Chapter – 2

ORGANIZATIONAL SET-UP OF ONGC
2.1 ONGC: GENESIS AND GROWTH

ONGC (Oil & Natural Gas Corporation Ltd, formerly: Oil & Natural Gas Commission) was set up in 1956 soon after India got its independence in 1947, with the strategic objective to explore and exploit hydrocarbon resources of the country. Today ONGC is one of the leading oil companies of India, evolving as a fully integrated, upstream petroleum company. It is playing a prominent role in the area of oil exploration, development and production of crude oil, natural gas, and some value added products. But the principal business of organization is Petroleum. ONGC is exploring and producing oil & natural gas from acreages both onland and offshore in diverse logistic conditions, from rugged mountains to deserts and deep oceans.

Today, ONGC is poised to emerge as a complete energy company; and this is possible by its dedicated team of professionals who toil round the clock. It is this toil, which amply reflects in the performance figures and aspirations of ONGC. The company has adapted progressive policies in scientific planning, acquisition, utilization, training, and motivation of the team.

ONGC contributes around Rs. 10,000 crore to the nation’s oil pool account to subsidise the prices of kerosene, LPG and diesel and is India’s largest producer of crude oil, natural gas and LPG. It also produces other value-added petroleum products such as NGL, C2-C3, Aromatic Naphtha and kerosene.
ONGC has entered into a joint venture (JV) with Coal India Limited to undertake commercial exploitation of CBM (Coal Bed Methane) in the coalfields of Raniganj West, Jharia East, West Bokaro, Ramgarh and Karanpura. ONGC is endeavouring to become a world class Oil & Gas Company in pursuit of Exploration & production (E&P) business in the domestic and international arena. OVL (ONGC Videsh Limited, a wholly owned subsidiary of ONGC has a number of existing and upcoming interests in select oil patches across the world, including development of an offshore gas field discovery by it in Vietnam.

2.2 VISION AND MISSION

**Vision:** The vision of ONGC is to be a world class Oil & Gas Company integrated in energy business, with dominant Indian leadership and global presence.

**Mission:** ONGC has the following mission before it.

1. Dedicated to excellence by leveraging competitive advantages in R&D and technology with involved people.

2. Imbibe high standards of business ethics and organisational values.

3. Abiding commitment to health, safety and environment to enrich quality of community life.

4. Foster a culture of trust, openness and mutual concern to make working stimulating & challenging experience for our people.

5. Focus on domestic and international oil & gas exploration and production business opportunities.
5. Provide value linkages in other sectors of energy business,
6. Create growth opportunities and maximize shareholder value.
7. Retain dominant position in Indian Petroleum Sector and enhance India's energy availability.

2.3 WORK CENTRES & INFRASTRUCTURES

C&MD (Chairman & Managing Director) is the top most position in ONGC under the drive of CRC (Corporate Rejuvenation Campaign) (fig.-1). Prior to CRC, ONGC's board was comprised of Chairman, and the members like, Member (Exploration), Member (Drilling), Member (Technical), Member (Finance), Member (Operations), and Member (Personnel). Now the members of C&MD's board are constituted of Director (Offshore), Director (Onshore), Director (Exploration), Director (Human Resource), Director (Technical & Field Services), Director (Finance), and Director (Corporate Services), with Company secretary as nominated member of Ministry of Petroleum and Natural gas.

In the new assess based structures the entire major activities and regions are entrusted with EDs (Executive Directors) who are administering control over the specified functioning of Asset Managers. The whole gamut of ONGC is divided into the distinct structure in accordance with the organisational activities, and operations to ensure greater cohesion, communication, and knowledge transfer, maximising outputs with quality concepts.
These are based on a system for communication of information that enables those at the top to know what goes on at the bottom, at the sharp end with respect to the actual outcomes against expectations and objectives. The structures are presented in diagrammatic fashion as below.
2.4 TRANSFORMATION/ CORPORATE RESTRUCTURING SCENARIO

To comprehend the scenario of change in this fast changing environment, organizations as well as individuals are to join proactively in the game and then strive to extend their own spheres of influence for survival and sustained growth. This issue is of great
significance for India's Oil Sector, which has to provide oil security, and thereby economic strength & resilience, to the country. This sector has to be globally competitive for achieving its rightful place amidst the global oil industry. Under the existing business regime, transition to a competitive market environment calls for a radical change in the management culture & processes and the whole architecture of the organization encompassing delegation of powers, planning & decision making processes, executive accountability, and business paradigm.

In the restructuring scenario, the competitive strengths of such virtual enterprises, which are the cornerstones of the total corporate entity, are synergised across the internal organizational boundaries to strengthen the overall corporate culture. The emphasis is more on organizational process and empowerment of people with clear accountability than on hierarchical structure.

The hallmark of changing environment due to the impact of globalization has created challenges and opportunities in E&P (Exploration & Production) business. The challenges are in terms of more volatility of business environment and more competitions, and opportunities towards more advanced technology. NELP (New Exploration Licensing Policy) has to pose challenging edge to compete against other companies in obtaining oil blocks for exploration, market driven pricing mechanism, deep-sea exploration, and processes. For an enterprise it has to be a quantum leap in transformation from what it is today to a more responsive and innovative organization of tomorrow. And that ensures the extension of its sphere of influence with a
competitive strength in the market place. An intensive company-wide diagnostic survey conducted in ONGC in 1996-97 made certain revealing findings on its performance trend. With a distinctive track record of independently finding and opening up new basins such as Cambay, Assam, and Mumbai Offshore, the organization possesses certain fundamental skills and potentials to excel, including a good cost position, qualified & experienced Geoscientists & technologists, and access to high quality acreage in the country, and also overseas.

2.5 INTEGRATED R&D INSTITUTES OF ONGC

ONGC Institutes' Integrated services (OIIS) is the common platform for the nine premier ONGC institutes that offer R&D need and consultancy support in all areas of hydrocarbon sector. OIIS provides a single window service to ensure customers' satisfaction in terms of quality, reliability, cost effectiveness, and time consciousness. OIIS, which has developed a multi-dimensional expertise over the years, offers services that some of the best in the world in terms of quality, reliability, and cost-effectiveness.

ONGC, during the period 1962-1977, had only one Research & Training (R&T) centre supported by regional Laboratories at Vadodara and Sibsagar. This mother institute prepared the first ever sedimentary basin map and tectonic map of India, institutionalized integrated basin evaluation almost as pioneering approach internationally. That introduced two cycles of resource appraisal and exploration perspective and plans for the country. The optimism R&T generated in respect of offshore exploration led to the discovery of Bombay High
subsequent to the initial foray by ONGC in these shallow waters off the Gujarat coast under the company's initiative called 'Leap Frog'. The discovery of Bombay High was a watershed that provided innovation in expanding research so as to take it close to the operational assets confining some areas of work in some specialized centres.

The basic objectives of these R&D institutes are to meet its needs and provide consultancy services to private and multinational companies around the world in all the areas of exploration, drilling, production, etc. The purposes of R&D of ONGC are to help increase hydrocarbon reserves and production through understanding habitats of petroleum and managing costs for maximization of value and profitability. It aims at maintaining and augmenting success ratio per unit investment and maximizing field growth opportunities in proven prospects and upgradation of ultimate recovery of producing fields. Harnessing the leading state-of-the-art technologies, R&D in ONGC has intensified core competence areas for exploration, reservoir management, and production of hydrocarbons, including the aspects of safety and environment management. Training of manpower through advanced training agencies and also work in association with world leaders in petroleum technology are part of efforts on creation of functional excellence.

Managing change, quality of work life and organizational excellence are the focused areas for realizing the basic objectives effectively. Beyond the quality focus, in pursuit of excellence, many of these
institutes have been accredited with the prestigious ISO 9001, ISO—9002, ISO-14001, ISO—18001.

The company set up the following institutes, which Kuldeep Chandra (2001) called “Nava Durga”—the nine institutes with the defined objectives and mission

1. K. D. Malaviya Institute of Petroleum Exploration (KDMIPE), Dehradun--1962
2. Institute of Reservoir Studies (IRS), Ahmedabad--1978
3. Institute of Drilling Technology (IDT), Dehradun--1978
4. Institute of Oil & Gas Production Technology (IOGPT), Panvel-1984
5. Institute of Engineering & Ocean Technology (IEOT), Panvel--1983
6. Geophysical Data Processing & Interpretation Centre (GEOPIC), Dehradun--1987
7. Institute of Petroleum Safety Health & Environment Management (IPSHEM), Betul (Goa)--1989
8. Institute of Biotechnology and Geotectonic Studies (INBIGS), Jorhat (Assam)--1989
9. Institute of Management Development (IMD), Dehradun--1985

Besides these, there are attached RTIs (Regional Training Institutes) at regional centres—Mumbai, Chennai, Baroda. ONGC has been instrumental in the establishment of Data Studies Institute (DSI) with
Andhra University and the Centre for Petroleum Biotechnology (CBPT) with Tezpur University. It also operates a Wireline Research Centre (OSWRC) jointly with Schlumberger in New Delhi.

2.5.1 Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE)

Founded in 1962 at Dehradun, KDMIPE occupies today a unique place in the Indian petroleum sector as a nodal agency for hydrocarbon exploration activities in India.

The Vision & Mission:

KDMIPE is a symbol of the initiative of ONGC towards self-reliance in the field of oil and natural gas exploration, stands to foster the culture of excellence, and provides technological competitive edge. The institute's mission is to help conceptualize and initialize exploration efforts in virgin and inadequately explored areas and to contribute to enhancement of effectiveness of efforts towards petroleum exploration and energy security. There are three major functions of the institute—geosciences research, basin research and petroleum economics, and foreign appraisal.

Objectives of KDMIPE:

- to unravel the complexities of habitat of petroleum through synergic geoscientific research,
- to identify prospective zones and exploration plays,
- to evaluate hydrocarbon potential and to estimate ultimate resources of sedimentary basins,
to develop exploration models and to firm up and prioritize prospects for exploratory locations in various plays,

to generate operation activity priorities through long-term perspective planning and medium-term strategic planning and techno economics,

to absorb, improve and develop pre-drilling, while-drilling, post-drilling and post-discovery exploration technologies,

to generate area specific optimized data acquisition, processing and interpretation protocols,

to help harness alternate /non-conventional energy sources.

**Services from KDMIPE:**

KDMIPE offers its services broadly in the following areas:

1. Regional geological studies.
2. Integrated Basin evaluation including 3D genetic modeling.
3. Interpretation of remote sensing data including generation of satellite altimetry maps.
4. Modelling and designing of all geophysical prospecting techniques.
5. 2D and 3D seismic interpretation.
7. Geochemical classification and correlation of oil and formation fluids.
8. Absolute age dating
11. Petrophysical and reservoir characterization.
12. Paleogeographic reconstruction.

KDMIPE undertakes collaborative projects with universities and other institutes of Indian and abroad as a follow up of the national policy towards utilization of academia in the domain of dedicated research in various disciplines of earth sciences and applied research in petroleum exploration. The institute has strived to establish organization-wide E&P database network, i.e. EPINET (Exploration & Production Information Network). The future R&D thrust areas of KDMIPE for the tenth plan shall focus on meeting the challenges of the accredited exploration and development programmes of ONGC. The areas in which the major activities will revolve around are: Remote sensing, Geochemical prospecting, well logging, stratigraphic research, sedimentology, Palynology, Petroleum geochemistry, Basin evaluation and modeling, Energy research, Exploration economics, Non-conventional energy, Geodata base, and Instrumentation.
2.5.2 Institute of Reservoir Studies (IRS)

IRS was founded in Ahmedabad in 1978 for comprehensive evaluation of reservoir and preparation of an optimum strategy for exploration of the reservoir.

Objectives of IRS:

- To provide holistic reservoir description through integration of all data.
- To maximize the value of proven serves with conventional and improved oil recovery techniques.
- To enhance the skills and knowledge for better reservoir management.

Services from IRS:

IRS has distinguished for its capabilities in the fields of:

1. Reservoir evaluation & description—Core studies, PVT analysis, Tracer studies, Well test analysis, Log analysis and analysis of production & reservoir data.
2. Oil & gas field Development—Prospect evaluation, Reservoir modeling, and Techno economic appraisal.
3. Enhanced Oil Recovery—Water flooding, Chemical flooding, Miscible Gas processes, Thermal processes and Microbial EOR.

IRS has close interaction/collaboration with a number of scientific and industrial organizations within India and abroad. The Institute has state-of-the-art hardware/software for providing cost effective solutions to complex exploration and exploitation problems. As a part of international collaboration process, feasibility studies of High-pressure...
Air Injection (HPAI) for improved oil recovery is taken with University of Calgary, Canada, and Institut Francais du Petrole of France. As national collaborative projects are: NCL, Pune, and TERI, New Delhi. The thrust is being given for improvement in recovery of existing fields through identification of appropriate Improved Oil Recovery (IOR) and Enhance Oil Recovery (EOR) techniques.

2.5.3 Institute of Drilling Technology (IDT)

Founded in 1978 at Dehradun, IDT is engaged in relentless efforts in R&D in the areas of Oil & gas well drilling technology; IDT is engaged in providing advance technical knowledge through training and offering solutions to field problems. The focus of R&D is directed towards drilling technology, drilling fluid engineering, and cementation & cementing materials.

The Vision & Mission:

To provide services in an environmentally harmonious manner through continuous knowledge assimilation adaptation, up gradation, and development of technologies.

The institutes' mission is to become a leading global institute providing services for the E&P related drilling activities.

Objectives of IDT:

- To carry out R&D work pertaining to oil well drilling technology, drilling fluid cementation and cementing materials.
- To Design well programmes & providing on the spot technical back up and consultancy services for drilling
of high temperature, high-pressure deep wells in varied geological conditions.

➢ To design and application of drilling rig, associated equipment and manpower with complete technical back-up world wide on contract basis.

➢ To impart training to drilling personnel, hands-on training on simulator including specially devised on the rig well control school.

➢ To render specialized services for troubleshooting.

Services from IDT:

1. Applied research and Development in the areas of; drilling technology, Drilling fluid Engineering, Cement and cementing materials.

2. Human Resource Development

3. Operations monitoring

4. Technical back-ups and consultancy

Apart from R&D activities, IDT provides support to drilling operations through knowledge sharing and by providing feasible solutions to difficult technical problems encountered in the course of drilling wells. The institute's state-of-the-art specialized training node called Well Control School (1997) is at part with international standards and imparting training of world class. Institute's drilling services in overseas markets and contracts have been executed successfully in Bangladesh and Oman. The R&D thrust of IDT is directed towards drilling technologies that are relevant for successful and efficient drilling of
wells under varied sub-surface geological environment. IDT has also been assigned the task of upgradation of the onland drilling rigs in ER, WOBU and SR. This exercise will enhance the useful life of rigs and modernize them.

2.5.4 Institute of Oil & Gas Production Technology (IOGPT)
IOGPT was founded in 1984 at Panvel with the assistance of UNDP to provide a strong Research & Development base for oil and gas production. This is the first institute in the country to provide integrated R&D support to the entire spectrum of oil and gas production, which begins in the well bore and ends at the consumer point.

The Vision & Mission:
To play increasingly an important role in view of the advanced technological requirements of ageing oilfields, improved recovery processes and also production interest from frontier areas such as deep water and CBM.

The institute's mission is to provide reliable services through assimilation, upgradation and development of technology.

Objectives of IOGPT

➢ To ensure customer satisfaction by providing reliable, cost-effective and timely services.

➢ To develop scientifically oriented and technically competent professionals.

➢ To equip IOGPT with eco-friendly and state-of-the-art technology through acquisition, collaboration and in-house R&D
Services from IOGPT:

IOGPT has six major functional groups, and the capabilities in the areas are:

1. **Production Engineering**—well completion design, well stimulation and sand control, water shut off/conformance control, hydro impact, high energy gas fracturing, work over / trouble shooting with coil tubing.

2. **Process Engineering**—Basic engineering for new installations, Engineering packages for new process plants, Optimization & troubleshooting, Basic engineering for value addition, Pipeline design for multiphase/network transportation, Characterization of crude oil, Clay mineralogical analysis, Rheological properties of fluids.

3. **Corrosion Engineering**—Corrosion prediction & monitoring techniques, remedial measures of Internal & external corrosion, Design of corrosion inhibitor, Corrosion audit, onsite corrosion monitoring.

4. **Deepwater & Marginal Field Development**: Sub-sea architecture design, Flow assurance study, Development of offshore marginal fields, Evaluation of FPSO for deepwater/marginal fields.

5. **Artificial Lift**: Artificial lift design, Troubleshooting of lift systems, Sucker rod pumping, Combination lift,
Electrical submersible pumps, Probe testing of gas lift valves.


7. Training Services: IOGPT offers specialized training services in all the areas of oil & gas production. Processing and transportation for technologists and engineers.

As a part of its future plans, the institute envisages more interactive role in existing work areas and work with field teams for solutions already given and application of new technologies.

2.5.5 Institute of Engineering & Ocean Technology (IEOT)

The institute was founded in 1983 at Panvel as an applied research and development wing of ONGC. Today the institute is the nodal centre in ONGC for technology management in the areas of risk analysis and conceptual engineering, structural engineering and material & corrosion engineering.

The Vision and Mission:
The institute has set a vision to transform itself into a global centre of excellence in its four areas of core competence

Objectives of IEOT:

- Applied R&D in frontier areas of engineering and ocean technology.
Quality consultancy services to wider clientele in the fields of:

1. Risk assessment and HAZOP studies
2. Geotechnical engineering
3. Structural engineering
4. Materials and corrosion engineering

Services from IEOT:
1. Conceptual engineering for development of oil & gas fields
2. HAZOP Studies
3. Offshore, onshore and near shore soil investigations
4. Laboratory testing of soil samples
5. Estimation of jack-up-rig leg penetration
6. Analysis & design of offshore and near shore foundations
7. Structural analysis & design of offshore structures
8. Fatigue testing and analysis
9. Corrosion audit of pipelines and installations
10. Materials selections and failure investigations
11. Corrosion mitigation schemes
12. Cathodic protection system—design and review
13. Non-destructive examinations
14. Customized training in the above areas.

The institute has collaborations with premier research and academic institutions, like IIT, Mumbai, Roorkee University, BARC, Mumbai, Structural Engineering research Institute, Karaikudi and various other
reputed universities for carrying out in-depth study of different problems related to engineering in oil and gas industry. The institute has also entered into collaborations with NGI, Norway in the area of soil testing and foundation design.

2.5.6 Geophysical Data Processing & Interpretation Centre (GEOPIC)

GEOPIC at Dehradun was established in 1987 to cater to the specialized needs of seismic data processing and interpretation of ONGC. It is the largest computing facilities with dedicated state-of-the-art infrastructure and specialists in the fields of seismic data processing, geoscientific data interpretation, and software development. Land and marine seismic data of ONGC is processed and interpreted synergistically at this centre to unravel the structural and stratigraphic complexities of the subsurface. GEOPIC processes one of the finest capabilities in the world in the area of data evaluation, as is evident from its success rate of 54% for exploratory wells.

The Vision & Mission:

To become a global player in providing geoscientific solutions to E&P problems.

GEOPIC's mission is the computer aided exploration and reservoir description by integrating seismic with other geoscientific data.

Services from GEOPIC:

1. Seismic & Log data interpretation—Computer aided 3D data interpretation, interactive interpretation techniques
2. Seismic data processing—2D & 3D seismic data processing, customized re-processing, optimal utilization of resources and special processing.

3. Seismic software development—Dip & Azimuth Transformation Software (DATS), Post stack 3D cross line statics, 3D seismic survey design, Corporate serve estimation, vigilance Information system (VIS)

4. Business Development—Consultancy training in the field of seismic data processing and interpretation has been imparted to oil industry professionals from Iraq, Tanzania, Uganda, and Vietnam.

2.5.7 Institute of Petroleum Safety Health & Environment Management (IPSHEM)

The institute was established in 1989 in Margao, Goa

Objectives of IPSHEM:
The primary objective of the institute is to promote standards of safety, Health, and environment management in petroleum sector in India.

➢ To upgrade and develop human resources with a view to minimize the overall risk to human life, damage to property, process and environment.

➢ Applied Research and development

➢ Consultancy Services

➢ Advisory role in evolving standards and procedures

➢ Data bank and information services related to safety and environment management

Services from IPSHEM:
1. Training—Theoretical classroom training of safety, health and environment management

2. Practical skill building training programme on—
Offshore survival and safety, Coxswain/boat handling, Swimming, jumping into water, abandonment exercises, first aid. Basic fire fighting

3. Safety Consultancy—Safety audit, development of SMS and procedures, Development of DMPs/ERPs


IPSHEM has plans to develop the environment laboratory to take up R&D projects to solve problems, in addition to providing back up to field projects. The institute has planned for augmenting its practical training facilities in the areas like, Helicopter underwater escape training, advanced fire fighting, academic course in safety and environment affiliated to Goa University.

2.5.8 Institute of Biotechnology and Geotectonic Studies (INBIGS)

INBIGS was founded in 1989 at Jorhat, Assam. The northeast and Assam region, in particular, is a pioneer in crude oil production and has a number of oil fields throughout the region. Being rich in flora and fauna, the region was selected to locate INBIGS of marked tectonic movements.
Petroleum biotechnology plays a vital role in geomicrobial prospecting, enhancing oil recovery from reservoir and environmental protection by bioremediation techniques.

Objectives of INBIGS:
The main objectives of INBIGS are:

➢ To take up innovative research in the frontier areas of petroleum biotechnology and geotectonics through talented, dedicated and highly motivated team of bioscientists.
➢ To provide support to industries involved in hydrocarbon exploration, exploitation and other related activities.
➢ To upgrade /elevate existing technical know-how and state-of-the-art status in the field of petroleum biotechnology.

Services from INBIGS:
INBIGS offers following services:

1. Microbial EOR
2. Geomicrobial hydrocarbon prospecting
3. Bioremediation of oil spilled soil and oily waste
4. Screening of wellhead samples for presence of SRB/GAB.

To its credit, bioremediation of effluent pits of Borholla and Koraghat fields of DVP, ER, and bioremediation of oil spilled soil of cluster, I, II, III of Borholla of Koraghat oil field DVP were done successfully.
2.5.9 Institute of Management Development (IMD)

Founded in 1985 at Dehradun, the institute emerged out of a SWOT (Strength, weakness, opportunity, and threats) analysis by the organization in 1982. IMD is an interface and stimulant between ONGC and its work force to enhance their professional and managerial skills.

Objectives of IMD:

IMD’s primary objective is to be a global player by realizing the full potential of ONGC's human resources to meet the challenges in the upstream sector and it is committed to achieve global excellence in meeting managerial and technical needs of customers in upstream oil industry by:

- Continuously upgrading training programmes to suit the requirement of the emerging skills and technologies internationally
- Effectively implementing and maintaining ISO-9001 Quality management system
- To identify the gap between the current technological know-how and those emerging internationally in order to bridge the same by developing appropriate training modules
- To periodically evaluate the resource base of IMD to meet the provisions of the strategic Business objectives of the parent company
➢ To promote quality awareness, develop quality in practices and include creative and innovative thinking.

IMD organizes different types of management training program for middle level and senior executives, in association with the leading management institutes of India. Foreign nationals of Uganda, Vietnam, Yemen, Philippines, Sri Lanka, Iraq, Tanzania, Malaysia, and Nigeria have also availed training facilities of IMD.

2.6 PROJECTS/ PLANTS/ WORK CENTRES

ONGC’s network of working and activities are spread over the various projects, plants and work centers in the respective regions.

Projects:

MR: -- Neelam Pilot Project, Mumbai

CR: -- West Bengal Project, Kolkata
     -- Tripura Project, Agartala

ER: -- Dhansiri Valley Project, Jorhat
     -- Cachar Project, Silchar

SR: -- Cauvery Project, Karaikal
     -- Krishna Godavari Project, Rajahmundry

WR: -- Ahmedabad Project, Ahmedabad
     -- Ankleshwar Projects, Ankleswar
     -- Mehsana Project, Mehsana
     -- Cambay Project, Cambay
     -- Jodhpur Project, Jodhpur

Plants

-- Uran Plant, Uran Mumbai Region
-- Hazira Plant, Surat, Mumbai Region
Regional Work Centres:

1. Delhi
2. HQ, Dehradun (Uttaranchal)
3. MR (Mumbai Region), Vashudhara Bhavan, Mumbai (Maharashtra), Hazira (Surat)
4. CR (Central region), Kolkata (West Bengal), Silchar (Agartala)
5. ER (eastern Region), Nazira, Jorhat (Assam)
6. NR (Northern Region), Jammu (J&K)
7. SR (Southern Region), Chennai (Tamilnadu), Rajahmundry (AP)
8. WR (Western Region), Baroda, Mehsana, Cambay, Ankleswar (Gujarat), Jodhpur (Rajastan)

2.7 INFORMATION RESOURCE POTENTIALS OF ONGC

"Knowledge management is not ONGC's business but ONGC is in Knowledge industry", is an established phrase known among ONGC work culture. Information is the key input to the modern E&P business in the present era of competitive open market economy. Appreciating this, ONGC has leadingly taken several initiatives to ride over Information Technology cultures. The on-going IT projects are: IMMS (Integrated Material Management system); UFSO (Up gradation of Financial system of Organization); SHRAMIK (System of Human Resource Automated Management information by Kaizen); EPINET (Exploration & Production Information Network), and ICNET (Integrated Communication Network). INFOCOM (Information Communication) centres are now established at different work centres with its long terms and knowledge business objectives.
2.7.1 Library & Information Centres as Information Pool

Libraries of ONGC play an important role in knowledge transfer on the latest know-hows, technological advancements and global oil scenarios, and other up-coming challenges of E&P business. The resources of Libraries & information centres of ONGC are of paramount nature specialized in its collections and facilities needed to meet the information needs of scientists and engineers in their varied degree of business activities, industry operations, and R&D thrusts.

The development of libraries, particularly in R&D institutes started along with the foundation of institutes themselves. Most of the work plans, programmes of work, pilot projects, R&D future projections, New thrust areas of concerns, Alternate Energy options, and safety & environment programmes are based on new knowledge order and information support. These are possible through the various primary and secondary sources of information available with the libraries.

Libraries of different projects/ Plants, and work centres started with gradual pace as per the demands of the working scientists and engineers to fulfill their information needs in consonance with the activities of projects/plants. Thus the libraries of ONGC act as information pool for effective decision making processes and knowledge enrichment of entire organization. These libraries are in readiness to bridge the gap between the point of information generation and the end users.

The followings are the ONGC libraries scattered all over the regions and functioning under the control of Assets/ Work centres/ Projects/ plants and institutes.
1. **KDMIPE Library (Dehradun)**

This is the central Library of ONGC (HQ) and known to be the biggest among all the libraries, with huge collection of about 60,000 books and bound journals. The collection is comprised of mainly the core disciplines of Engineering, Computer sciences, Technology, Energy, Geology, Geophysics, Reservoir Engineering, Petroleum engineering, Petroleum economics, Oil exploration, Geochemistry, Management, Chemical technology, etc. The special collections include: the leading publications of technical/Scientifics societies/associations—American Associations of Petroleum geologists (AAPG), American Society of Testing and Materials (ASTM), American Petroleum Institute (API), Society of Exploration Geophysicists (SEG), Petroleum Extension Services, American Geological Institute (AGI), Society of Petroleum Engineers (SPE). The valuable collections also include the seminar/conference proceedings: SPE conference proceedings, World petroleum congress (WPC), International geological congress (IGC), Deep offshore technology conference (DOT), etc. Apart from these, there are good collections of Abstracting and indexing journals: Petroleum Abstracts, Offshore abstracts, Engineering index, AGI Index, Georef. The most costly data services being subscribed: Foreign Scouting Services Reports (FSSR) is also available. Library automation is in progress. Electronic database of Petroleum Abstracts, ONGC Bulletin-Image library, Georef index are also available on CD-ROM offline. On-line access is also available to the users. A large number of current periodicals on different core subjects, like Geology, Exploration,
Sedimentology, Geophysics, Petroleum engineering, Petroleum geology, Geochemistry, Electronics & telecommunications, Oil & gas, Management, etc. are subscribed:

The library caters the needs of all the employees of ONGC at Headquarters, Dehradun. However, it also provides library services and document delivery on demand to other libraries and work centers of ONGC. The working hours are from 9.30 to 17.30 and remains closed on Saturday and Sunday.

2. IDT Library (Dehradun)

The library is located at Dehradun and exclusively meant for specialized collection and knowledge base in the areas of Drilling technology and its sub facets. The collection ranges to 10,000 books and bound journals. The core collection concentrates on the subjects, like Drilling technology, Petroleum engineering, Drill bits, Drilling fluids, cementing, composite catalogue, offshore drilling, Drilling site structures, Management, and computers. The special collections are also on SPE drilling Publications, IADC Publications, Society publications—AAPG, ASTM, API, etc, Technical journals coverage is on: Drilling, exploration, Reservoir engineering, Petroleum singeing, Drilling bits, Oil & gas, Oil recovery, Oil economics, etc. Library automation is in its way.

The library has started switching over towards the collection of electronic formats. CD-ROM offline access of Petroleum Abstracts, API Standards, BIS standards, ASTM standards. The library's working hours
is 9.30 to 17.30 hrs. on 5 days pattern. The facilities are restricted to the employees posted at IDT only.

3. IMD Library (Dehradun)
The library is located in the campus of KDMIPE with exclusive collection on the discipline of management, administration, and training & development. The core collections are on: Human resource management, financial management, training, organizational development, and also having formal collection on – oil exploration, geology, geophysics, petroleum engineering, technology, geochemistry, computer science, etc.
The subscription is restricted to technical journals in Management and training only. The management trainees are the exclusive users of this library. The working hrs is 9.30 to 17.30.

4. Technical Business Library (Dehradun)
Library's exclusive collection is on engineering disciplines, like Mechanical, Electrical, Civil, Electronics & Telecommunication, Production, and Management. Some collections are available on Oil & Gas, Reservoir engineering, Geology, Exploration. Technical journals include the subject areas on: electronics, electrical engineering, Engineering advances, society publications—IEEE, SPE, Engineering index, SPWLA, etc. Electronics information sources are also available on CD-ROM—engineering index, Indian standards, OISD standards, and Conference proceedings on CD. The membership is restricted to Technical business groups and employees of Tel Bhavan campus. The working hrs is 9.30 to 17.30 hrs.
5. IRS Library (Ahmedabad)

The library is located at Ahmedabad, equipped with specialized collections on Reservoir engineering and its various related studies. The main collections are comprised of oil and gas, petroleum engineering, Reservoir studies, Oil recovery, production engineering, Cementing, Chemical technology, Computer technology, Reservoir management, and drilling engineering. The technical journals concentrate its subscription on: Oil & gas, reservoir engineering, oil recovery, petroleum engineering, chemical technology, reservoir fracturing, Formation evaluation, well over control, etc. specialized facilities available are – Microfiche collections, on-line access, SPE publications. Library automation is in its full swing, and having network linkage with INFLIBNET. Timings of the library are 9.30 to 17.30 hrs. The membership is extended to the employees of Ahmedabad project of ONGC, in addition to IRS.

6. Baroda Asset/Project Library (Baroda)

The library is located at Makarpura in Baroda. The collection is normally on the subjects like, Petroleum Engineering, Electrical engineering, mechanical engineering, Oil & gas, chemical technology, drilling & production. The subscription of technical journals concentrates on oil & gas, chemical engineering, processing, production management, process engineering, field development, drilling & exploration. The other specific collections are: Technical standards—API, ASTM, BIS, OISD. The membership is allowed to the employees of Baroda Asset/project. The timings are 9.00 to 17.00hrs.
7. Chennai Regional Library (SR-Chennai)
The library is the regional library of SR (southern region) situated in Egmore Bldg at Chennai with well equipped collection on petroleum engineering, oil & gas, geology, geophysics, oil exploration, reservoir engineering, chemical technology, oil & gas, electrical & electronic engineering. In addition to these, the library is equipped with electronic information sources with CD-ROM off-line access facilities, like API standards, ASTM standards and OISD standards. Library is partially automated and discharging the services of issue /return of books on computer itself. The library is open from 9 - 18 hrs. It provides membership to all the employees of SR project/work centers of Chennai region.

8. Rajahmundry Project Library (SR-Rajahmundry)
The library is located at Rajahmundry (A.P.) of southern region of ONGC. Since, the library is in its initial phase of development with the concentration of core collections on Technical literature, Engineering, Oil & gas, technical standards (CD-ROM) version—API, and ASTM. The reference books are also available. Technical journals are very few in number. The library is in pilot stage of automation with the platform of campus LAN. Membership is restricted to Rajahmundry project/Asset. The timings are 9.30 to 17.30 hrs.

9. IOGPT Library (MR-Panvel)
The library is located in the institute at Panvel and well equipped with excellent collection on operations, production engineering, chemical engineering, drilling, technology, offshore engineering, Oil & natural
gas, electronics and telecommunication, management and computer science. The technical journals are regularly subscribed on almost all the related aspect of oil production and operations. These are on: Oil & gas, Production technology, offshore engineering, chemical technology, corrosion engineering, pipeline etc. The electronics information sources are mostly on CD-ROM version of technical standards—API, BIS, ASTM, OISD, etc. The library is in active charge of computerization. The issue and return is done by computer itself. The membership is restricted to the scientists and engineers of IOGPT only. The library is open from 9.30 to 17.30 hrs. This library is known to be the active pool of technical information sources, particularly rich in the areas of operations and production of oil and gas.

10. **IEOT Library (MR-Panel)**

Located in the same campus of IOGPT, the library is having good collection on ocean technology, offshore engineering, petroleum technology, corrosion engineering, underwater technology, rig flotation, offshore drilling, oil and natural transportation, pipeline, etc. Electronic formats are the off-line CD-ROM version of technical standards. The library automation is in process, which has been taken in phase manner. The timings of the library are from 9.30 to 17.30 hrs. The users are those who are posted at IEOT only.

11. **RTI Library (MR-Panvel)**

RTI library is adjacent to the IOGPT. The core collection of this library is on Management, training, human resource development, financial management, drilling rigs, exploration & production, engineering,
computer science, and general readings, etc. Journals are very few on management, training, petroleum, natural gas, Human resources, etc. The members are the temporary basis for the specialized trainees and faculties of ONGC posted at MR region. The library is open from 9.30 to 17 hrs.

12. **Mumbai Regional Library (MR-Vasudhara Bhavan)**
This library is known as regional library of Mumbai region located Vashudhara Bhavan corporate building at Bandra. Equipped with all core collections of literature on Petroleum engineering, production engineering, chemical engineering, electronics and electrical engineering, corrosion, pipeline, Oil and natural gas, oil exploration, drilling, reservoir engineering, Management and computer science. Electronic resource collections are adequately maintained in this library particularly the CD version of Petroleum abstracts, technical standards. Internet services are available to the employees of Vasudhara Bhavan. Library automation is in momentum. The issue and return tasks are done in computerized way. Members of the regional library are covered widely from offshore rigs/platforms, Mumbai asset, in addition to the other institutes/projects of Mumbai region. The library is open during the working hrs on all working days.

13. **Exploration Business Library, Sion (MR-Mumbai)**
Now known as WOBS (Western Offshore Basin Studies) and located in the Priyadarshini building at Sion, Mumbai, this library caters the needs of exploration information and literatures. The core collection include on the subjects: Exploration business, oil & natural findings, Offshore field development, Basin studies, Geology, geophysics, well logging,
Offshore exploration, R&D of oil & gas, Geochemistry, management and computer science. The technical and scientific journals are in the areas of: Basin studies, exploration, sedimentology, geophysics, reservoir engineering, petroleum geology, etc. Library is advancing towards computerization, which is at threshold. The timings of library are 9.00 to 17.00 hrs. The members are allowed to access the facilities posted at Mumbai region in exploration business with Regional geological Laboratory (RGL) and Regional chemical Laboratory (RCL).


This library is specially concentrating on developing the collection in the area of Engineering and Construction (E&C) of offshore platform, geotechnical engineering, civil engineering, construction & maintenance, Electrical and electronics engineering, corrosion engineering, pipeline, etc. Technical journals are also subscribed on these areas of engineering activities and operations. Electronic information collection are exclusively on specifications and technical standards—API, BIS, ASTM, IP, ISO, AANSI, IEC, etc. The library is open from 9.30 to 17.30 hrs and allows accessing the employees of ONGC placed at Maker tower building in Mumbai and others linked with offshore duties.

15. **Technical Library, Uran Plant ( MR-Mumbai )**

This library is located at Uran Township quite far from the main city of Mumbai. The Plant is inevitably established near the seashore to receive oil and gas from Mumbai High field off the costal areas of Arabian Sea. The library's collection is basically on Chemical
engineering, plant engineering, process engineering, Production engineering, Waste water treatment, effluent treatment, Loss control, pipeline engineering, corrosion control, Crude oil processing, LPG, Naphtha, Management, etc. Technical Journals are also subscribed in the line of demands of engineers necessary for plant and processing of crude oil and gas. Electronic information formats are also available in this library. Mostly the technical standards on CD-ROM—API, ASTM, BIS, OISD are referred to by engineering disciplines and also by scientists. Apart from this, the library is connected with IMMS, ICNET of ONGC. Internet services through LAN /intranet are available. Library services are from 9 to 18 hrs and allow to the employees of Uran plant only. Here the employees are attending the duties in Shift pattern.

16. Regional Library—(ER-Nazira)
The library is equipped with technical collections on various aspects of technology & engineering: production engineering, chemical engineering, geosciences—geology, geophysics, geochemistry, exploration, R&D etc. Journals are also subscribed on these topics to enable the engineers and scientists aware in the area of oil and natural gas exploration and production, drilling, and reservoir engineering. The library is extensively used by the technical officers of ER of ONGC at Nazira and Jorhat. Library has also developed collections on electronic formats. The library's working is 9.30 to 17.30 hrs.

17. Bengal Asset/Project Library (CR—Kolkata)
The library is located at RCC complex Kolkata. The collection is very static on key subjects of business of ONGC—Geology, geophysics,
production engineering, drilling, computer science, oil & gas, etc. Books and journals are procured on the basis of occasional demands by the engineers and scientists working at Kolkata establishments. Library is accessed and opened when needed by the users.

18. IPSHEM Library (MR—Goa)

Located at Madgaon in Goa, the library is well established with exclusive collections on Safety, environment, health, Pollution control, Loss prevention, Waste treatment, Fires and safety control, safety auditing, training and management. Some formal collections are also on oil and gas, drilling, reservoir engineering which has got relevance with the core activities of the institute. Journals are subscribed on Safety, health, environment, chemical hazards, fire engineering, etc.

Library working hrs is normal and allow to the trainees and employees of IPSHEM. Library automation is in progress.

19. GEOPIC Library (HQ—Dehradun)

The library is located in GEOPIC building of KDMIPE campus at Dehradun. The collection is purely on data processing, interpretation, and programming. Geological and geophysical data processing are done at great extent. The computer scientists, geophysicists are the users of this library. The collections are on these areas with non-conventional storage, like huge magnetic tapes, spools, etc. Few journals on electronic and communication, computer engineering, data processing, and network are subscribed. Officers of GEOPIC are also open to access other libraries of headquarter. The Library is open
round the clock as the Geopic centers work in shifts and managed by the technical officers themselves.

20. INBIRS Library (ER-- Jorhat)

INBIRS library is very recent in its development and has acquired little collection on Geology, geotectonics, Biotechnology, oil & gas, and geotechnical engineering. Journal are very few in number, as demanded by technical officers, the books and journals are procured on occasional basis.

In addition to the above libraries, there are number of departmental and unit libraries, project libraries, and divisional libraries. With limited collections to meet the requirement of specific needs of local nature. These libraries are at Mehsana (WR), Ankleswar (WR), Delhi Corporate Office, Jodhpur project (WR), Hazira Project (WR), RTI libraries of the regions, and the libraries of regional Laboratories.

2.7.2 Information generation in ONGC

Information is generated due to various hazards of human behaviours and socio-economic actions in almost all the spheres of activities—be it common community or scientific & industrial inter-operability. In the mega organization like, ONGC, information generation is definite and pre-determined in the given framework, at various junctures of operations, processes and R&D activities carried all over the organization.

In Oil Exploration business, Basin analysis and studies are the vital area where the large amount of data are generated and correlated with acreages and reserve estimates for finding oil & gas. Geophysical surveys, field survey, exploratory drilling and production of oil and
natural gas are regularly generating handful of data and information for computing the performance status of the projects / Assets in oil and gas production tasks. All the projects/plants of ONGC invariably bring out internal reports, performance appraisal, and monthly & quarterly progress reports by documenting the in-flow of data interpretation being processed at various centres of ONGC. GEOPIC is only such centre in Asian region, which is engaged round the clock in this business at large. These specific and classified data and information are monitored and validated under the control of technical group of scientists and engineers of concerned Assets/ regions. The data generated intermittently within the organization are finally used and vehemently recycled for further use by the engineers and scientists for their up coming projects and assignments they await. Deep sea drilling is another challenge where reservoir information and exploration become very urgent to strike oil & gas at great depth of meterage. The joint ventures (JVs) are another challenged area where ONGC is looking for organizational development and sustainable scenario. The prospects of oil findings and production abroad are going well with new projects and also as consultancy services, tend to involve huge data and information of its own nature to soar exchequer to the economy of the country.

2.7.3 IT and Information Consolidation Efficiency (ICE)
The ICE project—a burgeoning approach of organization towards information consolidation that would ensure seamless cross-functional integration of all IT applications in ONGC, has been taken into its shape of working. The integrational drive of IT and its interface
related matters among the applications with the communication network, the teething difficulties are obvious to face. With a view to overcome the problems of integration of enterprise-wide IT applications, it was envisaged to create a single application platform as a project. The project of such integration is called as Information Consolidation Efficiency (ICE). The results of integration would focus on:

- Elimination of redundant data
- Total focus on business processes
- Single point of data entry—visibility across the enterprise
- Easier business consolidation
- Better managerial control
- Minimisation of interfaces
- Faster adaptation to technology solutions
- Faster reaction to changing structures

SAP has been considered as preferred platform for project ICE. The major ongoing applications—UFSO and SHRAMIK are already on the SAP platform. The solution architecture of SAP taken into account the expectations of the business users in terms of meeting the transactional needs, enabling tactical and strategic decision-making based on online information. The key benefits of ICE projects envisaged are: (Project ICE, ONGC, 2001).

- Better Decision Support
- Better Operation Support Control
- Efficient Cost Control
- Enable Internal Performance Measurements
- Improved responsiveness to changing market/global conditions
- Enable Transformation (alignment to new organization structure, and leveraging new technology)

However, to derive the full benefits of comprehensive IT integration, it was felt that the material management function need be automated, and must also be integrated into SAP platform for seamless cross functional integration.

2.7.4 Manpower strength and Information flow

ONGC has a unique distinction of being a Company with in-house service capabilities in all the activity areas of exploration and production of oil & gas and related oil field services. ONGC’s entire manpower strength is 39956 (http://www.ongcreports.net, 2003). There are 23,798 (table-1) technical & non-technical experience and competent executives (fig.-6). Out of these, 20305 (fig.-7) are mostly the scientists and engineers that include: geologists, geophysicists, geochemists, drilling engineers, reservoir engineers, petroleum engineers, production engineers, E&T service providers, financial and human resource experts and IT professional (table-2 to 5).

Table—1: Region wise strength of Executives (E-0 to E-9) (Technical & Non-Technical)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Region</th>
<th>E9</th>
<th>E8</th>
<th>E7</th>
<th>E6</th>
<th>E5</th>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>E1</th>
<th>E0</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>WR</td>
<td>-</td>
<td>5</td>
<td>32</td>
<td>116</td>
<td>369</td>
<td>1417</td>
<td>1327</td>
<td>918</td>
<td>1073</td>
<td>1559</td>
<td>6816</td>
</tr>
<tr>
<td>2.</td>
<td>ER</td>
<td>1</td>
<td>1</td>
<td>14</td>
<td>39</td>
<td>140</td>
<td>716</td>
<td>826</td>
<td>827</td>
<td>924</td>
<td>1634</td>
<td>5122</td>
</tr>
<tr>
<td>3.</td>
<td>CR</td>
<td>-</td>
<td>5</td>
<td>10</td>
<td>33</td>
<td>206</td>
<td>177</td>
<td>145</td>
<td>168</td>
<td>312</td>
<td>1056</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>NR</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>16</td>
<td>57</td>
<td>31</td>
<td>41</td>
<td>16</td>
<td>17</td>
<td>182</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>MR</td>
<td>4</td>
<td>12</td>
<td>58</td>
<td>181</td>
<td>469</td>
<td>1525</td>
<td>1372</td>
<td>835</td>
<td>736</td>
<td>720</td>
<td>5912</td>
</tr>
<tr>
<td>6.</td>
<td>SR</td>
<td>-</td>
<td>2</td>
<td>12</td>
<td>50</td>
<td>142</td>
<td>702</td>
<td>435</td>
<td>303</td>
<td>348</td>
<td>259</td>
<td>2253</td>
</tr>
<tr>
<td>7.</td>
<td>HQ</td>
<td>1</td>
<td>3</td>
<td>34</td>
<td>68</td>
<td>169</td>
<td>551</td>
<td>293</td>
<td>189</td>
<td>204</td>
<td>321</td>
<td>1823</td>
</tr>
<tr>
<td>8.</td>
<td>Others</td>
<td>2</td>
<td>3</td>
<td>16</td>
<td>29</td>
<td>77</td>
<td>258</td>
<td>84</td>
<td>50</td>
<td>53</td>
<td>62</td>
<td>634</td>
</tr>
<tr>
<td>Level Total</td>
<td>8</td>
<td>26</td>
<td>172</td>
<td>486</td>
<td>1415</td>
<td>5432</td>
<td>4545</td>
<td>3308</td>
<td>3522</td>
<td>4884</td>
<td>23798</td>
<td></td>
</tr>
</tbody>
</table>
Fig.- 6: **Strength of Executives of ONGC**

![Bar chart showing the strength of Executives of ONGC across different levels.]

Fig.- 7: **Strength of Engineers & Scientists**

![Bar chart showing the strength of Engineers and Scientists across different levels.]

Levels of Executives

Levels of Executives

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**Table-2: Discipline & Level-wise strength of Engineers (E-0 to E-9)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Disciplines</th>
<th>Levels of Engineers</th>
<th>No. of Engineers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Production Engg.</td>
<td>E-0 691 E-1 777 E-2 1166 E-3 734 E-4 248 E-5 84 E-6 23 E-7 4 E-8 0</td>
<td>4692</td>
</tr>
<tr>
<td>2.</td>
<td>Drilling Engg</td>
<td>E-0 776 E-1 232 E-2 750 E-3 419 E-4 123 E-5 25 E-6 18 E-7 1</td>
<td>3207</td>
</tr>
<tr>
<td>3.</td>
<td>Mechanical Engg.</td>
<td>E-0 299 E-1 448 E-2 530 E-3 418 E-4 123 E-5 35 E-6 20</td>
<td>2603</td>
</tr>
<tr>
<td>4.</td>
<td>Electrical Engg.</td>
<td>E-0 301 E-1 261 E-2 287 E-3 302 E-4 400 E-5 84 E-6 20 E-7 2</td>
<td>1658</td>
</tr>
<tr>
<td>5.</td>
<td>Material Management</td>
<td>E-0 266 E-1 46 E-2 82 E-3 119 E-4 223 E-5 19 E-6 18 E-7 6</td>
<td>780</td>
</tr>
<tr>
<td>6.</td>
<td>Elx &amp; Telecommunication</td>
<td>E-0 31 E-1 97 E-2 63 E-3 160 E-4 232 E-5 71 E-6 24 E-7 5</td>
<td>683</td>
</tr>
<tr>
<td>7.</td>
<td>Civil Engineering</td>
<td>E-0 12 E-1 52 E-2 57 E-3 194 E-4 181 E-5 45 E-6 8 E-7 6</td>
<td>555</td>
</tr>
<tr>
<td>8.</td>
<td>Auto</td>
<td>E-0 189 E-1 93 E-2 110 E-3 67 E-4 0 E-5 0 E-6 0 E-7 0</td>
<td>459</td>
</tr>
<tr>
<td>9.</td>
<td>Instrumentation</td>
<td>E-0 47 E-1 66 E-2 63 E-3 83 E-4 66 E-5 17 E-6 3 E-7 2</td>
<td>347</td>
</tr>
<tr>
<td>10.</td>
<td>Transport</td>
<td>E-0 61 E-1 22 E-2 33 E-3 81 E-4 70 E-5 20 E-6 14 E-7 5</td>
<td>306</td>
</tr>
<tr>
<td>11.</td>
<td>Marine Engineering</td>
<td>E-0 96 E-1 14 E-2 108 E-3 4 E-4 2 E-5 2 E-6 0 E-7 0</td>
<td>226</td>
</tr>
<tr>
<td>12.</td>
<td>C&amp;M</td>
<td>E-0 1 E-1 24 E-2 5 E-3 59 E-4 70 E-5 24 E-6 14 E-7 2</td>
<td>199</td>
</tr>
<tr>
<td>13.</td>
<td>Cementing</td>
<td>E-0 6 E-1 24 E-2 62 E-3 70 E-4 35 E-5 9 E-6 1 E-7 0</td>
<td>207</td>
</tr>
<tr>
<td>14.</td>
<td>Computer programming</td>
<td>E-0 1 E-1 60 E-2 24 E-3 17 E-4 66 E-5 12 E-6 7 E-7 3</td>
<td>190</td>
</tr>
<tr>
<td>15.</td>
<td>Mathematics</td>
<td>E-0 0 E-1 0 E-2 4 E-3 1 E-4 7 E-5 7 E-6 2 E-7 1</td>
<td>22</td>
</tr>
<tr>
<td>16.</td>
<td>Short Hole Drilling</td>
<td>E-0 0 E-1 1 E-2 7 E-3 5 E-4 1 E-5 7 E-6 2 E-7 1</td>
<td>14</td>
</tr>
<tr>
<td>17.</td>
<td>Marketing</td>
<td>E-0 0 E-1 0 E-2 0 E-3 0 E-4 0 E-5 0 E-6 0 E-7 0</td>
<td>8</td>
</tr>
<tr>
<td>18.</td>
<td>General Management (EBG)</td>
<td>E-0 0 E-1 0 E-2 0 E-3 0 E-4 0 E-5 0 E-6 0 E-7 0</td>
<td>10</td>
</tr>
<tr>
<td>19.</td>
<td>General Management (Coordination)</td>
<td>E-0 0 E-1 0 E-2 0 E-3 0 E-4 0 E-5 0 E-6 0 E-7 2</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>E-0 3568 E-1 2526 E-2 2362 E-3 3609 E-4 2931 E-5 804 E-6 255 E-7 99 E-8 14 E-9 7</td>
<td>16175</td>
</tr>
</tbody>
</table>

**Table –3: Discipline & Level-wise strength of Scientists (E-0 to E-9)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Disciplines</th>
<th>Level of Scientists</th>
<th>No. of Scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Geology</td>
<td>E-0 51 E-1 57 E-2 85 E-3 202 E-4 499 E-5 117 E-6 45 E-7 18 E-8 0</td>
<td>1074</td>
</tr>
<tr>
<td>2.</td>
<td>Geophysics</td>
<td>E-0 4 E-1 28 E-2 135 E-3 141 E-4 789 E-5 179 E-6 65 E-7 19 E-8 1</td>
<td>1361</td>
</tr>
<tr>
<td>3.</td>
<td>Chemistry</td>
<td>E-0 84 E-1 43 E-2 115 E-3 169 E-4 555 E-5 126 E-6 35 E-7 6 E-8 0</td>
<td>1133</td>
</tr>
<tr>
<td>4.</td>
<td>Reservoir Engineering</td>
<td>E-0 9 E-1 48 E-2 29 E-3 46 E-4 180 E-5 57 E-6 21 E-7 6 E-8 1</td>
<td>397</td>
</tr>
<tr>
<td>5.</td>
<td>Surveying</td>
<td>E-0 87 E-1 18 E-2 31 E-3 16 E-4 10 E-5 0 E-6 0 E-7 0 E-8 0</td>
<td>162</td>
</tr>
<tr>
<td>6.</td>
<td>General Management (EBG)</td>
<td>E-0 0 E-1 0 E-2 0 E-3 0 E-4 0 E-5 0 E-6 0 E-7 2 E-8 0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>E-0 235 E-1 194 E-2 395 E-3 574 E-4 203 E-5 479 E-6 166 E-7 49 E-8 5 E-9 0</td>
<td>4130</td>
</tr>
</tbody>
</table>
Table—4: **Age-wise & Level wise strength of Scientists**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Age Groups (in years)</th>
<th>Level of Scientists</th>
<th>No. of scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>E-0</td>
<td>E-1</td>
</tr>
<tr>
<td>1.</td>
<td>25—30</td>
<td>106</td>
<td>174</td>
</tr>
<tr>
<td>2.</td>
<td>31—40</td>
<td>112</td>
<td>17</td>
</tr>
<tr>
<td>3.</td>
<td>41—50</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>51—60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>235</td>
<td>194</td>
</tr>
</tbody>
</table>

Table—5: **Age-wise and Level wise strength of Engineers**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Age Groups (in years)</th>
<th>Level of Engineers</th>
<th>No. of Engineers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>E-0</td>
<td>E-1</td>
</tr>
<tr>
<td>1.</td>
<td>25—30</td>
<td>1352</td>
<td>1128</td>
</tr>
<tr>
<td>2.</td>
<td>31—40</td>
<td>1238</td>
<td>817</td>
</tr>
<tr>
<td>3.</td>
<td>41—50</td>
<td>927</td>
<td>434</td>
</tr>
<tr>
<td>4.</td>
<td>51—60</td>
<td>51</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>3568</td>
<td>2526</td>
</tr>
</tbody>
</table>

As observed by the researcher in his paper, the transitional trend in the organization from low technology to high technology is always a feature, but the technology found in information services is seldom an integrated part of such development. The management at apex is becoming more and more dependent on advice of experts, consultants and outsourced resources and the need for information directly geared towards problems solving, while traditional services are seldom capable to meet such needs (Das, 2000). The cohesion of awareness of three basic forms is pre-requisite: Information, technology, and needs. The *awareness of information* gives vision; the *awareness of technology* adds power; and *awareness of needs* inherit insights among the end users.
In the drive of CRC, the corporate executives ranging from E-6 to E-9 level have the strength of 692 (table-1), which falls under the category of 'top level management'. The middle level management (E-3 to E-5) has the strength of 11,392 (table-1), and the remaining forms the part of lower management / operative levels. The formal and informal information transfer patterns are the two way of information flow ranging from top level of management to the middle management. The communication patterns are generally followed the organization's hierarchy. Most communication and information flow are lateral and downward; upward communication is crucial due to point of increased absorption for decision-making.

The information flow is explicitly visualized at all levels of management moving along the nodal points of transactions, that is MSGs (Management services Groups, and TSGs (Technical services Groups) attached with all the key offices of the top level management, Asset managers, and regional heads. The top management is known to be as the planner, decision makers, strategists, technologists, policy makers, and reformers of socio-economic throughputs in the organization, and in general, nation at large. The information in-takes and generation both are at crucial stage at the level, that navigates the entire organization to rise, if not cautious, may lead to disaster. The important and key information percolates down to the middle levels of management for its execution through the various segments of working units processing plants/ projects, and establishments. The operative levels are responsible for absorption and implementation of decisions.
for the ultimate net effects. Thus, the drive of the information flow mechanism is almost intangible, which estimates the high absorption and generation at top level of managers, and this trend of absorption of information tends to be gradually low while reaching to operative level. Here, information or decision conveyed has taken granted for its effective use and implementation for the purpose it is deliberated, without any sort of distortion.

With the restructured demand of the present age, the organization is in the way to facilitate the information transfer processes as well as production process and their intertwined cohesiveness. In multi-operational oriented organization learning culture, the information system has to synthesize, package, and disseminate information to various levels of management, to provide internally produced and externally derived information in proximity.