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A comparative study of ERP implementation

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ABSTRACT
The advent of ERP Systems, marked a new beginning in the Information Systems arena. It has brought about in reality the much sought after idea of providing competitive edge to organizations with the help of Information Systems. Though worldwide, several companies have extended their ERP systems to cover the entire supply chain, most of the Indian companies are still lagging behind. The research work carried out, was a Case Study based research work where a comparison and analysis of 10 cases was carried out in such organizations where ERP has been implemented. The basic objective of the study was to compare ERP implementation projects of ten successful companies and find critical issues related to various Pre-implementation, Implementation and Post implementation phases. The role of Information Systems in effective management of organizations has been since a long time. From merely crunching numbers, to helping taking strategic decisions, Information Systems have come a long way today. Enterprise Resource Planning (ERP) system, a term coined by Gartner Research firm in the beginning of 1990s, was one such IS application that marked the beginning of a new age of enterprise wide computing.

Introduction

The evolution of ERP took place slowly and gradually from the 1960s. In the 1960s, very few companies could afford to own a computer. Therefore, both manufacturing and inventories were handled on the basis that companies must hold enough stocks to satisfy customer demand, and that customers would order what they had ordered in the past.

In the 1970s and 1980s, when computers became small and affordable, attention was focused on Material Requirements Planning (MRP) and Master Production Schedule (MPS). MRP started as a system for planning raw material requirements based on the MPS. Soon it developed into Manufacturing Requirements Planning (MRP II), which used the MRP system as the basis and added scheduling and capacity planning activities. In the early 1990s MRPII was further extended into Enterprise Resource Planning (ERP), incorporating all the MRPII functionality, in addition to Finance, Supply Chain, Human Resources and Project Management functionality.

What is ERP

Enterprise Resource Planning (ERP) system is a business management system that comprises integrated sets of comprehensive software, which can be used, when successfully implemented, to manage and integrate all the business functions within an organization.

Benefits of ERP

The benefits of implementing an ERP are many fold. In general, these systems help companies replace old and fragmented legacy systems, integrate data and applications, provide greater access to information, adopt best practices in organizational processes, link employees, partners and customers, improve on time delivery, reduce working capital, lower inventory level and lead to better resource management. In the manufacturing sector, ERP implementation has reduced inventories anywhere from 15 to 35 percent (Gupta, 2000).

The Pitfalls of ERP

Although ERP systems have certain advantages, they have some disadvantages also due to the tight integration of application modules and data, huge storage needs, networking requirements and training overheads. ERP projects are large, costly and difficult and they require large investment in capital and staff and management time. Implementation of an ERP project is painful, and customization is costly and time-consuming.

Research Objectives

The major objectives of the present study were ‘to identify the major issues involved in the ERP implementation phases and compare these in around ten different organizations.

The study has been carried out with a view to find answers to the following specific questions that had emerged in this area:-

1. What are the major issues in ERP implementation project’s Pre implementation phase and compare these amongst the ten selected companies.
2. What are the major issues in ERP implementation project’s Implementation phase and compare these amongst the ten selected companies.
3. What are the major issues in ERP implementation project’s Post Implementation phase and compare these amongst ten selected companies.
4. What are the possible ERP extensions and compare how companies are implementing these extensions by analyzing the ten selected companies.

Research design

The effort of this study was essentially a non-experimental Case Study research.

Selection of case for study

As per the research objective, the present study involves studying ERP implementation project of any ten organizations.

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The criteria on the basis of which the organizations were selected are as follows:

1. Those organizations which have implemented an ERP from SAP.
2. Those organizations which have had a successful ERP implementation.
3. Those organizations which have implemented ERP at least 3-6 months prior to this study (in order to analyze the benefits of ERP implementation and do other post implementation analysis), and,
4. Those organizations which are present in and around Indore, Bhopal.

Research Tools

The Schedule of interview and the Questionnaire for interaction with the ERP project Champions and/or IT heads of the selected Organizations was prepared after an extensive review of literature on ERP and its related issues.

The Questionnaire, though common to all, had specific questions for various issues related to ERP implementation.

Case 1: Godrej Hershey Foods & Beverages Limited (GHFBL)

The Hershey Company, North America's leading chocolate and confectionery manufacturer, and Godrej Beverages and Foods Ltd., one of India's largest confectionery and food company and an associate of Godrej Industries Limited, came together to manufacture and distribute confectionery, snacks and beverages across India in April 2007. This joint venture was named as Godrej Hershey Foods and Beverages Ltd.

ERP at GHFBL

Since 1995-96 Godrej Foods and beverages Ltd was using MFG PRO at plant level and Head Office. After the JV with Hershey, in 2007, the new born entity Godrej Hershey Foods and Beverages Ltd , in a pursuit to seamlessly integrate across national boundaries, decided to revamp the IS system. Hershey which operated on SAP worldwide, decided to implement SAP in the company in order to provide uniformity worldwide. This was the main reason for abandoning MFG/PRO and implementing SAP. There was also a need to provide connectivity to C&F agents and distributors, which was not present earlier.

In case of GHFBL, both, the pre-evaluation screening and the package evaluation stages were skipped because the package, that is, SAP was chosen directly, as it was already present in Hershey. The implementation partner chosen for the project was Siemens India.

GHFBL decided to go for a big-bang SAP implementation which would take shorter implementation time and would not need maintenance and revision of legacy software.

In case of GHFBL, a blue print of processes was prepared by Siemens on the basis of the as is process defined by the company people. These were mapped with the SAP processes. Five modules: MM, PP, SD, FI/Co and PM were selected for implementation. New Hardware and network were installed on a large scale. Around 20 C&F Agents and around 400 Distributors were connected through VSAT and the no of user licenses purchased was around 1500.

Selected Team Leaders were first provided training in different functional modules, by some employees from Siemens. These team leaders further provided end user training at different sites for their respective modules. Test cases were made for system overloads, users entering invalid data, etc and testing was carried out.

In September 2008, when MFG/Pro was stopped, the closing stock, assets, liabilities etc were filled up in various templates and sent to the Head Office to be fed in the SAP system. On 4th September 2008, SAP went live in all the three plants, Bhopal, Chittoor, Nalagad and Head Office Mumbai along with the C&F Agents and distributors in a Big Bang manner. The SAP implementation project at GHFBL was thus completed in 6 months, costing around 9 Crore.

Case 2: EICHER TRACTORS

Eicher Motors Limited disinvested the businesses of Tractors & Engines to TAFE Motors and Tractors Limited (TMTL) in June 30, 2005. Tractors and Farm Equipment Limited (TAFE) is a part of the Chennai based Amalgamations group , a US$ 1 Billion light engineering group with diverse interests in Tractors and their aggregates, Diesel Engine, Automobile Components, Engineering Tools, Paints, Plantations etc. TAFE produces tractors in the 25 to 90 HP range in a variety of models.

ERP Project at Eicher Tractors:

Prior to ERP, Eicher Tractors had several home grown solutions based on Oracle in various departments such as Materials, Finance etc. These were not integrated with each other. Due to less data transparency and fragmented data, there were inefficiencies arising. There was a need to put into place a more robust system that would handle all this data inconsistency.

The Eicher Tractor plant at Faridabad and Bhopal had quite similar products and there was a need to integrate these plants also so as to have more coordination and data transparency.

The other reason for implementing an ERP was the need to link to the suppliers as well as customers for increasing organizational productivity and profits. This wasn't possible until and unless a unified view of the business was available to one and all. This led to the top management decision to implement an ERP system. The impending Y2K problem was another reason seen for making changes to the IT infrastructure.

In 1997 the ERP selection process at Eicher Tractors, began with the selection of IBM as the implementation partner. RFP was created by the project team which was matched with the product offerings of several ERP players such as MFG PRO, BAAN and SAP. The main points considered to evaluate and compare the various packages with each other were things such as volume of data to be handled, ease of use, the product flexibility, name and experience in the automotive sector. On the basis of these criteria, the company selected SAP Enterprise 3.0 as the right solution. The company chose 6 modules of SAP 3.0, FI, MM, PP, QM, CO and SD for implementation. Eicher selected the Chennai office, where Enfield Bullet was being manufactured, as the Pilot Site because of its much smaller size compared to other sites as well as the presence of Skill Sets at Chennai site.

At Eicher Tractors the modules were configured at the pilot site, that is the Chennai office and the change management process was devised, with 95% of the structure being retained and only 5% of customization done to the SAP software.

Eicher picked up domain experts from different fields and different sites and trained them at the Chennai office. For example the VP Manufacturing at Bhopal was the domain expert in MM module and was trained for this module so that he would be the project champion and guide for the MM module at the three plants of Bhopal, Faridabad and Alwar. Similarly a designated Manager from Parwanoo was the Trained Domain

expert for PP module and a designated manager from Pithampur, Indore was to be trained as the domain expert for SD module. These domain experts then provide training to selected managers at each site and thus the user training was done in a very systematic manner.

The first rollout of SAP 3.0 was done in Chennai plant in December 1998, whereas the rest sites implemented the software almost in a Big Bang strategy, with Faridabad going live in April 1999, Alwar going live in May 1999 and Bhopal going live in June 1999. The complete process of ERP selection and implementation thus took around 15 months which was justifiable, since it involved purchase and training of around 500+ user licenses. According to the project estimates, the ERP project was implemented before time and it quite complied to the budget as well.

The ERP data helps in providing BI capability as well; though SAP has inbuilt BI facility some amount of off SAP BI is also performed by Eicher Managers. Eicher Tractors is further considering implementing several other applications such as Data warehouse, Advanced planning and scheduling system, supply chain management software based on this ERP data.

Case 3: Lupin Limited

Lupin Limited, headquartered in Mumbai, India has successfully positioned itself as a Transnational Pharmaceutical Company, with a wide global footprint. The Company develops and markets a wide range of quality, affordable generic and branded formulations and APIs in multiple markets across the world.

The ERP Project at Lupin

Prior to the advent of ERP in Lupin there were various applications running in its operations spanning across five plants and 30 depots. Due to this, they were facing a problem of lack of connectivity within the contact points. They were not working online and it used to take almost ten days to get the month end sales figure collated, compiled and presented to the marketing head.

The first ERP system selected had the localised versions, wherein, every location kept on verifying it as per its own requirements. However, this ERP project faled due to the lack of a centralised cohesive strategy. To acquire a centralised control, in 2001-02, the company decided to go for a bigger and better ERP.

Package selection

The two options available to Lupin were, first of all an in house ERP developed by its team of IT specialists, and secondly, buying a off the shelf ERP product from a well known company. The first option was problematic since in-house customized ERPs do not adhere to best practices and involve constant tweaking headaches. Therefore Lupin went with the second option. After studying various products available in the market, Lupin opted for SAP's ERP solution based on the following parameters

1. Technical support offered by them and
2. The degree of customisation that can be achieved in terms of complying with the taxation requirements and accounting standards to suit Indian conditions.

The implementation partner was PWC which is now known as IBM, which was selected on the basis of its experience and past successful ERP implementation projects. After zeroing in on the product to be chosen, the next step was to create a RFP document. The discussions and debates held between the heads of all functions led to the preparation of a document of current processes. This was followed by preparation of a blue print document to map these in SAP. Approval from the core team led to configuring the system, where each of the processes was tested independently.

Lupin implemented 8 modules of SAP : Payroll, SD, MM, PM, QM, FI-CO, PP and HR. The initial investment was of thee order of Rs 15 crore, which included aspects like upgradation of network, hardware installations and cost of implementation.

Before the SAP ERP (version 4.6c) roll out, all disjoined systems and locations were brought online in terms of connectivity. Lupin selected the big bang approach for the implementation, where the legacies were cut off and all the functions were moved on the ERP system from day one.

SAP was implemented across six factories and 30 depots, in a record time of seven months and twenty five days. Under the big bang approach, all modules of SAP were flagged off across multiple locations at precisely the same time. The system went live on 1st April 2003. A formal notice was issued to all users to stop the entry of any new information into the legacy system as on April 1st. No new events were allowed to be recorded into the legacy system, and it was just maintained as a historical archive for future reference.

Case 4: Tata International

Established in 1962, Tata International is an international marketing company with a global turnover of US$ 850 million in 2006-07. It is a trading company with business lines that include leather, engineering and pharmaceutical products. Tata International is a member of the Tata Group - India's best known industrial group, with an estimated turnover of US $ 28.8 billion (equivalent to 3.2 % of India's GDP). Besides its trading house profile the company has stakes in mines, a five star hotel, distributorships, trailer and railway wagon manufacturers and IT ventures; it has customer support facilities for Tata vehicles, design studios for leather, and warehouses dotted across the world.

ERP at Tata International

In Case of Tata International there were a number of legacy systems already in place in 17 locations including Sales, purchase and manufacturing. The most important reason for implementing an ERP was to integrate these 17 locations and provide a unified vision to the management.

In case of Tata International, Tata Technologies did the formal evaluation for about 2 months. But, the package studied and evaluated was only SAP. This was because of SAP's reputation and its past track record of successful ERP implementations.

The company's IT team evaluated SAP. The search for validation was done by Tata technologies and IBM, the implementation partner for SAP implementation.

In Tata International, the implementation Strategy used was Big Bang. Because of this the implementation time was approximately 11 months from August 2005 to July 2006.

There were 6 modules implemented in Tata International: Material Management (MM), Production Planning (PP), Sales and distribution (SD), Finance and Control (FICO), Quality Management (QM) and Business Warehouse (BW), where BW is the inbuilt data warehouse provided by SAP 5.0.

At Tata international, the ERP project was handled extremely successfully. It was completely on time implementation and the Compliance with estimated budget was also more than 90%. This was a result of effective project management and user training and support. The critical success

factors for the successful SAP implementation were Top management support, effective project management and proper training and education of end user.

Case 5: Dainik Bhaskar

Bhaskar Group is a leading news services group in India with a strong presence in the Media Industry, Entertainment, Printing, Textiles, Fast Moving Consumer Goods, Oils, Solvents and Internet Services. Its Media business includes ownership of Print Media, Radio Stations and TV channels. Dainik Bhaskar (Hindi: दैनिक भास्कर) is a Hindi-language daily newspaper of India. It was started in year 1958 from Bhopal, the capital city of Madhya Pradesh. Its current editor is Ramesh Chandra Agrawal.

ERP at Dainik Bhaskar

In Dainik Bhaskar, before 2001 there were all Foxpro based applications. In 2001 Dainik Bhaskar implemented SAP 4.0 Sales and Distribution module with the help of Sapphire Infotech, a Delhi based company. From 2001 till 2007, Dainik Bhaskar used the Sap SD module along with other applications such as Tally for Finance.

It was in 2007 that the need to integrate all the functional departments and all the 46 centres, and provide a common platform was felt and thus the idea of implementing a complete ERP package came into the picture.

On the basis of vendor experience and maturity of products, two names were finalized: Oracle and SAP. After conducting a deep analysis followed by presentations made by the two companies, SAP was chosen for its more appropriateness according to the media industry and the SAP ECC 6.0 version was selected for implementation.

The initial implementation partner, Sapphire Infotech was abandoned and Siemens subsidiary, Siemens Information Systems Limited (SISL) was taken up as the implementation partner. The implementation strategy chosen was Big Bang. Four modules were selected for implementation at Dainik Bhaskar: MM, MAM, MSD and FICO. The implementation duration was approximately 7 months right from the vendor selection till the going live stage.

At Dainik Bhaskar also, training phase was very well planned and scheduled. A core team was made which consisted of 20 people, 10 from the Head Office that is, Bhopal and 10 people from Jaipur. The Training sessions started in July 2007 with two modules: MAM and SD training conducted at Jaipur office and two modules: FICO and MM training done at the Bhopal Head Office. These core team representatives further provided training to the end users at the other centers.

CASE 6: L & T CASE EQUIPMENT LTD.

With more than US$4 billion in revenue, Larsen & Toubro Limited is India's largest engineering and construction conglomerate and is one of India's top five enterprises. It has diversified interests in IT, cement and electrical business.

L&T – Case is a subsidiary of L&T and is a 50:50 joint venture between L&T and CNH America LLC (CNH America LLC is a wholly owned subsidiary of CNH Global N.V., USA), which has manufacturing facilities worldwide. It is the world's largest manufacturer of loader backhoes.

ERP Project at L&T Case:

The ERP adoption and implementation at L&T Case was a result of the decision taken by parent company L&T. Prior to ERP, L&T, the parent company of L&T Case, had several applications such as payroll, suppliers' accounting, inventory and costing systems, all developed in Cobol, for a very long time.

The parent company, L&T, has been a fully dedicated SAP software customer since the early 1990s, starting with a mainframe based enterprise resource planning (ERP) software predecessor of today's mySAP™ ERP solution. The decision of implementing SAP at L&T Case was due to adoption of SAP by several other L&T group companies

In case of L&T Case, a deep analysis of the SAP modules and the functional requirements led to the selection of six modules for implementation: Materials management (MM), Project planning (PP), Sales and Distribution (SD), Finance and Control (FICO), Quality Management (QM) and SM.

The implementation of SAP 4.0 B was done in L&T Case in year 2000 with the help of L&T Infotech, the implementation partner. The implementation was done with a Big-Bang strategy and therefore took less time, approximately 8 months. This system was later on upgraded to SAP 4.7 in the year 2003.

In 2003 access was given to dealers through Internet. L&T Case doesn't have a proper CRM package as yet, but they have customer records and services, market analysis, developed in-house. There are also planning to link Suppliers with the ERP system in the future.

Case 7: CROMPTON GREAVES

Crompton Greaves (CG) is part of the US$ 3 bn Avantha Group, a conglomerate with an impressive global footprint. Today, Crompton Greaves is one of India's largest private sector enterprises. It has diversified extensively and is engaged in designing, manufacturing and marketing technologically advanced electrical products and services related to power generation, transmission and distribution, besides executing turnkey projects.

ERP at Crompton Greaves

Before 2000, Crompton Greaves was working on separate applications for separate departments like Marketing and Purchase; made on Oracle. In order to overcome inefficiencies of the legacy system, there was a need to integrate functional area's information systems at the least, and simultaneously improve overall organizational productivity and efficiency by integrating all the offices. Responding to the Y2K problem was also on the agenda, which was also easily achieved by implementing an ERP solution.

After studying several products and comparing the offering to the company RFP, in April 2000, SAP 3.1h was implemented in the company. The implementation partner was PWC. There are 5 modules of SAP implemented at CG: Sales and Distribution, MM, PP, FI and CO.CG has also implemented a Data Warehouse Cognos, developed by TCS. The Servers are stationed at the Mumbai Head Office and the backup of all the data is taken at Chennai every day.

Case 8: VA TECH HYDRO INDIA PVT. LTD

V A TECH HYDRO India Pvt. Ltd. is a 100% subsidiary of VA TECH HYDRO, Austria - a leading global supplier of electro-mechanical equipment and services ("Water to Wire") for hydro power plants.

VA TECH HYDRO has an experience of more than 120 years and has executed large number of hydropower projects across the globe and is leader in Hydropower business worldwide. They have Generator Manufacturing unit at Mandideep near Bhopal (M.P.). They manufacture Hydro Generators upto 300 MVA, Thermal Generators upto 50 MVA, Automation, Control Equipment and SCADA system.

ERP at V A Tech Hydro

In 2001 V A Tech Hydro took up the decision of implementing SAP. The decision was only due to the parent company which was already running SAP. Also, there was a need to improve control of Information resources and overcome inefficiencies of legacy system.

At V A Tech Hydro, 4 modules of SAP were chosen for implementation: MM, PP, SD, and FICO. The company initially implemented SAP R/3 in around 12 months. Later on it upgraded to SAP R4 and later to R6. The implementation was done in a phased manner rather than in a big-bang manner. V A Tech Hydro chose Siemens India as the implementation partner because of its successful SAP projects in other companies.

The SAP system is already being used to get connected to the suppliers and vendors through Purchase Order generation. Some vendors can access drawings through registered login ids and passwords. This is done though an internet site.

The other applications which are being considered for the future in collaboration with SAP are: Advanced Planning and Scheduling System, Data Warehouse and Business Intelligence.

Case 9: RANBAXY

Ranbaxy Laboratories Limited, India's largest pharmaceutical company, is an integrated, research based, international pharmaceutical company, producing a wide range of quality, affordable generic medicines, trusted by healthcare professionals and patients across geographies.

ERP at Ranbaxy

In 1998, Ranbaxy was the first Pharmaceutical Company to opt for an ERP. It was a crucial time for the company since it had now entered USA, the world's largest pharmaceutical market, with products under its own name. The growing business and increased need to reduce costs and improve efficiency and productivity, led to the need to streamline all functions and integrated them together to provide a unified vision of the Company.

At Ranbaxy, a core implementation team comprising of Functional heads from different locations, studied various products and their pros and cons. They also took demo of these products to get a feel of the system. All this exercise led to choosing of SAP as the most appropriate package. The Implementation Partner chosen was IBM.

The implementation strategy used at Ranbaxy was Gradual phase in and not Big bang. This was because of the sheer size of the Company. The modules implemented included Finance(FI), Costing(CC), Materials(MM), Production and Production Integration(PP &PI) and Sales and Distribution (SD). The implementation process began in April-May 1998.

Certain legacy systems were kept intact in Finance and Sales and Distribution as well as in Procurement and Warehousing. This was done either because SAP didn't have the required functionality or because these existing systems provided some unique features which were considered to be important for the company's overall performance.

Since SAP was also new to the Pharma industry, 4-5 ABAP programs had to be written and a few ABAP consultants were hired almost for two years right from the commencement of the ERP project.

The team size at Ranbaxy, was of 40-50 people who co-located at a single location and underwent the training. Two types of training were provided: fundamental ERP systems education and technical training in the usage of the ERP software.It took two years to rollout at major locations. The pilot implementation was at Muhali in April 1999 followed by Dewas plant in May 1999.

Case 10: PROCTER AND GAMBLE

Procter & Gamble (P&G) is a highly successful consumer packaged goods company (with around $40 billion in sales revenue). P&G Hygiene and Health Care Limited is one of India's fastest growing Fast Moving Consumer Goods Companies that has in its portfolio P&G's Billion dollar brands such as Vicks & Whisper. With a turnover of Rs. 500+ crores, the Company has carved a reputation for delivering high quality, value-added products to meet the needs of consumers.

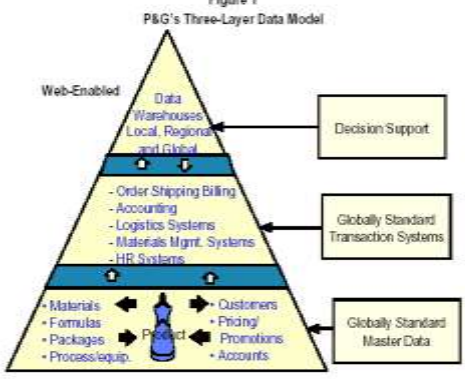
ERP at P&G

P&G started its relationship with SAP in 1987, after which it quickly initiated a regional implementation of the R/2 mainframe application. In 1994, P&G started to switch all of its regional ERP applications to R/3. The major change came in 1997 when P&G embarked on a harmonized global SAP deployment strategy to support its strategic move to standardized global business processes.

As a nominated "global account" of SAP, P&G has benefited from a particularly close relationship with SAP, which means access to real product experts. P&G decided to centralize business processes wherever possible. However, due to the sheer scale of P&G's business, multiple SAP production instances would be inevitable, potentially leading to data integration and synchronization problems that could challenge the vision of a globally integrated supply chain.

Therefore, P&G designed a clever three-tier data model (see Figure 1), as a fundamental building block to facilitate business process harmonization across multiple SAP instances. All business master data is rigidly standardized and managed globally by one dedicated organization. This master data is maintained on one specialized R/3 system — the Global Data Client (GDC) — and has proved fundamental to P&G's success.

Figure 1



This standardized master data underpins a number of separate but fully standardized R/3 transaction-processing systems. The top decision support layer of the pyramid is highly effective by virtue of the tight integration with the transaction-processing layer within the data model. P&G uses Business Information Warehouse (BW) for supply chain operational reporting and some management decision support, but the bulk of the financial management reporting is handled through its internally developed corporate data warehouse (based on Oracle). BW became much more important as further mySAP applications, such as Advanced Planner and Optimizer (APO) and Enterprise Buyer Professional (EBP), were subsequently deployed.

P&G implemented single global SAP R/3 instances for each of finance, HR and capital management to support its global

business process strategy. Figure 2 depicts the main ERP systems against the three-layer data model.

The central finance system handles the closing of the books across all operations, but production costing is deployed at plant level, to define standard costs by plant. All employees are managed globally through the SAP HR system. Some payroll for plant operations is still handled through local systems. However, P&G will pay all staff for 10 key countries (including the United States) through its shared service center using SAP Payroll within one year, and have plans to progressively move the other countries to this model.

Around 80 percent of order management is handled separately by two large in-house-developed mainframe applications that are linked to the SAP systems. Figure 2 shows the GDC reference system, which also synchronizes master data for non-SAP systems. SAP's Application Link Enabling (ALE) middleware was selected to drive master data synchronization but, at the time, this was very much an emerging technology. Master data synchronizations take place at regular intervals of 10 minutes, one hour or one day, according to business need. The GDC system carefully validates all master data for uniqueness, and filters individual data to the right transaction systems. ALE is also used to link some transactions across SAP instances.

As a consequence of this pragmatic instance strategy, P&G has deployed 38 separate SAP production systems, based on Unix and the Oracle database. Around 25 of these are relatively small systems (not shown in Figure 2), with fewer than 100 concurrent users each, to serve separate small business units or specific languages (e.g., Japanese, Korean, Russian). However, the largest regional logistics system has more than 1,500 concurrent (11,330 registered) users and more than 1.2TB, even after data archiving.

It has been a pioneer in implementing Information technology for achieving maximum benefits and has become the leader in IT enabled infrastructure. It has implemented all the extensions including SCM systems and Data Warehouse.

The famous channel partnership between P&G and a retailer (Wal-Mart) has been very well known and has been a role model showing the effectiveness of IT enabled organizations working in collaboration to maximize benefits. Both P&G and Wal Mart are major players in their industries. They found a way to leverage on information technology by sharing data across their mutual supply chains. The resulting channel has become more efficient because channel activities are better coordinated. There are reduced needs for inventories with increased sales by focusing on selling what the customers want.

Case 11: Bridgestone

Founded way back in 1931, in Japan, Bridgestone is a tyre manufacturer with 75 years of experience. Today Bridgestone is globally the No. 1 tyre and rubber manufacturer and it sells its tyres and products in more than 150 nations, employing more than 110,000 people.

ERP Project

The main reason for implementing an ERP system was thus business process related, that is, to improve the control of information resources by integrating functional area's information systems. ISCC was selected the ERP project consultant at Bridgestone. Since PRISM was available on IBM Ace 400, the hardware platform that was most reliable, it was selected in May 1997. Bridgestone didn't employ a one product ERP solution, but it was a case of Best of Breed implementation.

In November 1997, Bridgestone signed up with PRISM and started the process of Hardware, Software and Networking. In the first phase, the Finance, Inventory and Procurement modules were installed. For Taxation, EXVAT module developed by DSQ Software was connected with PRISM. In the second phase Sales and Marketing and HR module called SAPICS (both developed by DSQ) were implemented. By August 1998 the process was finished.

Data Analysis

ERP details:

- ERP Vendor: SAP (100%)
- Implementation Partner: Siemens India (30%), IBM (50%), L&T Infotech (10%), None (10%)
- No. of Modules: 4 (40%), 5 (20%), 6 (20%), 7 (10%), 8 (10%)

Pre Implementation Issues

1. Reasons seen for ERP implementation
- Improve control of Information resources: Average= 4.5
- Integrate Information System: Average= 4.2
- Development of Data Warehouse: Average = 3.8
- Support SCM: Average = 3.8
- Overcome inefficiencies of legacy system: Average = 3.7

Implementation Experience

1. Implementation Strategy used: Big Bang = 60%, Gradual Phase in = 40%
2. Implementation Duration

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
6 months	15 months	9 months	9 months	7 months	8 months	10 months	12 months	20 months	More than 2 Yrs globally

3. ERP Usage Time

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
6 months	10 Yrs	6 Yrs	3 Yrs	9 Yrs	9 Yrs	9 Yrs	5 Yrs	10 Yrs	10 Yrs

1. Lateness of Implementation Project
- On Time = 60%
- 1 Month Late = 10%
- 2 Months late = 20%
- Before Time = 10%

2. Compliance with budget

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Mean
3	3	3	5	4	5	3	3	3	3	3.5

3. ERP Implementation problems faced
- Lack of top management commitment and support = 1.8 (least value; Not seen as a problem.
- Lack of data accuracy = 2.9 (seen as a problem in ERP implementation)

4. How would you define a successful ERP Implementation?
- Maintain data integrity = 90%
- System works without disruption = 70%
- User Acceptance = 40%
- On time and within budget = 40%

5. How would you rate your Organization's ERP project success?

6. How would you rate the following Critical Success Factor for ERP implementation.
- Effective Project Management (mean = 4.5) = Most critical success factor

• Education and Training (mean = 4.4) = Second most critical success factor

• Top Management Support (mean = 4.3) = Third most critical success factor

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Mean
2	4	4	4	5	4	3	4	4	5	3.9

Post Implementation

1. Benefits of ERP Usage

• No. 1 Benefit of ERP Usage (100%) = Quicker response time and Better resource management

• No. 2 Benefit of ERP Usage (70%) = Lower inventory levels and Improved on time delivery

• No. 3 Benefit of ERP Usage (60%) = Improved interaction with customers and suppliers

2. End User Satisfaction

• Very Satisfied = 60%

• Satisfied = 30%

• Some what satisfied = 10%

Top 2 extensions = DW (70% organizations have implemented) and BI (50% organizations are using)

P&G and Ranbaxy are the two organizations which have implemented all the extensions. Eicher Tractors has also implemented all the extensions except 'linking with customer'. All these three companies have been using ERP since past 10 years or more.

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Future directions

ERP Extension	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
1. Advanced Planning and Scheduling	Planned for future	Imple-mented	Planned for future	Consider-ing	Impleme-nted	Planned For future	No Plans	Considering	Implemented	Implemented
2.Data Warehouse	Considering	Implemented	Implemented	Implemented	Implemented	No plans	Implemented	Considering	Implemented	Implemented
3.Ecommerce/ EBusiness	Planned for future	Implemented	Planned for future	No Plans	No Plans	No Plans	Considering	Implemented	Implemented	Implemented
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
4.Linking Customers	No plans	Implemented	Planned for future	No plans	No plans	No plans	Planned for future	Implemented	Implemented	Implemented
5.Business Intelligence	Considering	Implemented	Implemented	Considering	Implemented	No plans	No plans	Planned for future	Implemented	Implemented
6.Supply Chain Management	Considering	Implemented	Planned for future	No plans	Planned for future	Planned for future	No plans	Implemented	Implemented	Implemented
7..Linking Suppliers	No plans	Implemented	Planned for future	No plans	Planned for future	Planned for future	Implemented	Implemented	Implemented	Implemented