

Bharat Petroleum Corporation Limited (BPCL)

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Bharat Petroleum Corporation Limited (BPCL) embarked upon a major change initiative towards the end of 1996. It planned an enterprise-wide integration through Enterprise Resource Planning (ERP). The objectives were to remain competitive through improved customer service and customer satisfaction and to transform the company into a Learning Organization.

The case highlights the process and challenges faced by BPCL in successfully implementing ERP (SAP R/3). The focus of the implementation process was on Change Management where significant change in technology led to a change in the work culture.

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BPCL was one of the earliest amongst organizations in the energy sector to successfully implement Enterprise Resource Planning (ERP). While there have been some attempts by other organizations to implement ERP, the effort at BPCL was considered significant because for the first time it encompassed the entire operation of an integrated downstream oil marketing company involving nearly 200 locations across the country. This was certainly a bold technological step considering the general bandwidth-constraints prevailing then. As BPCL's General Manager (Information Systems) put it, "It was a veritable technological challenge inasmuch as we could not get a reference case of running the downstream oil industry transactions comparable to BPCL's magnitude on a TDM/TDMA VSAT link anywhere in the world." With this achievement, BPCL also came to be ranked among the large ERP implementations of the country.

The Background

The Indian oil industry was under government control until the economic reform process began in the year 1991. After liberalization, the private sector entered several areas within the industry, viz., LPG, lubricants, refinery, and even oil exploration and production. The intention of the Government of India was to completely deregulate the oil industry by the year 2002. Considering the impact of changes experienced during partial deregulation and anticipation of the radical changes in the business environment after deregulation, BPCL undertook a massive exercise for preparing itself to face the challenges.

BPCL has always enjoyed the image of a progressive organization. It is, in fact, the only Indian company to have won the CIO Global 100 award for its use of technology and forward looking human resource (HR) policies. Also, it was the only public sector organization to figure in the top ten best employers in India in the *Business Today* survey in 2001.

BPCL's change initiative started towards the end

of 1996 with the help of Arthur D Little, Inc. (ADL). ADL's methodology involved a cross-section of the organization in co-creating a vision for the company, determining its current reality, conceptualizing the gaps between vision and current reality, and finally evolving a change plan to bridge these gaps. Customer focus emerged as the overriding dimension of this exercise and, hence, down the line, the change initiative of the company was transformed into a programme called CUSECS — Customer Service and Customer Satisfaction. In tangible terms, the change plan resulted in restructuring and radical delayering of the organization. It did away with the earlier departmental silos and created six strategic business units (SBUs), viz., Refinery, Retail, LPG, Lubricants, Industrial and Commercial, and Aviation; shared services and support entities such as finance, human resources, information systems, etc. The new structure comprised of four layers, as compared to the previous six or seven. In intangible terms, it involved change processes that would transform BPCL into a learning organization (Senge, 1990)'.

The entire change plan necessitated effective integration and was premised on a massive increase in the information intensity of the organization. It was envisaged that IT would contribute significantly in this and thus began the project for evolving an information system for the organization.

IS Plan

BPCL's IS plan envisaged the creation of a comprehensive system for supporting the business aspirations of the company. A small team of nine people drawn from the IS and CUSECS programme set out to map the existing business systems (legacy systems) vis-a-vis the future needs characterized by customer focus, resource-optimization, integration, and flexibility. The team concluded that it was imperative to replace the existing batch-process-oriented legacy systems with a state-of-the-art ERP system.

Thereafter, the challenge for the team was to select the most suitable ERP package. As part of the selection process, the IS plan team mapped all the major processes in BPCL and created over 600 process maps with the help of people identified as possessing expertise and conceptual insights in their business areas through a series of process workshops. These workshops were conducted at all the four regional headquarters, viz., Mumbai, Delhi, Chennai,

" Songe, l'cter (!!>)(). *The Fifth Discipline: The Art and Practice of Learning Organizations.*

and Calcutta. The team developed a detailed requirement-list and a comprehensive questionnaire based on these processes and wrote a number of scripts in order to capture significant business scenarios. The requirement-list and questionnaire served the purpose of pre-selecting/validating the ERP products for detailed evaluation, while the scripts were used in the final evaluation of the product.

While the team was preparing itself for an objective evaluation of the ERP products, it was the SBUs and the supporting functional entities that had to own it up. "Sheer expanse and intrinsic complexity of ERP packages in itself posed a formidable challenge but the bigger challenge lay in enrolling all the stakeholders in the selection process" said one IS team member. A series of educative workshops were conducted for the SBU/Entity heads and their teams on aspects ranging from basic concepts to architectural specifics of ERP products. These presentations were later extended to a wider cross-section of people in the organization.

After deciding upon the possible ERP vendors, each vendor was asked to give presentations to an identified set of over 100 people from different businesses. The objective was to make key people understand the working of ERP systems, clear their doubts, and create a felt need in them and eventually make them commit themselves to ERP implementation in their respective businesses. Through this process, each business came out with its expected quantitative as well as qualitative benefits, which formed the basis for project approval. A detailed technical selection process was undertaken to find the 'best fit' ERP package for current and future needs of BPCL. SAP R/3 software was selected for implementation. The selection process of SAP R/3 is discussed in Annexure 1. The estimated quantitative benefits totalled Rs 42 crore per year. The contributors to these benefits in terms of SAP modules and business processes are given in Annexure 2.

Project ENTRANS

The top management decided to name the project for implementation of SAP R/3 as project ENTRANS, a short form for Enterprise Transformation. The name signified the top management's vision of a totally transformed organization — a new BPCL. "The unique thing about BPCL's ERP implementation is that right from its conception, it has been a business initiative. We just performed the necessary catalytic role;" paradoxically, this expression of pride

came from the Head of IT in BPCL. Although during the software selection phase, on account of criticality of technological issues, IS had to don the role of a process-anchor, the implementation phase was led by a non-IS person. The person who eventually came to head the project was Mr Shrikant Gathoo, an HR professional. The notable feature of the IS plan team was that it had only ten persons from IS, the remaining 60 coming from various businesses.

A Project Steering Committee (PSC) was constituted with the heads of all the SBUs, Finance, HR, and IS as its members. The mandate of the PSC was to validate decisions taken by the project team, take decisions on interface (inter SBU/ Entity) issues, identify and solicit decisions from the Apex Council (that comprised working members of the board of directors) on issues with wider strategic /organizational implications, provide resources, and review the progress of the project. The PSC met at least once a month and as and when the issues demanded resolution.

Two-Phase Implementation

BPCL planned to implement almost all the modules of SAP R/3 as given in Annexure 3.

The implementation was conceived in two phases. The first phase comprised the Conceptual Design and Planning (CDP) while the second phase covered Detailed Design and Implementation (DDI).

The necessity of assistance of an external agency — a SAP Implementation Partner having relevant expertise and experience — was generally conceded. Price Waterhouse Coopers (PWC) was selected as the implementation partner through a bidding process for the CDP phase. PWC was mandated to complete the CDP phase within six months. The scope of the CDP phase is given in Annexure 4.

"Most of the CDP phase was done without the actual software in place. We got the software and thought that we would look at the product and start designing the processes. But, we learned that it was not possible. This was because to see end to end of a process you needed to really configure the product, which was not possible in the limited time frame of six months," said KB Narayanan, a member of the ENTRANS team who worked in the CDP phase.

The CDP phase helped to bring in the stakeholders to discuss many important aspects that were needed for the detailed design such as the organizational structure (in SAP) or the unit of

measure for petroleum products. It catalysed a considerable buy-in of the company and provided time for many preparatory tasks such as capacity planning, network planning, authorization management, system landscaping, printing methods, etc. which benefited the implementation immensely in the long run.

The experience acquired through the CDP phase enabled the management to realize that the DDI phase of the SAP-implementation project should be led by the in-house team with necessary inputs from the implementation partner. Accordingly, most of the team members were sent for training in SAP-run Sapien College for becoming SAP-certified consultants in their respective areas. Eventually, BPCL had over 70 in-house SAP-certified consultants, making it one of the largest resource-pool for SAP implementation in the country.

SAP India was chosen to assist BPCL in the DDI phase through a bidding process. A note on the selection of the implementation partner for the DDI phase along with the deliverables is given in Annexure 5. SAP provided 24 consultants headed by Mr Vijay Motwani and deployed its ASAP (Accelerated SAP) methodology. The project team evolved a broad implementation schedule of 24 months.

Pilot Implementation

It was decided that, initially, pilot implementation would be carried out at a couple of locations/business areas. On the criteria of business and IT-readiness, proximity to project team (Juhu, Mumbai), and salience of processes involved, three sites were identified: Refinery, Wadilub Lubricants Plant, and a Lubs C&F Agency at Pune. The SAP modules implemented during the pilot implementation were FI, MM, QM, PP, SD, PM, IS oil, and CIN (Annexure 4). Many teething problems were experienced at the pilot locations. For instance, at Wadilub, the staff observed that many simple tasks in the earlier system had now become tedious involving many steps and demanding longer working hours than before. They tended to take short cuts but soon realized that the system would not allow it. Likewise, many of the informal processes of the past needed formalization in SAP. For instance, the container suppliers used to directly despatch the containers to the third party blenders without making Goods Receipt (GR) and Goods Issue (GI). Even while making the receipt of finished products from such supplies at Wadilub, the system would not physically receive because it did not have any issues

of such materials. This being a pilot implementation, many configuration problems were also encountered causing a lot of anxiety among the staff. It was accentuated by the premature redeployment of five management and 11 clerical staff from the plant. It was commonly felt that the stress on the staff after implementation of SAP was more as compared to working in the old system.

Notwithstanding these difficulties, Mr Vairamohan, the Plant Manager, recounted the benefits from the pilot implementation saying, "SAP system imposed strict discipline among the staff to follow certain sequence of operation, as a result, there is no suspense issue at Wadilub today. We are able to get many logistics information such as material inventory, product despatches, and pending indents." He felt that the benefits could be further leveraged if the plant processes are automated.

Roll-out

SAP's ASAP methodology for implementation consisted of five distinct phases, viz., project preparation, business blueprint, realization, final preparation, and go live and support. However, in BPCL, the whole project was divided into a pilot phase and a roll-out phase. All the SBUs went live at one or two locations and only after their stabilization, the remaining locations were added. The main anxiety during the roll-out was the network support because the tenuous links to most of the BPCL locations could not support the on-line SAP transactions. The network plan of the IS was delayed because of the non-availability of satellite transponders. IS took many contingency steps like reconfiguring mails, providing ISDN links, implementing *ad hoc* reservations, etc. and supported the roll-out schedule. Later, when the second subnet and the leased line network was implemented, the network withstood all demands of the roll-out.

The typical roll-out was preceded by certain preparatory tasks. A team comprising ENTRANS, Business, and IS would visit the location and ascertain its readiness for the roll-out in terms of hardware, software, and connectivity. The training of the users would be conducted at the suitable location. The actual roll-out team will then go to the location and execute cut-over to SAP R/3.

In order to provide continued support to the users who had gone live on SAP, a new structure called Centre for Customer Support and Excellence (CCSE) was formed within ENTRANS. A cross-functional team of 15 people representing expertise

in all the modules of SAP R/3 manned this centre. The centre was expected to look after all the crucial areas in SAP environment, viz., master files, authorizations, processes, and maintenance of SAP system. Besides, it was mandated to perform many other important tasks that are connected with the maintenance and running of the SAP system, viz., performance management (response times), changes in SAP software, testing and getting acceptance for all changes, data archival, upgrades of hardware and software, documentation, and communication to all the users. The centre was also expected to take new initiatives like data warehouse, internet enablement of processes, supply chain management, etc. CCSE was supposed to operate as a central help desk to all the SAP users and would periodically interact with the business co-ordinators who were identified at all the locations to arrive at the best possible solution for the end users. The CCSE at BPCL was already operational.

Management of Change

ERP implementation in a large organization like BPCL poses many obvious technological and project management challenges. Every organization, therefore, consciously prepares itself for facing them. One challenge that is not so obvious in the beginning but becomes most formidable at the end is that of change management. BPCL recognized it as the foremost challenge and dealt with it right from the conception phase in the most elaborate manner. It had an advantage of successfully managing a change of similar magnitude in the recent past during the CUSECS project. The same methodology was employed again. A note on the change management methodology is provided in Annexure 6.

Right from the beginning, change management issues were considered to be of utmost importance. Apart from training, various motivational workshops were conducted throughout the organization in small groups. This was done to maximize employee participation and acceptance of the change process. Six full-time coaches were appointed for taking up the change management process. These coaches further trained a few others to work as part-time coaches. The role of these coaches was to facilitate the transition of employees into their roles in the post-ERP organization. They went in for an in-depth discussion and clarifications on all the issues concerning the employees. The employees were concerned that there would be a large scale reduction of workforce. Their fears were allayed by an early

announcement by the Chairman that there would not be any downsizing on account of SAP implementation. SAP implementation was bound to change. every role in the organization and the management was committed to equip each employee to take up that role. There were special communication exercises conducted all over the country on these issues that included the workmen and their trade union leaders.

The final roll-out of implementation of various SAP modules across the organization was smooth. At the time of writing this case, BPCL had already rolled out SAP at 160 locations out of an estimated 200. On the technological front, the project had been quite stable from the beginning. This was a veritable feat considering the sheer size of the project and complexity of certain operational features. Says K B Narayanan, the Head of the Basis team and a member of the IT team, "We have set many things right such as the 64-bit implementation (OS, DB, and SAP), good disk sub-system, choosing the right database, careful sizing of load for the ambitious roll-out, network planning, huge training across locations, streamlining of authorizations (for 2500 users) with profile administrators in the business, strict performance monitoring, streamlining of printing jobs across the corporation, etc." Comparing with some of the past large implementations, BPCL has indeed done exceedingly well in managing IT. However, there are many challenges ahead in terms of managing database growth and performance, backup times, upgrades, archiving, network performance/uptime, implementation of new solutions like BW, CRM, SCM, etc. The implementation process is rated highly successful and is reported to be in the 'top quartile' by SAP.

The benefits that would be derived from this high cost implementation are substantial. According to Mr A Sinha, Director (Finance), the benefits expected would amount to Rs 42 crore per year. However, the moot question is how to follow-up the measurement of the benefits.

BPCL's ERP implementation has distinguished itself in terms of at least two important features: top management commitment and organizational efforts put in for change management. It has already been acknowledged among the successful implementations. But, the question still lingers as to how to define this success. This key question remained unanswered in the minds of the case writers for the following reasons:

- The cost estimates of the project do not cover disaster recovery or networking.
- Many of the estimated benefits could be attributed to networking of the locations and not to ERP.
- Essentially, ERP benefits should accrue through the radical change in processes. There has not been process reengineering in BPCL's implementation.
- The change in process and consequently in roles has been software-driven and not through a radical business review.
- Without process reengineering, ERP provides mere process automation and integration that can lead certainly to downsizing of the workforce. BPCL's benefit list does not include any man power reduction.
- In order to provide for benefit measurement (project evaluation), there should be benchmarks for the key parameters. In the absence of these benchmarks, benefit measurement remains a big question mark.
- ERP is not a monolith. It comes in a modular form and is amenable to data interface. It provides opportunity to maximize benefits from ERP by strategically optimizing the mix of ERP modules and non-ERP systems. BPCL did not carry out this optimization exercise.

Similar concerns arise in the strategic realm which are as follows:

- What impact will ERP have on the productivity of people?
- A laid down process works opposite to innovations. Would creativity of employees be killed by process regimentation that an ERP entails?
- ERP may give an illusory impression of reducing the mundane tasks and releasing time for people to engage in analytical thinking. It can release people but not time for the people who remain behind. We learnt that people are more stressed in an ERP environment than before. The data deluge may not necessarily lead to analysis.
- How do we keep the motivation level of people high over a period of time in the face of the danger of human beings getting lost in the cobweb of systems?
- According to the Chairman, there would be no reduction in the workforce. On the contrary, new jobs would be created for employees who had been trained for different roles. This has worked well till date but would this continue in future?

- What would be the role of the 70 odd employees who are now certified SAP consultants? Would BPCL be able to exploit their expertise/knowledge?
- The roles of people tend to get defined in terms of profiles in the system. Would it not engender a narrow outlook in people?
- Does ERP provide process flexibility to organizations? Being intrinsically complex, the ERP systems require very specialized resources and a

long time to reconfigure processes. Would it not affect the agility of an organization in the emerging dynamic market?

These and many other questions may never get incontrovertible answers.

"The question is not how business will benefit from an ERP but what it will lose if it does not have one. It is like the hygiene factor of Herzberg's theory," as one of the case writers commented which perhaps provides an apt answer to these vexing questions.

Annexure 1: Selection of SAP R/3

The first step was the selection of appropriate vendors' from among those in the market. Three vendors were short-listed for further analysis based on their Indian presence, technology features, industry knowledge, and availability of manpower. Following observations were made:

SAP's R/3	Oracle's OED	Ramco's Marshall
<ul style="list-style-type: none"> • Industry leader with multiple leading oil company implementations 	Acquisition of British Petroleum's in-house developed product being marketed as the Oil Energy Downstream (OED) suite of systems	Indian vendor Availability of resources
<ul style="list-style-type: none"> • Indian presence 	Indian presence	R&D investments
<ul style="list-style-type: none"> • Technology and R&D advancements 		

A cross-functional management team was formed to evaluate the short-listed vendors. Following criterion were considered:

<i>Business Functionality</i>	<i>Technology</i>	<i>Oil Industry Specifics</i>	<i>Localization Credentials</i>	<i>Vendor</i>
Fit with current requirement	• Performance throughput	• Implementation in oil industry and abroad	• Excise, MODVAT, Sales Tax, TDS, etc.	• Market share
Fit with future requirements	• Scalability	• Support to oil accounting		• Financial strength
Options for process flexibility	• Fit with hardware and network plan			• Technology partnership
<ul style="list-style-type: none"> • Ease of use 	<ul style="list-style-type: none"> • Technical design of the product 			
<ul style="list-style-type: none"> • Audit trail 	<ul style="list-style-type: none"> • Integration • Ease of deployment • Road map 			

For the final selection, Oracle abstained from the evaluation quoting its inability to demonstrate the product as per BPCL's requirement. SAP's "R/3" was found more fit over Ramco's "Marshall" to support the complexity of current and future business needs of BPCL.

¹ SAP, ORACLE, and RAMCO SYSTEMS.

Annexure 2: Details of the Estimated Quantitative Benefits on Account of ERP

<i>SBU/Entity</i>	<i>Business Area</i>	<i>Benefit per Annum (Rs Crore)</i>
Lubricants	Inventory management	11.40
	Prompt payment discount on purchase/service	0.11
	Sub-total	11.51
Retail (Sales)	Statement of accounts	
	Reduction in debit/credit notes	1.80
	RO maintenance: Reduction in spare maintenance	0.10
	Sub-total	1.90
Retail (Logistics)	Inventory management: Interest savings on account of reduced working capital by reducing level of inventories by one day	3.50
	Reduction in OT: Benefits accruing out of elimination of clerical OT	0.37
	Reduction in communication expenses	1.71
	Sub-total	5.58
Industrial and Commercial	Credit management: Savings in the lead-time of lodgement of bills and better collection	1.54
	Stock management: Reduction in communication costs incurred for obtaining information	0.75
	Logistics economics: For locations such as Kandla, Koyali etc., with reduction in consequent transport costs	0.03
	Sub-total	2.31
Aviation	Sales and stocks accounting	0.12
	Maintenance and inventory management	0.13
	Quality control and ISO documentation	0.09
	Communication	0.20
	Shift management	0.20
	Sub-total	0.74
Finance	Treasury: Cash flow management	4.07
	Corporate finance: Reduction in reconciliation and costing of accounts	0.28
	Shared services: Reduction in staff cost and increase in ROI on funds invested by retirement benefits	0.23
	Sub-total	4.58
Human Resources	Stationery and mailing costs: Reduction in internal mailing	1.95
	Sub-total	1.95
Information Systems	Reduction in application maintenance	0.50
	Reduction in printing of reports	0.11
	Sub-total	0.61
Engineering and Projects	Payment of bills	1.93
	Handling of surplus project materials	1.30
	Tendering and award of contracts	1.44
	Monitoring and control of projects	0.10
	Sub-total	4.77
	Materials (Marketing)	Bulk purchase discounts
Inventory management		0.38
Payment to vendors		0.78
Sub-total		1.66

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Refinery	Reduction in OT cost, staff cost, and administration cost	0.84
	Inventory management and disposal of surplus materials	0.48
	Maintenance	1.71
	Increase in sales tax set off and savings from shipping and excise	1.00
	Project monitoring and tendering	0.55
	<i>Sub-total</i>	4.58
LPG	Inventory management	1.39
	Reduction in OT benefits accruing out of elimination of OT	0.61
	<i>Sub-total</i>	2.00
Total Estimated Quantitative Benefits		42.19

Annexure 3: Modules Considered for Implementation

BPCL deployed the following SAP modules across the organization.

a) General Function Block (Base Package)

FI Financial Accounting/Asset Management
 IM Investment Management
 EC Enterprise Controlling
 MM Materials Management at Refinery and Marketing Locations SD
 Sales and Distribution QM
 Quality Management

TR-CM Cash Management
 CO Controlling
 PS Project Systems
 PM Plant Maintenance and Service at Refinery and Marketing Locations
 PP Production Planning at Two Lubs Plants

b) HR Function Block

PA Personnel Administration
 PD Personnel Development
 Indian Pay Roll **d)**

c) Optional Packages
 PP-PI Production Planning for Process Industries

Industry Solution

IS Oil Downstream

e) Country Localization
 CIN India Version

In addition, the implementation covered the following:

Interfaces (Refinery)

- Primavera/MS project
- Yokogawa DCS/Toshiba Process Control
- SCADA

Laboratory Information Management Systems
 Terminal Automation System Various
 Optimization Solutions, viz. Distribution
 Optimization, Transport Optimization, etc.

Interfaces (Marketing)

- Electronic Data Interchange
- Terminal Automation System
- Attendance Recording Systems
- Interactive Voice Response Systems
- Electronic Fund Transfer
- Email - MS Exchange
- Fax
- Bar Code

Internet/ Intranet
 Network and System Management Software
 Data Warehousing
 Document Management System
 PC DOCS
 GIS Solutions
 Primavera
 CAD/CAM
 Various Optimization Solutions

Tools

Query and Report Writer User
 Customization Tools Standard Data
 Import and Export Tools

Accelerated Solution Aids
 System Maintenance and Administration Tools
 Archiving and Restoration

Annexure 4: Scope of the CDP Phase

The details of the scope and deliverables of the CDP phase are defined below:

Implementation Coverage

The implementation scope covered the following process areas:

<i>R/3 Module</i>	<i>Process Areas</i>
FI/AM	Financial accounting including GL, AP, AR, treasury and asset management
TR-CM	Cash management
IM	Investment management
CO	Cost centre accounting, product and services costing and profitability analysis
PS	Project systems
MM	Materials management: Purchasing, inventory management including hydrocarbon materials
PM	Plant maintenance and service at refinery/marketing plants
SD/IS Oil	Sales and distribution including IS oil enhancements
PP, PP-PI	Production planning for discrete/batch processes (Lubs, LPG) and continuous process (Refinery - integration with manufacturing execution systems)
HR	Personnel administration, personnel development, career and succession planning, competency modeling and benefits administration
CIN	India version for Excise, MODVAT, TDS, sales tax, octroi, etc.
QM	Quality management

Key Deliverables of the Conceptual Design and Planning Phase

At the end of conceptual design and planning, the following key deliverables were decided upon:

SAP Organizational Hierarchy: Develop the 'top-level' model of SAP R/3 organizational hierarchy to meet the current and future requirements. This model would have definitions for BPCL's financial and other management structures. The model would further evolve in greater details and get finalized in DDL

Conceptual Design: "TO BE" Processes: Through its "CUSECS" project of Organizational Redesign, BPCL had evolved an exhaustive change plan which identified the business vision, key improvement opportunities, performance measures, and other change initiatives for all its business units and support functions.

In addition, the business unit leaders and key personnel from across the company were exposed to multiple ERP systems. Based on their understanding, they identified the quantitative and qualitative benefits to be realized through implementation.

The outcome of CUSECS project, IS plan, and the benefits assessment provided BPCL with a detailed account of the business priorities which were to be leveraged through SAP R/3 implementation. These business priority areas, which provide the greatest impact on benefits, support the change initiatives and constitute the business critical processes.

Business Critical Processes

It is necessary to:

- a) Identify the business critical "TO BE" processes in SAP R/3 for the "AS IS" processes as well as other critical processes that may get identified during the CDP phase.
- b) Identify the best option available in SAP R/3 for the above "TO BE" processes.
- c) Document the rationale for arriving at the option.
- d) Identify the process number/reference from SAP R/3 reference model with the path clearly defined and documented.
- e) Identify the change requirements for implementing these "TO BE" processes, viz. re-engineering of processes; key performance indicators (KPI); new decision roles, responsibility changes and skill requirements and improvements, modifications to any technology aspects to meet the process objectives.
- f) Obtain the priorities/acceptance of the BPCL management (sponsor/process owners) for these "TO BE" process options (if the sponsor/process owners desire to add to or modify these "TO BE" processes, and to provide the flexibility for identifying solutions in SAP R/3).
- g) Ensure that the process owners clearly understand:
 - the conceptual framework and the process definition

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- the justification for arriving at the best option
 - the benefits realized by implementing these "TO BE" processes and that their business objectives will be met
- the implications and constraints involved
- the change requirements in people, process and technology

Gaps

It is also necessary to identify the approach for addressing those processes which do not have a fit in SAP R/3 ("gaps") by defining:

- whether they need any 'work-around' to fit in SAP R/3
- whether they shall continue in legacy systems, and if so, the interface requirements
- whether they would be met by third-party solutions, and if so, the interfaces that need to be built. If the implementation partner has already developed certain additional solutions (bolt-ons or complementary packages) for addressing the gaps identified, BPCL should identify/document them for future implementation.

Conceptual Application and Technical Architecture

The deliverables for reviewing and confirming the conceptual business (application) and technical architecture include:

an approach to archiving, control and security requirements, confirmation (including identification if required) of the application coverage by SAP R/3, function and location

creation of key information flows between applications/location

a validated conceptual technical architecture

an approach to archiving, control, and security requirements

Project Plan

BPCL recognized the need to plan the implementation of SAP R/3 based on business benefits, inter-dependencies within the package, minimal risks, quick-wins, and availability of resources. The implementation partner would create the project plan closely working with the team which would provide all necessary inputs including the projected business benefits. This project plan should obtain the acceptance/sign-off from BPCL management and the process owners. The project plan should contain the following:

Phasing of Modules

- Time-frame for each phase and sub-phases.
- Defined milestones and associated tasks for each phase/sub-phase
 - deliverables from the milestone
 - interfaces required at the end of each milestone with legacy/third party
 - technical infrastructure for supporting the deliverables of the milestone
 - pilots - identification of pilots/sites
 - an approach to roll-out - an indicative roll-out plan
 - an approach to end user training
 - an approach to disaster recovery and contingency plan

Transition Plan

BPCL needs to prepare a detailed approach for migrating from legacy systems to SAP R/3. This would be defined as part of the project plan deliverable defined below:

Resource Estimation for Implementation of the Project

The consultants should provide an estimation of consulting resources, BPCL team resources, and infrastructure resources required for every phase of implementation as per the derived project plan, along with the basis for the same.

Project Structure and Management

Keeping in view BPCL's objectives for R/3 implementation, the implementation partner should define a suitable project team structure to execute the implementation. Along with this, the implementation partner should define:

responsibilities of the project team and the process owners/governing authorities/decision-making teams

mechanism for keeping control and track of issues cropping up during the project (implementation of phases)

methodology for overall management/monitoring of the project.

Training and Communication

The implementation partner should provide the required training for inducting the project team in order to understand the implications of the decisions taken during the conceptual design and planning phase. This training should cover the following:

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- Project implementation methodology.
Project tools/Project management skills.
- SAP Hierarchy Workshop - This workshop needs to be held for the team, the sponsors (functional directors of BPCL), and the entity heads (process owners) together to provide an understanding of the SAP organizational hierarchy and its importance to the implementation.
- The implementation partners are required to draft an approach to the communication requirements.

Sign-off and Closure

BPCL needs to ensure acceptance/sign-off from the management/process owners for all the deliverables mentioned above.

Documentation

BPCL needs to ensure complete documentation of all the activities, and steps/stages involved in the above deliverables.

Quality Audit

The deliverables of the CD&P phase are subject to quality audit. Notwithstanding the internal quality audit which the implementation partner may carry out, quality audit will be carried out by the third party namely, SAP (India) Pvt. Ltd.

Working Principle

The implementation partner and the BPCL team, working as a combined team, would create all the above deliverables. The implementation partner would be responsible for quality and timely output of deliverables.

Budgetary Cost of Implementation

As part of CD&P, the implementation partner should provide budgetary estimates of the number of consultant man-days required and the costs thereof for different categories (based on skills, etc.) of implementation partners for implementation of different phases as determined in the project plan.

The above estimates of the implementation project should be supported with ROI justification and the methods to measure the project against the ROI on a regular basis to ensure project success from a business benefit perspective.

Estimation of Number of SAP R/3 Users

As a part of CD&P phase, BPCL needs to estimate the likely number of SAP R/3 users at the end of implementation. This number, however, would be subject to review at appropriate stages during the implementation.

Use of Knowledge Repository and Oil Industry Templates

For the development of CD&P, BPCL expects the implementation partner to use its knowledge repository, oil

industry templates, and solution centres. The company intends to know the extent of knowledge and support available from such sources from the implementation partner for this project.

Desired Outcome of the Conceptual Design and Planning Phase

In BPCL's definition, CD&P involves developing a conceptual blueprint of how the company will operate in SAP for most of its business critical processes and getting an understanding of the implications and transition (people, process and technology) to the new processes. BPCL would like to state its desired outcome of the CD&P phase as follows:

- The project team has defined the span of SAP's functionality necessary to support BPCL's operations (in all its locations) and the process owners have understood the areas that SAP will support along with the areas that it will not.
- The project team and the process owners have understood the SAP hierarchy and its implications. Therefore, they need to understand the implications of information consolidation (e.g. profit and loss statement at business unit versus territory level) determined by the choices of SAP hierarchical elements. BPCL expects to have defined the "top-level" SAP organizational hierarchy.
- The project team has got the acceptance of process owners for the identified business critical "TO BE" processes.
- For the business critical "TO BE" processes, BPCL has chosen the best option within SAP R/3 and has got the acceptance for the same from the process owners.
- For the business critical "TO BE" processes, the process owners have understood that the chosen process options will enable the realization of anticipated benefits along with the change implications involved.
- For the business critical "TO BE" processes, BPCL is in a position to embark on detailed design.
- For the other processes, the company has identified match (support) for them in SAP R/3.
- For all the processes, BPCL has identified the "gaps" between "TO BE" and SAP R/3 and "Just filled the approach to resolve these "gaps" as follows: '
 - whether they will be met by "work around" in SAP R/3
 - whether they will be met by "legacy interface"
 - whether they will be met by third party solutions

BPCL has understood the project implementation methodology, learnt the skills to effectively monitor the implementation, and drawn a detailed project plan.

Annexure 5: Selection of Implementation Partner

After the CDP phase, BPCL had to engage an implementation partner for detailed design and implementation. For the sake of continuity from the earlier phase, PWC was considered for the DDI phase also. However, later, SAP India was also included and eventually it was selected as the implementation partner.

Detailed Design and Implementation (DDI)

BPCL envisaged the completion of the detailed design and implementation (DDI) of the SAP R/3 in a time frame of 24-26 months. The implementation of the SAP R/3 system covered all the offices and units of the organization.

Objective

The objective was to execute the implementation in multiple phases considering the large scale of the effort. BPCL also executed certain phases in parallel where feasible. In order to provide clarity for the overall implementation effort, BPCL embarked on the first phase of implementation at some pilot locations. Through these pilots, it tried to understand and measure the efficiency of critical business processes in SAP and prepare for a company wide roll-out. The details of the scope and deliverables of this phase are defined in the following sections.

Key Deliverables of the Detailed Design and Implementation Phase

BPCL undertook the detailed design, configuration, and implementation in base SAP R/3 version 4.0B, IS Oil 4.0B, and CIN 2.2B. Process design in CDP has been done with version 3.1H, IS Oil 1.0D, and CIN 2.1A. The implementing partner validated the process design done in CDP in base version 4.0B, IS Oil 4.0B, and CIN 2.2B. DDI started from 16th August 1999. The key deliverables were as follows.

Pilot Implementation

Modules/Processes/Functionalities to be Implemented in Pilots. The work done in CDP provide a detailed documentation of "TO BE" processes in all functional areas. The "process design" also carries certain recommendations/solutions from SAP through their quality audit. Keeping the output of CDP as a base, BPCL proceeded with the detailed configuration and pilot implementations in phases as follows:

Phase I - April 2000	Phase II - July 2000
Phase III - October 2000	Phase IV - April 2001
Phase V - October 2001	Phase VI - April 2002

Benefits to be Derived from Pilot Implementations. Prior to CDP and through CDP, BPCL estimated certain quantitative and qualitative benefits. The focus of the pilot implementation was on derivation of these benefits. The

implementing partner facilitated the realization of benefits through the pilot implementation.

Detailed Process Design and Configuration

Keeping the process design work of CDP as the base, the processes were designed to further levels of detail. This involved the following important tasks:

- Designing of the specific screens and data along with the process and method.
- Configuring the system according to the processes and level of detail required.
- Integration of the detailed design across modules.
Module level testing of the configuration.
- Identification of the fields that need to be captured for the masters and mapping of the information with the legacy systems.

Data Migration

Preceding the pilot implementation, BPCL designed the relevant master files and built the data requirements. All specifications that were required to populate the data into the new system needed to be defined. Templates were developed to undertake the migration of legacy and new data elements to the SAP R/3 system.

Integration Testing

This included development of exhaustive test scenarios, carrying out the integration tests on these scenarios and correction based on test results and feedback.

Developments and Interfaces

The CDP work had identified certain critical developments and interfaces. An indicative list of such developments/interfaces included developments, enhancements, and interfaces that were both interim and permanent in nature.

Basis and Authorization

The implementing partner structured the access rights and created corresponding authorization profiles for carrying out the transactions as defined by BPCL.

Apart from the above, DDI included the following

Training	Roll-out plan
Documentation	Project structure and management
Technical architecture	Sign-off and closure
Cut over to SAP	Quality audit
Implementation supp	Establishing product
	Compatibility

Annexure 6: Change Management

For the change management process, a team of 16 employees was nominated/identified as coaches. The selection was done on the basis of their experience (10 to 15 years) and credibility. Eight of them became certified coaches after a training programme. But, only six opted for the new role and were positioned as full-time coaches to take the change management initiatives forward. M/s. Innovation Associates trained these coaches on the learning organization methodology. The primary role of coaches was to facilitate the transition of employees into their post-ERP implementation roles. These coaches further trained a few others to work as part-time coaches. Together, they carried out training programmes for teams in various businesses.

The selection of coaches was done mainly based on the following criteria:

- understanding the new system
- having basic knowledge and concepts of the business
- familiarization skills, and
- acceptability (authenticity and value addition)

The coaching essentials were identified as follows:

- team working
- group decision-making, and
- commitment to business results

The Change Management Process

Change management was carried out as follows:

- A list of new roles available at the location across all business/entities was prepared.
- Each role was defined in terms of: numbers required; competencies; and deliverables expected.
- The change management team visited the locations and identified SAP users, staff to perform non-SAP roles, staff to be deployed to new roles, and staff to perform transitory roles. The process was aspiration-driven and required that the staff met the competencies required to perform these roles.

Process for Undertaking SAP Training

- Training co-ordinator to create all the business event types (training programme) with faculty (trainers) as resources.
- Cross-modular business process training to be conducted by the co-ordinator for the trainer.

Regional roll-out I/c to schedule the business process events at least one month prior to the "Go-live."

Regional roll-out I/c to finalize the trainers for the business process events.

- Location roll-out I/c to get in touch with the location anchor for nominations for the business process events.
- Responsibility for nominating the participants for the programme by the location anchor/ location rollout I/c, location in-charge to ensure that the participants attend these programmes.
- Location roll-out I/c to enter data on the attendees for the programme. Therefore, there must be an authorization for the roll-out leaders to enter the data on the HR server.

If no nominations are received by the specified date, the issue to be raised by the roll-out leader to the regional head of the SBU/ Entity.

- Any changes in the scheduled programmes to be informed by the location roll-out I/c to the regional roll-out I/c so that the programmes can be rescheduled.

Process for Communication

The number one objective for the communication programme was to gain and sustain employee support for a quick and complete SAP implementation.

Communication Tools

- ENTRANS News: Periodic e-mail communication.
- Intranet: Intranet Magazine.
- Official company medium: *BPJ, Insight, and Madhyam*.

Process for Benefits Realization

The purpose was to identify the areas of business benefits for the post-SAP implementation at BPCL and the process changes required to achieve these benefits.

The team: The team comprised of a combination of members: Internal coach, business recipient, and senior ENTRANS.

The process included:

- Identifying the key process across BPCL and the performance impacted by R/3 and outline the performance measures (KPIs) for each of these.
- Consolidating the business benefit areas identified during the CDP phase.
- Outlining the benefits achievable in each of the above processes.
- One time benefit to BPCL on account of R/3.
- Benefits which can be tapped on a recurring basis using information available in R/3.

Contd.

- Quantifying the existing measure of performance of the process in respect of the KPI.
- Setting out the target levels for each of the KPIs and time frame for achieving the same.
- Quantifying the business benefits expected.
- Identifying the process changes required to enable recurring benefits.
- Getting a validation from the businesses on benefit areas, KPIs, and identification of a pilot project.
- Kicking-off the pilots, performance reporting, and monitoring.
- **Team processes** were carried out through Visionary Leadership and Planning Programmes (VLP). In this programme teams collectively explored their aspirations, purpose, and reality to co-create their shared vision and high leverage result areas, take up roles and accountability by choice to strategize and plan action steps for achieving their desired business results.
- **Business and process council meetings** were facilitated by coaches who were able to enhance the effectiveness of such meetings by raising awareness of the purpose of the meeting, structuring it with time lines, and making appropriate interventions.
- A programme on **performance coaching** was initiated to help leaders shift into the coaching style of leadership.

The training was done at four levels as described below:

- **A learning programme** called "The Foundations in Organization Learning" (FOL) was used to create awareness of the context and prepare the employees to **face** the challenges of the competitive scenario at an individual as well as at collective. The programme was meant to help people connect business goals with their personal aspirations, surface their mental models, and take responsibility of their own growth.

The LO tools were integrated with Indian philosophy to customize it to an Indian context. Regular meetings amongst the coaches were held to design and plan the required interventions where collective understanding was shared.

The biggest barrier faced in the training process was the shift in the mindset of the people who were used to a protective environment and had grown complacent to become market-driven and customer-focused.
