



Block 3

Public Systems Management Techniques

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THE PEOPLE'S
UNIVERSITY

UNIT 8 PUBLIC SYSTEMS MANAGEMENT AND NEW TECHNOLOGIES*

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8.0 OBJECTIVES

After reading this Unit, you should be able to:

- Examine the role of new technologies in public systems management;
- Discuss the application of Information and Communication Technologies in public service delivery;
- Describe the case studies relating to application of ICT-enabled initiatives in national and international context; and
- Identify the constraints in the application of new technologies.

8.1 INTRODUCTION

The twenty first century is regarded as information era. Information has the potential to influence every aspect of our life at the individual as well as societal levels. In the present competitive environment, information is being treated as the most important resource. Information facilitates sharing, exchanging, retaining as well as effectively managing the knowledge output. It is the life blood of public governance. Information

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and Communication Technology (ICT) has the potential to contribute towards sustainable growth in all countries. The major objectives of ICT are to bring efficiency, responsiveness, openness, and participation in public governance. Since ICT is dramatically changing the lives of people around the world, governments must come to grip with finding solutions that will increase public value to their citizens.

The focus of this Unit is to discuss the role of new technologies and their impact on public systems management. Further, the unit highlights some of the new technology initiatives adopted at global, national, and state levels as case studies.

8.2 ROLE OF NEW TECHNOLOGIES IN PUBLIC SYSTEMS MANAGEMENT

Human societies have transformed from one stage to another based on technological innovations. The influx of information technology is changing the industrial society to an information society. The significant indicators of the information society are:

- Utilisation and exploitation of information for development;
- Right access to right information at the right time;
- Introduction of computers and telecommunication technologies in dealing with information;
- Information as a strategic resource base rather than mere capital;
- Growth of infrastructure for information technology applications; and
- Shift in occupational structure from manufacturing to information-based activities.

ICT is creating the 'knowledge society' where information circulates to millions of people around the world creating a global consumer society for goods and all kinds of information and services. It is a technique to ensure accountability of the public systems management to the citizens. To transform public systems into positive and responsive social institutions, there is a need to explore new technologies for better governance. They facilitate good governance in terms of capacity building to respond more effectively to the needs of the people. They also establish better interface between people and government, and more transparency in the operation of public systems. The initiatives launched in the form of ICT-enabled services ensure to improve the quality and delivery of public services. Therefore, there is a need to draw up a clear strategy to redesign public systems' processes and select appropriate technology solutions to ensure good governance.

Modern societies are network societies. Technology innovations coupled with globalisation seem to be ushering in a new network age. The concept of network is central to the processes of globalisation. The future lies in a network of computers spanning the globe. Networks facilitate the dissemination of information, thereby increasing learning opportunities through easy access and allow ideas to travel speedily for use by many user-families. Public administration being a multi-actor phenomenon, networks are natural to it. Public governance is a part of multiple networks – organisational, human, and electronic, that are working to generate policies, services, and knowledge. They have become an important feature of modern public policy and

decision-making, administrative management, and public service delivery. Network transcends organisational and national borders and challenges many of the traditional structures and processes of public system management. Many problems of governance such as delay, corruption and red tape can be minimised, if not eradicated altogether, by technology-based networking which would also ensure transparency and accessibility of information to citizens. Information technology, global pressures and institutions, and the need for internal efficiency and productivity in the domestic sphere, are all changing the character of the State and the nature of public administration. The third world countries have introduced major reforms in their public systems to comply with the global pressures as well as respond to internal domestic demands. These reforms primarily focus on the following:

- Improving service delivery to people;
- Empowering people through dissemination of information;
- Increasing transparency in government and business transactions;
- Creating competitive environment by establishing synergy between public and private sectors; and
- Enhancing the administrative capacity and organisational efficiency of governmental systems through the application of information technology.

The above reform measures are introduced under the garb of New Public Management(NPM). In the NPM regime, public systems have been shifting from process to result-oriented performance with increasing focus on outcomes than inputs.

In the developing countries, the application of Information and Communication Technology(ICT) is intended to attain increased responsiveness of public systems towards the citizens. The major objectives of ICT initiatives are to bring efficiency, responsiveness, openness, and participation in governance. As it has been aptly pointed out, the significance of ICT applications in fostering governance lies in:

- Providing decision inputs to administration for improved planning, implementation, and monitoring of development programmes;
- Improving citizen-administration interface and public service delivery;
- Empowering citizens to access information and knowledge;
- Fostering transparency in service delivery and information sharing;
- Highlighting key issues such as project justification, multiple service centers, and sustainable training in planning and implementing ICT applications;
- Encouraging public debate in development issues;
- Enhancing the accountability of governance mechanisms;
- Sustaining the development of human resource towards the use of ICT; and
- Involving the grass roots groups and associations in development.

The Government of India and many state governments have taken commendable initiatives in ICT. Creation of infrastructure, maintenance and upgradation of systems, management of partnership arrangements with technology providers, building trust among

the public on the reliability of systems, making them accessible to large numbers, addressing the needs of multi-lingual users, subsidising the costs, building competencies among staff and users are some of the important concerns of ICT. There is evidence to suggest that new technologies in areas of information and communication are greatly influencing public systems management in India (The Indian Journal of Public Administration, 2004).

8.2.1 Electronic Governance

Application of ICT to public systems management is called e-governance. It is a form of governance comprising the processes and structures involved in the delivery of electronic services to public. The aim, ultimately, is to simplify procedures, enable people's participation and bring about improvement in governance through mail, telecommunication, and the Internet. Various manifestations of e-governance initiatives are using IT tools as (i) E-mail, (ii) Internet websites publishing, (iii) On-line interactive transactions. (iv) Wireless Application Protocol (WAP) application and publishing, (v) Short Messaging Service (SMS) connectivity, (vi) Internet development and usage, (vii) Promotion of citizen's access.

Electronic governance refers to public systems' use of technology particularly web-based internet applications to enhance the access to and delivery of public services to citizens, employees and public entities and stakeholders. It is an IT driven public and development administrative system. With the use of ICT, e-government projects have worked out a multimedia network of government agencies, citizens, and business to facilitate a collaborative and efficient administrative environment and improved delivery of government services. This collaboration and commitment will assure efficient and high-quality administrative services to citizens, streamline government's internal processes to improve quality of services, reduce costs and increase citizens' participation in public systems management. The scope of ICT implementation in public systems can thus result in:

- Enhancement of efficiency and effectiveness of the executive functions of government, including delivery of public services;
- Greater transparency of government to citizens and business, permitting improved access to information generated or collected by the government;
- Fundamental changes and improvement in relations between citizens and the State thereby strengthening the democratic process; and
- Better interactions and relationships amongst different wings of the same government, State, or local governments within a country and between countries whose governments are web-enabled.

Electronic governance goes far beyond mere simple computerisation of stand-alone back-office operations in governments offices. It implies a drastic change in the way the government operates, and this means a new and refined set of responsibilities for the executive, the legislature, and the judiciary. Initially, the e-governance activity starts with providing information services by the government departments to the public in terms of state websites. These websites provide information about the department concerned, its aims, objectives, citizens' charters, organisational details, facilities available and services provided to the public along with the fees payable, etc.

8.2.2 Digital Governance

It refers to government processes in which Information and Communication Technology (ICT) plays a significant role. It ensures active participation of citizens in decision making processes and their accessing public services.

Electronic governance can be introduced in multifarious ways and models. Digital governance is one of the models of e-governance. Digital governance systems use internet as a means by which people and governments get connected. This model is at the initial stage now in the developing countries.

The digital governance models exhibit several variations dependent on the local situation and the governance functions carried out through these models. These models bring about a radical transformation in the existing forms of governance as they change the nature of citizen-governance relationship and bring in new agents and mechanisms to influence the governance processes. The present trends on innovative applications of ICT in the public sector are:

- Extensive use of mobile technologies to provide for important public services in health, education, disaster management, environment;
- Increased efforts to develop and adopt applications that reduce the digital divide for vulnerable groups, such as elderly, the disabled, women and youth; and
- Across region adoption of open government approach in both data and public policy dialogue.

The third world countries including India have introduced new technologies in the interest of improved public service management to achieve good governance. Good governance has two major goals. The first is making administration accountable and citizen friendly. The second is ensuring transparency and right to information. ICT acts as an important instrument to achieve the goals of good governance.

ICT is widely being used in India as a strategy to realise the goals of good governance as well as to improve the processes of governance at all levels. The Government of India and other states are moving in a big way for creating websites or home pages that give information about policies and programmes. These websites are created by the National Information Centre. The governments, both at the centre and in the many of the states have set up Internet Kiosks, which are often franchised, to private operators. These kiosks use internet to provide information relating to various subjects like college admissions, prices of agricultural products, irrigation, weather forecasts etc., even in regional languages. In India, public policy seems to be moving steadily towards the spread of a vast network of call centers and information technology-enabled services in the country.

8.3 APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN PUBLIC SERVICE DELIVERY

Service delivery is a core component of any government's obligation to citizens. Traditionally, some of the services have been provided by the government through establishing booths and counters, as well as channels such as post office for payment

of utility bills and others. Today, citizens are demanding more efficient and responsive services from the government. As a result, governments around the world are attempting to reinvent themselves and produce innovative solutions in delivering public services. With the advent of ICT, there is now a greater need for governments to draw on these mechanisms to provide more efficient and responsive services to the public. The quest to improve service delivery using ICT in governments typically focuses on four main dimensions as under:

- **Government-to-Citizen (G2C):** This focuses primarily on developing user-friendly one stop centres of service for easy access to high quality government services and information.
- **Government-to-Business (G2B):** This aims to facilitate and enhance the capability of business transactions between the government and the private sector by improving communications and connectivity between the two parties.
- **Government-to-Government (G2G):** This is an inter-governmental effort that aims to improve communication and effectiveness of services between central, state, and local governments in the running of day-to-day administration.
- **Inter-government:** This aims to leverage ICT to reduce costs and improve the quality of administration and management within government organisations.

The above dimensions had led many governments to take on major transformation processes that maximise the utilisation of information and communication technologies through e-governance initiatives to reach the target user groups.

In the face of increasing demands from society on governments to become more effective and efficient coupled with a need to pay more attention to user needs, governments have been forced to rethink their approach to service delivery. The focus of governments in recent years has been to provide a more participatory and inclusive approach to public service delivery by developing e-service delivery frameworks which empower citizens to create their own personalised services that meet their needs. The challenge for governments worldwide has been to create organisational structures within the public sector, which accommodate a whole-of-government approach to service delivery.

Governments at the national, regional, and local levels have recognised the potential benefits of online service provision throughout the world. The use of internet to deliver government services has revolutionised the speed and effectiveness of government service delivery and public administration. The benefits of online service delivery manifest themselves in a faster, cheaper, and more personalised and efficient service delivery that citizens and businesses can access 24 hours a day, seven days a week (24 x 7).

Moving services online involves redesigning organisational structures and processes according to the citizens' and businesses' needs. It also entails integrating services across different governmental agencies, to simply interact, while reducing cost structures and improving overall service delivery. E-governance initiatives need to adopt a whole-of-government-approach.

Although many countries have implemented one-stop portals, online transactions, and e-participation possibilities, developing public value in e-government is still at the initial stages of conceptualisation and implementation. As a result, not all e-solutions and e-services that governments provide necessarily meet fully the needs of the ordinary

citizen. The ultimate objective of governments is to foster a more digitally inclusive society through more connected governance structures.

The traditional channels of service delivery continue to play an important role in bridging and complementing electronic channels for transactions since they cater especially to those who are unfamiliar with technology or electronic transactions. With the availability of the different channels of service delivery, it is of prime importance that governments generate awareness and educate the public on how to use these channels. Through proper awareness, they can get to know the changes that governments are promoting and reap the benefits of ICT in the provision of information and services.

The next section of the unit presents four case studies – two Indian and two international case studies to understand the application of ICT-enabled initiatives and their impact on public systems management.

Check Your Progress 1

Note: (i) Use the space given below for your answers.

(ii) Check your answers with those given at the end of the Unit.

1. What are the characteristics of information society?

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2. Bring out the significance of ICT applications in governance.

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3. Indicate the four main dimensions of use of ICT in governance.

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8.4 INFORMATION AND COMMUNICATION TECHNOLOGY INITIATIVES: CASE STUDIES

In India, increasing internet penetration, rapid technology adoption and high sale of technical gadgets like smart phones, tablets etc., have profound impact on socio-economic standard of the society. The National e-Governance Plan (NeGP) formulated in 2006 aims at making all government services accessible to the citizen, ensure

efficiency, transparency, and reliability of such services at affordable costs. The NeGP has enabled many e-governance initiatives as discussed below:

(i) **Digital India**

It is a flagship programme launched by the Government of India in 2015, to ensure the availability of government 's services through improved online infrastructure, increasing internet connectivity and making the country digitally empowered in the field of technology. The objective of 'Digital India' initiative is to transform the lives of citizens across the length and breadth of the country. It consists of three core components-the development of secure and stable digital infrastructure, delivering government services digitally and universal digital literacy. The programme envisaged to achieve the above three key vision areas in the following manner:

- **Infrastructure as a utility to every citizen**

The initiative is aimed at providing connectivity through fixed-line broadband, mobile connectivity, or Wi-Fi hotspots. Every citizen would be provided with a unique identity with lifelong validity that can be tied with mobile number and bank account to enable digital banking. Access to Common Service Centres (CSC) would be improved and shareable cloud space on public cloud servers would be provided.

- **Governance and services on demand**

The initiative plans to create seamless integration across multiple government departments and jurisdictions and make services available on online and mobile platforms. The financial transactions would be made cashless and electronic, and entitlements would be available on cloud. The ease of doing business in India would be improved.

- **Digital empowerment of citizens**

The initiative would provide universal digital literacy to empower citizens to use digital platform devices. Universal access to digital resources would be provided, wherein all documents would be available in digital form on the cloud. Government services would be provided in local languages and a platform would be made available to citizens for participative governance. Digital India aims to empower citizens to avail services with more ease and to conveniently interact with the government.

- (ii) **Aadhar:** It is a unique identification number that serves as a proof of identity and address based on biometric data.
- (iii) **myGov.in:** It is a national citizen engagement platform where people can share ideas and get involved with matters of policy and governance.
- (iv) **UMANG:** It is (Unified Mobile Application for New-age Governance) a common unified platform and mobile app which provides access to central and state government services.
- (v) **Digital Locker:** It helps citizen digitally store important documents and facilitates easy sharing of documents.
- (vi) **Mobile seva:** It aims at providing government services through mobile phones and tablets.

- (vii) **Computerisation of land records:** It ensures that landowners get digital and updated copies of documents relating to their property.
- (viii) **Pay Gov:** It facilitates online payments to all public and private banks.
- (ix) **National Portal of India:** It is developed to provide access to information and services being provided by the government.
- (x) **PM India Website:** It provides information relating to the Prime Minister's office.

8.4.1 Khajane in Karnataka

'Khajane' is a major e-governance initiative of the state government of Karnataka. It is comprehensive online treasury computerisation project of the government. The project became operational in 2003. It is first project of its kind in the country where the entire array of treasury activities has been computerised. It has strengthened the financial controls by automating procedures and internal controls and promoted accountability. The project can track every activity right from the approval of the state budget to the point of rendering accounts to the government. The main objectives of the project were to:

- Network all the treasuries for easy access and better control;
- Monitor all the transactions online through the central server;
- Eliminate all systemic deficiencies;
- Introduce effective budget monitoring and ways and means to control through the system;
- Automate generation of monthly accounts;
- Set up a comprehensive Financial Management Information System (FMIS); and
- Contribute for meaningful review of progress of various schemes.

Khajane is a end-to-end automation of government treasury system. The software is designed and developed by the CMS, a company belonging to TATA s. The software has been made modular and highly user friendly. The development of each module was supervised by a separate treasury team. The application of software caters to the leads of the department covering all varieties of transactions handled by the treasuries. These modules are: i) Receipts, (ii) Payments, (iii) Deposits, (iv) Stamps and strong room, (v) Pensions, (vi) Social security pensions, (vii)Accounts, (viii) Returns, (ix) Housekeeping, (x) Master maintenance.

The project has been implemented mainly to eliminate systematic deficiencies in the treasury system and for the efficient management of state finances (Administrative units below districts). Delays in submission of accounts and in settling the claims were some of the deficiencies. There are 216 treasuries functioning across the state, of them 31 are district level treasuries and 185 are sub treasuries at Taluk and sub taluk levels. The treasuries in the state disburse salaries to about 7 lakh government and grant-in-aid employees, 4,30,000 service pensioners and 1.5 million social security pensioners. There are 21,000 Drawing Officers from 228 departments who draw money for implementation of 2117 schemes from the treasuries in the state. In addition to state government treasuries, the treasuries also handle the Zilla Panchayat/Taluk Panchayat (Rural Local Bodies) transactions.

The project undoubtedly has ushered in unprecedented kind of financial discipline which augurs well for the financial management of public funds. It has resulted in huge expenditure and efficiency gains. The main advantage of the project is that most of the treasury functions were effectively smoothened. The full potential of the project has been contributed for better monitoring, reviewing, planning, auditing and to study the trends and patterns of revenue receipts and expenditure etc. With the successful implementation of the project, the government of Karnataka has enhanced the software to take up the complete management of the financial system for the effective and transparent public finance activities.

8.4.2 Lokvani Project in Uttar Pradesh

Lokvani Project is an e-governance initiative that attempts to reduce citizens' visit to government offices. It is a public-private partnership project at Sitapur district in Uttar Pradesh that was launched in November 2004. Its objective is to provide a single window, self-sustainable e-governance solution with regard to handling of public grievances, land record maintenance and providing a variety of essential services such as online submission, monitoring and disposal of public complaints, online land records, information about various government schemes, local employment opportunities in the district etc. In 2005, the state government issued an order to extend Lokvani to the rest of the state.

The programme format uses the local language Hindi and is spread throughout the district to a chain of 109 Lokvani Kiosk centres. There is no loan or government subsidies involved in this project. The system is expected to generate its own funds from the citizens and contribute to the earnings of the Kiosk operators.

The response to this project has been over overwhelmed. The user need not be literate or computer expert to lodge his/her grievance. A copy of the complaint is given to complainant along with the complaint number and the database keeps track of all the complaints filed by a particular Lokvani center. All complaints lodged through the site are monitored and sorted at the District Magistrate's office. The complaints are then marked to the concerned officers. A time frame is determined for the redressal, depending on the nature of the complaint. It varies from 15 to 40 days. The name of the officer, to whom the complaint has been marked, along with the deadline is uploaded on the server the next day. The complainant can access these details within 2 to 3 days of lodging the complaint. In case the complainant is dissatisfied with the decision, he/she can lodge a new complaint endorsing the details of the previous complaint. The new complaint lodged will carry a history sheet containing all the details about the previous complaint and its resolution. Low literacy rate, minimal computer literacy, poor internet connectivity, power problems in rural areas are some of the bottlenecks for the implementation of project. Despite these bottlenecks, there has been unprecedented and positive response to the online grievance redressal system. The project is considered a success.

8.4.3 e-Service delivery Project in Kenya

The government of Kenya has implemented e-service delivery project in June 2004 to facilitate better and efficient delivery of information and services to the citizens. The project also aimed to promote productivity among public servants, encourage participation of citizens in government and empower all Kenyans. It has committed itself towards achieving an effective and operational e-Government in the country.

The government has introduced SMS-based services as one of the services of the project that gives information on progress of identity card by SMS (text 2031) and passport processing (text 2032). The services available include:

- Tracking progress of passport processing accessible by sending the 9-digit tracking number issued to applicants to 2032.
- A help menu that enables the user to access user assistance by sending HELP to 2032.
- A question posting option by sending a message starting with PPQUEST followed by the question and sending the message to 2032.
- A compliment or comment posting option by sending a message starting with PPCOM followed by the complaint or suggestion and sending the message to 2032.

The government and Kenyan ICT Board planning to expand this service to other key areas of service delivery such as land and health. The website allows user to submit tax returns, access the business licensing registry, apply for all public service jobs, access exam results and candidate selection and report corruption online. The initiative has been successful in ensuring better and efficient delivery of government information and services to the citizen. The project has been encouraging participation of citizens in government programmes.

8.4.4 e-Kasih in Malaysia

The theme of the project is e-inclusion that initiated in 2008. The “e-Kasih” system is integrated database system that particularly aims to improve the living standard of people who belong to the low-income groups. These groups are the house holders identified by the Poverty Line Income (PLI) and their information is stored in the data bank.

e-Kasih allows government agencies to plan, implement and monitor poverty programmes more effectively. Information in the data bank can be accessed by the government bodies and participants to make administrative process more transparent while implementing poverty eradication programmes. The e-Kasih system helps to identify duplicated aid or programme and ensure delivery of benefits to the deprived and the needy. Public service providers by using this system through modules, through monitoring and tracking, can better coordinate and implement strategies to combat poverty. The data in the data bank also can be utilised in formulating poverty eradication policies.

The e-kasih data bank provides a detailed and systematic platform for formulating social inclusion planning as well as to make improvements in distribution of aid. Prior to e-kasih system, the poor people could hardly find a way to get assistance and public service providers were hardly able to recognise people in need. The launch of e-kasih aid distribution and poverty reduction activity has become more effective in Malaysia.

8.5 CONSTRAINTS IN APPLICATION OF NEW TECHNOLOGIES

The rapid growth of digitalisation has led to many governments across the world to introduce and incorporate technologies into processes of governance. Through new

technologies, government services are made available to citizens and businesses in a convenient, efficient, and transparent manner. Though there are several advantages of ICT, critics are questioning the relevance of increased emphasis of ICT based development in a country like India where a large section of population is illiterate.

Since the government is serving people through an electronic based system, it loses the person-to-person interaction and at times, technical problems relating to server, connectivity etc., are encountered. The public are concerned over security of websites, and fear of spam from providing email addresses. There has been growing concerns about the privacy of data being collected as part of unique identification projects.

The disadvantaged sections of the society do not have access to ICT. The ICT precipitates disparities between the rich and the poor, the governors, and the governed leading to a discriminatory 'digital divide'. Digital divide basically refers to lack of access of poor and people in rural areas to internet. The COVID-19 pandemic has brought out the challenges especially in education relating to online learning. Uninterrupted power supply, access to devices and internet facilities which are the prerequisites for online learning are not available with large sections of people in India. India's digital divide is huge with more than 400 million people having no access to internet. There is spatial divide too with low internet density in rural areas compared to urban areas.

A report of National Statistical Organisation (NSO) survey shows a stark digital divide across states, cities, and villages and income groups. Based on a survey conducted from July 2017 to June 2018, it indicated that most of the internet-enabled homes were in cities, where 42 per cent have internet access. In rural areas only 15 per cent are connected to internet.

To bridge this digital divide, steps need to be taken to introduce delivery of services like tele-medicine, tele-education, tele-marketing, and e-commerce to the rural areas. Also, in many cases, the reluctance on the part of government functionaries or lack of will to share the information with citizens/ beneficiaries defeats the aims of ICT.

Some of the major problems of widening the application of ICT in India have been succinctly summarised by Dhameja and Medury (2004). These are, inadequate infrastructure, language barriers, absence of right mind set of government officials, lack of capacity building exercises, absence of effective grievance mechanisms, non-availability of information and variations in the utilisation of information. ICT infrastructure readiness of the country is also of prime importance.

The success of new technologies initiatives hinges on how and when the governments in India at all levels decide to address the requirements of the downtrodden and the marginalised sections who constitute a large section of India's population. The country must create conducive atmosphere for the promotion of ICT initiatives and be receptive to the benefits and changes they bring forth. India being the world's largest home of scientists and engineers and the fourth biggest hub of IT specialists, should now make huge strides in building up the capacity to innovate, adapt and regulate technology for serving the needs of millions. ICT in the government's machinery will go a long way in improving the quality of life of people. ICT revolution has become an essential ingredient of effective public systems management in this era of accelerated democratisation and global competition.

Note: (i) Use the space given below for your answers.

(ii) Check your answers with those given at the end of the Unit.

1. Point out the key implementation areas of Digital India Programme.

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2. List the main objectives of Project Khajane.

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3. Bring out the constraints in application of ICT in public systems management.

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8.6 CONCLUSION

Governance is a challenge in a country as vast, diverse, and rapidly developing as India. That is where new technologies intervene and enable large -scale transformation and help in the implementation of ambitious government plans. The major objectives of ICT initiatives are to bring efficiency, responsiveness, openness, and participation in governance. Various manifestations of ICT initiatives are revolutionising the governance process. New technologies have been playing an important role in public policy and public delivery systems to provide citizen-friendly administration. Over the years, many initiatives have been undertaken by the central and state governments to usher in an era of e-government. ICT is widely being used in India as a strategy to realise the goals of good governance as well as to improve the processes of governance at all levels. The National e-Governance Plan(NeGP) takes a holistic view of e-governance initiatives across the countries. The Government of India has been spearheading radical digitisation to induce economic inclusiveness and social transformation through initiatives like, 'Digital India', 'Make in India' and 'Skill India'. The Government of India and many state governments have initiated different models of e-governance and digital governance to provide accountable and responsive governance to the citizens.

Though there are several advantages of ICT, critics are questioning the relevance of increased ICT based development in a country like India where a large section of population is illiterate. There has been growing concerns about the privacy of data

being collected as part of unique identification projects. The success of new technology initiatives hinges on how and when the governments in India at all levels decide to address the requirements of the downtrodden and the marginalised sections who constitute a large section on India's population. ICT revolution has become an essential ingredient of effective public systems management in this era of accelerated democratisation and global competition.

8.7 GLOSSARY

Information Society : It is a society in which low-cost information and ICT are in general use. It emphasises on investment in human and social capital and considers knowledge and creativity as the key factors.

Knowledge Society : It is a society in which people have open and timely access to information and knowledge. This is utilised for informed decision-making and transformation to quality life.

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8.9 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. Your answer should include the following points:
 - Utilisation and exploitation of information for development;
 - Right access to right information at the right time;

- Introduction of computers and telecommunication technologies in dealing with information;
- Information as a strategic resource base rather than capital;
- Growth of infrastructure for its applications; and
- Shift in occupational structure from manufacturing to information-based activities.

2. Your answer should include the following points:

- Empowering citizens to access information and knowledge;
- Fostering transparency in service delivery and information sharing;
- Encouraging public debate on development issues;
- Enhancing the accountability of governance mechanisms; and
- Sustaining the development of human resources using ICT.

3. Your answer should include the following points:

The four main dimensions of use of ICT in governance are:

- Government to Citizen (G2C)
- Government to Business (G2B)
- Government to Government (G2G)
- Inter-government

Check Your Progress 2

1. Your answer should include the following points:

The Digital India Programme's implementation areas are to:

- Provide infrastructure as a utility to every citizen by way of connectivity through fixed line, broadband, Wi-Fi hotspots. Also, to enable digital banking and access to common service centre.
- Facilitate governance and services on demand through creation of seamless integration across multiple departments, access to online services and cashless financial transactions.
- Ensure digital empowerment of citizens through universal access to digital resources and availing services with more ease.

2. Your answer should include the following points:

- Khajane is a major e-governance initiative of the government of Karnataka where the entire treasury activities have been computerised;
- Networks all the treasuries for easy access and better control;
- Monitors all transactions through central server;
- Eliminates all systemic deficiencies.

- Ensures effective budget monitoring, automatic generation of monthly accounts; and
 - Sets up a comprehensive Financial Management Information System (FMS).
3. Your answer should include the following points:
- Privacy issues
 - Wide digital divide
 - Infrastructure inadequacy
 - Language barriers
 - Lack of capacity building measures
 - Attitude of government officials



UNIT 9 KEY MANAGEMENT TOOLS (STRATEGIC MANAGEMENT, WORK MEASUREMENT, DECISION-MAKING TECHNIQUES)*

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Strategic Management
- 9.3 Work Measurement
- 9.4 Decision-making Techniques
- 9.5 Conclusion
- 9.6 Glossary
- 9.7 References
- 9.8 Answers to Check Your Progress Exercises

9.0 OBJECTIVES

After reading this Unit, you should be able to:

- Explain the meaning and the concept of management tools;
- Describe strategic management;
- Discuss the technique of work measurement; and
- Elaborate on the decision-making techniques.

9.1 INTRODUCTION

Good governance aims to achieve efficiency and effectiveness in the delivery of public goods and services to the citizens through public systems. Public administration deals with the establishment of organisational structures; human resource management; financial administration/management and computerisation of public systems. The public systems operate with administrative principles but recently, it has been observed by the scholars of public administration that management tools that are used in the private sector can also work in improving the public systems. The three key management tools that shall be discussed in this unit are strategic management: work measurement and few decision-making techniques. These can help the public systems improve their efficiency and effectiveness in the delivery of public goods and services.

9.2 STRATEGIC MANAGEMENT

Planning in organisations has been failing because of unpredictability of the external environmental factors. Strategic planning gave way to strategic management by:

*Contributed by Dr. Anupama Mahajan, Former Post-Doctoral Fellow (Public Administration), Himachal Pradesh University, Shimla.

- developing “enabling conditions” by integrating core strategy;
- internal organisation;
- external environment; and
- identifying areas which are not productive and useful within the organisation.

Strategic management (SM) is defined as ‘consisting of the analysis, decisions and actions an organisation undertakes to create and sustain competitive advantages’. A strategy is ‘a series of goal-oriented decisions and actions that match an organisation’s skills and resources with the opportunities and threats in its environment’. It generally implies that there is some instability in the organisational system that needs to be stabilised.

As students of public administration, we are concerned with strategic management in public systems management (PSM). It was popularised the 1950s and 1960s by scholars like Peter F. Drucker, Alfred Chandler, and Philip Selznick. PSM interventions or reforms began in the 1980s, called first-generation interventions that focused on realising efficiency gains in the period from 1981 to 1986 by reducing the size of civil service and wages. The second-generation interventions fall in the period of 1987-1993 that covered micro as well as macro issues like organisational restructuring, training, recruitment and pay reform.

Strategic management is the process of specifying an organisation’s objectives, developing policies and plans to achieve these objectives and allocating resources to implement the plans. It is the highest level of managerial activity, usually performed at the top levels of the organisation with the help of executive team. It provides overall direction to the whole enterprise (Chowdhry, 2005).

Need for Strategic Management

In today’s rapidly changing and unpredictable economic environment, it is essential to adapt strategic management for the following reasons:

1. **External variables:** The external environment does not remain constant and can have a big impact on the organisation. The external variables can be, shifting global trends; economic balances; political and legal forces and socio-cultural changes.
2. **Natural Sources:** It is common knowledge that the limited natural resources are depleting that require efficient and effective management.
3. **Profile of Workforce:** The profile of work force keeps changing with the increase in the focus on education and developing technology. Strategic management (SM) helps in proper distribution of human resources.
4. **Information:** We are in the age of information and there is an overload of information which needs to be analysed and used. SM devises how this information must be used.
5. **Pro-active:** SM helps in planning for the future although the future cannot be predicted. However, sound principles and strategies can help in developing a pro-active approach so that the changing environmental conditions become advantageous for the organisation.
6. **Motivation:** SM involves participation of employees which make them motivated to achieve the organisation’s targets.

Strategic management in government is a process by which line managers continually seek to reorganise the following:

- i. Core strategy
- ii. Internal organisational design
- iii. External environment

Strategic Management (SM) was given impetus by the World Bank to assist developing and transition economies by reorganising the government agencies. The three tools that are used in the process are incentives, information-processing institutions, and coordination mechanisms. In government organisations, SM is a computational process that involves the stages of reforms and consolidation.

Pareto-Efficient Public Sector Agency Model

The main purpose of SM is to achieve efficiency-maximisation and effectiveness in government/public sector agencies. This model has been propagated by the World Bank which consolidates the arguments given by different schools of thought.

Given below are the main concepts involved in the Pareto-Efficient Public Sector Agency Model:

1. **Strategic Alignment:** The strategic triangle of the core strategy; internal organisational design and the external environment can help in achieving an equilibrium. **Core strategy** refers to the *purpose* or mission of a particular agency. It provides an opportunity for group interrelatedness, and a conceptual framework for strategic managers. **Organisational Design** includes the processes and patterns of the work so that the public officials can work efficiently according to the core strategy. Lastly, the **external environment** of a government/public agency is complex which is made up of the citizens, the employees, and the stakeholders outside the organisation that is, the lawmakers.

The managers are assigned the task to achieve an equilibrium among the three elements defined above which is called strategic alignment. It can be done through a taxonomy (classification) of outputs, the internal organisational design, and the external environment. Technical efficiency is essential for outputs of a government agency which are the public goods and services. The public managers must be held accountable for their operations in the core strategy. The problem in accountability is the difficulty of measuring outcomes, especially, in developing nations. However, it is important to define the outcomes which can be carried out easily with accessible information on performance and operations of a government agency.

2. **Defining Outputs:** Reforms in public sector management regarding the defining of outcomes have pushed for the use of conceptual tools, like organisational or managerial economics. All operations in a government agency are carried out on the base of contracts or agreements between elected representatives, public officials, or the private stakeholders. Rule-based hierarchies help in specifying and monitoring performance. Institutional arrangements and framework must consider all external factors that impact the public activities.
3. **Organisational Design and Culture:** An organisational design not only defines and facilitates the institutional arrangements and contracts but also incorporates the following:

- Professional culture;
- Norms of loyalty; and
- Overall organisational culture.

Norms and informal rules must guide incentives that are given according to formal rules. Greater flexibility will improve productivity, loyalty, and stability for the core strategy of the organisation. Production process and organisation of work help the public sector organisations make the interactions with external stakeholders easier and establishes a standard of quality for public goods and services.

4. **Outsourcing:** The inclusion of private stakeholders by government agencies in the delivery of public goods and services, that is “outsourcing”, does not render the government any less important. The government plays an important role in setting up contracts; rules of standardisation and other regulations for the private organisation to which the task is outsourced. This requires the government agency personnel’s expertise and capacity.
5. **Areas of Reorganising:** The reforms suggested in this model of strategic management require pinpointing the areas of misalignment by conducting periodic strategic audit of a specific government department’s core strategy, organisational design, and the external environment. This is necessary because the nature of public goods and services that have to be delivered changes rapidly. For example, students at government schools earlier, were given free books and uniform but with the COVID-19 pandemic, their requirement has changed to internet and computers for studying online.

To sum up, latest information technology and tools must be employed in implementing the model of strategic management at an agency level first to set an example for others. The success stories at the agency level can motivate the elected officials to consider strategic management at a macro level.

Strategic management is a process that involves strategic assessment, planning, strategy implementation and performance evaluation of the activities and processes in the organisation.

Check Your ProgressExercise 1

Note: (i) Use the space given below for your answers.

(ii) Check your answers with those given at the end of the Unit.

- 1) What is strategic management?

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- 2) Explain the need for strategic management.

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- 3) Discuss the Pareto-Efficient Public Sector Agency Model.

9.3 WORK MEASUREMENT

Work measurement has been a part of our work culture since organisations became large along with their activities. Since the industrial revolution in the twentieth century and the scientific management approach, work measurement has been an important part of work processes and procedures. Organisations use work measurement in improving their performance and productivity. It is an efficient way to manage the rapidly growing and complex government activities. Since governance can be complicated, its measurement is also as difficult due to the ambiguousness of development outcomes.

Work measurement is a term used to describe a family of techniques, any one of which can be used to measure work. It is the “art of observing and recording the time required to do each detailed element of an organisation’s activity or an operation.” It concerns investigating, reducing, and eliminating ineffective time during which productive work could have been done. The activity includes:

- i. the mental time that the worker takes to think of which method to employ in doing the job;
- ii. the manual time taken by the worker in operating the materials, machines, and tools; and
- iii. the time taken by the machine to complete the task.

Objectives of Work Measurement

Work measurement is used by private and public organisations alike to gain the most in terms of effectiveness, efficiency, and economy. The objectives of work measurement are:

1. **Workforce Planning:** It is crucial for an organisation to have workforce planning to achieve its goals and the best way to do it is through work measurement. This determines the right persons for the right job. Work measurement data can help in identifying the precise number of hours required to do a job. The organisations can find out the number of machines and materials required in the future and how many employees will be able to operate them.
2. **Production Planning and Scheduling:** The data received through work measurement study reveals the time that will be taken to produce in specific terms. It helps in figuring out the production time so that the customers or clients can be given a delivery date and if new orders can be accepted or not.

3. **Production Costs:** The production time data received in work measurement study helps in calculating the direct and indirect costs like rent, salaries, etc. If there are any unproductive costs, those processes can be eliminated, and it helps in cost reduction. The determination of production costs helps in fixing the selling costs also.
4. **Incentives and Performance Appraisal:** Since work measurement gives the standard production time, it helps the management to decide on the nature and quantum of incentives to be given to employees whose work performance adheres to certain prescribed standards. Those employees who perform better are given a good appraisal report which results in an increase in salary and perks for them.
5. **Training and Alternative Methods:** Once standard time for performing a task has been worked out through work measurement, it helps in training new employees accordingly. If the results of the study are not favourable for the organisation, alternate methods can be further explored.

The above-given objectives help in better management of most of the aspects of the organisation.

The four methods of work measurement, work study, time study, motion study and fatigue study (propagated earlier by F.W. Taylor) are briefly described below:

1. Work Study

According to the International labour Organisation, work study is a term used to enhance the techniques of method study and work measurement which are employed to ensure the best possible use of human and material resources in carrying out a specific activity. It implies that work study is a management tool that conducts a study and analysis of a task or an operation to increase organisational productivity. It involves the following steps which are given in brief:

- Selection of the job to be studied.
- Critical examination of the data as to how it was done previously;
- Recording all methods employed;
- Determining, establishing, and maintaining the new method; and
- Focuses on time, economy, and appropriateness of the method.

Thus, work study is a systematic, critical, and objective study and analysis of all the variables that affect work in maximisation of efficiency.

2. Time Study

Time study is a work measurement technique that records the time taken by workers to complete a task by a stopwatch in three elements:

- i. Repetitive work cycles;
- ii. Type of work; and
- iii. Controlling factors.

Time study aims to increase operational efficiency; simplification of work; standardisation of work methods; planning cost and safety. Important variables like layout of the workspace; machines; tools; physical motions employed to do

the task and the ways to reduce production time are worked out. Time study requires continuous research because external factors keep changing like the nature of job or the demand of the order at an earlier date.

3. **Motion Study:** It is a scientific management technique that records and finds ways to improve the physical motions of workers. Many times, both the studies, time study and motion study are combined because they are inter-related and have the same objectives. It takes into consideration the strengths and capabilities of the worker before specifying the time that he/she must take to finish a job.
4. **Fatigue Study:** Fatigue study is the fourth technique of work measurement that must be in fact done before motion study. It is natural that a worker would feel fatigue while working and if there are no rest periods or motivation provided, work efficiency will decrease markedly. It studies how many and how much time must be given as rest periods to the workers to recover from fatigue so that they can resume with the necessary energy.

To sum up, work measurement is a key management tool which was invented in the twentieth century but is relevant in the present times also. It is being used in industrial organisations to improve productivity and efficiency. In government sector organisations, it is important that delivery of public goods and services is carried out so that the weaker and vulnerable sections receive maximum benefit from the efforts and intentions of the government.

9.4 DECISION-MAKING TECHNIQUES

Decisions are taken at all levels of public organisations which affect the policy process and delivery of public goods and services. There have been numerous theories and models proposed by scholars of public administration since more than a century but in the past, intuition ruled the management decisions. However, the present times have changed due to globalisation and the information and communication technology and so have the decision-making techniques. There are various quantitative and qualitative techniques that organisations employ but only a few major ones will be covered here. They can be normative, prescribing the ideal process, and descriptive, explaining how rational and sound decisions can be taken. Given below are the main decision-making techniques:

1. **Classical School of Decision-Making:** Thinkers like Peter Drucker, Henri Fayol, Herbert Simon, and many others fall in this category of decision-making. The most popular process of decision-making has been given by Drucker consisting of the following five steps:
 - i. **Defining the Problem:** All organisations have their own share of problems which need to be defined so that a decision regarding its solution can be taken. The manager must consider all the variables, internal and external, while looking at the larger perspective.
 - ii. **Analysis:** All the available data must be analysed based on the the period for which the decision needs to be taken; and its impact on other factors.
 - iii. **Developing Alternatives:** Various alternatives along with their consequences must be developed. They must be ranked according to their merits and demerits

after brainstorming sessions or by using operations research and computer applications.

- iv. **The Best Solution:** The alternative that considers all pros and cons and is sustainable solution becomes the best choice for the decision.
- v. **Transforming the Decision into Action:** The last stage involves the details how the decision will be translated into action by keeping in mind the following:
 - Effective flow of communication.
 - Monitoring and supervision;
 - Acceptance of the decision by those who are impacted by it;
 - Development of group participation; and
 - Feedback and review.

- 2. **Incrementalistic Political Model of Decision-Making:** Charles Lindblom proposed his model of decision-making that he named “Incremental Approach” in an article that he published titled, “The Science of Muddling Through”. He gave two approaches to prove which one is better. They are given below in brief:

Approach 1: Root Method

The decision-making approach in Root Method involves the steps given below:

- Enlistment of all related variables in their order of importance.
- Rating of all possible outcomes of the decision with respect to efficiency-maximisation.
- Comparison of all alternatives by application of related theories.
- Making a choice of the best decision that would maximise value.

Approach 2: Branch Method

The Branch Method involves the following three main steps:

- Simplification of the principal main objective while not considering other related values at all.
- Selection of few alternatives.
- Comparison of alternatives without any application of theory.
- Final selection of the decision that would combine all values into one.

According to Lindblom, Approach 1 is applicable to simple problems. But in government organisations and public systems, Approach 2 is more suitable because it saves resources.

- 3. **Mixed Scanning Model of Decision-Making:** Amitzai Etzioni proposed the Mixed Scanning Model of decision-making in his article, “Mixed Scanning: A Third Approach to Decision-Making”. Given below are the main components of the Mixed Scanning Model decision-making technique:

- i. **Scanning:** All possible alternatives are categorised into an inclusive and a detailed level.
- ii. **Investment:** In scanning the alternatives, the assets and resources that have to be used are a part of the strategy. Budgets must be increased to include the investment on the utilisation of resources while scanning the alternatives.
- iii. **Effect of Increase in Investment:** A mixed scanning that combines alternatives at various levels and standardises the level that needs emphasis, will help in achieving goals.
- iv. **Fundamental and Incremental Decisions:** This approach distinguishes between the fundamental and incremental decisions and proposes to mix them and use them judiciously. Fundamental decisions are made by scanning the main alternatives while incremental decisions are made within the context of fundamental decisions. Both these types of decisions must be mixed to achieve the best solution.
- v. **Evaluation of Decisions:** The decisions are ranked in an informal manner rather than on an ordinal scale which is not practical.

An active democracy must have the capacity to build consensus; effective means of control; and a mixed scanning strategy. This technique suggests a practical approach instead of being a formal rationalistic view because the individuals taking decisions cannot be idealistic in ranking the alternatives. Limited resources with governments restrict lengthy procedures in decision-making.

4. Garbage Can Model

John Kingdon criticised the conventionality of the theory in decision-making in 2003 and proposed March and Olsen's Garbage Can Model. He stated that decision-making in the public sectors and the government is quite different. Decision-making can be categorised in three streams:

- i. **The problem stream:** It gives an understanding of "how and why" one of set of problems rather than the other gains focus of the officials.
- ii. **The political stream:** The citizens problems and expectations are realised in this stream with respect to elections, public service delivery, etc.
- iii. **The policy stream:** The administrators, technocrats, researchers, and political 'staffers' formulate policy proposals.

The above-mentioned three streams combine at critical times. The Garbage Can Model states that organisations are anarchies which work in chaos, disorder, and irrationality rather than always confining to rational behaviour. The three streams do not occur in the normal course of action for decision-making in organisations. March and Olsen proposed to think of decision-making alternatives like being thrown into a garbage can and out of the mix, one is selected depending on the factors of speed and time. They introduced the fourth stream which helps to decide – choice opportunity – which is chosen at an intersection of the three streams mentioned above.

The above-given decision-making techniques give an understanding of how decisions are made in public organisations because decisions have to be taken at each step of the government activities.

Check Your Progress Exercise 2

Note: (i) Use the space given below for your answers.
(ii) Check your answers with those given at the end of the Unit.

1) What is work measurement?

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2) State the objectives of work measurement.

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3) Discuss the various methods of work measurement.

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4) Explain some of the major decision-making techniques.

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9.5 CONCLUSION

The key management tools which have just been discussed are quite comprehensive and have certain principles and techniques. The focus of all these tools is on improving managerial processes, planning, coordinating, and controlling the activities. It also aims at reducing cost and time overruns and ensuring accountability. Public systems management is set in a particular contextual setting and faces certain unique problems. Yet exposing it to these managerial tools could prove beneficial in the long run both from the organisational and client angles. They provide the ability to establish a hierarchy and sequence of tasks for effective and efficient completion. Some other advantages of using the management tools in public systems are smooth collaboration among different stakeholders; easy and quick planning; budget control; resource allocation and strong team workflow.

9.6 GLOSSARY

- Organisational Design** : It is the process of aligning the structure of an organisation with its objectives, with the aim of improving efficiency and effectiveness.
- Outsourcing** : It is a practice of hiring a party outside a company to perform services and create goods that traditionally were performed in-house by the company.
- Strategic Alignment** : It is a process that ensures an organisation's structure, use of resources that support its strategy. All elements of a business including the way a company is organised are arranged in such a way to support the fulfilment of its long-term purpose.
- Workforce Planning** : It is the process of analysing the current work force, determining future workforce needs, identifying the gap between the present and future requirements, and arriving at solutions to enable the organisation to accomplish its objectives and goals.

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9.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

- 1) Your answer should include the following points:
- Strategic management is defined as 'consisting of the analysis, decisions and

actions in an organisation undertakes to create and sustain competitive advantages’.

- Definition of strategy
- Focus of Strategic management

2) Your answer should include the following points:

- External variables
- Natural Sources
- Profile of Workforce
- Information
- Pro-active
- Motivation

3) Your answer should include the following points:

- Strategic Alignment
- Defining Outputs
- Organisational Design and Culture
- Outsourcing
- Areas of Misalignment

Check Your Progress Exercise 2

1) Your answer should include the following points:

- Work measurement has been a part of our work culture since organisations became large along with their activities.
- Organisations use work measurement in improving their performance and productivity. It is an efficient way to manage the rapidly growing and complex government activities. Since governance can be complicated, its measurement is also as difficult due to the ambiguousness of development outcomes.
- Work measurement is a term used to describe a family of techniques, any one of which can be used to measure work. It is the “art of observing and recording the time required to do each detailed element of an organisation’s activity or an operation. It concerns investigating, reducing, and eliminating ineffective time during which productive work could have been done. The activity includes:
 - i. the mental time that the worker takes to think of which method to employ in doing the job;
 - ii. the manual time taken by the worker in operating the materials, machine, and tools; and
 - iii. the time taken by the machine to complete the task.

2) Your answer should include the following points:

- Workforce Planning
- Production Planning and Scheduling
- Production Costs
- Incentives and Performance Appraisal
- Training and Alternative Methods

3) Your answer should include the following points:

- Work Study
- Time Study
- Motion Study
- Fatigue Study

4) Your answer should include the following points:

- Classical Model
- Incrementalistic Political Model
- Mixed Scanning Model
- Garbage Can Model

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UNIT 10 MANAGEMENT INFORMATION SYSTEM*

Structure

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Relevance of Information
- 10.3 Management Information System: Evolution and Framework
- 10.4 Structure of Management Information System
- 10.5 Management Information System in Practice: A Case Study
- 10.6 Management Information System in Public Services: An Appraisal
- 10.7 Conclusion
- 10.8 Glossary
- 10.9 References
- 10.10 Answers to Check your Progress Exercises

10.0 OBJECTIVES

After reading this Unit, you should be able to:

- Explain the relevance of information in public systems management;
- Discuss the evolution and framework of Management Information System;
- Explain the structure of Management Information System; and
- Appraise the Management Information System in public services.

10.1 INTRODUCTION

In recent times, a great emphasis is being put on public management systems' effectiveness and efficiency in service delivery, ostensibly under pressure from increasing public aspirations and demands. The enforceability of accountability is gaining currency and the stakeholders are increasingly becoming vocal. Consequently, the tasks of public service managers are under greater scrutiny. They must respond to challenges efficiently and take judicious decisions. Information is a critical factor in decision-making. Sound managerial decisions are not made in vacuum. They are to be made with awareness of general conditions, competition, public policies and above all with adequate knowledge of management information. Thus, data can be leveraged to gain greater insights and formulate better policies. At the same time, information about the public management systems when put in public domain strengthens the accountability mechanism. In modern world information has become an important resource.

*Contributed by Dr. Sachin Chowdhry, Associate Professor, Indian Institute of Public Administration, New Delhi

In this unit, an attempt is made to equip the learners with the knowledge of the processes, techniques and tools that form the basis for Management Information System (MIS). Moreover, an effort is made to make the learners understand the utility of the technique of MIS to plan and control the organisation's activities and in the policy arena.

10.2 RELEVANCE OF INFORMATION

Information in an organisation is the collection of expertise, experience, and database that individuals and workgroups use for discharging their responsibilities. It is produced and stored by individual minds, or implicitly encoded and documented in organisational processes, services, and systems. It is required for better planning and control. Shammon and Weaver (1949), define information as “the amount of uncertainty that is reduced when a message is received”. Public service managers need information to

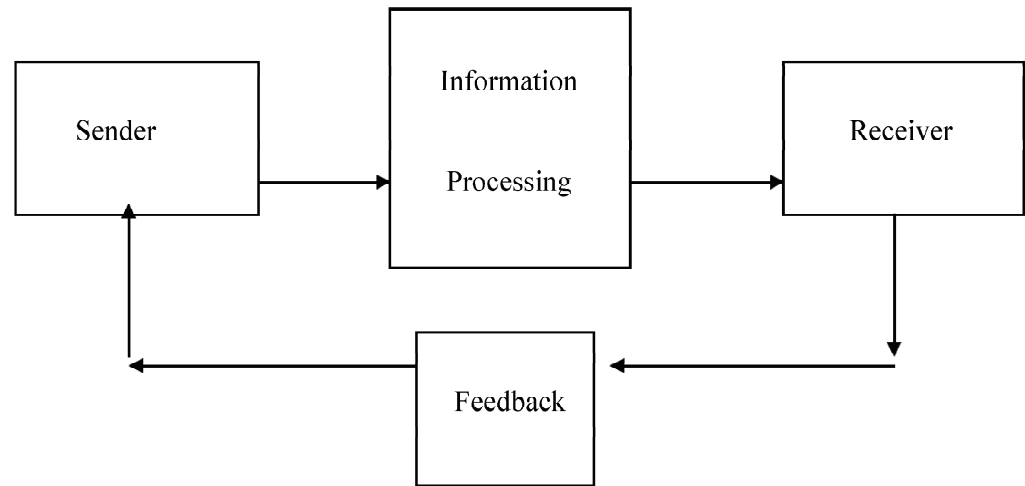
- Decide the mission and objectives of the organisation;
- Determine the plan of action for achieving the objectives of the organisation;
- Implement the plans and programmes;
- Evaluate the performance; and
- Facilitate feedback, to enable the modification of plans / programmes if required.

It is pertinent to mention here that importance of information has been recognised ever since the emergence of the discipline of public administration. Taylor had emphasised collecting information through studies to find out the ‘one best way’ to do things. Simon in his treatise focused on ‘designing’ - one of the activities of ‘decision-making’, which was related to finding as many alternatives as possible so that a rational decision could be taken. It again depended on the knowledge of the decision maker derived from the information. Moreover, in the absence of models, people tend to rely on simplistic “rules of thumb” in decision making and fall prey to a variety of common mistakes. These errors can be minimised with training and experience. It is by now, clear that we need organised means to evaluate data and make decisions.

What is Information?

Information is knowledge derived from data that is placed within a context. It is a message, something to be communicated from the sender to the receiver. The view of information as a message came into prominence with the publication in 1948 of an influential paper by Claude Shammon, “A Mathematical Theory of Communication”. This paper provided the foundations of information theory.

In many organisations, the information used to solve problems, to direct actions and to make decisions, together with any lessons learnt, are lost in the ‘noise’ of a turbulent environment (Vasconcelos *et al*, 2003). It is something that inhibits the flow of communication or creates misunderstanding. In addition, information may be geographically distributed and stored in a variety of different representations, e.g., tacit knowledge in peoples’ minds and structured information in databases. In the communications discipline, a message is information which is sent from a source to a receiver. The following diagram explains the system.



The nature of information, as evident from this figure is as follows:

i. Information as a pattern

Information is any represented pattern. This view assumes neither accuracy nor directly communicating parties, but instead assumes a separation between an object and its representation, as well as the involvement of someone capable of understanding this relationship. The quantity of information is totally distinct from its medium.

ii. Information as a sensory input

Information is any type of sensory input. It receives the input and transforms the input into information. Often it is abstract.

iii. Information as an influence which leads to a transformation

Information is any type of pattern that influences the formation or transformation of other patterns. Systems theory at times seems to refer to information in this sense, assuming that information does not necessarily involve any conscious mind, and patterns circulating (due to feedback) in the system.

Characteristics of Good Information

Good information must be:

- a) pertinent
- b) timely
- c) accurate; and
- d) certain

The usage of information depends on the availability of the type of information. Senior policy makers need strategic information; middle level officials may need technical information and operational information may be used by the oversight institutions and agencies as well to hold public service agencies accountable.

Management Information System

In this unit, we are focusing on Management Information System (MIS). It is not concerned with day-to-day operations, but rather with the management of activities that do support operations. MIS are typically computer-based information systems

that are used within an organisation. Peter Keen (1978), defines MIS as “the effective design, delivery and use of information systems in organisations.” MIS has much larger perspective and is not intended solely for managers. It includes all the people in the organisation and the structure and design of the organisation as well. The goal of MIS is to enable managers to make better decisions by providing quality information. The following table illustrates the kind of information required for different levels of decision making.

Decision Level	Description	Type of Information
Strategic	Long-term outlook, competitive advantage	External events, competing agencies, financial, quality trends
Tactical	Improving operations with restructuring organisations	Cutting expenditure, forecasts, revenues
Operations	Day-to-day actions to keep the organisation functioning	Transactions, accounting, human resource management, inventory

10.3 MANAGEMENT INFORMATION SYSTEM: EVOLUTION AND FRAMEWORK

It is being envisaged that a world is emerging in which executives would be supported (guided) by operations research staff employing computers to do sophisticated modelling, simulation, and analysis. Initially, there were two strong trends in the use of computers in organisations: the one was the automation of transaction processing and routine reporting; and the other was the use of computers to support analysis and decision-making. To emphasise the second role, the combination was termed Management Information System. Prior to 1965, it was expensive to build large-scale information systems. Large mainframe computers were used for computing by the technical experts. Minicomputers were also used but their capacity was less.

In the late 1960s, a new type of information system became practical i.e., model oriented DSS or management decision systems. In 1966-67, Scott Morton had studied how computers and analytical models could help managers make a key decision. Personal computers started being used both in the government and the private sector. There was also design and development of Management Information Systems.

By the late 1970s, several researchers and companies had developed interactive information systems that used data and models to help managers analyse semi-structured problems. In 1978, development of an EIS called Management Information and Decision Support (MIDS) System began at Lockheed-Georgia. MIS slowly became more sophisticated with the availability of client – server network. More people could access information on a server to which they were linked.

Web-based enterprise applications made their way with the rise of the internet in the 1990s. Used by different departments, these were consolidated on a single platform and information was accessible to all those in the network. High speed networks enable better connectivity and access. Now since 1999, cloud computing has emerged in a major way. The tools of information collection, processing and storage have undergone huge transformation. Enterprise computing and cloud computing enable access to data from anywhere in the world.

Evolution of Management Information System

The evolution of MIS can be discussed in three parts.

i) First Generation Management Information Systems

The first-generation MIS involved the capture of information and experience so that it was easily accessible. An alternate term was “knowledge capture”. Managing this capture allowed the system to grow into a powerful information asset. Technology had primacy in this phase. Accordingly, MIS was an issue of information storage and retrieval. It used ideas derived from systems analysis and management theory. It typically involved developing sophisticated data analysis and retrieval systems to ensure how the information they contained would be developed or used. This led to organisations investing heavily in technological fixes that had either little impact or a negative impact on the way in which knowledge was used.

But the failure of the efforts in this phase to provide any theoretical understanding of how organisations learn new things and how they act on this information meant that first generation MIS was incapable of managing knowledge creation.

ii) Second Generation Management Information Systems

Faced with the theoretical and practical failure of first-generation techniques to live up to its promise, theorists began to look more closely at the ways in which knowledge is created and shared. At the same time there was a realisation that organisations are capable of learning, and so a link grew between learning theory and management. At the same time hierarchical models of organisational structure were replaced by more organic models, which found effective organisations as capable of bringing structural change in response to their environment.

The second-generation knowledge management gives priority to the way in which people construct and use knowledge. It derives its ideas from complex systems, often making use of organic metaphors to describe knowledge growth. It is closely related to organisational learning. It recognises that learning and doing are more important to organisational success than dissemination and imitation.

iii) Third Generation Management Information Systems

The third-generation knowledge management has undergone major changes and paradigmatic shifts. The thrust given to ‘evidence-based policy making’ since 2000 necessitated knowledge creation at a much larger scale. In the process ‘big data’ is being generated. It refers to a large and diverse volume of data characterised by volume, velocity, and variety. Governments receive a huge volume of data daily in different sectors. Big data can help government agencies improve overall efficiency, boost the speed and accuracy of forecasting and decision making, and better understand their own operations as well as citizens’ needs.

To draw value from a diverse ‘big data’ many applications have emerged like ‘data analytics’ and ‘artificial intelligence’ (AI). Data analytics is the process of examining data sets to find trends and draw conclusions about the information they contain. AI refers to “machines that respond to stimulation consistent with traditional responses from humans, given the human capacity for contemplation, judgment, and intention” (Shukla & Vijay, 2013). Use of AI in big data and MIS can be a big enabler for the governments. The governments have also realised its significance.

Since 2017, the Government of India has been using it in its programmes. The Ministry of Commerce and Industry has built up an AI taskforce to create strategies that encourage advancement in AI, ‘machine learning’ and ‘3-D printing’. Under the Digital India Programme, the government has earmarked funds to support the progress of AI. Digital India is an umbrella programme that covers multiple government Ministries and Departments. It weaves together many ideas and thoughts into a single, comprehensive vision so that each of them can be implemented as part of a larger goal. NITI Aayog has adopted a three-pronged approach – undertaking exploratory proof-of-concept AI projects in various areas, crafting a national strategy for building a vibrant AI ecosystem in India and collaborating with various experts and stakeholders. Since 2018, NITI Aayog has partnered with several leading AI technology players to implement AI projects in critical areas such as agriculture and health (NITI Aayog, 2018).

Characteristics of Management Information System

Some of the important characteristics of modern MIS are given below:

1. MIS is management oriented, reflecting the management concerns all the employees of the organisation. The system is designed from top to bottom. The development of the system starts from the appraisal of organisational needs and its objectives.
2. The management actively directs, reviews, and participates in the system development efforts to ensure that the implemented information system meets the requirements of the organisation.
3. An integrated system and MIS are not synonymous. However, the integrated concept is a necessary characteristic of MIS.
4. Due to the integrated nature of MIS, it is prudent to capture relevant data close to the source where the event occurs and use it throughout the functional areas. The common data flow concept supports several tenets of systems analysis avoiding duplication, combining similar functions, and simplifying necessary functions wherever necessary.
5. While the integrated approach makes it appear a single entity, it is broken down into desirable sub-systems.
6. MIS should be developed with the flexibility so that future changes in the organisational needs may be accommodated in the system.
7. MIS includes every type of systems that gives information, whether it is formal or informal system (Srivastava, 2004).

Check Your Progress 1

Note: (i) Use the space given below for your answers.

(ii) Check your answers with those given at the end of the Unit.

1. Justify the need for information in public systems management.

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2. List the characteristics of Management Information System.

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3. Discuss the evolution of MIS.

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10.4 STRUCTURE OF MANAGEMENT INFORMATION SYSTEM

Management information system is a system designed by an organisation to collect and report information on a programme, and which allows managers to plan, monitor, and evaluate the operations and the performance of the whole programme. To be successful, an MIS initiative must address both the 'hard' knowledge in databases and the 'soft' knowledge in people's minds (Hildreth and Kimble, 2000). MIS addresses these problems by providing a mechanism to capture, retain and distribute knowledge assets within and between organisational agents (e.g., employees and information systems). Information has several phases namely identification, acquisition, development, dissemination, use and preservation of knowledge (Abecker *et al*, 1998).

Components of Management Information System

There are five components of MIS.

Hardware - This includes the physical equipment used in computing the data.

Software - This comprises the set of instructions that control the hardware.

People - In the early days of introduction of computers, the people directly involved in MIS tended to be programmers, design analysts and a few external users. Today almost everyone in the organisation is involved with the information system. In some cases, experts / expert agencies are engaged to decipher the information.

Procedures - These are instructions that help people use the systems. They include items such as users' manuals, documentation, and procedures to ensure that backups are made regularly.

Databases - These are collections of related data that can be retrieved easily and processed by the computers. Data is a statement accepted at face value. Raw data are numbers, characters, images, or other outputs from devices to convert physical quantities into symbols in a broad sense. Data Flow Diagrams (DFDs) help in representing information systems. They are designed to show how systems are divided into smaller portions and to highlight the flow of data between those parts.

Example of MIS

One good example of MIS is Enterprise Resource Planning (ERP). ERP refers to a type of software that organisations use to manage all the processes needed to run it by integrating these processes into a single system. Thus, different functions in an organisation like planning, human resources, finance, services, etc., can be integrated. The ERP solutions have evolved over the years. ERP can be hosted on cloud or in the premises of the organisations or if needed a combination of the two (hybrid). They enable communication across modules and thus eliminate data duplication and provide data integration that can be used most productively. Some benefits of ERP are:

- a. Higher productivity from lower management and operational costs;
- b. Improved organisational information from real time information generated by reports;
- c. Reduced risk through improved data integrity;
- d. Lowering expenditure like inventory costs;
- e. Better service delivery through timely and speedy response; and
- f. Modernised business process standardisation by sharing data across functions and standard responses.

There are some disadvantages also:

- a. Costs of ERP installation and maintenance may be high if not selected properly;
- b. Complex data tasks may be beyond the capacity of the staff; and
- c. Requires thorough and continuous training.

10.5 MANAGEMENT INFORMATION SYSTEM IN PRACTICE: A CASE STUDY

An example of a governmental programme being implemented throughout the country may illustrate the various concepts discussed above. The Mahatma Gandhi National Rural Employment Guarantee Act aims at enhancing the livelihood security of people in rural areas by guaranteeing hundred days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work. Under the Scheme Gram sabhas recommend the works that are to be undertaken. Panchayati Raj Institutions are primarily responsible for planning, implementation and monitoring of the works that are undertaken. The Act provides a legal right to employment for adult members of rural households. Employment must be provided within 15 days of being demanded failing which an 'unemployment allowance' must be given. For more than a decade, it has been one of the important programmes and is being implemented countrywide to ensure a kind of social security extension.

The Government of India has developed a robust MIS system which captures each detail related to programme like the guidelines, man-days generated, wages paid, assets created, month-wise and panchayat wise details, etc. These are in public domain and available online, which can be seen by anyone. It is useful for the policymakers for deciding on course of action, as and when required. Researchers can use the data for analysis. A sample of some data is given below.

02-Dec-2020 01:33:46 AM

a. MIS report of Baghpat district of Uttar Pradesh relating to man-days generated

The Mahatma Gandhi National Rural
Employment Guarantee Act

R5.1.1.1 Employment Generated during the year 2020-2021

State : UTTAR PRADESH District : BAGHPAT

S No.	Blocks	No. of Registered	No. of Jobcard deleted in current YR		No. of Jobcard included in current YR		Cumulative No. of HH issued jobcards				Employment demanded		Employment offered		Employment Provided			No. of Families Completed 100 days	No. of HH which are beneficiary of land reform /IAY	No. of Disabled beneficiary individuals		
			House hold	Per sons	House hold	Per sons	SCs	STs	Others	Total	House hold	Per sons	House hold	Per sons	House hold	Per sons	Perso ndays					
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	BAGHPAT	7810	10969	15	29	284	368	1247	0	6339	7586	647	763	647	763	647	529	607	14005	2	0	2
2	BARAUT	6177	8830	25	35	270	404	2442	0	3596	6038	867	1119	857	1109	783	783	1001	26900	5	3	2
3	BINAULI	8966	11176	17	37	333	415	1921	0	6787	8708	705	798	697	788	591	591	650	16336	3	2	3
4	CHHAP-RAULI	2838	4493	19	34	404	542	808	8	1792	2608	580	691	573	683	499	499	580	16084	5	4	1
5	KHEKRA	1334	1845	1	2	52	64	194	0	1128	1322	241	274	241	274	203	203	229	4529	0	2	1
6	PILANA	7458	10097	2	3	502	604	1713	7	5060	6780	888	996	886	994	790	790	878	23597	3	3	0
	Total	34583	47410	79	140	1845	2397	8325	15	24702	33042	3928	4641	3901	4611	3395	3395	3945	101451	18	14	9

Source: MIS Reports, Ministry of Rural Development

10.6 MANAGEMENT INFORMATION SYSTEM IN PUBLIC SERVICES: AN APPRAISAL

The advancement of information technology, has made the government focus on harnessing the advantage, the country has in Information and Communication Technology (ICT) through National e- governance Plan' (NeGP) and now 'Digital India'. This has led to creation of highly sophisticated MIS systems. In fact, since 2017, some big data centred MISs have been designed so that data analytics could help in governance. Government has benefited also from this.

The 'Project Insight' launched by the Income Tax Department in 2019 leveraged data mining techniques and analysed the data to get information about the black money. It tracked down 5000 entities that were in existence despite being deregistered. The details from banks, which comprised 50,000 deregistered companies that deposited and withdrew nearly Rs 17,000 crore during demonetisation was procured. The Government leveraged big data to flag accounts with sizable black money deposits. AI and ML were leveraged to find patterns and trends in these bank accounts, to flag other accounts (Misal, 2018, paraphrased).

Gathering the data and goods flow throughout the country through Goods and Services Tax (GST) was another we assure the government employed to have a proper look at how the trade is conducted. The entire data was cached through the Good and Services Tax Network. In the agriculture sector, the soil moisture level, controlling irrigations and selection of right inputs is also data driven. The entire agriculture sector infrastructure has been geo-tagged. This was possible only because of a robust MIS developed for the sector (Lalawat, 2018).

However, managing large, scattered data, especially with public service delivery agencies in a vast country like India has several constraints. Let us discuss some of them.

Field-mission information

Government projects and missions are often long-term programmes. Since the public servants are often transferred frequently and have scarce time which is generally focused on bureaucratic/operational work, there is a great loss of knowledge and capital.

Communication between the Field and the Main office

Governments have a multi-level knowledge management which goes, in the field, from usually the district administration to the state agencies. Often the central ministries are partners in the programmes. In various developmental projects, international donor agencies are also stakeholders. Due to the presence of several local, state, national and international players, too much information is lost.

Some specific problems include:

- a) A strict hierarchical top to bottom decision making, which works against a more participative approach to decision making built through local knowledge;
- b) The autonomy of field agencies, which could lead, sometimes, to an information crisis in the management of the project or even a crisis in the agency itself; and
- c) An absence of a communication platform accessible by levels of responsibilities for a timely and proper information flow and information register.

Communication between Different Agencies

Too often, several developmental agencies, work in the same area, without knowing about organisational purposes, projects, and activities of each other. Some specific problems are the absence of access to:

- a) A map of previous agency interventions, if possible, through purpose and projects;
- b) Simple and direct access to communication forums or to create one which could invite and congregate all the concerned agencies through purpose, project, or activities in each field; and
- c) Absence of best practices and databases of projects.

Communication between Service Delivery Agencies and the Beneficiaries

State agencies' relations with beneficiaries of the projects are not so easy and well defined as the project is formulated without sufficient participation of the beneficiaries. In addition, at the implementation phase, authorities are often more aware of the project purposes and activities than the ones the project will directly benefit. Nevertheless, knowledge management through web interface tools could be an asset because besides and beyond information concerning the project, beneficiaries should have a continuous possibility of taking positions in relation to it.

Some specific problems are:

- a) Inadequate, non-participative analysis of the needs felt by the community in which the agency plans an intervention;
- b) Inadequate participation or representation of the beneficiary community in the formulation and implementation of the project.

Communication between Service Delivery Agencies and Civil Society Organisations

Each individual and organisation could be an active development actor and agent if it has the proper knowledge capital (understood as social, symbolic and, therefore, economic capital) to make a difference. It is possible if there is a good communication network between development agencies and civil society organisations. The problem is absence of efforts to involve individuals and organisations to affect a participative effort toward development, both in a local and in a global sense. A system needs to be developed to deploy information concerning basic capacity building of citizens and organisational intervention, and institutional support.

Capacity issues

At the field level, in many service delivery agencies there is lack of skilled staff, who can understand the MIS formats and do the reporting as required. The government has, since the launch of NeGP, paid attention to this area and has developed a comprehensive capacity building programme. However, given the number of the employees, both at the state level and central level employees, which is to be covered, it would require a sustained effort over a long period of time. Problem is especially acute at the state level and the district and sub-district levels.

The generation of large-scale data and use of internet and networks also exposes it to cybercrimes. There have been reports of data breach and hacking of government websites. Data security measures need to be taken to minimise such vulnerabilities. This would include cyber security, which requires the processes and methods that secure computer devices, networks, and data and information against attack, theft, misdirection, misuse, or disruption. Cyber threats need to be handled and managed.

Information overload

The big data approach may lead to information overload. Information management may itself become an end unless the needs are clearly spelt out. Decision makers may feel constrained to make use of every information, which may not always be necessary.

Check Your Progress 2

Note: (i) Use the space given below for your answers.

(ii) Check your answers with those given at the end of the Unit.

1. List the components of MIS.

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2. What is 'Project Insight'?

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3. Bring out the constraints in implementation of MIS.

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10.7 CONCLUSION

Decision making is an important activity of public systems management. It requires information of varied nature, putting it in the form of appropriate data and format that the organisation can use for its operations. New technologies in the present times are facilitating the collection, assimilation, and retrieval of data in various forms and one such method is the management information system. MIS involves the physical equipment, relevant instructions, procedures, data bases and participation of people at

all levels in organisations. There are practical problems in handling large quantum of data especially in public service organisations. This can be minimised through effective communication network, leveraging the technologies, involvement of people at all levels through capacity building and strengthening institutional mechanisms. Besides that, there are threats like cyber attacks which are evolving and escalating in their sophistication and can cause immense damage. Measures need to be taken to protect the data as well. Information is a key source and needs to be utilised as a critical input for effective decision making and service delivery.

10.8 GLOSSARY

- Artificial Intelligence** : It refers to the simulation of human intelligence in machines that are programmed like humans. It is a branch of computer sciences concerned with developing smart machines capable of performing tasks that typically require human intelligence.
- Big data** : It is data that is huge in volume that can be used by organisations to create new growth opportunities.
- Cloud computing** : It refers to a model of computing that provides access to a shared pool of computing resources (computers, storage, applications, and services) normally over the internet.
- Information system** : Information system is a system consisting of the network of all communication channels used within an organisation.
- Knowledge Management** : It refers to the process of collection, organisation, analysis and sharing of information, experiences and knowledge of individuals and groups in an organisation. It also involves making this information available to others in the organisation.
- Organisational Learning** : It is the organisation's capacity to improve the task performance through generating better knowledge, understanding and experience sharing. The capacity of organisation to acquire knowledge, skills and appropriate behaviour that helps in improving the performance can be considered as organisational learning.
- Operations Research** : It involves the use of mathematical models, statistics and other scientific methods and techniques in decision making pertaining to the operations of a system. It aims at optimising for improving organisational performance.

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10.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1. Your answer should include the following points:

- Information in an organisation is the collection of expertise, experience and database used by individuals and groups for discharging their responsibilities.

It is needed to

- Decide the mission and objectives of organisation.
- Determine the plan of action for achieving the objectives of the organisation.
- Implement the plans and programmes.
- Evaluate the performance; and
- Facilitate feedback.

2. Your answer should include the following points:

- Management Information System is a system designed by an organisation to collect and report information on a programme and which allows managers to plan, monitor and evaluate the operations and performance of the total programme.

Its characteristics are:

- It is management oriented.
- It is a integrated concept.
- It is broken down into several sub-systems.
- It includes every type of systems that gives information whether formal or informal.

3. Your answer should include the following points:

- The evolution of MIS can be traced in three phases.
- The first-generation MIS involved the capture of information and experience to make it accessible. Information under the influence of econometric standards

was treated as a commodity rather than a process. MIS was incapable of managing knowledge creation.

- The second-generation knowledge management gave priority to the ways in which people construct and use knowledge.
- The third -generation MIS refers to creation of huge and diverse volume of data characterised by volume, velocity, and variety. This phase is characterised by emergence of various forms such as ‘data analytics’, ‘artificial intelligence’ etc.

Check Your Progress 2

1 Your answer should include the following points:

There are five components of MIS

- Hardware
- Software
- People
- Procedures
- Databases

2. Your answer should include the following points.

- The ‘Project Insight’ is a tax tracker, launched by the Income tax department in 2019, to help analyse the data to get information about the black money. Under this 5000 entities that were in existence despite being de registered were tracked down. The details from banks regarding 50000 de-registered companies that deposited and withdrew about Rs. 17000 crores during demonetisation was procured. The government leveraged big data to flag accounts with sizable black money deposits. It uses big data and artificial intelligence in this tracking activity.

3. Your answer should include the following points:

- Focus on bureaucratic and operational work of government programmes.
- Hierarchical form of decision-making.
- Absence of a communication platform accessible by all levels of responsibility in organisation.
- Inadequate and non-participative analysis of needs of community where agency plans an intervention.
- Lack of skilled staff to understand the MIS formats and do the reporting.

UNIT 11 TOTAL QUALITY MANAGEMENT*

Structure

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Concept of Total Quality Management
- 11.3 Total Quality Management in Public Administration
- 11.4 Evolution of Total Quality Management in India
- 11.5 Principles of Total Quality Management
- 11.6 Total Quality Management Tools
- 11.7 Total Quality Management: Strengths and Challenges
- 11.8 Conclusion
- 11.9 Glossary
- 11.10 References
- 11.11 Answers to Check Your Progress Exercises

11.0 OBJECTIVES

After reading this Unit, you should be able to:

- Discuss the concept and emergence of Total Quality Management (TQM);
- Describe the principles of total quality management;
- Explain the forms of its application;
- Analyse the implementation processes and tools of total quality management; and
- Appraise its strengths and challenges.

11.1 INTRODUCTION

The growth of human society is an ongoing process. The evolution of quality management from the industrial revolution to present day has been interpreted in several different ways. In recent times, reliance is placed on total quality management in public systems and governance. The concept of Total Quality Management (TQM) and its practice is increasingly being applied in industrial and service sector. Quality management practices are both people-oriented and process-oriented and providing quality service is the principal criterion that measures the competitiveness of a service organisation (Ping Lu *et.al*, 2019).

The industrial revolution, in the early 19th century witnessed the application of inspection and control in quality processes to ensure results. Frederick Winslow Taylor developed the management system to improve productivity. By 1940s, during the post-world war II era, Japanese companies emphasised on quality of life and products. In the

*Contributed by Dr. Vandana Dabla, Project Officer, Society for Health Allied Research & Education India, New Delhi.

early 1950s, with the work of certain proponents of quality namely, Juran, Deming and Feigenbaum, gaining prominence, Japanese plants rapidly developed quality management practices and by 1960, quality control and management became a national agenda. Gradually the concept of total quality management has gained importance and is being applied across sectors in organisations.

In India, imbibing the spirit of quality and to measure qualitative outcomes, the National Institution for Transforming India (NITI Aayog), has put measurable incremental annual outcomes in critical sectors like health, education, water, and Sustainable Development Goals (SDGs).

In this Unit, we shall discuss the conceptual framework of total quality management and how this phenomenon is impacting the services in every sector of India. An attempt is also made to examine the principles and tools for application of TQM.

11.2 CONCEPT OF TOTAL QUALITY MANAGEMENT

Till mid-eighties, the use of quality related terminologies and acronyms were not much in practice. Although TQM has no universally accepted definition, quality is both a user-oriented and production-oriented expression. From the user's point of view, quality is an expression of the products' or services' usefulness in meeting the needs and expectations and its reliability, safety and durability. Thus, although its concept is studied by many scholars, the concepts of quality and total quality management are defined in different ways.

A significant component of F.W. Taylor's philosophy still finds place in the field of quality management, such as standardisation, management by facts, motion efficiency, and emerging customer focus. Perhaps, the main reason for the origin of the term TQM could be a substitution in the previously used term of Total Quality Control (TQC), the word "control" by "management" with the reasoning that quality is not just a matter of control, it must be managed. In a paper by Feigenbaum (1991), the term "total quality" was used for the first time, and referred to wider issues such as planning, organisation and management responsibility. Further, together with the impact of the writings of Crosby, Deming, Feigenbaum, Juran and Ishikawa; their integrating approaches with quality management, gave rise to the concept of TQM.

With Japan producing quality results and improving its condition post war, led to the rise of quality era. Their results motivated USA in the West to the extent that they officially recognised the importance of quality with establishment of its Malcolm Baldrige National Quality Award in 1987 to reward performance excellence in organisations.

Britain, which was facing the declining global share also could not resist the benefits of quality philosophy and in 1979, established the British Standard (BS) 5750 for quality systems. Moving a step forward, with an objective of bringing the attention of industry towards the importance of quality for competitiveness and survival in the world marketplace, it launched the National Quality Campaign in 1983, using BS5750 as its main theme.

The International Organisation for Standardisation (ISO) published the globally renowned ISO 9000 standards in 1987. It details out the fundamentals of quality management systems and assists organisations to ensure that they meet the requirements

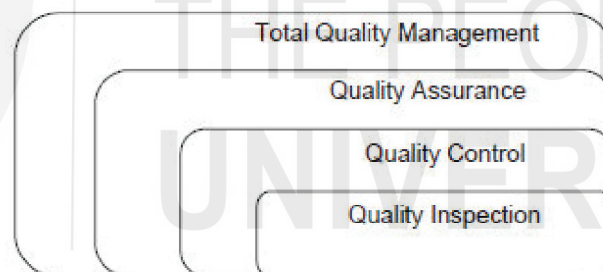
of customers and other stakeholders while complying with the statutory and regulatory requirements related to a product or service. The aim is to provide a universal framework for quality assurance — primarily through a system of internal and external audits. Later, ISO also published its series of standards for use. Indeed, TQM percolated from manufacturing to the commercial services sector and eventually to public services.

To meet the challenges of this global revolution, many businesses have invested substantial resources in adapting and implementing total quality management strategies. The role of total quality management is widely recognised as being a critical determinant in the success and survival of a service or product in today's competitive environment.

Ho (1997) defines the expanded term of TQM where reference to “Total” is made when everyone associated with the organisation is involved in continuous improvement (including its customers and suppliers if feasible), “Quality” refers to the customers when their expressed and implied requirements are fully met, and “Management” refers to executives who are fully committed.

The role of total quality management is widely recognised as being a critical determinant in the success and survival of an organisation in today's competitive environment. Any decline in customer satisfaction owing to poor service quality, would be a matter of concern. Consumers are becoming increasingly aware of rising standards in service quality, prompted by competitive trends which have developed higher expectations (Yavas & Shemwell, 2001).

Figure 1. Illustration of the concepts of quality inspection, quality control, quality assurance and total quality management. The figure shows one common description of the evolution of quality management. [From Bergman & Klefsjö 2003].



As we have discussed in the preceding section, the quality movement has a long and complex history, and not surprisingly its evolution from the industrial revolution to present day has been interpreted in several different ways. Perhaps, the most common description of the way in which quality and quality improvements have been evolved into “Total Quality Management (TQM)”, is that which identifies the **four phases or stages** illustrated in Figure 1: Quality Inspection, Quality Control, Quality Assurance, and TQM (Dale, 1999).

The first stage of quality i.e., **Quality inspection stage** started around 1910 when the Ford Motor Company, then one of the world's largest manufacturers, employed teams of inspectors to check the quality of the T-model car (Ford car). The idea behind quality inspection was that poor quality products could be found by inspection and then either scrapped, reworked, or sold as lower quality products.

By 1930s, Statistical **Quality Control** was being embraced by Ford and several other manufacturing companies to find problems initially and control the manufacturing process, instead of rejecting or repairing it post-production. The origin of quality management

based on inspection and control is firmly rooted in the school of management of Taylor, whereby he demonstrated ways to inspect and control the manufacturing process to minimise errors and maximise profits.

The **Quality Assurance stage** concentrates on pre-production activities and relies on quality standards to assist with the reducing failures and mistakes in the processes of output or services.

The **fourth and current stage, Total Quality Management**, involves understanding and implementing quality management principles and concepts in every aspect of an organisation, including its customers and suppliers.

In simple terms, total quality management is a management approach to the long-term success of an organisation through customer satisfaction. It encompasses efforts to institute an organisational climate where employees continuously put in their best efforts to provide products and services that are of value to the customer. It is a participative and systematic approach to planning and implementing a constant organisational improvement process that focuses on meeting customers' expectations, identifying problems, building commitment, and promoting open decision-making among employees.

Check Your Progress 1

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) What do you understand by the term 'Total Quality Management'?

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2) Describe the evolution of quality management from quality control.

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11.3 TOTAL QUALITY MANAGEMENT IN PUBLIC ADMINISTRATION

Public administration, since the inception of human society, has led its way towards infallible continuous improvement. This was evident through the works of Taylor, who thrived for minimising the defects and improving the work output by applying principles of management. His paper titled "The Principles of Scientific Management", way back in 1911, laid the foundation of the concepts of analysing and reducing defects to enhance productivity. Relatively, quality has always been obliquely related to public administration

concept since the creation of the modern administrative state. Then, it was more linked with the observance of regulations and procedures, abidance of formal correctness and absence of arbitrary decisions (Engel, 2003).

Nevertheless, the meaning of quality in the public sector changed in the late 1960s, when Management by Objectives (MBO) gained popularity in public administration. The dire need of improved concept of management in all spheres, led to the emergence of New Public Management (NPM) during 1980s, and this paradigm shift laid the foundation of total quality management with wider vision of management techniques. Total quality management was an important example for organic and humanistic styles and approaches amongst others. The NPM, having its base as rational choices and public choices contains elements of TQM, seeks to offer more efficient mechanisms for delivering goods and services and for raising governmental performance levels (Kelly, 1998).

A considerable overlap between TQM and NPM can be found. “TQM provides a systematic and quantified rationale for the NPM idea of government that both work better and cost less” (Mathiasen, 1999). Hood (1991) has seen NPM as a reorganised idea that is adopted for enhanced quality services. In sum, the major components of the NPM paradigm, namely customer orientation, increased managerial freedom in resource and personnel management, performance measurement, investment in human and technological resources and receptiveness to competition are represented in one or another version of TQM.

11.4 EVOLUTION OF TOTAL QUALITY MANAGEMENT IN INDIA

In India, the concept of quality emerged through statistical processes and need for evaluation of services and programmes. The need for formulation of national standards led to the setting of “Indian Standards Institution (ISI)”, which came into being on the 06 January 1947 and legitimised by law on 21 March 1952, with Parliament enacting the Indian Standards Institution (Certification Marks) Act to certify standards.

The Bureau of Indian Standards

To broaden its scope and more powers, through an Act of parliament dated 26 November 1986, the Bureau of Indian Standards (BIS) came into existence on 1 April 1987, taking over the staff, assets, liabilities, and functions of erstwhile ISI. Since then, Bureau of Indian Standards is acting as a National Standards Body of India and has so far formulated over 19000 standards in various technology areas. The reformed BIS Act came into force on 21 March 2016, adding more new laws.

The BIS Product Certification Scheme is one of the largest in the world, with over 26500 licensees covering more than 900 products. It also carries out operation of Product Certification Scheme, Management Systems Certification Schemes and Training.

With a view to encouraging Indian manufacturing and service organisations to strive for excellence, and to recognise the efforts made towards quality, the BIS institutes awards for organisations which have excelled in the field of “quality”, either in manufacturing sector or in-service sector. Such awards are also prevalent in other countries, like USA, Japan, and Europe.

The Government of India, to realise the objective of improving quality competitiveness of Indian products and services, and administering the National Quality Campaign, laid the foundation of Quality Council of India (QCI) in 1997. Under the Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, QCI operates the National Accreditation Structure for conformity assessment bodies. QCI was set up jointly with the Indian Industry represented by the three premier industry associations i.e., Associated Chambers of Commerce and Industry of India (ASSOCHAM), Confederation of Indian Industry (CII) and Federation of Indian Chambers of Commerce and Industry (FICCI); with the aim of establishing and operating national accreditation structure and promote quality through National Quality Campaign.

QCI has announced its mission as “Quality for National Well Being”, wherein it envisions to support the country achieve and sustain total quality and reliability, in all areas of life, work, environment, products and services, at individual, organisational, community and societal levels. It includes vast services, namely education, healthcare, environment protection, governance, social sectors, infrastructure sector and such other areas of organised activities that have significant bearing in improving the quality of life and wellbeing of the citizens of India.

The Council formulates strategy, general policy, constitution, and monitoring of various components of QCI including the accreditation boards with the objective of ensuring transparent and credible accreditation system. In addition to having an exclusive Board for promotion of quality, the accreditation is done through the executive boards in the specific areas:

- I. Conformity Assessment Bodies
- II. Healthcare Establishments
- III. Education & Vocational Training Providers.

Although, theoretically, the use of TQM practices is an important part of improvements in business performance, a considerable number of organisations have fallen short in implementing their quality programmes (Rad, 2006).

The erstwhile Planning Commission of India, in its report of “Faster, Sustainable and more Inclusive Growth, An Approach to the Twelfth Five Year Plan”, emphasised upon the qualitative aspect of the services. The need for total quality management was further recognised by the erstwhile Planning Commission of India, in its Twelfth Five Year Plan (2012–2017), in which it reiterated the distinction between creating yet another ‘organisation’ and stimulating a ‘movement’ towards ensuring quality.

While accreditation of health institutions was voluntary during the 11th Five-year plan (2007-2011), currently, the accreditation status is essential for empanelment benefits in healthcare establishments. Taking the quality parameter on a serious inclination, the 13th Five Year Plan emphasised the importance of qualitative services.

NITI Aayog, in present times industriously supports application of quality management aspects amongst all spheres and services, and henceforth aims to measure services as per set indices, indicating the application of TQM in real time. In the direction of emphasising qualitative goals and to measure progress, Niti Aayog also developed Health Index and Composite Water Management Index by June 2018; and is currently

under process in developing School Education Quality Index, SDG India Index and Digital Transformation Index (state- wise). In June 2021, the Niti Aayog released SDG India Index.

11.5 PRINCIPLES OF TOTAL QUALITY MANAGEMENT

The government's interest in TQM translated into an increase of TQM initiatives in areas such as road maintenance, welfare, police protection and emergency services. Local administration finds TQM an interesting concept, in the sense that it helps in understanding the community's needs, as well as assists administration in curbing the costs and improve services. Local administration may benefit from TQM as it may become a means to enhance responsibilities, increasing revenues and decreasing public's cynicism regarding civil servants' skills (Berman and West, 1995). Thus the presence of quality processes will not only be able to increase customer satisfaction in public services but also build trust through transparent processes, accountability, and democratic dialogue.

Quality management is applicable through its principles of management. Since these are essential elements to implement TQM, these are also called factors, steps, or functions to achieve total quality, and being proposed by many eminent scholars and experts in the field of quality. These principles came into existence with the work of Gulick in 1937, who introduced the concept of POSDCORB, which stands for seven managerial functions as Planning, Organising, Staffing, Directing, Coordinating, Reporting and Budgeting. These functions are proposed to be performed by all managerial staff to achieve quality in the services offered by an organisation.

Crosby (*ibid*) defined quality as "conformance to requirements or specifications". According to him, requirements are based on customer needs. Crosby identified 14 steps for a zero-defect quality improvement plan to achieve performance improvement [Figure 1]. Crosby's main idea to achieve quality was to prevent defects and conform to requirements. At the same time, the product or the service must be deficiency free.

Figure 1. Crosby's 14 steps, (Crosby, 1987)

Crosby's 14 steps	
1. Management Commitment	8. Quality Education
2. The Quality Improvement Team	9. Zero Defects Day
3. Quality Measurement	10. Goal Setting
4. The Cost of Quality	11. Error-cause removal
5. Quality Awareness	12. Recognition
6. Corrective Action	13. Quality councils
7. Zero defect Planning	14. Do it over again

Juran (1995) believed that main quality problems are due to management rather than workers. He emphasises on team and project work, which can promote quality improvement, improve communication between management and employees, and bring about coordination between employees. He considered quality management as

comprising three basic processes, also famously known as The Juran Trilogy. This trilogy includes quality control, quality improvement, and quality planning.

The ISO 9000 series, as we have discussed in the earlier section, are based on seven quality management principles (QMP). The seven quality management principles are:

- I. Customer focus:** Organisations depend on their customers and therefore should understand current and future customer needs, meet customer requirements, and strive to exceed customer expectations.
- II. Leadership:** Leaders establish unity of purpose and direction of the organisation. They should create and maintain the internal environment in which people can become fully involved in achieving the organisation's objectives.
- III. Engagement of people:** People at all levels are the essence of an organisation and their full involvement enables their abilities to be used for the organisation's benefit.
- IV. Process approach:** A desired result is achieved more efficiently when activities and related resources are managed as a process.
- V. Improvement:** The improvement of the organisation's overall performance should be a permanent objective of the organisation.
- VI. Evidence-based decision making:** Effective decisions are based on the analysis of data and information.
- VII. Relationship management:** An organisation and its external providers (suppliers, contractors, and service providers) are interdependent, and a mutually beneficial relationship enhances the ability of both to create value.

The TQM applications are multiple and varied with different contextual realities, from reducing costs in public administration to reorientation strategies intended to meet people's needs as effectively as possible. The implementation strategies and the intensity of the implementation process differ from one country to another and are clearly influenced by several contextual factors such as the degree of executive decentralisation and the administrative and judicial traditions in each separate country.

Indeed, the reform strategies of public administration promote identification of measures for ensuring its modernisation. This was based on reorganising the State institutions for optimising decisional process, improving human resources and public finance management.

Having discussed the principles of quality management for its successful implementation in the services and processes, let us discuss about the methods of its application in the subsequent section.

11.6 TOTAL QUALITY MANAGEMENT TOOLS

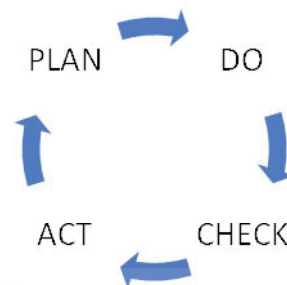
The application of principles of quality requires use of systematic processes and tools to identify, measure, prioritise and improve the current processes or yield desired results. Often, these are referred to as techniques, methods, or procedures. The absence of a well-defined process results in an arbitrary mode of execution with unpredictable

performance. To “do it right the first time” as well as “do the right things right,” processes must be efficiently managed. Let us discuss some prevalent processes and tools of TQM in this section.

Plan-Do-Check-Act (PDCA)

Deming introduced “PDCA Cycle” in 1950s as an effective quality process. It is also famously known as Shewhart Cycle or Deming Wheel. PDCA stands for Plan, Do, Check and Act.

Figure 2. Illustration of PDCA cycle



Planning is to identify and evaluate a procedure for problem or defect. Points should be made about problems, resources, current processes, and possible better options. Define the modified procedure. Second step is to *Do*, i.e., implementing the planned procedure or potential solution and measure the results. Then, *Check* or evaluate the result, measure effectiveness, and examine the improvement. Lastly, if the output is satisfactory and improved, *Act* on it by implementing. Use of the PDCA cycle represents continuously looking for better methods of improvement. It is effective in both doing a job and managing a programme.

SWOT Analysis

SWOT Analysis refers to **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats and is used to evaluate the quality aspect by identifying its positive and negative factors. It helps in identifying the internal strengths and weaknesses and opportunities and threats in its external environment. The knowledge and insight of these is helpful in strategic planning and decision-making activities. Thus, SWOT analysis presents a four-way look of a service/ department.

Figure 3. Illustration of SWOT Analysis

Internal Factors	Strengths	Weaknesses
	Opportunities	Threats
External Factors		

Bench Marking

Benchmarking is defined as a process of comparing performance to that of the best that either exists outside or based on the performance arising out of the competition. It improves performance by identifying and applying best demonstrated practices into own policies through redesigning of internal processes. Benchmarking goes beyond competitive analysis to understanding the competitor’s output and process of obtaining

the output. The advantages of benchmarking include enabling organisations to outperform competitors, opening minds to new ideas, and placing organisations in a continuous improvement mode.

Benchmarking helps in performance improvement and in identifying methods for improving operational efficiency and organisational process. It also helps in managing budget and focus is on capabilities vital to building strategic policies. It promotes organisational learning and facilitates brainstorming on new techniques or initiatives an organisation can adopt for improving its output or services.

11.7 TOTAL QUALITY MANAGEMENT: STRENGTHS AND CHALLENGES

The following are the strengths and challenges of TQM:

Strengths of TQM

1. TQM ensures fulfilment of customer's expectation and meets the set output criteria.
2. There is a clear involvement of employees and staff in the management of enterprise and thus in the improvement process.
3. TQM assists organisations to develop a robust and organised structured and documented system, to ensure system driven culture and continuous output.
4. It potentially reduces the probability of errors in the process of the service or operational procedures, resulting in saving resources, time, and efforts.
5. TQM absorbed in the organisational culture, leads to an automatic qualitative results and services. Thereby, making the quality output as a default result.

Challenges of TQM

1. Leadership guides the level of quality philosophy adopted by the organisations. Lack of management commitment towards TQM, is a major roadblock for implementation of quality at the ground level.
2. Application of TQM processes vary from one service to another. Every organisation has its own strengths and weaknesses. Adoption of processes of another enterprise without thoughtful evaluation yields no benefits.
3. Closed bureaucratic system deters collective decision making and fails to involve opinions of employees, suppliers, and customers. This impacts the success of the TQM programme.
4. Focus on the short-term objectives and neglecting long-term goals is not consistent with spirit of quality philosophy.
5. Laxity in adopting the TQM in the initial stages of the process. The culture of reliance on corrective actions rather than preventive is hindrance towards TQM implementation.
6. Dearth of appropriate training and motivation of the staff.
7. Insufficiency of resources often results in postponing of the quality measures, even if measures are defined.

Check Your Progress 2

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) State the basic principles of TQM as laid down by ISO 9000.

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3) Explain the tools of quality management.

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3) List some strengths and challenges in adopting total quality management.

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11.8 CONCLUSION

The rapidly changing world is witnessing the change of expectations in the kind of services we need and in the current progressive governance, quality management has emerged as a tool to provide the best results. With the concept acquiring global connotation, the advantage of TQM phenomenon is being enjoyed by both industrial and service sectors and has rightly become a need to measure its services. An obvious expectation today, however, is that the implementation strategies of TQM are greatly influenced by the resources, economic structure, societal need, and willingness to achieve excellence.

11.9 GLOSSARY

Accreditation	: It is a voluntary process where issuing organisation is a recognised national body or non-governmental organisation. Accreditation evaluates organisation for compliance with published standards, on-site evaluation. Here standards are set at a maximum achievable level to stimulate improvement over time.
Certification	: Certification is a formal attestation or a document issued by an authorised body, either government or NGO

evaluates both individual or organisation or one of its components. Certification evaluates pre-determined requirements, additional education/ training demonstrated competence in a specialty area or additional services, technology, or capacity the organisation has and so on. The standards are set by national professional or specialty boards. Industry standards (e.g., ISO 9000 standards) evaluate conformance to design specifications.

Management by Objectives (MBO) : It was first outlined by Peter Drucker in 1954. It aims to improve the performance of an organisation by clearly defining objectives that are agreed to both by management and employees.

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11.11 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check your Progress 1

- 1) Your answer should include the following points:
 - Total quality management is management approach to the long-term success of an organisation emphasising on quality to gain customer satisfaction.
 - It encompasses efforts to institute an organisation climate where employees put in their best efforts to provide products and services that are of value to the customer.
 - It is a participative and systematic approach to planning and implementing an organisational improvement process that focuses on meeting customer's expectations, identifying problems, building commitment, and promoting open decision-making among employees.
- 2) Your answer should include the following points:
 - The first stage i.e., quality inspection stage started around 1910 wherein poor-quality products found by inspection can either be scrapped, reworked or sold as lower quality products.
 - The second stage is quality control stage wherein efforts were made by industries to inspect and control the manufacturing process to minimise errors and maximise profits.
 - The third stage i.e., quality assurance stage concentrates on pre- production activities and relies on quality standards to reduce failures.
 - The fourth stage is total quality management involves understanding and implementing quality management principles and concepts to all aspects of organisation.

Check your Progress 2

- 1) Your answer should include the following points:
 - Customer focus

- Leadership
- Engagement of people
- Process approach
- Improvement
- Evidence-based decision making
- Relationship management

2) Your answer should include the following points:

Description of the processes of

- Plan-Do-Check-Act
- SWOT analysis
- Benchmarking

3) Your answer should include the following points:

The strengths of TQM include:

- Fulfilment of customer's expectations.
- Developing a robust and organised structured system to ensure continuous output.
- Reduces probability of errors resulting in saving of resources, time and efforts.
- Brings in qualitative results and services.

The challenges in implementation of TQM are:

- Lack of management commitment.
- Closed bureaucratic system.
- Laxity in adopting TQM in the initial stages of any process.
- Dearth of appropriate training and motivation of staff.
- Insufficiency of resources.

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