

**Internship Report on**

**“Implementing Automation by Digitization of Information Systems**

**At Dhaka WASA”**

**Submitted To:**

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**Submitted by:**

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**Date of Submission:**

**Letter of Transmittal**

Date:

Dr. Dhiman Kumar Chowdhury

Professor and Chairman

Department of Accounting & Information Systems

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University of Dhaka.

**Subject: Submission of Internship Report.**

I am here by submitting my Internship Report, which is a part of the MBA Program curriculum. It is great achievement to work under your active supervision. This report is titled- “Implementing Automation by Digitization of Information Systems at Dhaka WASA”.

I have got the opportunity to work as an Engineer at Dhaka WASA both in projects and in operation and maintenance divisions. While preparing this report, I have tried my level best to include all the relevant information, explanations, things I learned from the organization, my contribution to the organization to make the report informative and comprehensive. It would not have been possible to complete this report without your assistance, of which I am very thankful. This job gave me both academic and practical exposures. I learned about the organizational culture, working procedure of a prominent public water supply utility of the country, this also gave me the opportunity to develop a network in the public sector. It would be my immense pleasure if you find this report useful and informative to have an apparent perspective on the issue.

Therefore, I pray and hope that you would be kind enough to accept my Internship Report and oblige thereby.

Sincerely Yours

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**Acknowledgment**

I would start by thanking my honorable internship supervisor Dr. Dhiman Kumar Chowdhury who has provided me with the necessary guidance needed to complete this internship report. Without his help it would not be possible for me to compile necessary information, make necessary adjustments to finish the report in time. I am also deeply grateful to him for allowed me to choose an organization for internship according to my job.

I would like to thank Dhaka WASA colleagues for all their support, necessary tips and guidelines during the internship period and the entire divisional team for being helpful and supportive in every little help I needed and for creating the opportunity for me to bring out my best performance.

I would like to express my sincerest gratitude to my family members and friends who always encouraged me for my higher studies and successful result.

**Executive Summary**

This report is an overview of my internship job experience at Dhaka WASA. During my job I have learned a lot about working with various stakeholders at public sector, public relations, Digitization of information systems, Digitalization of work process and its different applications. I have known about the work flow of public projects and public organizations, along with the functions the management and accounting department performs.

I have learned to work in a public utility corporate space which not only enriched me professionally but also helped me grow personally as well. My contribution was appreciated by my supervisor and other members of the department. I have had a great opportunity to practically see how automation and digitization sector is working and evolving in Bangladesh.

This report has been presented based on my observation and experience gathered from the company.

The organization has many projects, divisions and departments but the focus is given more on the Technical, Engineering, Automation and Digitization works of various Department. This report mentions about the overall procurement process for automation, financial information of those divisions and vendor management in Dhaka WASA.

However, this report has been written in a short time. I have tried my level best to make it meaningful by reflecting my works at Dhaka WASA. After knowing the scenario of automation process and information management and financing related to automation at Dhaka WASA, I came up with some important deductions. The report also consist recommendations and conclusion according to my point of view, which I think would improve the organization in the automation aspects.

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|  | ERP Software |  |
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*CHAPTER 01 – INTRODUCTION*



**1.1 Background / Origin of the report:**

This report is a partial requirement of the Internship program of MBA program of – Department of Accounting & Information Systems, Faculty of Business Studies, University of Dhaka. The main purpose of internship is to get the student exposed to the job world of the business managers. Being an employee & intern, the main challenge was to translate the real life experience into theoretical concept and write a report.

The internship program and the report have following purposes:

* To get and organize detail knowledge on business processes of the organization.
* To experience the real world business activities.
* To fulfill the requirement of MBA program.

This report is the result of three months long internship program conducted in Dhaka WASA and is prepared as a requirement for the completion of the MBA program of University. As a result I need to submit this report based on the **“Implementing Automation by Digitization of Information Systems**

**At Dhaka WASA”**. This report also includes writing on the overview of the organization, the products and services of Dhaka WASA, and also what factors they consider while selecting automation for different purposes.

**1.2 Objective of the report:**

The objective of the report can be viewed in two forms:

* General objective
* Specific objective

General Objective: The internship report is prepared primarily to fulfill the Masters of Business Administration (M.B.A) degree requirement under the Faculty of Business Studies, University of Dhaka.

Specific Objective: More specifically, this study entails the following aspects:

* To give an overview of Dhaka WASA.
* Look at various works related to automation of various divisions and financial information.
* To identify the strategies, policies and cost for implementing automation into all type of management process.
* To find out bottleneck of automation process with effective solutions to overcome the limitations.
* To make some recommendations regarding implementation of automation effectively and efficiently.

**1.3 Significance of the report:**

Other than pointing out the key factors for Automation of to the management, it will also be useful to employees, management practitioners, automation industry and the society as a whole.

Employees can find out in which direction the management is going and based on the organizational environment what should be their future preparations. Management practitioners can gain important insights regarding the areas for improvement in similar sectors. Automation industry and Technology-vendors/bidders can also benefit from the outcomes of this study by getting an indication of where to focus resources and efforts for business opportunities. Finally, the society at large will benefit from improved customer services, if the findings help improve overall atmosphere of the organization.

**1.4 Methodology of the report:**

**Framework of the report:**

The whole report has been arranged in nine specific parts. Part one named as Introduction, which includes the origin, objectives, significance and methodology of the report. Part two named as Organization Overview, which includes the description of the overall organization of Dhaka WASA. Part three named as Job experience which includes my job responsibility and activities in the organization as employee for past ten years. Part four points out key areas of automation. Part five discusses about. Part six mentions the digitized processes and services. Part seven includes case study of automated AIS and billing. Part eight includes recommendation and conclusion and Part nine is Appendix.

**Target population:**

The target populations for the study are –

* Internal employees.
* Vendors of the organization.
* Consumers
* Key executives of Dhaka WASA.
* Government Regulators
* International Agencies

**Study Area:** The study will be conducted within the organization to study the automation process of Dhaka WASA.

**Data Sources:** For the information of the report mainly both type of internal and external - primary, secondary and tertiary sources of data have been collected. For accurate study we have to follow some rules & regulations. The study materials were collected from these sources:

**Primary sources**: Data which is considered as first-hand information collected by a surveyor, investigator, etc. is defined as Primary Data. The sources from which such data is collected is termed as the primary source of data collection for the concerned information. Primary sources of data consist various data collected by-

1. Analysis of Practical work, Job responsibilities.
2. Face to face conversation with the co-workers and informal interview with the employees of Dhaka WASA.
3. Direct observations of DWASA activities- Zonal office works, Project works, Services to Customers.
4. Interview with Customers, Vendors & Consultants.

**Secondary sources:** Data that has already been collected, analyzed, published and has undergone statistical treatment can be defined as Secondary data. Such type of data is tailored from primary data sources.Secondary sources including

1. Files & folders in work computers have been used for this purpose. Digital copies of file notes, survey reports, estimates, drawings, contracts etc.
2. Old project files, letters, papers and old work documents, design and drawings printed on paper.
3. Official letters, notices, circulars, organization reports and publications collected & maintained by office or record section.
4. Dhaka WASA information from the official websites.
5. Internal Study report, Masterplan on Dhaka WASA automation DWASA central SCADA committee.
6. Presentation materials and training manuals from DWASA training center and trainers.

**External sources:** Some external sources (Some are also known tertiary source) were also used for information also

1. Various report and documents published by government units or development partners.
2. Newspapers & news websites.
3. Various Water Utility related Websites.
4. Automation guidelines and user manuals of international companies.
5. External Research or Study reports on WASA.
6. Textbooks.

**1.5 Limitation of the study:**

While doing this project I had to face some limitations. These are as follows-

* To perform employee survey involved in Accounting and Revenue/Billing Departments became very hard because I was not directly involved with the Accounting and Revenue/Billing Departments team; rather I worked with engineering team.
* Some employees were not willing to co-operate with external study.
* All the Information is not easily accessible or not permitted to disclose according to the organization policy, rules and regulations had been followed on the disclosure of confidential information.
* It was also difficult to collect information from different vendors of automation works.
* I also faced problem in communicating with my University Internship supervisor, Employees, Management members and Vendors of Dhaka WASA- face to face, due to COVID-19 situation.



*CHAPTER 02 - ORGANIZATION OVERVIEW*



**2.1 Introduction to DWASA**

Dhaka Water Supply and Sewerage Authority (WASA) is a service oriented autonomous commercial organization in the Public Sector, entrusted with the responsibility of providing water supply, sewerage disposal (wastewater), and storm water drainage service to the urban dwellers of Dhaka City. It covers more than 360 sq. km service area with more than 20 million people with a production capacity of 2650 million liters water per day (MLD). Dhaka WASA was established in the year 1963 as an independent organization and currently which is running under the WASA ACT 1996. The First Water Treatment Plant in Dhaka City Established in 1874 - Chadnighat –WTP.

**Legal Framework:** Under the order No. 19 of the East Pakistan Ordinance No. XIX of 1963 Dhaka WASA was established to ensure water supply and sewerage in Dhaka city. Later in 1996, Dhaka WASA Act (Act No. 6 of 1996, 17 August 1996) was promulgated to formulate and implement the rule of corporate management.

**Dhaka WASA Organization Mandate:** To ensure Water Supply, Treatment and Disposal of Wastewater (sewage) and Storm Water Drainage.

As an autonomous body Dhaka WASA started its journey with the mandate to effect (EP Ordinance NO. XIX, 1963)

1. Supply of water
2. Disposal of sewage
3. Storm water drainage and
4. Solid waste management

The organization however, continued to provide services spanning water supply, treatment and disposal of sewage since inception.

**Water Sources:** Major River System and Water Sources in Dhaka City: Padma , Meghna , Buriganga, Shitolokkha. Ground Water – Water present beneath earth’s surface aquifer is pulled up to surface and then distributed to customers.

**2.2 Organizational Profile:**

**Organizational Structure:**

Dhaka WASA is under the supervision of - Ministry of Local Government, Rural Development and Co-operatives, Local Government Division of that ministry of the People's Republic of Bangladesh.

The organizational structure of Dhaka WASA was changed according to the WASA Act 1996. As mentioned in the Act, Dhaka WASA Board consists of 13 members, headed by the Chairman. The Board is formed by representatives from different professional organizations and Government officials. According to the organizational structure of 2007, total number of approved posts and present employees are as follows:

**Manpower at a glance**

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Approved Posts | Existing Posts | Vacant Posts |
| First | 309 | 221 | 88 |
| Second | 331 | 260 | 71 |
| Third | 1917 | 1079 | 838 |
| Fourth | 2111 | 1340 | 771 |
| Total | 4668 | 2900 | 1768 |

**2.3 Area of Jurisdiction:**

All the extended areas of Dhaka South City-Corporation and Dhaka North City-Corporation.

**Dhaka WASA New Demand Areas Forecast**

|  |  |  |
| --- | --- | --- |
| **Year** | **Population (Million)** | **Area (Sqkm)** |
| **2025** | 21.6 | 1000 |

**2.5 Mission & Vision:**

**Vision:** To be the 'Best Water Utility' in the Public Sector of South Asia-Ensuring an environment-friendly, sustainable and pro-people water supply management system.

**Mission:**

1. To reduce the dependency on ground water.
2. To implement the projects effectively and speedily.
3. To practice a corporate culture in its management and operation.
4. To ensure a high level of transparency and accountability in all its service and activities.
5. To improve the efficiency and reduce operating cost.
6. To constantly seek way to serve our customers.

**2.6 Activities at DWASA:**

**Water Supply System:** Mostly, water supply system of Dhaka WASA is dependent on ground water. Around 78 per cent water comes from underground sources and the rest 22 per cent from surface water. Ground water is abstracted by using a total of 887 deep tube wells. Surface water is supplied by treating water of the river Shitalakshya and Buriganga through 4 Water Treatment Plants. Dhaka WASA supplies water to the mega city of Dhaka city and Narayanganj area. At present over 20 million people live in Dhaka and Narayanganj and this will increase many times by the year 2050.

It is notable that ground water level is declining by 2-3 meters per year due to continuous abstraction of water. For this reason, Dhaka WASA with the support & cordial cooperation of the present government, has pointed out the importance of reducing dependency on ground water by supplying water from surface water body as an alternative and sustainable source of water. For that purpose Dhaka WASA is moving towards environment-friendly, sustainable and pro-people water supply management system. Several water treatment plants projects have already been taken with a view to increasing dependency on surface water up to 70 percent.

To fulfill this target, Saidabad Water Treatment Plant, Phase-Ill is under implementation, which will supply a total of 450 million liters water per day in the city. Furthermore, two additional large Water Treatment Plants at Gandharbpur and Padma (Josholdia WTP) Water Treatment Plant, (Phase-I) have been taken. In Gandharbapur, it is planned to treat water from the river Meghna, which will produce 500 million liter of water per day. The Padma Water Treatment Plant is being built at Josholdia near the bank of the great river Padma from where 450-million-liter treated water will be supplied for Dhaka city dwellers

Dhaka WASA has 410 (including 42 mobile generators) diesel-driven generators which help maintaining the extraction of ground water during the Interruption of power supplies. Particularly during the summer season water demand as well as the electricity rise to its peak. At that period water supply system in Dhaka city is kept under normal condition by extracting water with the help of these generators. Dhaka WASA has taken initiatives for purchasing two hundred new generators which is under process. Moreover, if there is any water crisis anywhere in the city, Dhaka WASA instantly supplies water by using 43 water carrier trucks and 44 tractor trolleys.

**Sewerage System:** An effective sewerage system is a must for a healthy city. The sewerage system of Dhaka city was initiated in 1923.

Summary of the existing Sewerage System is as follows:

Number of Operating Sewage Treatment Plant – 2 (Pagla , Dasherkandhi)

Number of Proposed Additional Sewage Treatment Plant – 3 (in Uttara, Mirpur, Rayerbazar)

Number of Sewage Lift Station - 26

Sewer Line - 934 km

Number of Sewer Connection - 88,980

**2.8 Dhaka WASA at a glance:**

Demand and Supply of Water by Dhaka WASA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | Population (In million -  approximately) | Water Demand (Million Liter) | Water Supply Capacity  (Million Liter) | Shortage (Million Liter) | No. of Deep Tube  wells |
| 1963 | 0.85 | 150 | 130 | 20 | 30 |
| 1970 | 1.46 | 260 | 180 | 80 | 47 |
| 1980 | 3.03 | 550 | 300 | 250 | 87 |
| 1990 | 5.56 | 1000 | 510 | 490 | 216 |
| 1996 | 7.55 | 1300 | 810 | 490 | 216 |
| 1997 | 8.0 | 1350 | 870 | 480 | 225 |
| 1998 | 8.5 | 1400 | 930 | 470 | 237 |
| 1999 | 9.0 | 1440 | 1070 | 370 | 277 |
| 2000 | 8.5 | 1500 | 1130 | 370 | 308 |
| 2001 | 10.0 | 1600 | 1220 | 380 | 336 |
| 2002 | 10.50 | 1680 | 1300 | 380 | 379 |
| 2003 | 11.02 | 1760 | 1360 | 400 | 391 |
| 2004 | 11.56 | 1850 | 1400 | 450 | 402 |
| 2005 | 12.15 | 1940 | 1460 | 480 | 418 |
| 2006 | 12.65 | 1900 | 1540 | 460 | 441 |
| 2007 | 13.15 | 1980 | 1660 | 320 | 465 |
| 2008 | 13.65 | 2050 | 1760 | 290 | 490 |
| 2009 | 14.15 | 2120 | 1880 | 240 | 518 |
| 2010 | 14.50 | 2180 | 1990 | 190 | 560 |
| 2011 | 15.00 | 2240 | 2150 | 90 | 599 |
| 2012 | 15.00 | 2240 | 2180 | 60 | 615 |
| 2013 | 15.00 | 2250 | 2420 | - | 644 |
| 2014 | 15.00 | 2250 | 2420 |  | 672 |
| 2015 | 15.80 | 2250-2300 | 2420 | - | 702 |
| 2016 | 16.00 | 2400 | 2450 |  | 795 |
| 2017 | 17.00 | 2450 | 2500 | - | 827 |
| 2018 | 20.00 | 2500 | 2550 |  | 887 |
| 2019 | 20.10 | 2500 | 2600 | - | 886 |
| 2021 | 20.10 | 2520 | 2740 |  | 923 |

**Water Supply Infrastructure**

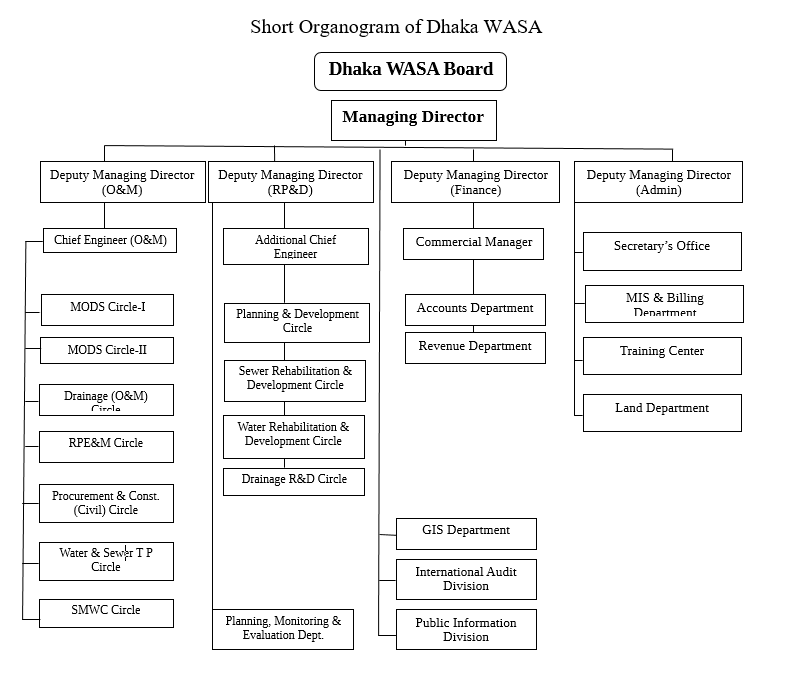
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Unit | 2017-2018 | 2018-2019 | 2019-2022 | 2020-2021 |
| Deep Tube Well | Nr | 795 | 827 | 887 | 896 |
| Water Treatment Plant | Nr | 4 | 4 | 4 | 5 |
| Water Production/Day | MLD | 2450 | 2500 | 2550 | 2560 |
| Water Line | Km | 3600 | 3720 | 2550 | 2560 |
| Water Connection | Nr | 371766 | 379686 | 390642 | 392400 |
| Overhead Tank | Nr | 38 | 38 | 38 | 38 |
| Street Hydrant | Nr | 1643 | 1643 | 1643 | 1643 |

**Water and Sewerage Billing and Collection (In Million Taka)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2017-2018  (In Lack Taka) | 2018-2019  (In Lack Taka) | 2019-2020  (In Lack Taka) | 2020-2021  (In Lack Taka) |
| Billing | 105285.95 | 1191110.47 | 13062 | 13679.20 |
| Collection | 100055.82 | 117942.50 | 13067 | 12813.06 |
| Bill Receivable (Dues) | 44711.09 | 45881.06 | 4584 | 7661.46 |

**Water Tariff**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Category | 01/11/2017  To  31/07/2018 | 01/8/2018  To  30/06/2019 | 01/7/2019  To  30/06/2020 | 01/7/2020  To  30/06/2021 | 01/07/2021 |
| Domestic | 10.00 | 10.50 | 11.02 | 14.46 | 15.18 |
| Commercial | 32.00 | 33.60 | 35.28 | 40.00 | 42 |
| Industrial | 32.00 | 33.60 | 35.28 | 40.00 |  |
| Community | 10.00 | 10.50 | 11.02 | 14.46 |  |
| Government | 32.00 | 33.60 | 35.28 | 40.00 |  |



**2.9 Why DWASA Should Implement Automation:**

* Reduce Costs - To reduce labor cost, DWASA should turn to automation. Since machines and computers can do complex tasks quickly, DWASA can skip hiring additional staff for simple needs.
* Save Time - Time equals money. This is why all companies should treat time like gold. Sometimes staff spends countless hours doing simple tasks. This not only decreases their morale, but it also makes them feel overworked. Having a machine perform tasks for employees will allow them to spend their time doing more important jobs.
* Better Customer Service - In today’s digital age, customers do not tolerate bad customer service. Revenue will start to slip if customers cannot reach service providers easily. To achieve this, DWASA can turn to automated e-mail services, message chat-bots.
* Enhanced Workflow - By automating business processes, DWASA can execute operational activities efficiently. Since machines will take care of monotonous tasks, your employees can focus on main business processes and ways to generate more revenue. Connecting all automated processes will also shorten workflow by eliminating unnecessary steps.
* Satisfied Employees - Nobody likes to do repetitive tasks all through their career. Having an automated workflow will liberate staff from doing so. In turn, it would make them happier and more satisfied since the machine will be doing all the boring tasks. If employees are happy, they will become more productive.
* Situational Awareness - Automating business process will enable DWASA to access information in just one click. It will also be easier for you to track and monitor processes.
* Better Quality - Customers expect you to deliver consistent quality products and customer service. Automating your business will ensure that every action is the same.
* Automation also promotes consistency. This way, all customers will experience the same level of service from your company. With no increase in production cost and time, you can focus more on improving products or services.
* Improved Insight - Integrating analytics is one of the most effective strategies to get to know your customers. Knowing more about your customers’ behavior will allow you to identify which campaigns yield the best results.
* Embrace New Technology - Many people are hesitant about integrating new technology into public sector. However, making way for a work culture that welcomes technological change will be better for public service in the long run.
* Reduce System loss and Unethical Practices - With automation we can achieve real time data gathering. Instant data can be turned into useful information by automated processing, which is easy to be analyzed by DWASA management. Management then can take decision to change processes that causes ineffective and inefficient works to reduce system loss (Any loss of water, electricity, machinery, materials or manpower at Water production facilities and distribution network system).
* Improve Span of control - The span of control is the number of subordinates a supervisor manages within a structural organization. Introducing automated business process concepts has a considerable impact on the span of control. Improved Span of control can reduce cost.



***CHAPTER 03 –SERVICES &***

***JOB RESPONSIBILITIES***



Dhaka WASA is a service oriented public, autonomous authority, which as a part of Local government division provides services of Water supply and Sewer waste water disposal. Dhaka WASA did not collect any service charge for providing Storm Drainage services. Dhaka WASA received drainage development fund and only a part of operation cost from LGRD&Co ministry. Dhaka WASA is not a business oriented profit focused organization. Service at various divisions and job responsibilities: -

**3.1 Drainage Operation and Maintenance works:**

* At the start of my work at DWASA, on 2010 November - I was posted as Assistant Engineer at Drainage (Electrical & Mechanical) Division. That Drainage (E & M) division was created on 2008 and was responsible to mainly operating and maintenance of 4 permanent and various seasonal or temporary storm water pumping facility at various places of Dhaka City.

**Job Responsibilities:**

1. Worked at Various Pumping /Lifting Stations of Canals and Many more Temporary/Mobile Pumping Facilities of Dhaka city under Electrical and Mechanical division at Dhaka Drainage Network Operation and Maintenance division.
2. There were permanent pumping stations at Old Dhaka -Mill Barakh Dholaikhal-Burigangah point; Janapath-Titipara- Maniknagar area Pumping station on the Segunbagicha Canal, Rampura Pumping station on east side of Rampura bridge on Begunbari canal, another pumping station at Kallianpur regulating pond area pumping out to Turag river. I mainly looked after Titipara -Maniknagar and Rampura -Begunbari Pumping stations. There were 20 to 25 temporary pumping stations established during rainy seasons, at various points and at the edge of Dhaka City to drain out storm water. We had to visit those sites regularly during rainy season.
3. Planning, Tendering, Evaluating, Procurement or Purchase for Drainage Electrical-Mechanical Operations and Maintenance Works.
4. Supervise over DWASA staff and contractors at work and quality control.
5. There were Electric motor driven pumps and Diesel Engine driven pumps. But mostly electric ones were used where there was electricity available. Diesel pumps were problematic and operational cost was high .Also operation and maintenance of a truck mounted crane which helped in various lifting works at DWASA.

* Sub-Divisional Engineer (Operation & Maintenance) Division-1, Drainage System of Dhaka city (March 2013). There were 10 kilometers of Open Canals and Box-culvert and 190 km pipe storm sewer drain line and more than 2000 manholes to maintain under this division, Drainage Operation and Maintenance – 1 (Operation and Maintenance of Pipe Drainage, Box-Culverts and Canals network of Dhaka to keep the water flowing specially during rainy season).

**Job Responsibilities:**

1. Planning, Budgeting, Tendering, Evaluating, Procurement or Purchase for Drainage Operations and Maintenance Works.
2. Supervise over DWASA staff and contractors at work and quality control. Plan and schedule cleaning activities for DWASA cleaners to clean all drainage units- pipe lines, box culvert, canals, manholes, pits etc.
3. Excavation and Re-excavation of canals.
4. Eviction of illegal structures canal land or other property of Dhaka WASA drainage facilities.
5. Manual tendering, evaluation, Notification award, contracting- system was being phased out and paperless, web portal based time and work saving- tendering system were being introduced. I was the first person in my division to implement e-GP and also, I trained other colleagues to work with that system.

* Sub-Divisional Engineer, UDDP - Urban Dredging Demonstration Project. (Operation and Maintenance of Pipe Drainage and Canals network of Dhaka) With co-operation of Vitens Evides International – Dutch water Operators (Netherlands) and Water operators partnership /WOP, based upon MOU with Dhaka WASA.

**Job Responsibilities:**

1. Urban Drainage / cleaning of Pipes, Box Culverts and Canals dredging and Sediment deposition and removal monitoring management with online/web-server base WIT software and mechanized equipment (floating bulldozer, Excavator etc) and drainage inventory/asset management software system.
2. Attempts were taken to modernize, mechanize and automate drainage works.
3. Introduction of digital GIS system and software.
4. Working to gather information previously unknown or not used. Example – Waste water sample collection, water testing to determine content, mobile gas analyzer, sedimentation data collection and digitization for storing etc.
5. This project also tried to popularize mechanization and Automation at various levels of our work by arranging various meetings and seminars which I also attended.

* Executive Engineer (Dec 2018 - Jun 2019). Five Canal Development Project by Land Acquisition of Manda, Baishteki/Journalist colony, Kurmitola, Hazaribagh, Begunbari Canals with Excavation and Re-excavation.

**Job Responsibilities:**

1. Preparing various documents maps, drawing, list of land owner related to land acquisition work,
2. Contacting with related stakeholders, government authorities, local people related to project site.
3. Planning, Tendering, Evaluating, Procurement or Purchase for Drainage Electrical-Mechanical Operations and Maintenance Works.
4. Excavation and Re-excavation of canals.
5. Eviction of illegal structures canal land or other property of Dhaka WASA drainage facilities.
6. Budgeting, Financial management of project funds.
7. Easy and time saving Automated web portal-based file, note, reporting, letter drafting & distribution system was introduced. I also updated my work and also improved my skills.

**3.2 Sewer Projects Works**

* Executive Engineer, Sewer (R & D) Project Executive Engineer, Sewer (R & D) Project, (Nov 2017 - Jul 2019) Sewerage System Rehabilitation and Development Project works for Dhaka city.

**Job Responsibilities:**

* 1. Planning, Tendering, Evaluating, Procurement or Purchase for Drainage Electrical-Mechanical Operations and Maintenance Works.
  2. Managing Construction works of pipe sewer lines and manholes at old Dhaka area.
  3. Ensuring safety and security of the workers and the people or property nearby the work site, as the sewer lines were being constructed at more than 10- 15 feet deep trenches.
* I was also responsible as an Executive Engineer (Additional charge) Jan 2021 - Apr 2021 · 4 months, at Dhaka Sanitation Improvement Project. Working on improvement of Sanitation system- Sewer network and Lifting stations and Pagla sewerage treatment plant at Narayanganj. Upgrading the Pagla STP from 120 mld to 600 mld capacity (mld = million liters per day) was the main focus. Almost 15 KM trunk main sewer line construction was also planned. Construction of pipe sewer collection network was also part of the project.

**Job Responsibilities:**

1. I was mainly involved in the preparation phase of this project. My main duty was to help the project director with preparation of Tender documents, technical documents of large packages.
2. I also prepared documents for required land acquisition for a sewer lifting station at Golaphbagh, Dholaipar area.
3. I also helped the project team to prepare documents, specifications and BOQ for small office restoration and reconstruction civil works, vehicle procurement, office equipment and procurement of Computers and related equipment.

**3.3 Planning and Design Division Works**

* Executive Engineer at P & D (E & M) Division. Planning and Design works related to Electrical and Mechanical equipment.

**Job Responsibilities:**

1. Planning Electrical & Mechanical works as needed by various divisions of Dhaka WASA.
2. Drawing, Designing, preparing specification, tender evaluation for Electrical & Mechanical works or supplies.
3. Inspection & Testing for Quality assurance of various works and supply.
4. Supervision, Inspection and Management of Work-site and Office works.
5. Inspection of various works related to implementation of automation for water production and distribution system. Example – SCADA, VFD, PLC, HMI, Sensors etc were specified and inspected for quality control.

**3.5 Training received from DWASA:**

During past 10 years of my work at Dhaka WASA, I have received many trainings related to work. Some of the trainings I received are listed below: -

1. At the start of my job at Dhaka WASA, I was placed in an orientation training course and was informed about overall structure and scope of work and business process, DWASA Act 1996 and DWASA regulations 2010 by DWASA.
2. Public Procurement Act 2006 and Public Procurement Rules 2008 by DWASA training center.
3. Office management, Leadership, Staff management trainings by DWASA and training center.
4. Project planning, management and implementation by training center.
5. Web and Computer based E-GP and digital web-based file/Nothi management by DWASA.
6. Microsoft office suite software package by DWASA and training center.
7. Budget planning, budget management and implementation by training center.
8. Planning, Modeling and Designing of Draining system by Vitens Evides International and training center.
9. Asset and Inventory management by software-based systems by Vitens Evides International, Vei-Dutch Water Operators and DWASA.
10. Water distribution network - design, operation and maintenance by Water Operators Partnership.
11. Gender role in Water policy making by Water Aid Bangladesh, Water & Gender Alliance.
12. Procurement management, PPR PPA, local and international bidding, vendor management, contract management – 21day training hosted by Engineering Staff College.
13. Office manner, staff development, personal skill development by training center.
14. Time management and Emotional Intelligence by training center.
15. Personal and Official financial management by training center.
16. Divisional procedures by training center.
17. Non-revenue water management and implementation of SCADA by training center.
18. Organization management and Leadership Training by WOP and MDF consultant & Training center.



***CHAPTER 04 - Digitized & Automated Systems and Services at Dhaka WASA***



**4.1 DWASA Web sites & Web pages:**

**DWASA Web Site & pages show following information:**

Main Menu – About DWASA, Rules and Regulations, Project Reports, Master Plan, Reports about DWASA, Gallery, Webmail, Contacts pages, Notice Board – Various notices about DWASA or matters related to DWASA internal or external issues, National Integrity Strategy of Bangladesh and DWASA activities pages, Dhaka WASA Citizen Charter pages, Annual Performance Agreement (APA) pages, Grievance Redress System pages, Right to information pages, DWASA Innovation Corner pages, Water tariffs and connection fees, Office orders, Pages about tenders, Official travels, passport, government orders pages, Reports, Career pages, Public information pages, Miscellaneous pages, Bank List, Central e-services, DWASA Hotline, Important links, site map etc.

This web site is maintained by MIS division of DWASA.

**4.2 Web Portal, Web application & Internal and External Web services:**

**DWASA Web Portal services for Clients and Employees:** Water and Sewer Connection Application, Personal Deep Tube-Well Application, WASA billing website, WASA bill online Payment, Supply Chain Management, [Info of IT Return Submission under 108A](http://27.147.238.114:9999/pridebook/#/login), PIMS, Official Residence / Quarter Allocation, Maintenance Management Software, [SCADA](http://www.dwasa.org.bd/site/view/internal_eservices), Digital Map, Web Mail, Land Estate Management Software, Vehicle Management Software, [Software for Public Information Division Usage](http://192.168.111.175/), [Bottle Plant Management Software](http://27.147.238.114/login), Dhaka WASA Central Store, Salary and Income Tax Statement /Certificate etc.

**4.3 Dhaka WASA Mobile APP:**

DWASA mobile application is now available for Android and iPhone mobile service. We can view all DWASA water and sewer bills through one app and pay all due bills from the application by only a few taps. DWASA mobile application is the first water and sewer bill payment application in Bangladesh. Customers can easily download DWASA mobile App to experience the easiest DWASA bill payment in Bangladesh.

**Features:**

* View DWASA water and sewer bill
* Pay due DWASA water and sewer bill
* Pay DWASA new connection and private deep tube well connection fees and demand note payment
* Pay yearly deep tube well permission renewal fee
* DWASA complain feedback etc.

**4.7 Employee Leave, Pension, Salary Statement:**

**4.8 District Metered Area (DMA) / Water distribution network system monitoring, management and control with SCADA**

District Metered Area (DMA) Approach and Non-Revenue Water (NRW)

Reduction in DWASA:

Dhaka WASA has already started establishing DMA concept which is new and

Innovative in the South Asia Region. Dhaka WASA has been providing dedicated

service for safe water to the city dwellers.

The first water treatment plant was established by Nawab Khaza Abdul Ghani in

Chandni ghat named "Dhaka Water Works" in the year 1874. Which is also the 1 st water

treatment plant in South Asia. From then the piped water supply was started in Dhaka

city.

Almost 144 years ago these pipe lines was constructed and became leaky causing 40-

45% of non-revenue water. Due to this leakage the water demand of city dwellers cannot

be fulfilled and on the other hand Dhaka water supply & sewerage authority (DWASA)

are not getting the revenue also. For example if the water production is 3.0 crore liter

which can fulfill the water demand of 200,000 people) per day but due to leakage 1.35

crore liter (which fulfill the water of 90,000 people) water is unaccounted for and only

1.65 crore liter (which fulfill the demand of 1, 10,000 people) can be supplied to the

households. So, producing 3.0 crore liter water for 2,00,000 people per day only

1 10,000 peoples are served. Due to this unaccounted-for water it become difficult to

supply water to the people causing water crisis and this become serious especially in

hot season.

The situation has become challenging to meet the rapidly increasing water demand in

parallel to the rapid urbanization & development of Mega City, Dhaka. With course of

time Dhaka WASA water supply system was moving towards unsustainable and

unmanageable state due to inadequate system water pressure, use of suction pump,

plenty of unidentified leakages and illegal connections, poor water quality, high system

loss 40% -45%.

So, it is clear that water supply system cannot be improved unless and until the Non-

Revenue Water (NRW) can be reduced.

For this purpose, a pilot project was initiated in 2007 under a TA project by Asian

Development Bank (ADB) in Manikdi area of the city where NRW was 45%. Under

the project 7 km water line was rehabilitated and 500 nos. of house connection was

shifted from old water line to new one. After commissioning it was observed that the

NRW became 12%. The consultant found similar circumstances across the system and

concluded the network needs rehabilitation to prevent significance loss of water.

To cope up the challenge to ensure safe water for the city dwellers with customer's

satisfaction in terms of water quantity, quality, system pressure; technically sustainable,

economically viable approach introduced through DWSSDP in 2011. Dhaka WASA

implemented the DWSSDP with financial assistance full for from ADB & GoB.

The project aims to ensure sustainable, more reliable and improved water supply

services through strengthening distribution networks and capacity building for better

operation & management of the network by introducing of District Metering Areas

DMAs) to ensure 24/7 pressurized water supply in the network at 1-bar or more, to

reduce the water loss to 15% or less, and Improve Water Quality. District Metered Area

(DMA) is a technical term to define a hydraulically isolated small area from big network

system with its own water supply system and distribution network for a community

which can be isolated from remaining network without affecting supply system of other

areas but with facilitating surplus water to adjacent water deficit areas. Dhaka WASA

started establishing DMAs in 7- Zones, with a target of about 145 DMAs. So far

established 54 DMAs and remaining 91 DMAs are in progressing. The amazing

achievement of established DMAs is becoming a great focus to the customer and Dhaka

WASA management.

What is DMA:

> DMA is a hydraulically isolated area.

Interconnectivity with adjacent DMAs with provision of export or import

facilities through DMA chamber.

Conjunctive use of ground water & Surface Water.

>

Controlling and monitoring water balance.

A

Maintain pressurized system for 24/7 water supply

Minimum NRW.

Criteria for selection of the DMA boundaries are:

Selection of area for establishment a DMA

At least one or more DTW with in the DMA

Surveyed and Model designed for selected DMA

Rehabilitate the existing whole network by HDPE pipe.

Upgrade the pumping station.

X All illegal house connection must legalized.

Under Dhaka Water Supply sector Development Project (DWSSDP) a total of 47 nos.

of DMA was established in 6 MODS Zone of D'WASA. In the project total 2456 km

of water line was rehabilitated and 1,06,662 numbers of house connection was shifted.

The average NRW became 5% and 5.4 million people are getting benefit from the

project.

Achievements of DMA establishment are:

Pressurized water supply for 24/7.

All illegal house connections are legalized.

Average Water loss (NRW) became 5%.

Assured portable water.

. No further use of suction pump.

. .

Reduced electricity cost of consumers & D'WASA.

.. Decreased health cost.

Increased of DWASA Revenue.

Water Supply provided in LIC/Slum Area.

-> Easy operation & maintenance.

The achievement not only benefited to Dhaka WASA only, it is now becoming an icon

in the South Asia Region. Thus, the high-level delegation from India and Srilanka team

visited the DMAs to share knowledge and experience to introduce the innovative

concept to their water supply system. Both the teams highly appreciated the lessons they

earned from the experience of DWASA and they planned to replicate the DWASA's

successful experience in their countries.

The ADB mission in September 2015 noted that Dhaka is the first City in South Asia

to have achieved such high level of performance in NRW reduction and 24/7 water

supply and has become a role Model for other cities in the South Asia.

Dhaka WASA expressed that next challenge would be to sustain DMA Management in

order to keep low NRW.

Pressure balancing in the water supply distribution network - A properly designed

water supply network demands a hydraulically balanced system to have reasonably

uniform pressure over the entire command area of the network. This will ensure even

distribution of flow to all the consumers. Present water supply distribution network

lacks in this aspect. With several areas having very low pressure in the pipeline, while

certain areas experience high water pressure. Consequently, flow available to the

consumers is not uniform. Installation of electronically controlled pressure control

devices (pressure reducing valves/pressure sustaining valves etc.) at strategic

locations will improve upon the pressure distribution in the network and in turn will

improve functional efficiency of the system.

> Providing continuous (24/7) water supply-Wherever water supply is not

continuous, consumers tend to hoard water an apprehension of delay in next supply

During next time of supply, they discard the old water hoard fresh water once again.

Consequently, in case of intermittent supply, water loss is much higher.

DWASA has planned to undertake the project of converting present practice of

ntermittent water supply system to continuous pressurized 24/7 water supply system

for the entire city.

. Use of energy efficiency pumping machineries- this will ensure reduced power

consumption at different locations; in turn will reduce the recurring operational cost.

. Water quality monitoring-DWASA's long term goal is to monitor and network water

quality in real-time, so as to detect contamination early and control its spread to mini-

mize impact to customers. There is a need to move away from depending on custom-

ers to act as sensors for water quality issues like discolored water, bad smell, pres-

ence of sediments, taste etc. Furthermore, in today's volatile social-political climate,

we need to be even more vigilant to deter and prevent acts of sabotage that may

threaten the quality of the water supply. As a part of water quality management,

DWASA plans to enhance chlorination system, regular water quality monitoring,

implementation water safely plans, water quality safeguard etc.

Another technical innovative approach introduced is the Trench Less Technology,

which brings the tremendous quick pipe installation progress with minimum distur-

bance to the city dwellers & traffic and reduced cost for road cutting, damage & resto-

ration. It added a dimension & technical viability of pipe installation in busy city like

Dhaka. When all Zones of Dhaka WASA will come under DMA system it will be a great

achievement in terms of technical sustainability, customer's satisfaction, economical-

ly viable water supply system. In the course of time sustainable DMA Management

capacity of Dhaka WASA will be enhanced to run the system smoothly.

The DMA approach not only facilitates Unaccounted for Water (UFW), but also helps

in maintaining assets for longer duration and enables better pressure management,

better water quality and continuous water supply. DMA Managers, Deputy Managers

and Licensed plumbers has already deployed for individual DMAs for installations of

fresh connections, carrying out necessary repairs also will be responsible for any

illegal connections in the area to keep the DMA sustainable

**5.9 e-Government Procurement (e-GP) System**

This is National e-Government Procurement (e-GP) Portal of the Government of the People's Republic of Bangladesh.

**About e-Government Procurement (e-GP) System**

National e-Government Procurement (e-GP) portal (i.e. [https://www.eprocure.gov.bd](http://www.eprocure.gov.bd/) ) of the Government of the People’s Republic of Bangladesh is developed, owned and being operated by the Central Procurement Technical Unit (CPTU), IME Division of Ministry of Planning. The e-GP system provides an on-line platform to carry out the procurement activities by the Public Agencies - Procuring Agencies (PAs) and Procuring Entities (PEs).

The e-GP system is a single web portal from where and through which PAs and PEs will be able to perform their procurement related activities using a dedicated secured web based dashboard. The e-GP system is hosted in e-GP Data Center at CPTU, and the e-GP web portal is accessible by the PAs and PEs through internet for their use.

This complete e-GP solution introduced under the Public Procurement Reform (PPR) Program is being supported by the World Bank and gradually used by all government organizations. This online platform also helps them ensuring equal access to the Bidders/Tenderers and also ensuring efficiency, transparency and accountability in the public procurement process in Bangladesh.

**Important Messages and Support Details**

* The eGP guidelines were approved by the Government of the People's Republic of Bangladesh in pursuant to Section 65 of the Public Procurement Act, 2006. As per approved guidelines, e-GP system has been introduced and implemented. The eGP system has been developed and introduced in two phases.

* In the first phase, e-Tendering has been introduced on pilot basis in the CPTU and 16 other Procuring Entities (PEs) under 4 (four) sectoral agencies, namely: Bangladesh Water Development Board (BWDB), Local Government Engineering Department (LGED), Roads and Highways Department (RHD) and Rural Electrification Board (REB). The system rolled out to 291 PEs of those 4 sectoral agencies is now expanding to all the PEs of the government up to Districts and sub-Districts level.

* In the second phase, e-Contract Management System (e-CMS) has been developed and introduced and implemented. eCMS is a complete electronic contract management system which provides platform for preparation of work plan and its submission; defining milestone, tracking and monitoring progress, generating reports, performing quality checks, generation of running bills, vendor rating, generation and issuance of completion certificate.

**5.10 Digital/Online Portal for office work management. nothi.gov.bd or For Dhaka WASA - https://dwasa.nothi.gov.bd/ Working with digital/online/paperless documents, letters, files etc.**

**5.11 Water ATM**

**7.1 *Automated Dhaka WASA Customer Complain Management System*:**

Dhaka WASA is a service oriented public authority, main goal of Dhaka WASA is to provide safe potable water and safe sewerage system to Dhaka city dwellers. But providing any service to the dwellers of a megacity is a challenge. Sometimes even with best efforts citizens may face difficulties to get water to their desired places or there may be problem with sewerage system or any other problem related to services of Dhaka WASA. That is the reason Dhaka WASA had maintained several complain centers at various offices to serve various areas of the city.

**Old complain resolving steps:**

Consumers initiate a call

DWASA staff answers the phone call

Staff note down problem with relevant information on complain register book

Not related to WASA

In case of other problems

Advise &/or terminate the call

Field staff or SAW/AE or EE checks complain register for unsolved problems

Action may be taken by appropriate person assigned to that task.

**7.3 Dhaka WASA Automated Complain Management Center (Call center):**

**DWASA Complain Center Contacts:**

Hot line number: 16162 (short code)/ 09611016162 (long code). Website: dwasa.complaincenter.com:16162. Along with old complain management system, Dhaka WASA taken an initiative to setup a automated complain center to hear the problem regarding the services it offers to the population of Dhaka City. Now the consumers of Dhaka WASA can lodge complains just by dialing 16162 (from Bangla link) or 09611016162 from any operator serving in Bangladesh. People don't have to come to complaint center physically in their serving area anymore enabling them to save their valuable time and money spent in transportation.

**Costs:** Dhaka WASA signed a contract with a vendor to carry out these services according to DWASA requirements and yearly cost is between 7500000 to 10000000 takas. As the agreement the vendor will provide manpower, equipment, software, communication costs etc. Software cost is 500000 takas.

**7.4 A Complain Lifecycle of Automated Problem Solving (Flow Chart)**

Consumer Initiate a Call

Call Center agent answer the phone call

How can we help?

Other Problem. Advice the customer for proper action &/or terminate the call

Advise

Problem with Water & Sewerage

The agent note down the problem into a computer system with brief description and then issue a ticket number assigning to it.

The computer system then send two alert SMS to the concern SAE and AE/SDE assigned to the location of the problem.

The SAE will have 2 hours to acknowledge by dialing the magic number in the SMS. The AE/SDE will receive the notify SMS containing the assigned SAE name.

A Complain Lifecycle of WATER & SEWRAGE Problem (Flow Chart continued from previous page):

Problem acknowledged in two hours

Yes No

The computer system will generate an alert SMS and Send to AE/SDE to acknowledge the problem. AE/SDE will get 30 minutes to acknowledge.

Problem acknowledged in one hour.

The Computer System will generate two resolution SMS, One to SAE Requesting to update AE/SDE after solving the problem. The other SMS will be sent to AE/SDE with a magic number which he requires to dial once SAE finish the work.

The computer system will generate another alert SMS and send to SAE to acknowledge the problem. This time SAE will get one hour to acknowledge the problem. A notify SMS will go to AE/SDE.

Yes

NO

Yes

Problem acknowledged in 30 minutes.

NO

The time computer system will generate a notify SMS and sent EE. EE will take necessary actions.

**6.1 *AUTOMATED &* Biometric Time Attendance MANAGEMENT System (Face Detection/Fingerprint):**

Time attendance systems are used to track and monitor when employees start and stop work. A time and attendance system enables an employer to monitor their employee working hours and late arrivals, early departures, time taken on breaks and absenteeism. It also helps to control labor costs by reducing over-payments, which are often caused by paying employees for time that are not working, and eliminates transcription error, interpretation error and intentional error.

**6.2 Beginning of Biometric Attendance:**

July 2018, Dhaka WASA started its journey with biometric digital time attendance. Started with only 5 devices at Dhaka WASA head office (WASA Bhaban) 2 Number Devices at Saidabad Water Treatment Plant (SWTP)-1 & 2. Before COVID-19 Pandemic lockdown - Total Location covered: 32, Total Bio-Metric (Fingerprint) Device Installed: 48 (Including WASA head office).

**During lockdown:**

Government of Bangladesh declared lockdown from 26/03/2020. That’s why WASA all office stopped taking biometric attendance (Total Seven months) due to lockdown and so that the virus can’t speared by finger scanning devices.

**New Face detection Time attendance system:**

WASA authority took decision to replace biometric fingerprint attendance system with new technology 3D face detection attendance devices to avoid contagious contamination from finger touch.

Semi-Outdoor Multi-Biometric Time Attendance & Access Control Terminal which supports 3,000 face templates, 4,000 fingerprint templates and 10,000 cards – were to be installed.

New era of Face detection Time attendance system started on 2nd June 2020. DWASA installed 2 face detection devices at SWTP-1 & 2. Installed face detection attendance system at WASA Bhaban (Head Office) as well as different MODS zone, revenue zone, WTP etc. location.

**6.3 Customized Web based Realtime Attendance Software for DHAKA WASA:**

Connected Device in Different location WASA offices-

* WASA Bhaban/ Head office: 2 Devices
* MODS Zone-3 & Revenue Zone-3: 1 Device
* SWTP-1: 1 Device
* SWTP-2: 1 Device
* Total Device Connected: 5 Devices

**Features of present systems:**

* Dashboard for Management - A dashboard is a type of graphical user interface which often provides at-a-glance views of key performance indicators (KPIs) relevant to a particular objective or business process. In other usage it is considered as a form of data visualization tool. Digital dashboards allow managers to monitor various departments in their organization. The “dashboard” is often accessible by a web browser or an application and is usually linked to regularly updating data sources.
* Scheduled Reporting to Management by E-Mail – all the reports are automated to be sent to preset management members.
* Online access of Staff & user – all data can be accessed by internet if required.
* Android & iOS Application – Digital Apps for various devices can be developed.
* SMS alert – important data, information is automated to be sent to preset management members via SMS.

**6.4 Centralized customized Software feature:**

**User Management:**

* User administration – Creating new users, input various information, photograph entry, vital information about them, login authentication / authorization.
* Multi user Role access with different privileges - Users with single or multi user roles with different specified work can have only one or multiple user accounts.
* Role Based Access Control – various roles may allow or deny entry into the system from different devices or accounts.
* Role Based Input Control - various roles may allow or deny data input into the system from different devices or accounts.

**Staff Attendance:**

* Staff Attendance Entry – Only previously set employees can give easy automated attendance.
* Customized Reporting of Section Wise & Individual Staff Attendance – as required by managers.
* Daily Absent & Absconding SMS Notification to Staff - as required by managers.
* Customized Reporting on Staff & Assigned Subject Mapping - as required by managers.

**Software Features:**

* Complete Admission Process – Easy process for initial entry of a new staff or user.
* Staffs Details Profile – Detail staff profiles can be stored and used.
* Customized Reporting on Staff – Various types of reports for variety of staff or users.
* Attendance Automation – only fingerprint or face placement needed for attendance, no manual record keeping or sign in or authorization is needed for attendance.
* Staff Migration between Branch, Shift, & Section – when staffs get posted or promoted to a different office or to a different role.
* Staff Management – This system can also be connected to other digital management tools.

**Advanced Software Reporting Management:**

* Shift information for different staffs and different offices for different days.
* Employee information report/details.
* Leave information integration with other leave management tools/software/systems.
* Daily in/out report – time logging.
* Daily absent, present & leave report.
* Daily late arrival or early leave report.
* Daily over time (OT) report, Daily summary OT information.

**6.5 Additional Software Features:**

* Easy to use & fully customized, Ability to add employees easily.
* Reduces HR daily work & increases productivity.
* Integration attendance with various fingerprint or face detection devices.
* Tracks up to date work status.
* Centralized monitoring & Enhanced Reporting Capabilities.
* Employee personal information connected with MIS software.
* Attendance Management, Holiday Management & Leave Management -
* Employee wise leave day, General shifting and Employee wise shifting.
* Daily summary attendance information.
* Monthly in/out report, Monthly absent, present & leave report, Monthly late report.
* Employee over time (OT) calculation.
* Monthly over time (OT) report & Monthly summary OT information.
* Monthly summary attendance information for management.

**6.7 Challenge to implement this software:**

* Old Fingerprint Attendance Device connectivity is a problem, as they have older hardware and old software not used for integration.
* All Pump House connectivity to this software - almost 1000 water pump have various challenges.
* Different Time Schedule in different office/zone – this increases the complexity if software.
* Others software like Leave management integration – old leave management web app portal was not made to be integrated with the new software.
* Roaster duty/ Roaster Shifting changes almost every month for a large portion of workers, changing duty or shifts and office time for them may cause error for other staff data.
* 24hours duty schedule (6AM-2PM, 2PM-10PM, 10PM-6AM) and 12 hours schedule (8AM-8PM & 8PM-8AM) and General Duty (9AM-5PM) - these creates additional data sets.
* Data Collection and maintenance covering whole of DWASA – employees at all offices of DWASA have to be covered, that is a big task.

**6.8 Reasons to track employee hours:**

* Regular pays or Wages paid to employees are determined by the number of days or hours worked. Employers will want to be sure that they're accurately paying employees whether they're in the office or in a remote location.
* Overtime paid to most workers, whether hourly or salaried, are eligible for overtime pay when they work more than 40 hours per workweek. So, time tracking is important.
* Employees receive certain breaks & rest periods during their shifts. Tracking hours can show that employers are compliant with rules in providing these breaks.
* Companies that award paid time off for personal, vacation, and sick days based on work days, must calculate the earned time correctly.
* Tracking hours can help determine whether workers are arriving to the office on time.

**6.9 Benefits of automated time and attendance systems:**

* The biggest benefit of digital time and attendance tracking systems is that they eliminate the need for manual records. All the time data is collected electronically, with the desired data processing and calculations on demand.
* Since time and attendance software systems are automated, they cut down on the chance of human errors in calculations of labor and job costing. They also free up the person who was responsible for time and attendance tracking before to work on other tasks. Additionally, with fewer error comes lower risk of noncompliance with labor laws and regulations.
* Another positive is that these systems manage all your time needs – employee attendance etc. – in one program. This can be both cost-effective and a boost to productivity, as employees won't waste time toggling between different programs to ask for time off or look at their schedules. In short more efficient time tracking.
* With time and attendance software, we don't have to round the hours employees worked to more convenient numbers that work better with [payroll calculations](https://www.businessnewsdaily.com/12008-how-to-process-payroll.html) and pay rules. Our software of choice will automate and ensure the accuracy of all wage payments. In short more accurate payroll processing.
* Most time and attendance tracking software platforms integrate with many other human resources tools, so they improve all workforce management tasks, not just attendance-related processes.

**6.10 These are the main drawbacks of automated time and attendance systems:**

* Cost- The biggest drawback of time-tracking systems is that they are more expensive than the manual method where employees write down their hours each day.
* Errors-Even the best software programs may occasionally malfunction. There's always a mild risk of tracking or calculation errors when you use any software for time and attendance systems.
* This system is heavily reliant on electricity supply and communication network.

**6.11 Future activity related to automated time and attendance systems:**

* Administrative, salary and other stakeholders should get through training on all hardware, software and how to use them for maximum benefit of DWASA.
* Software should be commercially available and licensed. Customization of software can be developed after gaining experience.
* All employees (Permanent, temporary, Master-roll, outsourced, contractual) should be included in this system.
* All biometric attendance machines should be covered by monitoring camera also.



***CHAPTER 06 – AUTOMATION at MIS, AIS & GIS DEPARTMENTS***



**Management Information System (MIS):**

The MIS, plays a vital role in the management, administration and operation of an organization. The system ensures that an appropriate data is collected from the various sources, processed and send further to all the needy destinations. The system is expected to fulfill the information needs of an individual, a group of individuals, the management functionaries: the managers and top management. A MIS needs to have the necessary components in order to collect, process, store, and retrieve the needed information to deliver to leaders.

**Below are four important components of a MIS:**

**Information system:** A mix of hardware, software, personnel, and infrastructure that aids in the collection of data stored in the MIS. The information system component allows employees to interact with the system for information collection.

**Database management system (DBMS):** Software that handles the storage, retrieval, and updating of data in a computer system. It also includes the physical databases where information is stored after capture. The amount of data needing to be processed and stored will determine the type of DBMS used in the MIS. For example, a small DBMS may work well for a personal computer, but a larger DBMS will be needed for larger and more complex machines.

**Intelligence system:** Deals with the processing of collected data and presenting it in a way that is easily comprehended. This is sometimes referred to as business intelligence, which stores human knowledge and uses the logic to formulate quick solutions for future problems.

**Research system:** Identifies the main management problems within the organization and provides alternative solutions, helping ensure all possible options are analyzed and the appropriate decision is made.

**Some of the important roles of the MIS:** Companies invest in a MIS for the following reasons-

* Increases operational efficiency
* Adds value to existing products and services
* Brings about innovation and new products and services development
* Identifies strengths and weaknesses within a company due to reports and records
* Provides access to a singular database that holds the data necessary for day-to-day operations
* Supplies a higher level of accountability, as inputs and moderations are logged and authors noted

MIS department at Dhaka WASA pays as the main actor in the field of Automation, Digitation and Computerization. MIS and Billing department performs almost all the works, procurement of goods and services for Networking, Hardware and Software purchase, Operation and Maintenance is done by MIS department art DWASA.

Most of the DWASA communication and IT structure and computers, servers, internet, database, software, data center, digitized records are created and maintained by MIS. DWASA Geographical Information System (GIS), Accounting Information System (AIS), Internal Audit, Planning, Revenue Divisions, Billing Division, Administration department also uses services of MIS.

MIS and billing department is allocated average yearly budget or around 6 to 7 Crore taka.

**Work & Budget Allocation for MIS & Billing Department**

|  |  |
| --- | --- |
| Ministry | LGRD & Co-operative |
| Division | Local Government Division |
| Agency | Dhaka WASA |
| Procuring Entity | Senior Systems Analyst (MIS & Billing Dept.), Dhaka WASA. |
| Method of procurement | Most of the works will be done by Direct Procurement Method (DPM) and |
| Approver | Work will be approved by Head of Procuring Entity or Managing Director. |
| Budget Source | Own Fund / Revenue |
| Budget Heads | Allocation (Lakh Taka) |
| 1. Computer Repair & Maintenance | 3.06 |
| 1. Repair & Maintenance | 151.00 |
| 1. Computer Purchas | 491.96 |
| Total Allocation (amount in Lakh Taka) | 646.02 |

**ANNUAL PROCUREMENT AND WORK PLAN, FINANCIAL YEAR 2020-21**

|  |  |  |
| --- | --- | --- |
| **S/N** | **Description of Procurement package** | **Cost in TK.** |
|  |  | Contract Amount (TK.) |
|  | Software |  |
| 1 | Online PIMS Software Development | 3,35,000 |
| 2 | Pension Software Development and Online Bank Payment Service update of Billing System | 1,65,000 |
| 3 | Land and e-Lab Software Development | 5,00,000 |
| 4 | Accounting Software purchase and Development for Accounts Division of Dhaka WASA. | 37,50,000 |
| 5 | Online Electricity, Gas and Others Billing Information Preservation and Management software of Dhaka WASA. | 1,76,400 |
| 6 | Mobile application Development of Dhaka WASA. | 5,46,525 |
| 7 | Real-time Online Billing Software Upgradation. | 19,50,000 |
| 8 | Private DTW and Water New Connection Security System. | 4,39,500 |
|  | **1 – 8 Carried over from previous year** |  |
| 9 | Audit Software Upgradation | 4,50,000 |
| 10 | Digital Archiving of Employee Information of Dhaka WASA | 8,00,000 |
| 11 | Residence Management software | 8,00,000 |
| 12 | Private DTW, Store Inventory and Water New Connection Annual Maintenance Contract | 1,50,000 |
| 13 | PIMS, Pension, Payroll System Upgradation. | 5,00,000 |
| 14 | Loan Approval Process, Loan and Payroll Data Migration Tools | 9,00,000 |
| 15 | Enhancement work of Private Deep Tube well | 3,00,000 |
| 16 | Complaint Management Software for FM Division | 10,00,000 |
|  | Software Sub total | **12,762,425** |
|  | Hardware |  |
| 17 | Computer, Printer, Scanner, UPS & Laptop for Revenue Department | 91,00,000 |
| 18 | Line Printer for Billing Print | 1,96,00,000 |
| 19 | Purchase of a Multifunction color printer for the office of the Chief Revenue Officer of Dhaka WASA. | 3,98,640 |
| 20 | Purchase of Desktop computer offline UPS, Power Strip for Accounts Department and a mini Projector (Portable) for the Chairman of Dhaka DWASA | 5,17,525 |
| 21 | Online UPS Servicing of Computer Center Server Room | 1,57,550 |
| 22 | Photo copier Printer Servicing for Revenue Zone-5 of Dhaka WASA. | 19,200 |
| 23 | Computer, Printer, Scanner, UPS & Laptop for All other Department of Dhaka WASA. | 60,00,000 |
| 24 | Hardware Accessories for Regular Maintenance. | 2,95,000 |
|  | Hardware sub-total | **3,60,87,915** |
|  | Networking |  |
| 28 | Online Billing (Internet VPN-Central Internet 530mbps) Connection among Revenue, MODS and other Dept. of Dhaka WASA. | 26,71,200 |
| 29 | 200MBPS Backup Internet Connection for WASA Bhaban | 10,08,000 |
| 30 | 5mbps Internet Connection for AMR | 60,000 |
| 31 | Grameenphone Data Connectivity bill for backup billing connection of Dhaka WASA. | 1,44,000 |
| 32 | 2 no Network and Hardware Technician | 8,20,115 |
| 33 | 5mbps Data Connectivity for Revenue Zone-11, Narayanjonj. | 61,800 |
| 34 | Security Devices Collection for Revenue Zones of Dhaka WASA | 7,95,000 |
|  | 28 – 34 Carried over from previous year on Network |  |
| 35 | Update and New Billing Network Establishment for Revenue Zone-2 and 4 | 5,74,625 |
| 36 | Update/New Billing/Internet Network Establishment for Accounts, Central Laboratory Dasherkandi and Land Dept. of Dhaka WASA. | 3,95,650 |
| 37 | Update and New Billing Network Establishment for Revenue Zone 6 and Devices for regular maintenance of Dhaka WASA. | 4,95,350 |
| 38 | Update and New Billing Network establishment for MODS Zone8, Eater (R&M) Div-1, Sydabad Phase-3. | 4,93,050 |
| 39 | 50mbps internet connection establishment in Savar-Keranigonj Wellfield plant. | 5,33,500 |
| 40 | Network Accessories for Regular Maintenance | 14,00,000 |
| 41 | Billing and Internet Network Upgradation for Revenue, MODS, DMA Manager and other Departments. | 20,00,000 |
|  | Network Sub total | **1,14,52,290** |
| 42 | Emergency Allocation | 42,99,500 |
|  | **Grand Total=** | **6,46,02,130** |

**ANNUAL PROCUREMENT AND WORK PLAN, FINANCIAL YEAR 2021-22**

|  |  |
| --- | --- |
| Budget Source | Own Fund / Revenue |
| Allocation for MIS & Billing Department | |
|  |  |
| Budget Heads | Allocation (Lakh Taka) |
| 1. Computer Purchase | 526.44 |
| 1. Computer Maintenance | 100 |
| 1. Call Center Cost | 73.15 |
| 1. Rest of the amount of Budget of 2021-2022 of MIS & Billing Dept. (Serial No 3 to 10) | 10.58 |
| Total Allocation (amount in Lakh Taka) | 710.17 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Summary** | | | |
| Budget Head | Budget Allotment | Budget estimated for purchasing goods | Emergency fund |
| Computer Purchase | 526.44 | 512.11 | 14.33 |
| Computer Maintenance | 100.00 | 100.00 | 0 |
| Call Center Cost | 73.15 | 0.00 | 73.15 |
| Sub Total | - | 612.11 | 87.48 |
| **Total** | **699.59** |  |  |

|  |  |  |
| --- | --- | --- |
| **S/N** | **Description of Procurement package**  **(Works/Goods)** | **Estimated Cost in Lakh TK.** |
|  |  |  |
|  | **Networking** |  |
| 1 | Online Billing (Internet VPN-Central Internet 530mbps) Connection Among Own Fundenue, MODS and Other Dept. of Dhaka WASA. | 11.00 |
| 2 | 200 Mbps Backup Internet Connection for WASA Bhaban (Mango) | 5.40 |
| 3 | 5 mbps Internet Connection for AMR | 0.60 |
| 4 | 50 mbps Internet connection establishment in Savar-Keranigonj Wellfield plant. | 1.80 |
| 5 | Internet and Security device for Integrated Water Operative Center (IWOC) at WASA Bhaban | 1.38 |
| 6 | Purchase of required network accessories for managing director sir division of Dhaka WASA. | 5.76 |
| 7 | Purchase of Internet bandwidth centrally for online billing and internet related service among Own Funded Zones, MODS Zones and All other departments of Dhaka WASA. | 30 |
| 8 | Purchase of required network accessories for MODS Zone-3, Magistrate Court-2 and DESWSP of DWASA. | 5 |
| 9 | Network equipment purchase for regular maintenance ant various dept. of DWSAS. | 80 |
| 10 | Network Switch and Router purchase for DWASA Bhaban | 37 |
|  | **For Network Total Goods** | **208** |
|  | **Software** |  |
| 11 | Central WiFi at DWASA Bhabon | 30 |
| 12 | Online PIMS Software Development | 3.35 |
| 13 | Pension Software Development and Online Bank Payment service update of Billing Section | 1.65 |
| 14 | Land and E Lab Software Development | 5.00 |
| 15 | Accounting Software for Accounts Division, Dhaka WASA. | 13.00 |
| 16 | Online Electricity, Gas and Other bills information preservation and management software of Dhaka WASA. | 1.76 |
| 17 | Mobile Application Development for Dhaka WASA. | 2.90 |
| 18 | Real time online billing software upgradation | 19.50 |
| 19 | Private DTW and Water New Connection security systems | 4.40 |
| 20 | Residence management software | 7.80 |
| 21 | Private DTW Work enhancement | 3.00 |
| 22 | Complain management software | 5.00 |
| 23 | Loan Approval Process, Loan and Payroll Data Migration Tools | 9.00 |
| 24 | PIMS, Pension, Payroll System Upgradation. | 5.00 |
| 25 | Digital Archiving of Employee information of DWASA | 8.00 |
| 26 | Software for Public Information Division | 5.00 |
| 27 | Contractor Enlistment Software. | 6.00 |
|  | **12 – 27 Sub Total of Carried Over Goods Total: 100.36** | **100.36** |
| 28 | Audit Software Up gradation | 10.00 |
| 29 | Payroll Software Development | 5.00 |
| 30 | New Connection, DTW and Inventory Software | 1.50 |
| 31 | Software for Supply Chain Management. | 35.00 |
| 32 | Web based inventory, POS & Production Management Software. | 5.50 |
| 33 | Software for Land Record & Tax Payment for Land Division | 2.00 |
| 34 | API for BIDA | 5.50 |
| 35 | Software for Welfare Department | 5.00 |
| 36 | Software for DA Section | 8.00 |
| 37 | Software for Employee personal information update process | 10.00 |
| 38 | Software for MIS online report | 5.00 |
|  | Subtotal of goods to be done | 92.50 |
|  | **For Software Total Goods** | **192.86** |
|  | **Hardware** |  |
| 39 | Procurement of Server, WM ware and related services for keep running of software’s used in digitization of Dhaka WASA | 54.50 |
| 40 | Urgent purchase of Display for Dhaka WASA Board Room. | 6.81 |
| 41 | PC, UPS, Printer and Scanner for Dhaka WASA | 130.00 |
| 42 | Hardware Accessories for PC and Printer | 10.00 |
| 43 | Hardware Accessories for PC and Printer | 5.00 |
| 44 | Hardware Accessories for PC and Printer | 5.00 |
|  | **For Hardware total Goods 211.31** | **211.31** |
| 45 | Urgent and Unforeseen works/goods/services to be done under sudden emergency requirement. | 87.48 |
|  | **Total** | **699.59** |
|  | **Goods to be done subject to the Availability of Budget** |  |
|  | **Budget Head: Computer Purchase/Computer Maintenance/Call Center Cost.** |  |
| 46 | PC, UPS, Printer and Scanner for Dhaka WASA. | 130.00 |
| 47 | Line Printer for Own Funded Zones of Dhaka WASA | 185.00 |
| 48 | Storage for Server of Dhaka WASA. | 180.00 |

**Accounting / AIS:**

**Digital/Online Billing and Bill Payment:**

The WASA Authority has created a website where we can get all the information and payment system.

**Dhaka WASA bill statement:** The bill statement is a part and parcel for the people of Dhaka. Because it is the most important things. The bill statement will show your current water bill, bill payment last date. As a result, it is your duty to collect the Dhaka WASA Bill statement. The citizen of Dhaka can easily check their water bill from online. Because DWASA authority has customized the system of paying bills through online. You should to know the right method.

**How to calculate WASA bill:** Firstly- you need to visit- <http://app.dwasa.org.bd/>website. Then, put your Account Number (The number is mentioned on your Bill Card), Put Your Password (Your Account Number is your Password), finally- you can get your Bill Card. Put your Date Format which you want to check your Bill. Search it and you can check your Bill now.

**Dhaka WASA bill payment system:** After checking the bill, you need to complete your payment. In this modern era, it is really easy to make the payment. You can pay your bill through bKash, Nagad and Rocket.

The full procedure -

* Open the Mobile App bKash, Nagad or Rocket. Go to Payment section. Go to Bill Payment. Go to Dhaka WASA Bill. Enter your Meter Number. Put your amount of Bill. Enter your Pin Number. Complete your payment.

Digital billing and online bill payment has made it easy for consumers to pay bill and bill collection of DWASA has increased.

**Geographical Information System (GIS):**

Following functions were implemented-

**Water, Sewer and Drainage Networking Mapping:** Many have characterized Geographic Information Systems (GIS) as one of the most powerful of all information technologies because it focuses on integrating knowledge from multiple sources and creates a crosscutting environment for collaboration. GIS is a system for the management, analysis, and display of geographic knowledge, which is represented using a series of information sets. In the present study, GIS will be used to organize the data for usage in water distribution networks design, and analysis.

**DMA and Water Network:** A district metered area (DMA) is defined as a discrete area of a water distribution network. However, a DMA can also be created by permanently disconnecting pipes to neighboring areas. Dhaka WASA has already planning to build about 144 DMA using GIS tools.

**Deep tube well mapping:** Deep tube well is the only source of underground water which distributed to city dwellers. The Deep tube well position with information has been built in GIS. Using these data, can help to provide comments before installation of new Deep Tube wells both DWASA and private owned.

**Land Mapping:** To proper management of WASA land, old Land maps has been converted to digital maps using GIS tools.

**Surface Water Transmission line Mapping:** Dhaka WASA has four water treatment plant. Under those surface water treatment plants, all transmission line has been converted in digital format using GIS tools.

**Base line Mapping:** Dhaka WASA has built land, road, water body, house position, bridge, culvert and also other utilities network mapping.

**House Connection mapping:** Dhaka WASA has been determined to be with Digital Bangladesh and progressing to step by step development to achieve the Goal. In this Stage, DWASA has taken initiative to make Smart Metering. GIS mapping for House Connection can be the first step to turn smart metering

**Valve mapping:** Valve point are using to proper maintenance for water service area. So it's very important to know the location and related information of Valve. Mapping of Valve position has been built in GIS including information to provide better operation and maintenance. Flow control, pressure sustaining and reducing valve are using in DMA management.

**Bulk Meter mapping:** Bulk meter are using to estimate inflow/ import and outflow/export into adjacent DMA areas for calculation of water loss. So it's very important to know the location and related information of Bulk meter. Mapping of bulk position has been built in GIS.

**Digital elevation modelling (DEM):** Ground elevation is the important component for water, sewer and drainage network.

**LIC Mapping:** As a part of the plan to bring all slum and Low Income Community areas in Dhaka city under water distribution service, prepare GIS database for LICs – 25000 households done.

**Zonal Billing Mapping:** Billing information is being joined with these maps; as a result of which is possible to find out connection status, non-metered household and connection type etc. for better understanding of physical features of service areas.

**A few works have been done:** Scan and digitize of about 1200 system maps on Water, Sewer and Drainage line. Upload of all types of maps to DWASA website. GPS survey Based mobile apps for water, sewer and drainage network.

**Plans are underway to:** Develop GIS Based on Web Platform for Dhaka WASA, Integrate whole billing system with GIS, Integrate SCADA system with GIS.

**DWASA GIS Annual Budget:** DWASA Computer-GIS mainly operates, maintains and modify existing software, servers, web portals / Apps supplied by vendors or MIS division.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Head | FY 2020-21 | FY 2021-22 | Remarks |  |  |
| Computer-GIS Total Budget | 242.64 | 253.79 | Lakh Taka |  |  |
| Capital Expenditure | 141.80 | 154.59 | Lakh Taka |  |  |
| Operating Expenditure | 100.84 | 99.20 | Lakh Taka |  |  |



***CHAPTER 07 - CASE SUDY: Opportunity of Automation at bottle water plant***





***CHAPTER 08 – SWOT MATRIX of DWASA, CONCLUSION and RECOMMENDATIONS***



SWOT matrix is a vital strategic planning tool that can be used by managers to present a situational analysis of the organization. It is a simple technique to map out the present Strengths (S), Weaknesses (W), Opportunities (O) & Threats (T) Dhaka WASA is facing in its current business environment.

SWOT Matrix of Dhaka WASA:

|  |  |
| --- | --- |
| **Strengths:**  •Stable, experienced & dynamic staff & Senior Management Team.  •Capable & experienced employees supported by a Training Centre established in 1980.  •50+ years successful record in providing water & wastewater services for Dhaka.  •Progress of “Turnaround Program” is continuing & trust & support of GoB & Development Partners.  •Customer-oriented corporate culture and using technology for efficiency & cost saving.  •Long-term master plans for development of water & sewerage are in place & current major projects to substitute groundwater by surface water, rehabilitate water networks, reduce NRW & expand sewerage service- are ongoing or in advanced planning stage.  •A monopoly position in piped water supply & wastewater service for Dhaka City with assured revenue with very satisfactory Operating Ratio  •Water production capacity is more than water demand. | **Weaknesses:**  •Customer complaints about the quality of supplied water are too frequent.  •There are many weaknesses in current water quality monitoring, including: 1) Frequency of water quality monitoring in the networks vis-à-vis international norms;  2) Equipment, protocols & WQM equipment at water treatment plants;  3) Control of Drinking Water Treatment Chemicals;  •Monitoring of quality of surface water sources.  •Terms of employment for contract-based employees is leading to high employee turnover and loss of skills (e.g. DMA Management Staff).  •Sewerage coverage, 20% of Dhaka WASA Service Area, lags far behind water supply coverage.  •Although Dhaka WASA is striving to provide Quality service to the public, little is being done to publicize this.  •Water tariff is lower than the production cost. |
| **Opportunities:**  •Exploring potential for increasing efficiency and cost saving through outsourcing & PPP (Public Private Partnership).  •Expanding Dhaka WASA’s service area into surrounding urban, or urbanizing, areas to bring in new customers & revenue.  •Increasing sewerage coverage from the present 20% has potential for a very large increase in revenue.  •Devolution of some HQ responsibilities to MODS Zone Offices (Mini-WASAs) for closer ties to local communities.  •Taking advantage of Dhaka WASA’s internal expertise and facilities to supply services to other parties on a commercial basis. | **Threats:**  •Population migration to Dhaka, rapid economic development & increasing water demands outstrip ability to increase & distribute water supply.  •Project delays, due to external factors (road cutting, land acquisition, public & legal protests, etc.), lead to increased costs and protracted Government approval process for budget increases. Lack of inter-agency coordination between the organizations disrupts project success.  •Delay of surface water supply projects and network rehabilitation projects, extends reliance on a diminishing groundwater resource & may result in deteriorating groundwater quality & water shortages and declining ground water table.  •Increasing surface water pollution of Dhaka’s surrounding rivers & increase in the cost of water supply, climate change & increased possibility for droughts, dropping of water layer and flooding. |

**8.2 Recommendations:**

1. To build a staff awareness and Consensus about automation, digitization and its use to bring benefit.

2. All staff, from senior management to the crew, should understand the basics of Computerization, SCADA and MIS, GIS, AIS Automation systems at various levels.

3. Building the understanding of top-level management on Automation at every possible place.

4. Middle management and staff must understand their roles and responsibilities on automation, since it requires a long-term, combined effort from all departments in the utility.

5. To establish any automation specially Field level SCADA, MIS, GIS, AIS and related work should follow the guideline and verified by Internal and/or External Automation Expert team.

6. Automation experts, MIS, GIS, AIS and SCADA working teams should supervise, advice and update the technology as required. Every year the team should be checking technological change and after 5 years should upgrade the Automation masterplan.

7. All project, working divisions, DWASAS Administration, Revenue division, Accounts divisions, Field offices and all stockholder should follow the guideline of Government and DWASA Automation Masterplan for smart water management and MIS, AIS, GIS for administrative purposes.

8. Intensive training should be organized on Automation at various stages of organizational use for various levels of staffs and managers.

9. Cost benefit analysis of capital investment and maintenance cost should be formulated and only investment which adds values to products or services or saves expenditure- should be completed.

**8.3 Conclusion:**

However, Automation and SCADA is not only a brand-new concept using ICT but also is a tool for technology-based management concept. Therefore, primary and systematic operation and maintenance of water supply system is very critical issues above all. Integrated Water operation control and command platform is a future oriented water management strategy by integrating ICT based water management technology. So, it is managing the entire process of the water production source as well as water cycle scientifically and systematically above all. Aligning with master plan for automation will best impact on Smart water management systems. The outcome will be sustainable provision of a more reliable, improved and climate-resilient sustainable water supply in Dhaka city. Sustainable managerial capacity of district metered areas enhanced DWASA's managerial and technical capacity will be strengthened to keep Smart Water management Systems.

***Conclusion:***

From the overall discussion it can be said that, Dhaka Water Supply and Sewerage Authority (DWASA) as an autonomous government institution is working very hard for providing water supply, sewerage and drainage service to almost 2 million people of the Dhaka mega city. Its activities are not faultless because of financial, technical and technological challenges like - regular increase of Dhaka WASA geographical are, water supply network, drainage network and other activities. Various initiatives including strong monitoring by use of automation have been taken to ensure rapid improvement of its functions. Dhaka WASA is increasing number of water refinery station, surface water collection from city side Rivers, operating regular mobile court against bill defaulters and illegal connections etc. Dhaka WASA also achieved success in water production and supply through good administrative structure and efficient management system by using modern technology. Less political intervention and active participation of skilled employees may provide Dhaka WASA with the capability to fulfill total water demand as well as creating safe environment in Dhaka by near future.

***References:***

***Books & Articles***

 Urban Studies Program, Dept. of Geography, University of Dhaka

Urban Research in Bangladesh: Review of Recent Trend and an Agenda for the 1990s Nurul Islam, Centre for Urban Studies

 Urban Centers in Bangladesh: Trends, Patterns & Characters Md. Abdur Rouf & Sarwas Jahan

***Field Work & Collected Documents***

      Visit to Dhaka WASA Head Office, Dhaka

      Dhaka WASA website: www.dwasa.org.bd

      Interview from

* Deputy Managing Director (Technical & Development), Dhaka WASA
* Chief Accounts Officer, Dhaka WASA
* Deputy Secretary – Public Information Department, Dhaka WASA
* Chief Engineer, Dhaka WASA
* Chief Training Officer, Dhaka WASA
* Commercial Manager, Dhaka WASA

      Annual Report of Dhaka WASA, 2021 – 2022

      Annual Report of Dhaka WASA (under preparation) 2008 – 2009

      MIS Report of Dhaka WASA, October 2009, December 2009, January 2010

      Managing Director’s Speech & Presentation on DWASA in Singapore

      Dhaka WASA Institutional Assessment Report,

http://www.adb.org/Documents/Reports/Consultant/39405-BAN/Appendix-9.pdf

      Dhaka WASA “Revised Budget for 2020-21 and Budget Estimated for 2021 – 22”

      Urbanization: Definition

http://www.answers.com/topic/urbanization

http://www.answers.com/topic/urbanization

https://www.assignmentpoint.com/business/management/assignment-dhaka-wasa.html

https://www.assignmentpoint.com/business/organizational-behavior/dhaka-wasa.html

Dhaka WASA launches online billing system.

**Staff Correspondent**

Tue Feb 19, 2008 12:00 AM Last update on: Tue Feb 19, 2008 12:00 AM

Dhaka Water Supply and Sewerage Authority (WASA) yesterday officially launched its online billing system, with a view to reducing customer harassment and ensuring transparency in the billing process.  
If the online billing system is implemented properly, the customers will be able to access their monthly water bills over the internet and file complaints if there is any discrepancy in their bills, said Iqbal.  
Since about 80 percent of the city dwellers do not have internet access, WASA will need to explore ways how to draw the city dwellers into using the online service to make the online billing system a success, he also advised.  
Regarding the preservation of natural water bodies in the city, Adviser Iqbal said the government has decided to preserve the water body behind Sonargaon Hotel upto Rampura Bridge by demolishing 11 structures instead of 300 structures, as proposed by Rajdhani Unnayan Kartripakkha (Rajuk) earlier.  
Since sewage from Baridhara and Gulshan areas is being dumped into Gulshan lake due to the lack any proper sewer system in the area, the adviser urged the WASA authorities to prepare a plan for setting up a sewage treatment plant for these areas.  
Adviser Iqbal said in order to protect the Turag River from pollution during Ijtema, the government has already taken a Tk 10 crore project for building a multi-storied toilet facility on the Ijtema ground.  
Dhaka WASA now serves about 2 lakh customers. It earned Tk 271 crore in revenue in fiscal year 2006-'07 and it earned another Tk 25 crore from other sectors, he said.  
He urged all to come forward and turn Dhaka WASA into a corruption-free, transparent and profitable service provider.  
Dhaka WASA, said the Dhaka WASA website, [www.dwasa.org.bd](http://www.dwasa.org.bd/), contains contact details of high officials of Dhaka WASA, tender information, forms and guidelines for water and sewerage connection, customer billing information, download and print option for water and sewerage bill of any specific month, option to lodge a complaint and view the action taken by Dhaka WASA following a particular complaint.  
After the banks that collect WASA bills are integrated with the online billing system of Dhaka WASA, customers will be able to pay their bills online. Besides, customers will also be able to lodge their complaints directly to the top management of Dhaka WASA through this site.

Dhaka WASA (Water Supply & Sewerage Authority) was established in the year 1963 as an independent organization, under the East Pakistan ordinance XIX. In 1989, the drainage system of Dhaka city also handed over to DWASA from DPHE. Again in the year 1990, Water, Drainage & Sanitation service of Narayangonj city handed over to DWASA. Based on the tremendous geographical expansion and population growth over the last two decades, DWASA's activities has been reorganized by Dhaka WASA Act, 1996 and according to this act, DWASA it is operating as a service oriented commercial organization (and according to this act, DWASA is now operating as an autonomous body with corporate culture in its management & operation). Now, the jurisdiction of Dhaka WASA is more than 360 Sq. km and the population is about 12.5 million.

Vision of Dhaka WASA: To be the best water utility in the public sector of Asia-with commitment towards people and environment

Vision of Dhaka WASA

To be the `best water utility’ provider in the public sector of Southeast Asia - with ensuring an environment-friendly, sustainable and pro-people water supply management.

Mission

• To reduce the dependency from ground water to surface water by implementing ongoing mega surface water treatment plant projects. • To practice a corporate culture in its management and operation. • To ensure a high level of transparency and accountability in all its service and activities. • To improve the efficiency in all DWASA activities and; • To constantly ensure better customers service.

Responsibilities of Dhaka WASA

❑ Construction, operation, development and maintenance of necessary infrastructure (deep tube well, water treatment plant) for supplying safe water to residential, industrial and commercial customers. ❑ Construction, development and maintenance of storm sewer lines to remove water congestion in the city. ❑ Construction, development and maintenance of sewage treatment and sewerage system.

Introduction:

Dhaka wasa development Program has been formulated in line with the GoB’s sector policies and strategies, particularly the Sector development Program for water supply and sanitation spectrum of the country.

***Preface:***

Bangladesh is a third world Least Developed Country (LDC). Urbanization is relatively a new process in the third world where it is even more rapid than population growth and where the agglomerations are growing most rapidly. The negative impacts of urbanization include the loss of agricultural land coupled with problems of urban food supply, the destruction of habitats and urban diseconomies.

Presently Bangladesh has six city corporation and 309 municipalities those are having rapid urbanization. Urban administration though a relatively new concept but got a high significance here in Bangladesh. Dhaka as the capital of the country is badly in need of a good administration system. Various organizations like RAJUK, WASA, DPHE, UDD, RHD, HSD etc. are performing these duties.

Water supply and sanitation is the most fundamental demand of the dwellers of Dhaka city. The Dhaka Water Supply and Sewerage Authority (DWASA) is providing these important services. Its main functions include – supply of water, disposal of sewage, storm water drainage and solid waste management. Dhaka WASA has a 13 member’s board for undertaking policies and decisions. The organization is well performing as both service and commercial organization.

Dhaka WASA was created in 1963 as a public utility under the Ministry of Local Government, Rural Development and Co-operative, in charge of providing water supply and sewerage services in the Metropolitan area of Dhaka. In 1996 the WASA Act was amended in order to grant more autonomy to DWASA by reconstituting and strengthening the Board, introducing commercial regulations and reducing government role. The Act clearly defines the mandate of the Board and Managing Director of DWASA, their competencies and responsibilities in the matters related to procurement, budget approval, recruitment, staff promotion and definition of salaries and benefits.

In this paper we have tried to produce an overall scenario and setup of Dhaka Water Supply and Sewerage Authority (DWASA) as an urban development organization. We have collected real data and discussed on its establishment, background, administration, functions, service areas and services, personnel management, operation and maintenance, financial management, research planning and development, problems and some recommendation for solution. We believe that, this paper will demonstrate a complete overview of Dhaka WASA as an organization.

***Urban Administration definition:***

Urban Administration means a programme of the Govt to administer the Urban Bodies like the Municipality, Municipal Corporations and the City Corporation of the state. The aforesaid bodies are managed by their respective council members, elected by the people of that locality, coming under the bodies, through election. But the administration is controlled through the Dept of Urban Administration of the State Govt.

***Urban Organizations in Bangladesh:***

Bangladesh is relatively a low urbanized country than other Asian countries. However, the country experienced a remarkable rate of urban growth both in terms of urban population and urban centers immediately after its independence. Many organization and institution were established time to time to speed up the urbanization in Bangladesh and ensure proper administration. Here we shortly introduced some urban organizations of Bangladesh.

***RAJUK:*** The Rajdhani Unnayan Kartripakkha (RAJUK) works under the authority of Ministry of Housing and Public Works previously known as DIT. It is the leading construction actor in development process of Dhaka. Its main activities include construction of roads, box-culverts, bridges and houses. It is governed by chairman and 5 other members.

***DPHE:*** Department of Public Health and Engineering (DPHE) is a national agency under the Ministry of Local Government, Rural Development and Co-operative is entrusted to provide safe water and supply, environmental sanitation and hygiene education as mandated throughout the country except three cities namely Dhaka, Chittagong and Narayanganj.

***UDD:*** Urban Development Directory (UDD) is one of the sustainable urban development authorities that belong to the Ministry of Housing and Public Works. Its vision is to increase quality and standard of life of people through planned development of infrastructure. Main functions are to prepare regional plan, master plan and detailed layout.

***RHD:*** Roads and Highways Department established in 1962 belong to the Ministry of Communication. RHD is responsible for the construction, maintenance and management of the major National, Regional and Zilla road and bridge network of over 21000 km road length and some 18,258 bridges.

***KDA:***Khulna Development Authority (KDA) is an autonomous body works under the Ministry of Housing and Public Works. Its main functions are urban planning, urban development and urban control. It undertakes and implements master plan for Khulna with the help of Government.

***PWD:*** Public Works Department (PWD) is an organization under the Ministry of Housing and Public Works. It is the primary construction agency of the government of Bangladesh. It has almost 19000 employees including engineers. The administration is headed by a chief engineer and supported by several other engineers.

***WASA:*** Water Supply and Sewerage Authority (WASA) in an organization that belong to the Ministry of Local Government, Rural Development and Co-operative is responsible for water supply, sanitation and drainage facility to the town people. WASAs are guided by “WASA Act, 1996. Currently only two cities have WASA these are Dhaka and Chittagong.

***Dhaka*** ***Water Supply and Sewerage Authority***

***Background of Dhaka WASA:***

Dhaka mega city was established in 1600 during the reign of Mughols. The city is formed covering the river of Buriganga. The then internal canals and rivers of Dhaka were – Begunbari canal, Shegunbagicha canal, kalyanpur canal, Dholaikhal canal, Deb-Dholaikhal canal, BurigangaRiver, Turag, Balu, and ShitolokkhaRiver. These rivers were the basic water storage, water way and means of storing rain water.

Basically, pure drinking water supply in Dhaka city started in 1874 by establishing Chadnighat Water Filtering Plant under patronization of Nawab Khaja Abdul Gani. It was in small scale. Later the water supply and sewerage service in Dhaka started in large scale. After the division in 1947 government established Department of Public Health and Engineering (DPHE) to ensure water, sanitation and rehabilitation service in town and rural areas.

By introducing the town Improvement Act 1953” the planning development of Dhaka megacity started. In 1959 the first “Mega Plan” of Dhaka megacity was formulated. In the plan population was estimated to 5.75 lacs. Since the independence of the country the population of Dhaka city started to increase rapidly. Necessary materials for people living in Dhaka comprising – dwellings, electricity, water supply, communication system, were supposed to be extended and developed. Under this situation the “Mega Plan” of 1959 became ineffective. In 1996 RAJUK formulated the 2nd “Mega Plan” for Dhaka Metropolitan city. In this plan the population determined to 10 million and area to 590 square mile. The present population of Dhaka metropolitan city is 12 million.

In 1963, Dhaka WASA was established as a unique organization for water supply and sewerage of Dhaka city. Then the activities of Department of Public Health and Engineering (DPHE) transferred to Dhaka WASA. In 1989, the storm water reservation function of DPHE with all its human resource transferred to Dhaka WASA. Since 1 July, 1990 the function of water supply and sewerage of Narayangonj city transferred to Dhaka WASA. Presently the Dhaka WASA is performing key responsibilities of water supply, sewerage and storm water reservation of Dhaka metropolitan city. At present Dhaka WASA is rightly operating as a service oriented and commercial organization.

***Legal Framework:***

Under the order No. 19 of the East Pakistan Ordinance No. XIX of 1963 Dhaka WASA was established to ensure water supply and sewerage in Dhaka city. Later in 1996, Dhaka WASA Act (Act No. 6 of 1996, 17 August 1996) was promulgated to formulate and implement the rule of corporate management.

***Mission*** ***and Vision:***

Improving the standard of living of city people by developing safe and pure drinking water supply, sanitation and drainage system is the main objective of Dhaka WASA. The present main duties of Dhaka WASA are –

Construction, operation, development and maintenance of necessary infrastructure to filter, pick up, store and supply pure drinking water to general people. industry and business institution of Dhaka city.

Construction, development and maintenance of wastage water filtering and drainage system.

Construction, development and maintenance of storm sewer to remove metropolitan water blockage.

***Dhaka*** ***WASA Organizational Milestone:***

As an autonomous body Dhaka WASA started its journey with the mandate to effect (EP Ordinance NO. XIX, 1963)

Supply of water

Disposal of sewage

Storm water drainage and

Solid waste management

The organization however, continued to provide services spanning water supply, treatment and disposal of sewage since inception.

***Dhaka*** ***WASA: The Organization & Mandate:***

* 1989: Storm Water Drainage was transferred to Dhaka WASA from DPHE
* 1990: Narayanganj Water Supply Transferred to Dhaka WASA
* 1996: Dhaka WASA reorganized to introduce Corporate Management under WASA Act’96
* Mandate: To ensure Water Supply, Treatment and Disposal of Wastewater (sewage) and Storm Water Drainage.

***Major River System and Water Sources in Bangladesh:***

Bangladesh is a country with full of rivers, canals and other water storages. All these are sources of water. But of them can be identified as the major water sources and are used to collect water. The sources can be shown in map and pie chart.

***Map and Figure: water sources of Bangladesh and their portion.***

***National Water Demand in Urban Areas:***

Urban population will increase to 73 million by 2025, and 136 million by 2050. Major migration to Dhaka city and adjoining areas are the main cause of population increase in the city. If this situation continues the Urban Water supply, sanitation and drainage will be major issues confronting the nation.

***Service Zone of Dhaka WASA:***

Till June 1989 the service territory of Dhaka WASA was truly in the metropolitan city. At the beginning of 1990 Dhaka WASA has taken the duty of water supply and sewerage of Narayangonj city. Presently Dhaka metropolitan city and Narayangonj are known as the service zone of Dhaka WASA. On the basis of operation, maintenance and customer service the Dhaka WASA zones are divided into 11 geographical areas. From these 10 is in Dhaka and 1 is in Narayangonj. Every zonal office is responsible for technical operation, maintenance and revenue bill collection. As a consequence the standard of clients’ service increased.

***Dhaka*** ***WASA Jurisdiction by 1963 Ordinance and New Demand Areas***

|  |  |  |
| --- | --- | --- |
| **Year** | **Population (Million)** | **Area (Sqkm)** |
| **1991** | 7.3 | 250 |
| **2005** | 10.0 | 481 |
| **2010** | 12.2 | 587 |
| **2015** | 14.9 | 717 |
| **2025** | 21.6 | 1000 |

***Organization and Personnel Management:***

Under the order No. 6 of Act 1996 the organization structure of Dhaka WASA was changed. The Act suggested a 13 member Dhaka WASA board. The chief of the board is chairman and the members are from various professional organization and government representative. According to the organization structure there are a managing director (MD) and four Deputy Managing Directors (DMDs). At present Dhaka WASA have a total of 4375 employees combining all 1st – 4th class. Employees are from all 4 wings. Among these wings, Operation and Monitoring wing has maximum number of employees in all 11 zonal offices. Employees are appointed and guided by “Service Rule 1990” except MD and DMD. Board has no executive power while the MD is the executive head and is directly recruited from market through advertisement for 3 years. Service rule is amended in 2010 as “Dhaka WASA Employees Service Regulation 2010”. There are provisions of ACR, personal life, punishment and welfare of the employees. According to the organizational structure – 2007, a table & pie chart of officers and staffs of Dhaka WASA are shown here.

|  |  |  |  |
| --- | --- | --- | --- |
| **Class** | **Permitted**  **Positions** | **Existing**  **Positions** | **Vacant**  **Positions** |
| **1st class** | 293 | 160 | 133 |
| **2nd class** | 328 | 184 | 44 |
| **3rd class** | 1887 | 1686 | 201 |
| **4th class** | 1867 | 1671 | 196 |
| **Total** | 4375 | 3701 | 574 |

***Organogram of Dhaka WASA***

***Dhaka*** ***WASA at a Glance:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Water Supply System:*** | | | | | |
|  | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 |
| **Deep tube-well** | 402 | 418 | 441 | 465 | 490 |
| **Water refinery** | 4 | 4 | 4 | 4 | 4 |
| **Daily water production** | 146 c.lr | 160 c.lr | 166 c.lr | 170 c.lr | 176 c.lr |
| **Water line** | 2475.62 km | 2500 km | 2520 km | 2533 km | 2600 km |
| **Water connections** | 210771 | 210726 | 232907 | 243477 | 256375 |
| **High water tank** | 38 | 38 | 38 | 38 | 38 |
| **Street tap** | 1643 | 1643 | 1643 | 1643 | 1643s |
|  | | | | | |
| ***Sewerage System:*** | | | | | |
| **Sewerage lines** | 786 km | 808 km | 813 km | 881 km | 882 km |
| **Sewerage connections** | 49707 | 50130 | 50719 | 59299 | 60277 |
| **Sanitation lift station** | 26 | 27 | 29 | 29 | 29 |
| **Sanitation treat plant** | 1 | 1 | 1 | 1 | 1 |
|  | | |  | | |
| ***Drainage System:*** | | | | | |
| **Storm sewer lines** | 224 km | 230 km | 248 km | 256 km | 265 km |
| **Open canals** | 56 km | 65 km | 65 km | 65 km | 65 km |
| **Box-culvert** | 7.80 km | 8 km | 8.3 km | 8.4 km | 8.5 km |
| **Pumping station** | 2 | 2 | 2 | 2 | 2 |
| 1. **1.      Kallyanpur** 2. **2.      Dholaikhal** | 10 cm3 | 10 cm3 | 10 cm3 | 10 cm3 | 10 cm3 |
| 22 cm3 | 22 cm3 | 22 cm3 | 22 cm3 | 22 cm3 |
|  | | | | | |
| ***Revenew Income-Expenditure:*** | |  | | | **Lac taka** |
| **Revenue Income** | 22565.27 | 26939.17 | 30563.81 | 32862.80 | 36831.82 |
| **Revenue Expenditure** | 22284.86 | 26806.32 | 30505.10 | 32862.22 | 36170.68 |
| **Profit / Loss (+ / – )** | 280.41 | 132.85 | 58.71 | 0.58 | 661.14 |
|  | | | | | |
| ***Water and Sanitation tax:*** | |  | | | **Lac taka** |
| **Billing** | 20872.47 | 25018.46 | 28210.85 | 30139.87 | 33294.62 |
| **Collection** | 16847.72 | 19914.75 | 20901.81 | 27093.25 | 31434.32 |
| **Due (Provision)** | 22470.13 | 27473.74 | 34882.78 | 36034.61 | 37934.61 |
|  | | | | | |
| ***Development Project:*** | | | | | |
| **Water supply** | 4 | 1 | 2 | 2 | 6 |
| **Sewerage** | 2 | 1 | 2 | 1 | 2 |
| **Drainage** | 1 | 4 | 2 | 2 | 3 |
| **Total** | 7 | 6 | 6 | 5 | 11 |

***Major Areas of Functions***

***Water Production System:***

Total Actual Production: 1980 mld

Total production capacity: 2182 mld

*Surface Water Treatment Capacity*

Sayedabad      :           225 mld

Chadnighat     :           39 mld

Narayangonj    :           28 mld

(Godnail & Sonakanda)

Total Surface Water Production: 257 mld

*Ground Water:*

DTW in Operation: 554

Total water connection: 284461

Total length: 2662 km

***Sewerage Treatment System:***

Coverage Area            : 110 sq.km

                                    (30% of DCC)

Population served       : 25%

Treatment Plant           : 1

Treatment Capacity     : 120000 CuM

Actual Treatment        : 30000 – 50000 CuM

Connections                : 59510

Sewerage line              : 881 km

***Drainage System:***

Coverage         : 38 km

Service area     : 150 sq.km

Box culvert     : 12 km

Open channel  : 65 km

Pipe drain        : 250 km

Pump station   : 3 nos.

Pump capacity : 54 cumec

Temp Pumping arrangement

Total nos.        a. 6 × 25 = 150 cu sec

                        b. 145 × 5 = 725 cu sec

***Administrative Functions***

***Policy:***

To ensure the service standard and accountability to the clients a citizens charter has been formulated. After a long period of 24 years in 2007 a new organizational structure comprising 4375 position was rapidly approved by the government on 9/12/2007. Dhaka WASA (water connection and water tax) regulation 2007 published as gadget. Other than this the three regulations below approved by 72th special meeting and sent to ministry on 6/12/2007. They are –

  Dhaka WASA Employees Service Regulation 2007

  Dhaka WASA Finance Regulation 2007

  General Future Fund Regulation 2007

***Development Project Implementation:***

In 2008 – 09 fiscal year 205.92 crore taka was allotted and 195.47 expended against 12 development projects. By that time 98% of project progress and 95% of financial progress achieved.

***Water Production:***

At present Dhaka WASA is producing 176 liters of water by 490 deep tube well and 4 water filtering centre. Among this in running fiscal year water production was increased by placing 21 new deep tube well. More new deep tube well placing is under progress. To ensure continuous water supply a gas generator with 3.4 megawatt power placed in Sayedabad water purifying centre. In consequence electricity equal to an amount of 50 lacs taka is been saved in every month.

***Service:***

To ensure the standard of customer service the operation and maintenance system has been developed. Billing and collection system have made easier. To remove water blockage in Dhaka city 13 canals are been opened to flow away rain water. Pumping and other maintenance system has been developed to sewer block rain water on the street. As a result west Dhaka was free from water blockage in last year.

***Administration:***

Several administrative activities were taken to established good governance in various sectors including wastage and corruption protection. It reduces the administrative red-tapism. The important is, system loss has been reduced to 35%. To reduce 2% system loss in every year step taken against the bill defaulter and awareness programs were operated. To make administration more active 269 transfers were made during the stated fiscal year.

***Activities taken to Develop Customer Service:***

To provide customers with more facilities help desk is opened in every modes zone. Necessary services are being given by these. A complaint counter is also attached with every modes zone. Complaints are completed within three working days after complaining. In terms of new water connection, work in done within 15 days of application. Time for meter placing is also shortened by placing it within three days of testing. Any complaints relating to water supply are tried to solve by 24 hours of complaining. Computerized database is made on each of Dhaka WASA’s properties.

***Research Activities:***

To upgrade water supply, sewerage and drainage system of Dhaka city GLS based MIS is being activated. To bring transparency in billing and collection, computerized system is introduced. Pilot program is taken to publish revenue bill in website. Digital meter system is to be introduced to lessen customer harassment. Double entry accounting system and computerized accounts system are introduced to make organizational accounts transparent. Institute of water modeling is recruited to make feasibility test on if it is possible to produce 40 crore liters of water from 70 tube wells in Singair ground water source. If survey report is positive then the project will be implemented in financial association of government.

***Eviction of illegal possession:***

Action taken against any illegal dwellings or constructions made by Dhaka WASA officers or staffs relating to create profit. 2000 illegal constructions are destructed and possession evicted.

***Others:***

Dhaka WASA’s self financial bottle drinking water named “Shanti” has popularized to people. “Shanti” put great contribution fulfill pure water demand created by SIDR and flood in southern part of the country. In association with private organization special activities is taken to serve poor and slum dwellers. Under this project water and sewerage service is started in some slum areas of Mirpur.

***Operation and Maintenance***

***Water Supply System:***

In 2008 – 2009 Dhaka WASA has set up 54.50 km of new water line and reconstructed 4.8 km water line. In last three years (2005-06, 2006-07, 2007-08) Dhaka WASA has constructed 110.10 km of water line, placed 76 deep tube wells and replaced 70 deep tube wells.

 Dhaka WASA has achieved great success in water production and water supply. In last 3 years it has pointed different water crisis areas of Dhaka metropolitan city and placed deep tube wells. Therefore, by increasing water supply and decreasing the supply deficit they reduce the sufferings of people. It increased 76 deep tube wells in Dhaka in last 3 years. At present, Dhaka WASA depends on ground water. Total 490 deep tube wells are being used to lift and supply water. Other than this, Dhaka WASA 5 large and small water filtering centers including Sayedabad and Buriganga water filtering centre to filter river water and supply. It is mentionable that Dhaka WASA have total (2007 – 2008) 264 generators which are driven by diesel. By using these generators the ground water is lifted when there is no electricity supply, especially in summer season. Beside the increasing demand of water the crisis of electricity is getting extreme. Then by using the generators water supply in the city is kept usual. Other than this, if water crisis occur in any part of the city Dhaka WASA immediately supply water by using 22 water vans and 44 trolleys.

At present, Dhaka WASA is supplying about 176 crore liters of water daily. Among these 84% is ground water and 16% is surface water. Last years, 500 new water connection are provided in slum areas to development the standard of life style, heath condition and environment of the slum areas. In fiscal year 2007 – 2008 total 27109 different sample have examined to confirm the quality standard of water.

***Daily Water Production***

Dhaka WASA supply water in Dhaka metropolitan city and Narayangonj. At present, the population of Dhaka and Narayangonj is about 1.36 crore and will increase a lot by 2020. To fulfill the increasing demand water of city dwellers Dhaka WASA is lifting and supplying water by using deep tube wells. Because of lifting gourd water constantly the water layer is going down to 7 – 10 feet in each year. To tackle this situation Dhaka WASA has started to collect water from Deeper Aquifer (1000 feet or deeper) and for permanent solution of water problem in Mirpur are deep tube wells are established from Singayer of Manikgonj. The probability survey shows than supplying water in Dhaka using pipe line is about to end. Beside this, by using the river water of Meghna, a plan for construction of the water filtering centre in taken. It is mentionable that, the specialists doubt that ground water lifting world be the reason of land erosion and deferent environmental crises. In this circumstances Dhaka WASA give importance in water production from surface water as the alternate and dependable source of water supply. till 30 June, 2008 the production capability of Dhaka WASA was 190 crore liters (daily) and real production was 176 crore liters in average. For about 1.36 lacs people of Dhaka metropolitan city and Narayangonj municipality the demand of water per head estimated to be 160 liters daily where Dhaka WASA’s water production was a total of 205 crore liters. The difference between water production capability and demand was 35 crore liter and to fulfill the demand the capability of Dhaka WASA is about 80% to 85%. From 1963, the daily demand of water capability of supply and deficiency at different time in shown in a table below –

***Dhaka WASA’s Daily Water Supply, Demand and Deficit:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Years*** | ***Population (lac)*** | ***Demand (crore.liters)*** | ***Supply (crore-liters)*** | ***Deficit (crore-liters)*** | ***# of active deep tube-well*** |
| **1963** | 8.50 | 15 | 13 | 2 | 30 |
| **1970** | 14.60 | 26 | 18 | 8 | 47 |
| **1980** | 30.30 | 55 | 30 | 25 | 87 |
| **1990** | 55.60 | 100 | 51 | 49 | 216 |
| **1996** | 75.50 | 130 | 81 | 49 | 216 |
| **1997** | 80.00 | 135 | 87 | 48 | 225 |
| **1998** | 90.00 | 144 | 107 | 37 | 277 |
| **2000** | 95.00 | 150 | 113 | 37 | 308 |
| **2001** | 100.00 | 160 | 122 | 38 | 336 |
| **2002** | 105.00 | 168 | 130 | 38 | 379 |
| **2003** | 110.25 | 176 | 136 | 40 | 391 |
| **2004** | 115.76 | 185 | 140 | 45 | 802 |
| **2005** | 121.50 | 194 | 146 | 48 | 418 |
| **2006** | 126.50 | 190 | 154 | 46 | 441 |
| **2007** | 131.50 | 198 | 166 | 32 | 465 |
| **2008** | 136.50 | 205 | 176 | 29 | 490 |
| **2009** | 140.50 | 210 | 185 | 25 | 535 |
| **2010** | 145.00 | 220 | 198 | 22 | 554 |

***Financial Management***

***Revenue Income – Expenditure:***

As a service oriented and commercial organization the main income and expenditure source of Dhaka WASA are water and sewerage tax. In recent years Dhaka WASA has developed their billing and collection system. In consequence revenue income of Dhaka WASA is increasing and establishing a balance situation in income and expenditure. Presently, system loss is a big challenge for Dhaka WASA and to face this problem Dhaka WASA has already taken some necessary steps. These steps are putting contribution to the increase of real income of the organization. In case of revenue income, billing is a great challenge for Dhaka WASA. The late billing is raising the due amount. Dhaka WASA has computerized its billing and collection system by uninterrupted efforts of last few years. Presently Dhaka WASA started online billing system to provide customers with more facilities.

***Budget Making Process:***

Dhaka WASA runs by its own finance. The budget making process of Dhaka WASA is incremental. Each year it rises by 10%. The process contains revised and estimated budget. After every six months of the original budget Dhaka WASA prepare revised budget including 5% with six months total costs. And next budget include 10% more with it.  Government usually funds on projects. The accounts department first prepares a budget and send to board for approval. After being approved in the board meeting the budget is sent to Monitoring sell of Ministry of Finance. Then if everything seems alright the budget is approved by the government.

***A Recent Budget Summery of Dhaka WASA of last few years are shown below –***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | **Taka in lac** |
| **Sl.no.** | **Particulars** | **Budget est. 2010-11** | **R. Budget 2009-10** | **App. Budget 2009-10** | **6 Months Jul’09-Dec’09** | **Actual 2008-2009** |
| **1** | **2** | **3** | **5** | **7** | **8** | **9** |
| **A** | **Income** |  |  |  |  |  |
| **1** | Water | 38022.06 | 34565.51 | 32919.18 | 13271.64 | 28227.55 |
| **2** | Sewer | 12481.87 | 11347.15 | 10806.81 | 3317.91 | 9385.88 |
| **3** | Street Hydrant | 577.50 | 525.00 | 525.00 | 200.40 | 766.38 |
|  | **Subtotal (1+..+3)** | **51081.43** | **46437.66** | **44280.99** | **16789.95** | **38379.81** |
| **4** | Bottled Water sale | 138.60 | 126.00 | 126.00 | 63.00 | 125.16 |
| **5** | Water Sale (Direct) | 69.30 | 63.00 | 63.00 | 31.50 | 475.36 |
|  | **Sub-total (1+…..+4)** | **51289.33** | **46626.66** | **44439.99** | **16884.45** | **38980.33** |
| **B** | **Others** | **5226.54** | **4796.85** | **4346.85** | **2088.46** | **1934.52** |
|  | **Total Income (A+B)** | **56515.87** | **51423.51** | **48786.84** | **18972.91** | **40914.85** |
| **C** | **Expenditure** |  |  |  |  |  |
| **1** | Salary, Wages & Others | 10419.63 | 9053.52 | 8658.01 | 3559.78 | 8950.30 |
| **2** | Contingency & Others | 5837.46 | 6203.89 | 5955.22 | 2072.10 | 4652.21 |
| **3** | Chemicals | 1200.00 | 1030.00 | 1400.00 | 64.69 | 950.75 |
| **4** | Power | 10000.00 | 10000.00 | 10000.00 | 5149.73 | 11265.90 |
| **5** | Fuel for Generator | 1700.00 | 1500.00 | 1600.00 | 920.71 | 1204.80 |
| **6** | Depreciation | 7200.00 | 7000.00 | 7000.00 | 3500.00 | 7800.00 |
| **7** | Repair & Maintenance | 4673.89 | 3524.57 | 2400.00 | 1036.56 | 2955.10 |
| **8** | Saidabad (O&M) | 800.00 | 750.00 | 800.00 | 131.49 | 188.32 |
| **9** | DSL (IDA Loan) | 2500.00 | 2500.00 | 2500.00 | 1250.00 | 2500.00 |
| **10** | Interest Charge to Revenue | – | – | – |  |  |
| **11** | SIDA Loan | 50.00 | 100.00 | 100.00 | 50.00 | 82.50 |
| **12** | DSL (Govt.) | 80.00 | 80.00 | 80.00 | 40.00 | 80.00 |
| **13** | Drainage (watering pump) | 270.00 | 215.00 | 250.00 | 103.92 | 95.04 |
| **14** | Revenue Purchase | 1605.00 | 1683.00 | 2040.00 | 46.89 | 1512.95 |
| **15** | Resch.Dev.Study & Cons. | 420.00 | 420.00 | 420.00 | 61.07 | 18.36 |
|  | **Total Exp. C** | **46755.98** | **44059.98** | **43203.23** | **17986.94** | **42256.23** |
|  | **Profit/loss (A+B-C)** | **9759.89** | **7363.53** | **5583.61** | **985.97** | **(1341.38)** |
| **17** | Cap. Exp. From Revenue | 6617.00 | 5884.00 | 4480.00 | 859.19 | 2844.27 |
|  | **Surplus / (Deficit)** | **3142.89** | **1479.53** | **1103.61** | **126.78** | **(4185.65)** |
| **18** | Income tax provision | 200.00 | 200.00 | 200.00 | – | – |
|  | **Net profit after tax** | **2942.89** | **1279.53** | **903.61** | **126.78** | **(4185.65)** |
| **19** | Dividend to Govt. Fund | 500.00 | 500.00 | 300.00 | – |  |
|  | **Net Deficit / Surplus** | **2442.89** | **779.53** | **603.61** | **126.78** | **(4185.65)** |

***Customer connection:***

At the end of June, 2008 the total customers of Dhaka WASA are 256375, of which 245283 are from Dhaka city and 11032 from Narayangonj city. Moreover there are 1209 street tap in Dhaka and 434 in Narayangonj.

***The Total customer numbers of last five years is shown here –***

|  |  |
| --- | --- |
| **Years** | **Total Connection Number** |
| **2003 – 2004** | 210771 |
| **2004 – 2005** | 219726 |
| **2005 – 2006** | 227994 |
| **2006 – 2007** | 244097 |
| **2007 – 2008** | 246375 |

***Customer Statistics:***

***Revenue Income and Expenditure:***

|  |  |
| --- | --- |
| **Customer type** | **Total customer** |
| **Domestic** | 272002 |
| **Commercial** | 8562 |
| **Industrial** | 1764 |
| **Community** | 1309 |
| **Office** | 825 |
| **Total** | 284461 |

The overall development of Dhaka WASA shows a positive improvement of service zone range and quality standard. Presently WASA established a taskforce to strengthen the billing and collection system. To bring the mobility of activities WASA has taken strong monitoring system and other necessary initiatives.

***Summary of Income & Expenditure (Million taka):***

|  |  |  |  |
| --- | --- | --- | --- |
| ***Head*** | ***Income*** | ***Expenditure*** | ***Profit/Loss*** |
| **2001-2002** | 1,756.980 | 1,756.012 | 0.968 |
| **2002-2003** | 1,954.679 | 1,945.819 | 8.866 |
| **2003-2004** | 2,256.527 | 2,228.486 | 28.041 |
| **2004-2005** | 2,693.917 | 2,680.632 | 13.285 |
| **2005-2006** | 3,056.381 | 3,050.510 | 5.871 |
| **2006-2007** | 3,286.279 | 3,286.268 | 0.011 |
| **2007-2008** | 3,694.612 | 4,364.851 | (670.239) |
| **2008-2009** | 4,230.609 | 4,105.578 | 125.031 |

***Research, Planning and Development***

The research, planning and development wing is very important in all function of Dhaka WASA. All responsibility of future planning, development and research function is being operated under this wing. By this wing all planning and implementation of projects are taken. This wing in controlled by the Deputy managing Director (Research, Planning and Development). The functions those are performed by the wing are –

  Give consultancy of all kind of engineering matter to managing director.

  Implementation of all projects by the head of the department of the wing.

  Confirmation and fostering of government rules and instruction about engineering and technical matter.

  To ensure the implementation that is taken by the board and managing director of the controlling department.

  Supervision of the function of planning, design, research and construction department.

  Provide help to prepare project and planning of technical matter.

Under this wing the function is directed by an additional engineer, four supervisors engineer and director of all projects.

A total of 12 development projects are included in annual development functions of Dhaka WASA in fiscal year 2007 – 2008. Among these projects 6 are water supply related investment projects, 2 sewerage and 3 drainage related projects. There is also a technical assistance project.

***a)      Water supply related investment projects:***

* Reconstruction and development project of water supply system.
* Sayedabad water supply project.
* Emergency rehabilitation and expansion of water supply system.
* Dhaka water supply sector development project
* Purchase of generator for water pumps of Dhaka city

***b)      Sanitation related investment projects:***

* Emergency interim sewerage line building and reconstruction project
* Flood affected sewerage rehabilitation project

***c)      Drainage related investment projects:***

* Project to reduce water blockage of Dhaka metropolitan city
* Project to reserve regulating pond near to Kallyanpur Storm Water Pumping
* The project for storm water drainage system in Dhaka city

***d)      Technical Assistance projects:***

* TPP for project preparation facilities of Dhaka WASA

***Implementation Progress:***

Total allotment of annual development project was taka 168.58 crore. Among these, the amount of government financing was taka 139.96 crore. Total amount of expenditure of in the year was taka 148399 crore. 90% amount of total allotment has been used. As a result 96% of real progress has achieved.

***Proposed Projects:***

To solve future water problems pointed out by Dhaka WASA’s survey and research it is preparing to implement some projects. They are –

* Singayer oil field project (tk. 300 crore)
* Khilkhet water treatment plant (tk. 2500 crore)
* Pagla water treatment plant (tk. 2500 crore)
* North Dhaka STR projuct (tk. 850 crore)
* Eastern Bypass project (tk. 900 crore)
* Dasenkandi sewerage treatment plant (tk. 500 crore)
* Pollution control measures of Gulshan, Baridhara lake diverting drainage outlet of lake to the drainage channel (Gulshan area tk. 50 crore)
* Dhaka water supply and sewerage project (tk. 1160 crore)

***Dhaka*** ***WASA’s projects under implementation or to be implemented in future:***

1. Project to reduce water blockage of Dhaka Metropolitan city (amended)
2. Project to reserve regulating pond near to Kallyanpur Storm Water Pumping (amemded)
3. Sayedabad water filtering construction project
4. Emergency rehabilitation and expansion of water supply system
5. Dhaka water supply sector development project
6. Interim emergency sewerage line building and reconstruction project
7. Improvement of storm water drainage system in Dhaka city
8. Dhaka water supply and sewerage project
9. Reconstruction and development of water supply system of Narayangonj town
10. Technical assistance project for management support to Dhaka WASA.

***IT and e-Governance***

***Functions of Computer Centre:***

Necessary steps to make Dhaka WASA’s website more modern and informative. Such as –

  In 1992 a computer centre has been established to computerize water and sewerage billing system. Since then revenue zone 5 billing preparation started through computer one after one all zones have brought under this system.

  After contracting out the revenue zones 3, 4, and 5 in 1997 and 2003 the centre operating billing system provided by the centre.

  To facilitate clients with easier bill repayment Dhaka WASA had been preparing monthly basis bill since last 5 years.

  Under government decision Dhaka WASA already signed with two private organizations to outsource all the billing functions.

  To make computer billing system more faster Dhaka WASA expended 30000000 taka for buying hardware, software, update billing software, LAN connection in modes and revenue zones, WAN in booths of banks and upgrading the present software. New billing system started from 2009.

***After completion of the activities expected benefits are –***

a)      Revenue income will increase

b)      Transparency in billing functions

c)      Restoration of billing ledger in computer

d)     After networking all the offices and zones “Paperless Office Management (PMO)” would be possible. And information transfer will be easier.

e)      Online connection with booth will help to instantly update the customer database.

f)       Clients can find all billing information on the website, can download all bills, and pay through SMS/pay centre. It will help to fulfill the citizen’s charter.

g)      After completing all these Dhaka WASA will be able to enter into the world of Modern Technology.

Other then billing, computer centre is also operating future fund, payroll, including overtime and income tax, achieved holydays, personal MIS, electricity bill checking, collection of information about cases, renewal of privately owned tube well, analyzing & renew billing information, preparing monthly MIS etc.

Dhaka WASA already signed with an organization to computerize accounting and store inventory, upgrading Personal Information Management System (PIMS). All functions will be fully computerized by the coming fiscal year.

To introduce Geographical Information System (GIS) Dhaka WASA contracted with an organization. It will provide WASA with all information about water pipe. Presently water, sanitation and drainage are being trying to bring under GIS.

To bring more functions under computerized system WASA is outsourcing to make new software. It will contain File and Office Management System, information reservation relating to house allotment, generator fuel, vehicle, library, Sayedabad water refinery station test report etc. all functions are planned to be made fully computerized by coming fiscal year.

Dhaka WASA head office is brought under network since 5 years. Every officer is given broadband internet connection. Beside this Dhaka WASA developed its own website.  WASA’s functions like, all sorts of forms, citizen’s charter, tender, advertisement are published on the website.

Computer centre is also responsible for maintenance of organization’s 5 servers, 200 computers and other computer accessories. A training centre provides training to WASA’s officers and staffs. It has a plan to create a fully equipped computer lab. Lab will provide necessary solution and advice. If necessary the centre will provide training to other public sector government officials.

***Miscellaneous Activities***

***Human Resource Development:***

Dhaka WASA is constantly trying to increase work skill of its officers and staffs. Various training in home and abroad have introduced. Dhaka WASA Lalmatia Training Institute trained 178 officers and staffs under 9 courses with different duration by 2007 and 2008.

***Role of Dhaka WASA on Cyclone –SIDR:***

On 15 December 2007 a destructive SIDR attack on the total coastal area. It caused severe harm to corps and thousands of people died. As a result the affected areas found lack of pure drinking water. Dhaka WASA gave an helping hand to ensure pure water there. Dhaka WASA supplied bottle water “Shanti” and water refinery equipments in affected areas of Khulna and Barisal. Under the program Dhaka WASA supplied a total of 91247 liters bottle water. Beside this to purify water Dhaka WASA supplied 50 metric tons of lime in the affected districts.

***Library Development:***

Dhaka WASA operating a library since its birth. At present various initiatives are taken to make this library more modern and attractive one. Presently the library has more than 800 books.

***Medical Centre Service:***

To provide primary medical treatment to Dhaka WASA’s officers, staffs and their family members it has a medical centre. This centre provide general treatment and medicine to Dhaka WASA’s officers and staffs. There are two doctors to provide these services.

***Citizen’s Charter:***

Dhaka WASA has a citizen’s charter to provide necessary services to its clients. The charter comprises of –

1. Mission and vision of Dhaka WASA
2. Dhaka WASA’s promises
3. Services provided by Dhaka WASA
4. Service delivery system
5. Rules of application for sanitation connection
6. Rules and system for new meter placement
7. Deep tube well under ownership of individuals and institutions
8. Billing and collection system
9. Collection of due bills
10. Notice for break of water supply
11. Water supply with vehicles
12. Ensuring water quality standard
13. Supplying bottle water
14. Complaints receiving and solving
15. Return of mortgage

***Future Planning of Dhaka WASA***

***Future work plan is taken to fulfill 100% water demand by 2013. For this, various mid-term development activities are taken. According to priority –***

  Construction of water purification centre

  Establish and reestablish deep tube wells

  Construct and reconstruct pipeline, etc activities are constantly taken.

***To increase sewerage facilities from 30% to 45% future work plan in priority –***

  Construction of sewerage refinery

  Construction of sewerage line

  Reconstruction of sewerage line

  Construction of sanitation lifts station. All these activities are already taken.

***To increase drainage facility from 60% to 80% by 2012 future work plan in priority –***

  Canal development

  Construction of storm sewer line

  Reconstruct storm line, etc activities are already under implementation

Future plan is also constantly taken to facilitate water resource is slum area by 2012. To develop slum dwellers’ standard of life from 10% to 32% future planning made according to priority. 2500 connections in 1500 slum are to be given.

implementation

[ɪmplɪmɛnˈteɪʃ(ə)n]

NOUN

1. the process of putting a decision or plan into effect; execution.

"she was responsible for the implementation of the plan"

*synonyms:*

[execution](https://www.bing.com/search?q=define+execution&FORM=DCTRQY) · [application](https://www.bing.com/search?q=define+application&FORM=DCTRQY) · carrying out · carrying through · [performance](https://www.bing.com/search?q=define+performance&FORM=DCTRQY) · [enactment](https://www.bing.com/search?q=define+enactment&FORM=DCTRQY) · [administration](https://www.bing.com/search?q=define+administration&FORM=DCTRQY) · [fulfilment](https://www.bing.com/search?q=define+fulfilment&FORM=DCTRQY) · [fulfilling](https://www.bing.com/search?q=define+fulfilling&FORM=DCTRQY) · [discharge](https://www.bing.com/search?q=define+discharge&FORM=DCTRQY) · [accomplishment](https://www.bing.com/search?q=define+accomplishment&FORM=DCTRQY) · [achievement](https://www.bing.com/search?q=define+achievement&FORM=DCTRQY) · [realization](https://www.bing.com/search?q=define+realization&FORM=DCTRQY) · [contrivance](https://www.bing.com/search?q=define+contrivance&FORM=DCTRQY) · [prosecution](https://www.bing.com/search?q=define+prosecution&FORM=DCTRQY) · [effecting](https://www.bing.com/search?q=define+effecting&FORM=DCTRQY) · [enforcement](https://www.bing.com/search?q=define+enforcement&FORM=DCTRQY) · [imposition](https://www.bing.com/search?q=define+imposition&FORM=DCTRQY) · [effectuation](https://www.bing.com/search?q=define+effectuation&FORM=DCTRQY)

automation

[ɔːtəˈmeɪʃ(ə)n]

NOUN

1. the use or introduction of automatic equipment in a manufacturing or other process or facility.

"unemployment due to the spread of automation"

digitization

[dɪdʒɪtʌɪˈzeɪʃ(ə)n]

NOUN

1. the conversion of text, pictures, or sound into a digital form that can be processed by a computer.

"the digitization of the rare map collection at the library" ·

[[more]](javascript:void(0);)

* + adaptation of a system, process, etc. to be operated with the use of computers and the internet.

"as digitization continues, data will become more valuable than ever before" ·

information

[ɪnfəˈmeɪʃ(ə)n]

NOUN

1. facts provided or learned about something or someone.

"a vital piece of information"

*synonyms:*

[details](https://www.bing.com/search?q=define+details&FORM=DCTRQY) · [particulars](https://www.bing.com/search?q=define+particulars&FORM=DCTRQY) · [facts](https://www.bing.com/search?q=define+facts&FORM=DCTRQY) · [figures](https://www.bing.com/search?q=define+figures&FORM=DCTRQY) · [statistics](https://www.bing.com/search?q=define+statistics&FORM=DCTRQY) · [data](https://www.bing.com/search?q=define+data&FORM=DCTRQY) · [knowledge](https://www.bing.com/search?q=define+knowledge&FORM=DCTRQY) ·

[[more]](javascript:void(0);)

* + *law*

a charge lodged with a magistrates' court.

"the tenant may lay an information against his landlord"

1. what is conveyed or represented by a particular arrangement or sequence of things.

"genetically transmitted information"

* + *computing*

data as processed, stored, or transmitted by a computer.

system

[ˈsɪstəm]

NOUN

1. a set of things working together as parts of a mechanism or an interconnecting network; a complex whole.

"the state railway system" ·

[[more]](javascript:void(0);)

*synonyms:*

[structure](https://www.bing.com/search?q=define+structure&FORM=DCTRQY) · [organization](https://www.bing.com/search?q=define+organization&FORM=DCTRQY) · [order](https://www.bing.com/search?q=define+order&FORM=DCTRQY) · [arrangement](https://www.bing.com/search?q=define+arrangement&FORM=DCTRQY) · [complex](https://www.bing.com/search?q=define+complex&FORM=DCTRQY) · [apparatus](https://www.bing.com/search?q=define+apparatus&FORM=DCTRQY) · [network](https://www.bing.com/search?q=define+network&FORM=DCTRQY) · [administration](https://www.bing.com/search?q=define+administration&FORM=DCTRQY) · [institution](https://www.bing.com/search?q=define+institution&FORM=DCTRQY)

1. a set of principles or procedures according to which something is done; an organized scheme or method.

"a multiparty system of government" ·

[[more]](javascript:void(0);)

*synonyms:*

[method](https://www.bing.com/search?q=define+method&FORM=DCTRQY) · [methodology](https://www.bing.com/search?q=define+methodology&FORM=DCTRQY) · [technique](https://www.bing.com/search?q=define+technique&FORM=DCTRQY) · [process](https://www.bing.com/search?q=define+process&FORM=DCTRQY) · [procedure](https://www.bing.com/search?q=define+procedure&FORM=DCTRQY) · [approach](https://www.bing.com/search?q=define+approach&FORM=DCTRQY) ·

[[more]](javascript:void(0);)

1. *(the system)*

the prevailing political or social order, especially when regarded as oppressive and intransigent.

"don't try bucking the system"

[Information system - Wikipedia](https://en.wikipedia.org/wiki/Information_system)

[Digital Attendance || Dhaka Wasa (DWASA) Innovation Idea for a2](https://www.youtube.com/watch?v=pNkaCul3DvQ) - https://www.youtube.com/watch?v=pNkaCul3DvQ

sewer

[ˈsuːə]

NOUN

*sewer (noun) · sewers (plural noun)*

1. an underground conduit for carrying off drainage water and waste matter.

*synonyms:*

[drain](https://www.bing.com/search?q=define+drain&FORM=DCTRQY) · [sluice](https://www.bing.com/search?q=define+sluice&FORM=DCTRQY) · [sluiceway](https://www.bing.com/search?q=define+sluiceway&FORM=DCTRQY) · [culvert](https://www.bing.com/search?q=define+culvert&FORM=DCTRQY) · [spillway](https://www.bing.com/search?q=define+spillway&FORM=DCTRQY) · [flume](https://www.bing.com/search?q=define+flume&FORM=DCTRQY) · [channel](https://www.bing.com/search?q=define+channel&FORM=DCTRQY) · [conduit](https://www.bing.com/search?q=define+conduit&FORM=DCTRQY) · [pipe](https://www.bing.com/search?q=define+pipe&FORM=DCTRQY) · [duct](https://www.bing.com/search?q=define+duct&FORM=DCTRQY) · [chute](https://www.bing.com/search?q=define+chute&FORM=DCTRQY) · [trough](https://www.bing.com/search?q=define+trough&FORM=DCTRQY) · [trench](https://www.bing.com/search?q=define+trench&FORM=DCTRQY) · [ditch](https://www.bing.com/search?q=define+ditch&FORM=DCTRQY) · [furrow](https://www.bing.com/search?q=define+furrow&FORM=DCTRQY) · [cut](https://www.bing.com/search?q=define+cut&FORM=DCTRQY)

Sewer commonly refers to a part of [sewerage](https://en.wikipedia.org/wiki/Sewerage), the infrastructure that conveys sewage.

[Sewage](https://en.wikipedia.org/wiki/Sewage), wastewater produced by a community of people

History

Adam Smith

An important early (1776) description of processes was that of economist Adam Smith in his famous example of a pin factory. Inspired by an article in Diderot's Encyclopédie, Smith described the production of a pin in the following way:[7]

”One man draws out the wire; another straights it; a third cuts it; a fourth points it; a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on is a peculiar business; to whiten the pins is another ... and the important business of making a pin is, in this manner, divided into about eighteen distinct operations, which, in some manufactories, are all performed by distinct hands, though in others the same man will sometimes perform two or three of them.”

Peter Drucker

In the latter part of the twentieth century, management guru Peter Drucker focused much of his work on simplification and decentralization of processes, which led to the concept of outsourcing. He also coined the concept of the "knowledge worker — as differentiated from manual workers — and how knowledge management would become part of an entity's processes.[9][10]

A business process, business method or business function is a collection of related, structured activities or tasks by people or equipment in which a specific sequence produces a service or product (serves a particular business goal) for a particular customer or customers.

A business process may often be visualized (modeled) as a flowchart of a sequence of activities with interleaving decision points.

Overview

A business process begins with a mission objective (an external event) and ends with achievement of the business objective of providing a result that provides customer value. Additionally, a process may be divided into sub-processes (process decomposition), the particular inner functions of the process. Business processes may also have a process owner, a responsible party for ensuring the process runs smoothly from start to finish.

Broadly speaking, business processes can be organized into three types, according to von Rosing

**Operational processes**, which constitute the core business and create the primary value stream, e.g., taking orders from customers, opening an account, and manufacturing a component

**Management processes**, the processes that oversee operational processes, including corporate governance, budgetary oversight, and employee oversight

**Supporting processes**, which support the core operational processes, e.g., accounting, recruitment, call center, technical support, and safety training.

A slightly different approach to these three types is offered by Kirchmer: [2]

**Operational processes**, which focus on properly executing the operational tasks of an entity; this is where personnel "get the things done"

**Management processes**, which ensure that the operational processes are conducted appropriately; this is where managers "ensure efficient and effective work processes"

**Governance processes**, which ensure the entity is operating in full compliance with necessary legal regulations, guidelines, and shareholder expectations; this is where executives ensure the "rules and guidelines for business success" are followed

A complex business process may be decomposed into several sub-processes, which have their own attributes but also contribute to achieving the overall goal of the business. The analysis of business processes typically includes the mapping or modeling of processes and sub-processes down to activity/task level.

While decomposing processes into process types and categories can be useful, care must be taken in doing so as there may be crossover. In the end, all processes are part of a largely unified outcome, one of "customer value creation."[6] This goal is expedited with business process management, which aims to analyze, improve, and enact business processes.[2]

Other definitions

Davenport (1993)[11] defines a (business) process as:

”a structured, measured set of activities designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how work is done within an organization, in contrast to a product focus’s emphasis on what. A process is thus a specific ordering of work activities across time and space, with a beginning and an end, and clearly defined inputs and outputs: a structure for action. ... Taking a process approach implies adopting the customer’s point of view. Processes are the structure by which an organization does what is necessary to produce value for its customers.”

This definition contains certain characteristics a process must possess. These characteristics are achieved by a focus on the business logic of the process (how work is done), instead of taking a product perspective (what is done). Following Davenport's definition of a process we can conclude that a process must have clearly defined boundaries, input and output, that it consists of smaller parts, activities, which are ordered in time and space, that there must be a receiver of the process outcome- a customer - and that the transformation taking place within the process must add customer value.

**Hammer & Champy’s (1993)[12] definition can be considered as a subset of Davenport’s. They define a process as:**

**”Business Process is a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer.”**

Rummler & Brache (1995) [13] use a definition that clearly encompasses a focus on the organization’s external customers, when stating that

”a business process is a series of steps designed to produce a product or service. Most processes (...) are cross-functional, spanning the ‘white space’ between the boxes on the organization chart. Some processes result in a product or service that is received by an organization's external customer. We call these primary processes. Other processes produce products that are invisible to the external customer but essential to the effective management of the business. We call these support processes.”

The above definition distinguishes two types of processes, primary and support processes, depending on whether a process is directly involved in the creation of customer value, or concerned with the organization’s internal activities. In this sense, Rummler and Brache's definition follows Porter's value chain model, which also builds on a division of primary and secondary activities. According to Rummler and Brache, a typical characteristic of a successful process-based organization is the absence of secondary activities in the primary value flow that is created in the customer oriented primary processes. The characteristic of processes as spanning the white space on the organization chart indicates that processes are embedded in some form of organizational structure. Also, a process can be cross-functional, i.e. it ranges over several business functions.

Summarizing the four definitions above, we can compile the following list of characteristics for a business process:

Definability: It must have clearly defined boundaries, input and output.

Order: It must consist of activities that are ordered according to their position in time and space (a sequence).

Customer: There must be a recipient of the process' outcome, a customer.

Value-adding: The transformation taking place within the process must add value to the recipient, either upstream or downstream.

Embeddedness: A process cannot exist in itself, it must be embedded in an organizational structure.

Cross-functionality: A process regularly can, but not necessarily must, span several functions.

Frequently, identifying a process owner, (i.e., the person responsible for the continuous improvement of the process) is considered as a prerequisite. Sometimes the process owner is the same person who is performing the process.

Related concepts

Workflow

Workflow is the procedural movement of information, material, and tasks from one participant to another.[15] Workflow includes the procedures, people and tools involved in each step of a business process. A single workflow may either be sequential, with each step contingent upon completion of the previous one, or parallel, with multiple steps occurring simultaneously. Multiple combinations of single workflows may be connected to achieve a resulting overall process. [15]

Business process re-engineering

Main article: Business process re-engineering

Business process re-engineering (BPR) was originally conceptualized by Hammer and Davenport as a means to improve organizational effectiveness and productivity. It can involve starting from a "blank slate" and completely recreating major business processes, or involve comparing the "as-is" process and the "to-be" process and mapping the path for change from one to the other.[16] Often BPR will involve the use of information technology to secure significant performance improvement. The term unfortunately became associated with corporate "downsizing" in the mid-1990s. [17]

Business process management (BPM)

Though the term has been used contextually to mixed effect, "business process management" (BPM) can generally be defined as a discipline involving a combination of a wide variety of business activity flows (e.g., business process automation, modeling, and optimization) that strives to support the goals of an enterprise within and beyond multiple boundaries, involving many people, from employees to customers and external partners.[18] A major part of BPM's enterprise support involves the continuous evaluation of existing processes and the identification of ways to improve upon it, resulting in a cycle of overall organizational improvement.

Knowledge management

Knowledge management is the definition of the knowledge that employees and systems use to perform their functions and maintaining it in a format that can be accessed by others. The Duhon and the Gartner Group have defined it as "a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers." [19]

Information technology as an enabler for business process management

Advances in information technology over the years, have changed business processes within and between business enterprises. In the 1960s, operating systems had limited functionality, and any workflow management systems that were in use were tailor-made for the specific organization. The 1970s-1980s saw the development of data-driven approaches, as data storage and retrieval technologies improved. Data modeling rather than process modeling was the starting point for building an information system. Business processes had to adapt to information technology because process modeling was neglected. The shift towards process-oriented management occurred in the 1990s. Enterprise resource planning software with workflow management components such as SAP, Baan, PeopleSoft, Oracle and JD Edwards emerged, as did business process management systems (BPMS) later.[24]

The world of e-business created a need to automate business processes across organizations, which in turn raised the need for standardized protocols and web services composition languages that can be understood across the industry. The Business Process Modeling Notation (BPMN) and Business Motivation Model (BMM) are widely used standards for business modeling.[2][3][4] The Business Modeling and Integration Domain Task Force (BMI DTF) is a consortium of vendors and user companies that continues to work together to develop standards and specifications to promote collaboration and integration of people, systems, processes and information within and across enterprises.[25]

The most recent trends in BPM are influenced by the emergence of cloud technology, the prevalence of social media, mobile technology, and the development of analytical techniques. Cloud-based technologies allow companies to purchase resources quickly and as required independent of their location. Social media, websites and smart phones are the newest channels through which organizations reach and support their customers. The abundance of customer data collected through these channels as well as through call center interactions, emails, voice calls, and customer surveys has led to a huge growth in data analytics which in turn is utilized for performance management and improving the ways in which the company services its customers.[26]

Importance of the process chain

Business processes comprise a set of sequential sub-processes or tasks with alternative paths, depending on certain conditions as applicable, performed to achieve a given objective or produce given outputs. Each process has one or more needed inputs. The inputs and outputs may be received from, or sent to other business processes, other organizational units, or internal or external stakeholders. [1]

Business processes are designed to be operated by one or more business functional units, and emphasize the importance of the “process chain” rather than the individual units.

In general, the various tasks of a business process can be performed in one of two ways: [1]

Manually by means of business data processing systems such as ERP systems

Typically, some process tasks will be manual, while some will be computer-based, and these tasks may be sequenced in many ways. In other words, the data and information that are being handled through the process may pass through manual or computer tasks in any given order.

Policies, processes and procedures

The above improvement areas are equally applicable to policies, processes, detailed procedures (sub-processes/tasks) and work instructions. There is a cascading effect of improvements made at a higher level on those made at a lower level. [27]

For example, if a recommendation to replace a given policy with a better one is made with proper justification and accepted in principle by business process owners, then corresponding changes in the consequent processes and procedures will follow naturally in order to enable implementation of the policies.

**Reporting as an essential base for execution**

Business processes must include up-to-date and accurate reports to ensure effective action.[28] An example of this is the availability of purchase order status reports for supplier delivery follow-up as described in the section on effectiveness above. There are numerous examples of this in every possible business process.

Business process owners and operatives should realize that process improvement often occurs with introduction of appropriate transaction, operational, highlight, exception or M.I.S. reports, provided these are consciously used for day-to-day or periodical decision-making. With this understanding would hopefully come the willingness to invest time and other resources in business process improvement by introduction of useful and relevant reporting systems.

A web page (or webpage) is a [hypertext](https://en.wikipedia.org/wiki/Hypertext) [document](https://en.wikipedia.org/wiki/Electronic_document) provided by a [website](https://en.wikipedia.org/wiki/Website) and displayed to a [user](https://en.wikipedia.org/wiki/User_(computing)) in a [web browser](https://en.wikipedia.org/wiki/Web_browser). A website typically consists of many web pages [linked](https://en.wikipedia.org/wiki/Hyperlink) together in a coherent fashion. The name "web page" is a metaphor of [paper pages](https://en.wikipedia.org/wiki/Page_(paper)) bound together into a [book](https://en.wikipedia.org/wiki/Book).

A website (also written as web site) is a collection of [web pages](https://en.wikipedia.org/wiki/Web_page) and related content that is identified by a common [domain name](https://en.wikipedia.org/wiki/Domain_name) . All publicly accessible websites collectively constitute the [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web). A website is hosted and published on a single or multiple web server. It is accessible via a network like the Internet or a private local area network via IP address.

There are also private websites that can only be accessed on a private network, such as a company's internal website for its employees or the clients only. A web portal is a web-based system that acts as a point of access to content, web pages, applications, services, etc., and in most cases requires prior sign-in/log-in. A web portal is focused on a specific target audience. Like websites, web portals are normally available via the Internet, though there are types of web portals that can only be accessed from a private network. We use websites and web portals every day in different scenarios.

A web application (or web app) is application software that runs on a web server, unlike computer-based software programs that are run locally on the operating system (OS) of the device. Web applications are accessed by the user through a web browser with an active network connection. Its frontend is usually created using languages like HTML, CSS, JavaScript, which are supported by major browsers. While the backend could use any server programming technologies. Unlike mobile apps, there is no specific Operating system or Devices for developing or using web applications.

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*সর্ব-শেষ হাল-নাগাদ: ৬ জানুয়ারি ২০২০*

### **পানি ও পয়ঃ সংযোগ ফি**

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| ঢাকা ওয়াসার বিভিন্ন সাইজের পানির সংযোগের রাস্তার পানির লাইন হতে ১০মিঃ দূরুত্ব হিসাবে)ফি/চার্জ নিম্নরূপঃ (রাস্তার পানির লাইন হতে ১০মিঃ দূরুত্ব হিসাবে) | | |
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