

Innovative Changes for Progress of Indian Railways in the 21st Century

Ravi S. Kochak

CEng, FIE(I), FIMechE (UK)
CRSE, Northern Railway,
Baroda House, New Delhi-110001
Email: kochak@vsnl.net

Anil K Sinha

B.Tech, M.Tech. IIT, Kanpur
Regional Change Manager Asia Pacific,
Cap Gemini Ernst & Young
Email: anil_sinha@yahoo.com

Summary

This paper suggests innovative changes for progress of Indian Railways in the 21st century. These cover different areas including modern business vision, market orientation, new technology and materials, development of alternate fuels, strategies for managerial competency, development of the individual and the organization and managing for the future. Implementation of the suggestions will drive the revenues, cut costs and improve the operating ratio of IR.

1.0 Introduction:

Indian Railways is one of the largest government employers in the world. The challenges facing it are an increasing financial burden through salaries and pensions, which constitute about 55% of the total expenditure, a declining market share in freight traffic and an operating ratio which will soon make the functioning of the organization financially unviable. The image of the Indian Railways is low, with tardy bureaucratic delays, lack of cleanliness in public areas and trains, and a poor safety record in transportation. Governments the world over are downsizing to reduce expenditure on staff salary, as this money comes primarily from the tax payer, and it is better utilized in social and welfare measures, but IR continues to have a large workforce.

Innovations are new and improved products and processes, new organizational forms, the application of existing technologies to new fields, the discovery of new resources, and the opening of new markets. This paper suggests some innovative changes in the framework of technology, management and organizational aspects, for the progress of Indian Railways in the 21st century.

2.0 Technological Strategy:

IR is now 150 years old. There is an urgent need to have a re-look at corporate strategies in the wake of new emerging technologies. There is impending stiff competition from roadways, which shall ensue following the implementation of the 4-6 laning of the 1400 km route of the National Highways, which is growing at the rate of 11 km per day. We are already witnessing monster trucks of 58 tonne capacity plying on trunk routes and we need to address strategy issues urgently, if IR is to survive as a viable organization, without bleeding the exchequer. We need to realign our strategy with technologies that are leading edge, sustainable, friendly to the environment, energy efficient, provide next generation solutions and help accomplish national, strategic and security-related objectives. Let us engage an independent expert consultancy firm as a partner for a comprehensive review and re-formulation of our technology strategy for the new millennium. The recommendations must

be faithfully implemented even if they are hard-hitting. Innovative measures are seldom painless.

3.0 Information Technology:

The continuing revolution in the field of information and communication technology has had a profound impact on the manner and speed with which information becomes available. Knowledge has become a source of economic might and power. The Information Technology Act adopted in India came into effect from 17th Oct 2000. Information systems and knowledge are essential for creating a competitive organization and providing useful services to customers. IR must quicken the pace of its change-over to a digitalⁱ organization and use information technology and networking extensively to conduct its entire interface electronically with the government, businesses, customers and employees. This will help in improved performance. Information will be readily available to support decision-making. This will also help in doing business electronically with suppliers and reduce costs. Use of IT results in elimination of several processes, which are otherwise necessary. Information is instantly available throughout the enterprise. Automated services can also be provided to customers. Web-based applications should be used more extensively to provide all relevant information to the customers in an easy and pleasing way.

4.0 High Speed Technology:

This will give the country a more balanced growth. A suggestion is that we have a 250 kmph line from north to south and another one from east to west. This could be above ground and thereby protected also. There is enormous potential for getting funding from foreign direct investment. In the late 60s, the Japanese had offered to develop such a line from Delhi to Agra on BOOT basis, but unfortunately the proposal was shot down. The time is now ripe for giving permission to a consortium to develop high-speed corridors on BOOT basis. This requires legislative changes as well as a change of mindset of decision makers, and this suggestion needs to be pursued, especially in view of the fact that financial support to railways from the Centre has dwindled drastically.

5.0 Futuristic Technologies:

Smart cards for multiple applications like identification, attendance, inter agency communication, banking, health and personal data need to be used in IR. These cards can later be extended to other disciplines and areas for health, safety, growth and development of the employees as well as security considerations in the organization.

We need to use nano-technology to develop smaller and miniaturized components, which shall result in reduced weight and thereby energy savings in transportation. This is also achieved by component stress analysis using computer aided engineering. However on IR, stress analysis of components is not considered important, although major structures are virtually tested.

Technology in new materials like titanium alloysⁱⁱ need to be pursued as this is 40% lighter than steel and twice as strong and 4 times more anti corrosive as compared to steel. The future shall see IR extensively using this material. Metal foamⁱⁱⁱ is also being extensively used in auto applications for safety. This has wide spread applications in increasing the crashworthiness of vehicles. IR should look at this novel material for coaches and locomotives and other rolling stock. Whereas work on development of crashworthy coaches

has started, no work has yet been planned for providing a soft front on locomotives to dissipate the energy in a crash. No work has been done on crashworthiness of fuel tanks. Furthermore, mechanisms using latest technologies and procedures for evacuation of passengers need to be standardized. These issues should be simultaneously pursued.

Fuel Cell trains^{iv} are being developed by Vehicle Projects LLC of US and shall be running in 5 years time as part of a research project. These are more energy efficient than electric or diesel locomotives and are suitable for underground operations as they are independent of electricity grid. IR has no stated plan or objective to start work in this area yet. We must conceive of this project now, so that 10 years later we have a commercially viable product. This will help solve problems of non-availability of oil too.

Jatropha Bio-diesel technology^v is another area for substituting diesel oil. This should be grown along vast stretches of railway land. Trials with 10% oil from this plant have been successfully conducted in Shatabdi Express from New Delhi to Amritsar, without any adverse effect to the engine or environment, and without loss of punctuality.

6.0 Cleaning Technologies:

We need to adopt clean place systems in railways premises. Cleaning technologies will help in improving the image of railways. At Ratlam, a pilot project has been launched for clean trains and clean station. Outsourcing such activities is beneficial to Railways. However, checks are required for maintaining minimum standards of cleanliness. This will result in better image of railways and also result in public hygiene in public places like platforms, waiting halls and reservation premises. However, issues of concern to environment like the type of chemicals used need to be examined. We could also explore the option of involving the local communities or NGOs to make it a social cause and bring in fresh thinking and commitment and to reduce costs.

7.0 Change of Business Plans:

IR business plans need to be changed and reformulated. The policies that were successful in the 80s and 90s may not be successful in the new millennium. We need to review our vision^{vi}, mission, values, aims and objectives in the context of social and technological changes. The vision of IR, which was formulated in a different era, has lost its effectiveness and it needs to become more inspiring, better aligned to the marketplace, and futuristic. We need to look at whole new segments of customers who require transportation of their piece meal traffic. Strategies need to be designed to become more responsive to the customer needs in this new information age. We also have to focus on creating and sustaining the market space through innovative products, processes and services. Recently there was a requirement of wagons in the agricultural industry in the South for exporting products to Bangladesh. IR could not meet the customers demand and lost the traffic to road. If IR is not able to attract and retain customers, it shall soon be out of business.

8.0 Innovative Training & Development Concepts:

It is important to create a strong framework for continuing professional development. This concept is followed by IMechE, UK and ASME, USA. Plans for maintaining professional competency should be developed collaboratively by the individuals and the organization and these should be continually evaluated and monitored. Also, every practicing

engineer must be certified as a Chartered Engineer by a professional body. It should be mandatory for the engineers to seek certification from professional institutions.

We need to start education in Information Sciences and Engineering as a new stream. Customized degree courses can be formulated collaboratively with reputed universities. An interesting experiment on these lines has been conducted by the premier oil company of India, the Oil & Natural Gas Corporation Ltd (ONGC) under a scheme called “Unnati Prayas”. IR should develop itself on the lines of learning organizations, to help people learn about the industry, the market, the culture etc. There should be more focus on Knowledge management. E-filing of all reports and technical data can go a long way to create the “Less Paper Offices” of the future. E-mentoring of young engineers for their development is an excellent practice in other countries, as also Executive Coaching for high flyers, and these concepts can be innovatively adopted by IR as well.

Training in deploying the new technologies for design, operation and maintenance is essential. This has to be at the grass root level. Training in management skills, leadership, motivation and soft skills is absolutely necessary for the development of our managerial cadre. E-learning^{vii} programs and skill courses should be offered together with skill level certification and tracking of career development for higher employee performance. The training profession is now referred as ‘Workplace Learning and Performance’ by one third of the population as per a survey by American Society of Training and Development^{viii}. Outsourcing of training functions is bound to happen, so we should prepare to get the best out of it for the development of individuals and the organization. Training in areas of Offer management and Contract Negotiation is currently neglected. The employee should be responsible for taking charge of his own development, skill set and career growth. He should be encouraged to decide his own training requirement.

9.0 Innovation in Recruitment and Staffing:

There is a change in the employee profile in the new knowledge economy, which is emerging in the 21st century. There is constantly a need for phasing out old skills and a demand for new skills. Recruitment should be based on competence. Employees should be asked to apply for projects and posts. Recruitment should be at different levels in the organization to make it a knowledge organization. Selections should be strictly based on skills and experience. Employees should be encouraged to take up assignments outside the department, and return back to the cadre. This will help broaden their skill levels base and bring in fresh thinking. It would be worthwhile to organize most of the work as projects and provide staffing based on roles and competencies and not on hierarchical levels. A larger number of people will thus get exposure to leadership roles and help strengthen the team spirit, so very important in today’s world.

10.0 Marketing Innovative Services:

There is a constant market shift with competition from airlines and roadways. IR has to aggressively market its services. New products in the form of innovative rolling stock should be designed keeping in view customer requirement. To pace up this activity, tie-ups with suppliers of products and designs should be firmed up, so that prototype development time is reduced. There is a requirement of special rolling stock in many areas, but bureaucratic procedures are strangling the process. Therefore, more powers and freedom are required to be delegated to the executive to finalize agreements and contracts. The market research of IR is weak and its response slow. Many innovative measures and responses are

necessary to enhance our performance in this area. IR must take lead in creating and providing integrated transport solutions to the customer by collaborating with Road, Air and Sea transport companies and facilitating clearance and payments on-line through e-banking.

11.0 E-Governance:

E-governance is required to be fully implemented in railways to bring about transparency, accountability, responsiveness and efficiency in the interface between government, businesses, citizen and employees, and also to improve administrative programs. This will assist in right to information through the net. A lot of time and energy will be saved which is otherwise wasted in traveling^{ix} and approaching officials again and again and standing in queues. It will provide a solution to the vexing problem of corruption, as it will reduce the manual interface between government officials and the public. Administrative services are successfully using e-governance as E-Grama in Ganjam district, Gyandoot in Madhya Pradesh, E-Seva in Andhra Pradesh, Bhagidhari in Delhi etc. Furthermore, posting and receiving bids over the net, online payment and contract finalization are some of the other tools of electronic governance. Internal office orders, posting orders, vacancies, foreign training, policies etc are seamlessly and quickly communicated to all using this method.

12.0 Management of Waste:

IR can cut costs by reduced waste in manufacturing activities. Furthermore, better recycling of waste is another method of reducing cost. In Japanese Railways, more than 80% parts of components and sub-assemblies of rolling stock are recycled. This is kept in mind in the design and manufacturing philosophy. Thus natural resources are efficiently utilized and development is sustainable. Segregation and reclamation from waste can pay back handsomely, rather than scrapping products that are out of specification. In the future, what is left will be dealt with by bio-remediation, a new technology, through custom designed organisms for cleaning up the environment.

13.0 Innovative Cost Control Measures:

Everything within railways – manufacturing, operations, marketing, research etc. creates only ‘cost^x centres’. IR should create ‘profit centres’ in workshops, training institutions, R&D etc. Better utilization of assets by reduced turnaround times and higher capacity utilization shall result in reduced cost of operations per unit of throughput. IR should set up control measures that are SMART – simple, measurable, appropriate, relevant, timely and as well as economic, meaningful and operational. The concept of minimum information for having control should be used. There should be fewer controls and less effort needed to gain control. It is seen that 90% of any business is usually represented by 5 % of its products and services. Management must put its energies and resources in this 5% area for maximum cost control. If there are no revenues earned in any unit^{xi}, the operating unit should compare costs with prices in similar operations in the market.

14.0 Organisational Change:

There have been many changes in the organizational structure of the IR in the past years but the time has come to look at this aspect in totality and in-line with a modern business vision and market orientation. It would be worthwhile to engage a professional

consulting partner of international repute to help design a comprehensive organizational blueprint and a detailed roadmap to attain the change.

The success of any innovative effort depends to a large degree on an effective management of the change being envisaged. Indian Railways today, with its multi-cultural and multi-layered workforce and amalgamation of the ancient with the modern work practices is not just any other business organization but is truly a replica of the country itself. The management of the change will require a clear vision, strong and committed leadership and adequate follow through and monitoring. It will be important to clearly identify all the stakeholders and involve them in making the change sustainable. Properly designed communication interventions, both internal and external, and adequate and targeted training will be key factors to make the change happen and stay.

15.0 Organisational Influence:

Cultivating cooperative contacts with powerful members in Planning Commission, PMO, Finance Ministry, industry etc. can make IR's work and objectives much easier to advance. Organisational politics^{xii} through these means will result in attaining desirable outcomes in situations where there is uncertainty. Ingratiation through use of political skills will get the desired cooperation when it is needed, especially for mega projects.

16.0 Development of International Networks:

IR should create international networks for international business and transportation. There should be web based applications and interaction with designers and expert consultants abroad through the Internet. There is need for collaboration with stakeholders and influencing them for attaining corporate objectives. Today we live in a global village and it is necessary to nurture contacts with experts in other countries through the internet. These contacts will help us know the latest trends and happenings abroad in transportation technology, innovation and other managerial related issues.

17.0 Benchmarking:

There is diversity in languages, cultures, skills and specialisations in the railways. Accordingly, keeping this in view, it is required that benchmarking with best practices in other units is done with a road map in each unit of operations to achieve best standards over a specified period of time, in order to achieve excellence in transportation. This should take into account costs and productivity.

18.0 Managing for the Future:

Success comes to those who prepare for the future. IR should look for opportunities^{xiii} that presently do not exist and develop competencies in these areas, through pre-emptive investment in new areas. This is the only method of getting to new markets in time with our services. If we wait to develop products and services, we shall lose industry leadership and market share. Our top management has to allocate more time and energy to pre-market competition. The existing economic engine of Indian Railways will run out of steam if corrections are not made in policies and this has to be made clear to all employees. The opportunity horizon has to go beyond existing products and services. The trick is to learn

faster than rivals and decide which markets to target and to match price of services with performance expected by the customer, and to fully exploit all our resources.

19.0 Conclusion

Innovative changes in the Indian Railways are not just a cosmetic need but are mandatory for survival in the 21st century. No one can withhold progress and technology. As an intelligent organization we must align ourselves with the market needs quickly. We have seen the discomfort of large government organizations in the telecom sector once the winds of liberalization started blowing. Let IR not be in a similar situation in the times to come. “Adopt and Adapt” should be the motto.

As we can see, the innovations and changes required are not uni-dimensional but require a mutli-pronged and well coordinated effort. Synergy of efforts in different areas will be a Critical Success Factor. We have all the ingredients in place in the shape of our asset base, technical expertise and infrastructure. The right strategy will deliver the goods quickly and Indian Railways will truly transform into an “India Shining” modern business organization.

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