policy, the UNDP ICT Team will participate in drafting of the ICT Policy and implementation strategy with support from the working group consultations.

Among the expected outcomes of this new initiative are a background note on ICT Policy development in Orissa, a major workshop or conference to be co-sponsored with all stakeholders, a final draft of the ICT Policy, and development of a set of indicators and plans to monitor achievements.

##### **4.2 Findings of XIMB students- Information need assessment in Ganjam district**

A study was conducted regarding the information need and availability in the Ganjam district of Orissa. For the proposed study, five different blocks were chosen by a three stage stratified random sampling technique. In the first stage, 5 different blocks are selected based on the agro climatic zones of the district. In the second stage GPs are selected based on the proximity from the major towns of the district i.e., the distant GPs from the town, and in the third stage villages are selected based on occupational pattern, caste structure, livelihood patterns, demographic distribution, socio-economic condition, natural resources, population density and land holding pattern.

The whole summer training was divided into three parts (7 week). In the first week, orientation was done by exposure visit to different IT Kiosks established by UNDP in Cuttack, Jagatsinghpur and Kendrapara districts. In the second week, selection of Blocks, GPs and villages was done by consultation with various Govt. officials. For next 4 weeks, information regarding information need and availability of the villagers (How, Where, When, How much, Who etc.) were collected by PRA techniques and focus group discussions.

The study reveals that there exists a manual information system in almost all the villages. There are many intermediaries involved the manual information systems. They may be Govt. officials, village leaders or any other influential

person. The manual information systems pass through many stages. As there are large numbers of intermediaries involved, the manual information system has high transition period as information flow from one middleman to other. In the whole process, the real information seeker either gets a part of the information or may get wrong information or may get the right information at wrong time. In most of the cases, the real decision maker never gets the accurate and real time information. The manual information system has high opportunity cost.

**Study reveals:** It can be concluded that the villagers need information for various purposes. They need that at right time and in right magnitude. If the information's can be supplied to them by computer medium at their doorstep, they will get right information at right time, in right magnitude which has low opportunity cost and less transition period.

#### 4.3 Learning through knowledge sharing

UNDP ICT team represented by Arushi Ray and Rajiv Ranjan witnessed the congregation of entities which are closely linked with a common thread – ICT for Development – in a workshop at Baramati, Maharashtra in May 30 – June 2, 2003. Participants from Government, NGO, Funding bodies, beneficiaries, Academia and Development agencies debated questions, accompanying issues and solutions for empowering the poor using Information and Communication Technology.

The key recommendations were:

1. Need to have a sustainable business model- (From Philanthropy to Social Venturing) by utilizing the knowledge based economy to empower the poor.
2. Technology is not an end itself, focus should be on applying technology to achieve meaningful improvements in the standard

of living of families who are now struggling to rise from the bottom of our economy.

3. Focus on Narrowing the Social (not Digital) Divides by democratization of information.

### 5. BEST PRACTICES

#### Success Story:

Villages in Rajkanika block, Kendrapara district of Orissa face cyclones and floods almost every year. Besides formal literacy, the community is denied of basic information on sectors like agriculture, health, housing and disasters. UNDP's IT (Information Technology) programme attempted to cover some of these villages and develop better informed communities through the ICT (Information & Communication Tools) initiatives. The people welcomed it with open arms.

An IT kiosk was set up at Koranda village in Rajkanika block in July 2002 to disseminate information and also train the community in how to access the same. The kiosk was provided a computer with support from the on-going UNITEs programme of UNDP and was being run through the local NGO Nature's Club. Initially the kiosk initiated a lot of enthusiasm among the community, but after a couple of months with the disruption of power the enthusiasm of the community died out. It was after a period of long 10 months that power was restored. But by then all in the village had lost all hope with the kiosk. It was then that two local young girls Pravashri Dhal and Nibedita Mohanty of the Meena Club took it upon themselves to revive the morbid centre and make the mission of UNITEs programme a success.

Pravashri and Nibedita spread the message around that there was hardly any need for young boys and girls to go to the Block hqrs (10 Kms from Koranda) to learn basic computer operations. The training centre was there itself

and all could enlist themselves here! Before long, scores of young boys and girls got attracted and started getting trained by Pravashri and Nibedita. All information pertaining to Govt. development programmes, innovative agriculture improvement techniques, appropriate cost-effective technologies in housing, etc. was all disseminated through this kiosk, mainly through their earnest efforts.

Pravashri has been all for it, and Nibedita, the computer savvy that she is, remains perpetually charged with strong dedication and volunteerism. The dedication of these two young girls has won the admiration and hearts of all in the village and beyond. These are the souls in many remote villages whose tireless efforts go on to build the capacity of the literate youth towards computer operations and more importantly, towards developing better informed communities.

### **Model IT Kiosk in the district 'Sambhavana Agro Information & Research Center, - Taras'**

**Mission to accomplish 100 % computer literacy as pro-poor initiative**

"SAMBHABANA" Agro Information & Research Center - Taras is the most developing IT center in Kendrapra district. This center facilitates convergence mode from Low Cost Housing to Disaster Risk Management under UNDP programmes. Dissemination of information on different government schemes and capacity building of common people are carried out in this multi-purpose community center. Some of the common services available in this Agro Information Center care:

- Information on different schemes & programmes of govt.
- Computer training programmes for - School and College students / SHGs / Club members.
- Monthly Mass computer awareness training for school students
- Regular screening of documentary film on disaster preparedness, women empowerment and health issues among the villagers (farmers, women group and etc).
- Revenue generation activities for the Agro Information Center through DTP, Screen printing.



**Agro Information Centre in Rajkanika Block**

- Magazine club and literatures on different projects for all (Students, villagers and farmers). effective technologies in housing, etc. was all disseminated through this kiosk, mainly through their earnest efforts.

## Tool for Enterprise Wide Management of Educational Institutions

Mr. Srijat Mishra\*  
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### I. Education is one of the largest Industries

Education is one of India's prime Industries. While its contribution to nation building is well known and widely reported, its importance in terms commercial value is less appreciated. Education industry is estimated to be more than Rs. 20,000 crore and this figure is more than the size of the domestic software industry or the automobile industry.

Apart from being among the largest sectors, education sector is also among the fastest growing sectors of the country. With the enviable combination, of large size and high growth, no wonder education sector is among the most attractive industry sectors in the country today.

### II. Growing Complexity of Educational Institutes

With the stupendous growth of the education sector, educational institutions are becoming increasingly complex organizations. They are no longer institutions limited to education delivery. Educational institutes are confronted with managing a wide range of activities encompassing marketing of institutes to students for admissions and corporates for placements, managing internal operations (like smooth conducting of classes or recruitment and motivation of the human resource viz. faculty

and staff), sophisticated financial and cash flow planning, co-ordination with regulatory & statutory authorities etc. In addition, to all that, educational institutes are also subject to the vagaries of market forces due to stiff competition and demanding customers (read students and corporates).

In addition, the increasing size of the institutes and the breadth of activities have significantly enhanced the degree of interaction between different academic and administrative departments. These days, the academic and administrative departments need to work in tandem to meet each others work objectives and information needs. Also, localized financial autonomy to given different departments (as provided by some progressive institutes) necessitates the pervasiveness of the finance activity to academic and administrative departments, this further enhances the co-ordination needs between the academic / administrative departments and the finance team.

The huge manpower intensity of educational institutes (typically the revenues per employees is as low as Rs. 5 to 10 lakhs per employee, as against industry benchmark of quality companies of Rs. 1crore+ per employee) also adds to the co-ordination and information management needs of institutes. In today's

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scenario (especially for private institutes) meeting regulatory information needs also takes a sizeable chunk of the top management and key resource persons time.

All these factors manifest themselves in large manpower base, delays, laxity in following processes, adhocism, centralized decision making and regular fire-fighting efforts.

### III. Educational Institutes Need Sophisticated Management Tools

In today's world an educational institute is no less complex than a fledging corporate house. Therefore it goes without saying that educational institutes deserve the best in term of modern management practices and state-of-the-art technology for managing their internal and external operations.

In these days of stiff competition and customer service, what is most critical to success is continuous cost reduction, superior quality customer requirement management, effective project management, robust processes, effective target setting & performance review mechanisms, regulatory environment management and to top it all brand image enhancement. Across industries it has been seen that only those companies who have not been able to manage all this have reaped sustainable success. Others who have had a narrower perspective at best have a short lease of life, often they find it difficult to take off the ground. This is applicable to education sector as much as any other sector.

In today's world an educational institute is no less complex than a fledging corporate house. Therefore it goes without saying that educational institutes deserve the best in term of modern management practices and state-of-

the-art technology for managing their internal and external operations. Education sector has to soon start using all the sophisticated modern tools used in business houses to enjoy long term and sustainable financial, academic and brand strength.

### IV. Total Automation Tools of Educational Institutes

Of the many management tools widely used in successful corporates these days, one the most pervasive and the invaluable tools is use of automation for **information flow and management control**. Information technology has found an indispensable place in most companies. All activities and resources are seamlessly linked to each other to ensure cost & time efficiency, people productivity and decision support systems. No two organizations can be expected to have the same strategy and tactics but one have **one thing common** to all successful organizations is a robust and comprehensive Management Information System and Decision Support System.

Unfortunately educational institutes have not benefited from this IT explosion. This is most surprising, considering that most of the technology break-throughs have their roots in academic research. However, more and more institutes have started appreciating the needs for automation. Management members can have access to critical information at the click of a button, teachers can have access to their schedule and other financial/personal information from their tables most conveniently without needing the support of academic/administrative offices, parents can have access to the attendance and performance of the wards by the click of a button. Similarly students can access any information they require with utmost ease.

## V. Specific Benefits of an ERP

Benefits from a tested and demonstrated package are many. The key benefits from the standpoint of resource management are the following:

- Increases the effectiveness of the most scarce resource '**Time**'. Enhances the responsive of administrative and academic functions (less time for admission request processing, less time for academic result publication)
- Facilitates better investment planning and optimal utilization of expensive resources **like** computer labs, buildings and equipment
- Enables **optimal deployment of Human Resources** and hence ensure the best utilization of academic talent by frees the academic talent from arduous administrative responsibilities.
- Last but not the least, ERPs, properly implemented, would lead to significant **cost reduction**
- Access through the internet enables wider and convenient usage.

## VI. Guidelines for choosing an ERP

A few things to be kept in mind while choosing an education ERP:

- **Integrated Software:** Need to go for comprehensive automation products which integrates all the activities (admission, library, payments, hostels, student registration etc) into one data base and MIS. Integrated automation leads to process benefits like cost and time efficiencies.  
As an example, if the library and finance module are integrated then library penalties

are automatically reflected in the payment schedule and due records of students. On the other hand, if library and finance modules are not integrated then additional work has to be done by both the library and the finance department to make necessary entries and accounts.

- **Internet Based Product:** In today's world, web enabled technology is always preferred as it can give parents access to students information from home and also gives management access to important information from remote locations.

This significantly helps busy management members to keep in touch with the institutes and also helps parents to have updated information about their wards. Also a browser based product significantly reduces the licence cost and the complexity of the maintenance activity.

- **Multi User:** A multi-user solution is preferred as it minimizes duplication of effort and enhances communication speed.

A multi-user package is critical to give user based access rights to different categories of users. It is but obvious, that parents, teachers, students, companies will have an appetite for different types of information. A multi-user software can make that possible.

- **Demonstrated Product:** Using an unproved software is like having a hair-cut from an inexperienced barber. This significantly enhances the risk of failure and jeopardy.

Used software can mal-function and damage the foundation of an institute. Therefore it is important to use a product which has been already tested and implemented in comparable situations.

- **Decision Support System:** A system should provide a decision support system and not mere automation, as only through decision support system one can reap process gains and cost reduction benefits.

## VII. e-IMS Fills The Void

One of the leading educational institute automation products in the Indian market is e-IMS – An Educational Institute ERP. As the name suggests **e-IMS or e-Institute Management System** is a **Web** enabled Enterprise Resource Planning (ERP) software for educational and training institutes.

More than 20,000 hours have been devoted to the design, development, testing and implementation of e-IMS.

It is arguably the most comprehensive product in the realm of institute automation. e-IMS has been designed to meet the unique needs of Indian educational institutes. e-IMS endeavours to bring to the door step of Indian educational institutes, international quality products at affordable prices.

**GrapeVyn Technologies International Pte, Singapore (GrapeVyn)** had initially developed and implemented **GrapeVyn Education Management System (GEMS) in South East Asia and Australia.**

Subsequently, GEMS was redesigned **Kalinga Software Private Limited (KSPL), Bhubaneshwar** and

**GrapeVyn** for Indian markets and renamed e-IMS. e-IMS and GEMS together boast of a client base of more than two dozen institutes in India and South East Asia.

## VIII. Some Case Studies

There are maximum about 20 institutes in the country who have a full-fledged ERP. Kalinga Institute of Industrial Technology (KIIT), Bhubaneshwar and National School of Hotel Management (NHSM), Durgapur are among the early movers in this field. KIIT and NHSM management feel that implementation of ERP leads to:

- Easy and regular access of critical financial & other information to top management
- Reduction of time spent by staff on information processing
- Reduced effort in time table preparation
- Purchase of books based on frequency of book borrowing patterns
- Significant reduction in consumption of paper for notices, examinations and hand-outs
- Regular, fast and cost-effective communication with parents, teachers, placement corporates, marketing executives
- Institution effective performance appraisal and feedback systems
- Increased speed of result preparation and admission formalities completion
- Faster and fact based decision making

## IX. Caveats

Like any other tool, poor implementation can be often counter productive. Similarly ERP implementation needs to be done carefully, with proper planning and deliberation. Some of the identified pitfalls are instinct to develop in-

house, lack of focus on implementation and inadequate of top management involvement.

- **In-house development:** In-house development is the most dangerous thing, though unfortunately a very natural instinct, for an institute. It is like asking the professors to write the spend time on writing the books they want to use in their teaching. This distract them from the main work and both teaching and automation initiatives suffer badly. Specifically, own development leads to:
  - o Higher total cost of ownership, as the entire cost of the development will be borne by one institute.
  - o Higher risk of losses in using untested software and also the loss of the opportunity to use the collective wisdom of experts in the field on process automation.
  - o Higher chances of implementation failure, as it is very difficult to have teachers and student manage the implementation and testing efforts as they are very time consuming. Also, ERP implementation has a organizational change management

role involved in it. Insiders (unless they are top management themselves) are inherently weakly positioned to effect organizational initiatives

- **Inadequate implementation focus:** ERP is **not** a piece software. It is a way of living and managing ones activities. Therefore using ERP means doing things differently to do them better. As a result time and effort has to be invested to teach people how to operate the system effectively and to get their ownership of usage & implementation. Else the project will fall flat. Most successful ERP companies devote at least 40% of project costs to implementation activities.
- **Inadequate top management attention:** Research has shown that more than 50% of ERP implementation failure in companies can be attributed to top management not giving it adequate priority. Especially making the people perceive that the top management is keen in implementing the ERP. For this the top management has to use the ERP regularly, also reward people who use it effectively and punish effectively those who do not use the ERP regularly.

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## Orissa Information Technology Society (OITS)

S.P. Misra

In 1997, with mostly the initiative of Chitta Baral and Suchitra Patnaik, and active support of Pramod Meher, a meeting of many IT professionals as a National Conference took place in Utkal University with L M Patnaik as General Chair. A good number of members present sat on 22nd december, where it was decided that (i) we shall form a society called orissa information technology society, and (ii) that we shall have regular International Conferences every year around 21st to 24th of december for the uplift of level of IT in Orissa. S P Misra was requested there to be the President. The Society was registered in June, 1998.

The aims and objectives of the Society are to promote education and research and academic-industry interaction in IT, collaboration of IT personnel of Orissa at national and international levels, promoting usage of IT in Orissa, organizing conferences/symposia in IT area as well as raise funds from national and/or inter-national agencies/individuals for its activities. This is mainly a body of academi-cians having the target for its activities as the students and faculty in IT in Orissa.

Cit98 gave a kick start to the program of the conferences mainly with the initiative and hard work of R N Mohapatra. L M Patnaik was the general chair, and the conference was attended by forty or more participants from outside India. This function also gave a kick start to oits as an organization. There were about seventy members of oits by the end of the Conference. There are at present 196 members of oits, with one patron, about 20 donor members, and 175 life members. Instead of having different membership fees from inside India and from

outside India, there has been the strong convention that members from outside India be donor members, which members from outside have respected when intimated about this.

The funding of oits comes from membership fees, from residual money from conferences, and from donations by individuals and institutions. We started with Rs.10,000/ as membership fees, but at present have about rupees seven lakhs, most of which is kept in the form of fixed deposits. Since the activities of oits are mostly self-sustaining, and some times funded by other agencies, managing the same from the interest of fixed deposits becomes simple.

Obviously CITs (International Conferences on Information Technology) form a basis for uplifting IT in Orissa at the higher end. These have also acted as focal points for gathering of many IT professionals of Orissa, and, for them to interact with IT professionals outside Orissa and outside India. Also, in each of these conferences, tutorial classes for students were arranged, which with repeated trial and errors culminated in seven tutorials in six institutions attended by more than five hundred students during cit2002. During cit2003 it has been further extended to have three advanced tutorials within the main conference, and, two six hour and two three hour tutorials for students. These conferences thus not only reach the IT professionals, but also the students.

During 1998, 1999 and 2000, the organization of the cits had been the main focus of oits. The other activities undertaken were seminar talks by visitors off and on, as well as support of some IT programs organized by (then) Regional Engineering College, Rourkela, or, by KIIT, Bhubaneswar. From 2001 there was some

proliferation of activities, the most important among them being the IT olympiads, while the earlier activities also continued. For example, during November 2001, there was a State level conference at Utkal University, mainly aimed at young faculty and the final year students. There were three invited talks in the morning, and, about fourteen papers were presented in the afternoon. These papers were mainly by the young faculty, but in addition some four students were also encouraged to give seminar talks on their projects. This Conference was attended by more than 100 participants with about half of them being from outside Bhubaneswar. It was partly subsidized by a donation of Niranjana Tripathy, USA, through OSA.

Orissa IT Olympiads are held at two levels: junior (schools upto class XII), and, senior (colleges including BE, MCA). This was started in 2001 and is being held every year on the last Sunday of August or the first Sunday of September. Around 1200 students almost equally divided for both the levels have been taking these tests for the last three years. The spread here over the State is very wide, stretching all over Orissa - and that is very satisfying for the spread of IT awareness. During the prize distribution here to more than ten students in each category, a talk is held along with an interactive session with the students. Special prizes are given to class X students, as they can not generally compete with class XII students, and, also to B.Sc.(hons) students, who can not coompete with MCA or B.E.(comp sc) students. The parents of the prize winners in the junior level are also invited. Sudarshan Padhy of Utkal University has been coordinating this program, and the credit for the success of the same mainly goes to him. The names of the prize winners is given in the oits web-site to induce youngsters to do some web browsing.

Another important activity of oits is looking at the need for quality improvements of IT

teachers of Orissa. L N Bhuyan, USA, gave a course of five two hour lectures on parallel architecture in August 2002 for a week, where also some experts from BARC, Mumbai took tutorials in the afternoons and delivered two lectures, one of them being on Anupam computer designed at BARC. Special lectures are also taken with oits as a nodal agency, which helps the teachers. Sanyal of TIFR, Mumbai gave a series of lectures on Network security at KIIT, and D Misra of NJIT, USA gave lectures on VLSI circuits at KIIT and NIST. But we believe that this effort was rather localized and should really get a boost.

There was a verbal request by many members from Berhampur in early 2000 that we may open a chapter of oits there. With this in mind, it was then decided in an executive committee meeting of oits that it will help in decentralizing activities of oits and properly utilize the local enthusiasm for uplift of IT in Orissa. Appropriate rules were formed in the executive committee as an additional article (article 6) in the bylaws. However the members there had not taken further steps for this purpose. Recently in October however some members from Sambalpur formally requested that a Chapter of oits may be opened there. The executive committee in beginning of November decided that as per rules this chapter may be opened. Appropriate steps were taken, and the Chapter opened with a meeting on November 29<sup>th</sup> where Vice-Chancellor, Sambalpur University, Principal Gangadhar Meher College and President oits were present. Arun Pujari of Hyderabad University was the Chief Speaker, and gave a semi-technical lecture on Artificial Intelligence (besides having given a technical lecture to the students earlier). The Secretary, Sambalpur Chapter, B Patel first talked about cit2003 programs there, and then about plans to have a course of lectures in the beginning of

January, 2004 on parallel algorithms, with Sudarshan Padhy as the nodal faculty. They also plan to have a talk on biometrics by M C Dash, Vice-Chancellor, and a well-known scholar of life sciences at the National level with the field of research being biometrics.

Members of oits had often wanted that we may start a semi-technical Journal by oits.

A corresponding decision was taken by the executive committee to start OITS-Bulletin as a yearly magazine. President, oits sent the announcement for this in September, and a request for articles in October. It was however the serious efforts of the executive editor J R Hota to further look for articles which has given this a concrete shape.

Oits, though registered in Orissa, has de facto a global existence, with focus of all its members to work together for raising the level of IT in Orissa. As a voluntary Society, it has done commendable work, but more needs to be done. Let us examine some of these below:

The school program of oits needs to be augmented. The State government and some other organizations and individuals are working to this end, and we need to coordinate with them. When I gave a computer to my village school, the enthusiasm of a class IV student for using it was quite refreshing. Particularly Indian language fonts can be used there to make things more attractive for the students and others. Many other people have done much more than that. The department of mass education has taken up the job with supply of computers for about 270 schools. OCAC is also to take up 400 schools for this purpose. Oits (and possibly some others) may act as catalytic agents in these attempts.

The sector where oits should be most useful is that of arranging short courses for computer teachers. This should be done in collaboration with the University and the Government

depending on the type of Institutions. The relatively well established engineering colleges can play a leading role to make use of oits as well supplement the same.

Oits activities may be more decentralized. For example, we should definitely have oits chapters in Berhampur and Rourkela, if not at other places also. This will make some members think of activities rather than elections, and since these will be at a local level, they can be more easily organized. Of course, for relatively big events, oits as such shall be behind them.

Oits is expected to play an important role in improving IT know-how as well as IT usage in Orissa. For example we talk every now then about e-governance and use of computers in decision making processes. It is desirable that we tell others through example. In fact we may demonstrate how IT helps to decrease the divide between rich and poor, it being the cheapest means of communications as well as of acquiring knowledge. I have just now received a CD which claims to contain 250 books for Rs.200/-.

This is a very brief account of some of the activities of oits, as well as a rough road map for further action, but obviously we have miles to go before we can look back with any satisfaction. We should promise to ourselves that together we shall achieve - and make Orissa achieve, the much desired (and hyped) IT revolution.

A general picture of oits and its activities may be found in the web-site [www.oits.org](http://www.oits.org).

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**About the author :** He is basically a physicist. Five researchers working with him have won the prestigious Alexander von Humboldt fellowship. His book, 'Introduction to Supersymmetry and Supergravity' was a best seller for more than five years in amazon.com and has been recommended by Prof Witten of Institute of Advanced Studies, Princeton to his researchers. Now engaged in organization of OITS.

## ଓଡ଼ିଶା ସୂଚନା ପ୍ରଯୁକ୍ତିବିଦ୍ୟାର ପ୍ରମୁଖ ସାରଥୀ

ଜ୍ୟୋତି ରଞ୍ଜନ ହୋତା,

ଓଡ଼ିଶା କଂପ୍ୟୁଟର ପ୍ରୟୋଗ କେନ୍ଦ୍ର, ଭୁବନେଶ୍ୱର

ସେ ଦିନଟି ଥିଲା ମାର୍ଚ୍ଚ ୭ ତାରିଖର ସେହି ନିଷ୍ଠୁର ସକାଳ ଯେଉଁଦିନ କି ଓକାକ୍‌ର ଡ୍ରାଇଭର ବିଜୟ ଶୂନ୍ୟ ଆତ୍ମାସାତର ଗାଡ଼ିଟି ଧରି ରେଲଓ୍ଵେ ଷ୍ଟେସନ୍‌ରୁ ଫେରି ଆସିଥିଲେ । ତଥାପି ସମସ୍ତେ ଆଶାବାଦୀ ଥିଲେ, ସାର୍ ବୋଧହୁଏ ଫ୍ଲାଇଟ୍ ଟିକେଟ୍ ବାଡିଲ୍ କଲେ । କାରଣ ଏହିପରି ଦେବତୁଲ୍ୟ ଏବଂ ପ୍ରଶସ୍ତମନା ମଣିଷଟି ପ୍ରତି ଯେ କାଳ ଏପରି ନିର୍ଦ୍ଦୟ ହେବ, ଏହା ସମସ୍ତଙ୍କର କଳ୍ପନାର ବାହାରେ ଥିଲା । ପରେ ପରେ ନୌକା ଦୁର୍ଘଟଣାରେ ତାଙ୍କର ମୃତ୍ୟୁ ହୋଇଛି ବୋଲି ଜାଣିବା ପରେ ଓକାକ୍‌ରେ ଶୋକର ଛାୟା ଖେଳି ଯାଇଥିଲା । ନିଜ ରକ୍ତକୁ ପାଣି ଫଟାଇ ଓକାକ୍ ପାଇଁ କାର୍ଯ୍ୟକରୁଥିବା ସାର୍‌ଙ୍କର ବିଶ୍ୱସ୍ତ କର୍ମଚାରୀମାନଙ୍କର ବୁକୁଫଟା କ୍ରନ୍ଦନରେ ଅଫିସର ପରିବେଶ ଏକ ଶୁଷ୍କ ବୃକ୍ଷ ସଦୃଶ୍ୟ ମନେ ହେଉଥିଲା । ଏହି ଦୁଃଖଦ ଘଟଣା ଘଟିଥିଲା ଥାଇଲାଣ୍ଡର ରାଜଧାନୀ ବ୍ୟାଙ୍କକ୍ରାଠୁ ୧୪୭ କି.ମି. ଦୂରବର୍ତ୍ତୀ ଏକ ସ୍ଥାନରେ ଯାହାକି ପଟାୟ ନାମରେ ସାରା ପୃଥିବୀରେ ଏକ ପର୍ଯ୍ୟଟନ ବେଳାଭୂମି ଭାବରେ ପରିଚିତ । ଏହା ହେଉଛି ସେହି ବେଳାଭୂମି, ଯେଉଁଠିକି ସାରା ପୃଥିବୀରୁ ପର୍ଯ୍ୟଟକମାନେ ଆକୃଷ୍ଟ ହୋଇ ଆସିଥାଆନ୍ତି । ଏହି ବେଳାଭୂମିର ଦୈର୍ଘ୍ୟ ପ୍ରାୟତଃ ୪କି.ମି. ହେବ । ପଟାୟାର ଦ୍ୱୀପପୁଞ୍ଜକୁ ଭ୍ରମଣ କରିବାପାଇଁ ସାଧାରଣତଃ ପର୍ଯ୍ୟଟକମାନେ ବୋଟ୍‌ର ସାହାଯ୍ୟ ନେଇଥାଆନ୍ତି । ପଟାୟାର ଦ୍ୱୀପପୁଞ୍ଜରୁ ପ୍ରତ୍ୟାବର୍ତ୍ତନ କରିବା ସମୟରେ ମାର୍ଚ୍ଚ ୪ ତାରିଖ ଦିନ

୪.୩୦ ମିନିଟ୍‌ରେ ବୋଟ୍‌ଟି ଡୁବି ଯାଇଥିଲା । ଯାହାର ଫଳସ୍ୱରୂପ ଏକ ବହୁମୂଲ୍ୟ ଜୀବନର ଅବସାନ ଘଟିଲା ଏବଂ ଦୁଇଜଣ କାନଡ଼ାର ନାଗରିକ ଆହତ ହୋଇଥିଲେ । ଏପରିକି ଥାଇଲାଣ୍ଡର ଜଣେ ଲେଫ୍‌ଟନାଣ୍ଟ୍ ଜେନେରାଲ ମଧ୍ୟ ଆହତ ହୋଇଥିଲେ । ଭାଗ୍ୟର ବିଡ଼ମ୍ବନା ବଡ଼ ବିଚିତ୍ର । କଥାରେ ଅଛି-

“ଦଇବ ଦଉଡ଼ି ମଣିଷ ଗାଇ,  
 ଯେଣିକି ଟାଣାଇ, ସେଣିକି ଯାଇ ।”

ଆମର ପ୍ରିୟ ପୂଜାରୀ ସାର୍ ଏକମାତ୍ର ବ୍ୟକ୍ତି ଯିଏକି ଏହି ନୌକା ଦୁର୍ଘଟଣାରେ ପ୍ରାଣ ହରାଇଥିଲେ । ପଟାୟ ପ୍ରେସ୍‌ର ତଥ୍ୟ ଅନୁଯାୟୀ ବୋଟ୍‌ଟି ଲାଣ୍ଡ୍ ଦ୍ୱୀପରୁ ଫେରୁ ଥିଲା । ମେଟାର୍ ନାମ୍‌ଚୋକ୍ (Metar Namchok) ନାମକ ଏହି ଦୁଇ ମହଲା ବିଶିଷ୍ଟ ଡେକ୍‌ର ତଳ ମହଲାରେ ଏକ ଛିଦ୍ର ହୋଇଯାଇଥିଲା ଏବଂ ପାଣି ପଶିବା ଆରମ୍ଭ ହୋଇଯାଇଥିଲା । ଏହା ପର୍ଯ୍ୟଟକମାନଙ୍କ ମନରେ ଭୟ ସଞ୍ଚାର କରିଥିଲା । ଅନେକ ପର୍ଯ୍ୟଟକ ବୋଟର ଉପର ମହଲାକୁ ଉଠି ଯାଇଥିଲେ । ବୋଟର ତଳ ମହଲା ବା ଡେକ୍‌ଟି ବୁଡ଼ିବା ପାଇଁ ହାରାହାରି ୩୦ ମିନିଟ୍ ସମୟ ଲାଗିଥିଲା । ପରେ ପରେ ଉପର ମହଲାରେ ଥିବା ପର୍ଯ୍ୟଟକମାନଙ୍କ ଓଜନରେ ବୋଟ୍‌ଟି ତତ୍କ୍ଷଣାତ୍ ଡୁବି ଯାଇଥିବା ବିଷୟ ବୋଟ୍‌ରେ ଥିବା କିଛି ଦର୍ଶକ ଥାଇଲାଣ୍ଡ୍ ପୋଲିସ୍ ଆଗରେ ବର୍ଣ୍ଣନା କରିଥିଲେ । ବୟ୍ (Boy) ଏବଂ ଏଇ (Ae) ନାମକ ଦୁଇଜଣ ଯୁବକ ଏହି ବୋଟ୍‌ର କ୍ୟାପଟେନ୍

ଥିଲେ । ଯଦିଓ ଏହି ଦୁଇ କମ୍ପ୍ୟୁଟେନ୍ ପ- ଯୋଗେ ପାଣି କାଢ଼ିବାକୁ ଚେଷ୍ଟା କରିଥିଲେ, ଯାହାକି ତୃଟି ଯୋଗୁଁ ଏହି ଚେଷ୍ଟା ବିଫଳ ହୋଇଥିଲା । ଏହି ଭୀରୁ କମ୍ପ୍ୟୁଟେନ୍ ଦ୍ଵୟ ପର୍ଯ୍ୟଟକମାନଙ୍କୁ ସାହାଯ୍ୟ କରିବା ବଦଳରେ ସେଠାରୁ ପଳାୟନ କରିଥିଲେ । ସେମାନଙ୍କର ଏହି ଅବହେଳା ଯୋଗୁଁ ଜଣେ ପ୍ରତିଭାବାନ୍ ବ୍ୟକ୍ତିଙ୍କର ପ୍ରାଣହାନୀ ଘଟିଲା ।

ଡକ୍ଟର ପୂଜାରୀ ୧୯୯୭ ମସିହାରୁ ଓକାକ୍ ମୁଖ୍ୟ ନିର୍ବାହୀ ଭାବରେ କାର୍ଯ୍ୟରତ ଥିଲେ । ସେ ୧୯୪୮ ମସିହା ଜୁନ୍ ୧୯ ତାରିଖରେ ବଲାଙ୍ଗୀର ଜିଲ୍ଲାର ଇଚ୍ଛାପୁର ଗ୍ରାମରେ ଜନ୍ମଗ୍ରହଣ କରିଥିଲେ । IIS, Bangaloreରୁ Electronics ଏବଂ Communication Engineeringରେ ଡିଗ୍ରୀ ଏବଂ IIT, Mumbaiରୁ କମ୍ପ୍ୟୁଟର ଇଞ୍ଜିନିୟରିଂରେ ପି.ଏଚ୍.ଡି ହାସଲ କରିଥିଲେ । କୃତ୍ରିମ ପ୍ରଜ୍ଞା ବା Artificial Intelligence ପ୍ରତି ତାଙ୍କର ଅବଦାନ ଥିଲା ଅତୁଳନୀୟ । ସେ ଓକାକ୍ ମୁଖ୍ୟ ହେବା ପୂର୍ବରୁ ବହୁ ଗୁରୁ ଦାୟିତ୍ଵ ବହନ କରିଥିଲେ । ତାଙ୍କର ଚାକିରୀ ଜୀବନ Electronics Corporation of India Limited (ECIL)ରୁ ଆରମ୍ଭ ହୋଇଥିଲା । ସେଠାରେ ସେ କେବଳ ଦେଶୀୟ କାରିଗରୀ କୌଶଳ ପ୍ରୟୋଗ କରି କମ୍ପ୍ୟୁଟର ସିଷ୍ଟମ୍ ଡିଜାଇନ୍ ଏବଂ ପ୍ରୟୋଗ ଆରମ୍ଭ କରିଥିଲେ । ତାପରେ ସେ କେରଳ ବିଶ୍ଵବିଦ୍ୟାଳୟର ଡିନ୍ ଭାବରେ କାର୍ଯ୍ୟ ତୁଲାଇଥିଲେ । ସେ ଓକାକ୍ କୁ କିଛିଦିନ ଜେନେରାଲ୍ ମ୍ୟାନେଜର୍ (ଟେକ୍ନିକାଲ୍) ଭାବରେ ଆସି, କେରଳ ପ୍ରତ୍ୟାବର୍ତ୍ତନ କରିଥିଲେ । ଏବଂ ଶେଷରେ ୧୯୯୭ରେ ପୁନର୍ବାର ଓକାକ୍ ଆସି ମୁଖ୍ୟ ନିର୍ବାହୀ ଭାବରେ ଯୋଗଦାନ କରିଥିଲେ । ସେ କମ୍ପ୍ୟୁଟର ସୋସାଇଟି ଅଫ୍ ଇଣ୍ଡିଆର ଜଣେ ପୁରୁଖା ସଦସ୍ୟ

ଭାବରେ ସର୍ବତ୍ର ପରିଚିତ । ବନ୍ୟାର ପୂର୍ବାନୁମାନ ପାଇଁ ଭି.ଏନ୍. ନିଲକଣ୍ଠନଙ୍କ ସହ ମିଶି Knowledge Based System ଉପରେ ପେପର୍ଟିଏ କମ୍ପ୍ୟୁଟର ସୋସାଇଟି ଅଫ୍ ଇଣ୍ଡିଆରେ ପ୍ରକାଶ କରିଥିଲେ । ତାଙ୍କର ମୃତ୍ୟୁ ପୂର୍ବରୁ ସେ Asian Institute of Technology, Bangkokରେ development of e-Governance ଉପରେ Paperଟିଏ Present କରିଥିଲେ । କଳାହାଣ୍ଡିର ସବ୍ କଲେକ୍ଟର ଏବଂ କଲେକ୍ଟୋରେଟ୍ ଅଫିସର ଅଫିସରମାନଙ୍କ ସହିତ ଓକାକ୍ OSD ଏବଂ ଅନ୍ୟ ଜଣେ କର୍ମଚାରୀଙ୍କ ସହ ଆନ୍ଧ୍ରରେ e-Governanceର ପ୍ରୟୋଗ ବିଷୟରେ ଅବଗତ ହୋଇ ଏହାର ସମୀକ୍ଷା କରିବା ପାଇଁ ହାଇଦ୍ରାବାଦ ଯାଇଥିଲେ । ସେଠାରୁ ଫେରିବା ପରେ e-Governanceର କର୍ମଶାଳାରେ ଯୋଗଦେବା ପାଇଁ ମୁଁ ସାର୍ଙ୍କ ସହିତ ଭବାନୀପାଟଣା ଯାତ୍ରା କରିଥିଲି । ସେଠାରେ ପୂଜାରୀ ସାର୍ କଳାହାଣ୍ଡିର ସରକାରୀ ଅଫିସରମାନଙ୍କୁ e-Governanceର ଉପକାରିତା ବିଷୟରେ ପ୍ରାଞ୍ଜଳ ଭାବରେ ବୁଝାଇ ଦେଇଥିଲେ । ତାଙ୍କ ମୃତ୍ୟୁରେ ମୁଁ ମୁଖ୍ୟତା ହୋଇ Regional Conference on Digital GMSର Chair ତଥା AIT, Bangkokର Associate Professor Dr. Peter Haddawy ତାଙ୍କ ଶୋକବାର୍ତ୍ତାରେ ଲେଖିଥିଲେ-

“Dear Mr. Hota, I am terribly saddened and shocked at the news of Dr. Pujari’s untimely and tragic death. I feel terrible that Dr. Pujari’s death occurred in the context of his visit here. I only knew Dr. Pujari through his participation in the conference, but in

that short time he struck me as a very engaged intellectual and an extremely pleasant person. I am sure he will be deeply missed by his colleagues, friends and family. Please accept my sincere condolence.”

ତାଙ୍କର ଅଗାଧ ଜ୍ଞାନ, ତୀକ୍ଷ୍ଣ ବୁଦ୍ଧି, ନିସ୍ଵପଚ ବ୍ୟକ୍ତିତ୍ଵ, ନୀରଳସ ଜୀବନଦର୍ଶନ ତଥା କର୍ମଚାରୀମାନଙ୍କ ପ୍ରତି ଅମାପ ଶ୍ରଦ୍ଧା ପାଇଁ ସେ ସଦାସର୍ବଦା ସ୍ମରଣୀୟ ହୋଇ ରହିବେ । ଏହି କର୍ତ୍ତବ୍ୟନିଷ୍ଠ ବ୍ୟକ୍ତି “IT Man of Orissa” ଭାବରେ ସର୍ବତ୍ର ପରିଚିତ ଅଟନ୍ତି ।

ତାଙ୍କର ଆକର୍ଷକ ମୃତ୍ୟୁ ଓକାକ୍ ତଥା କଂପ୍ୟୁଟର ପ୍ରେମୀ ଓଡ଼ିଶାବାସୀଙ୍କ ପାଇଁ ଏକ ଦାରୁଣ ଆଘାତ କହିଲେ ଅତ୍ୟୁକ୍ତି ହେବନାହିଁ । ସେ ଓକାକ୍ରେ Technology Development in Indian Language (TDIL), Computerisation of STA, Photo I-Card Project, Health Care Project ଏବଂ କଳାହାଣ୍ଡି ପରି ଅନୁନ୍ନତ ଜିଲ୍ଲାର ସାଧାରଣ ନାଗରିକମାନଙ୍କ ଉଦ୍ଦେଶ୍ୟରେ e-Governanceର କରିଆରେ ସେବା ପ୍ରଦାନ ପାଇଁ

କଠିନ ପରିଶ୍ରମ କରିଥିଲେ । ତେଣୁ ମୁଖ୍ୟମନ୍ତ୍ରୀ ଏପରି ଜଣେ ମହାନ ବ୍ୟକ୍ତିଙ୍କର ସମସ୍ତ ପ୍ରାପ୍ୟ ଠିକ୍ ସମୟରେ ତାଙ୍କ ପରିବାରବର୍ଗଙ୍କୁ ପ୍ରଦାନ କଲେ ତାଙ୍କର ଆତ୍ମା ଶାନ୍ତି ପାଇବ । କଂପ୍ୟୁଟର ବିଦ୍ୟା ଏହି ମହାନ ବ୍ୟକ୍ତିଙ୍କର ରକ୍ତରେ ପ୍ରବାହିତ ହେଉଥିଲା । ତାଙ୍କର ପାର୍ଥିବ ଶରୀର ମାଟିରେ ମିଶିଯାଇଛି ସତ, ମାତ୍ର କଂପ୍ୟୁଟର ଶିଳ୍ପ ପ୍ରତି ତାଙ୍କର ତ୍ୟାଗ ସଦାସର୍ବଦା ତାଙ୍କୁ ତିର ସ୍ମରଣୀୟ କରି ରଖିଥିବ । ଏହି ଅବସରରେ ମୋର ଗୋପବନ୍ଧୁ ଦାସଙ୍କର ଏକ କବିତାଂଶ ମନେ ପଡ଼ିଯାଉଛି, ତାହାହେଲା-

ମାନବ ଜୀବନ ନୁହଁଇ କେବଳ  
ବର୍ଷ, ମାସ, ଦିନ, ଦଣ୍ଡ  
କର୍ମେ ଜୀବି ନର, କର୍ମ ଏକ ତାର,  
ଜୀବନର ମାନଦଣ୍ଡ ।

ମନୁଷ୍ୟ ଦେଶ ତଥା ଜାତିପ୍ରତି କରିଥିବା କର୍ତ୍ତବ୍ୟ ପାଇଁ ହିଁ ତିରସ୍ମରଣୀୟ ହୋଇ ରହିଥାଏ । ସେ କେତେବର୍ଷ ବଞ୍ଚିଲା ତାର କିଛି ମାନେ ନଥାଏ, ଯଦି ତାର ଦେଶମାତୃକା ପ୍ରତି କିଛି ଅବଦାନ ନଥାଏ । ଆସନ୍ତୁ, ଆଜି ଆମେ ତାଙ୍କର ଆଦର୍ଶରେ ଅନୁପ୍ରାଣିତ ହୋଇ ଆମ ରାଜ୍ୟର କଂପ୍ୟୁଟର ଶିଳ୍ପକୁ କର୍ଣ୍ଣାଟକ ଏବଂ ଆନ୍ଧ୍ର ଠାରୁ ମଧ୍ୟ ଅଧିକ କରି ଗଢ଼ି ତୋଳିବା । ତାହାହିଁ ହେବ ତାଙ୍କ ପ୍ରତି ଉପଯୁକ୍ତ ଶ୍ରଦ୍ଧାଞ୍ଜଳି ।