

**Internship Report on**

**“Implementing Automation of Business Processes**

**By Digitization of Information Systems at Dhaka WASA”**

**Submitted To:**

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**Letter of Transmittal**

**Scanned Copy of Internship certificate**

**Acknowledgment**

**Executive Summary**

(In three separate pages will be completed before draft final report)

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*CHAPTER 01 – INTRODUCTION*



Water (chemical formula H2O) is an inorganic, transparent, tasteless, odorless, and nearly colorless chemical substance, which is the main constituent of Earth's hydrosphere and the fluids of all known living organisms (in which it acts as a solvent). It is vital for all known forms of life, even though it provides no calories or organic nutrients. "Water" is the name of the liquid state of H2O at standard conditions for temperature and pressure.

Water plays an important role in our economy. Humans and modern civilization and also city life cannot sustain without clean water and sanitation. The size of human settlements are largely dependent on nearby available water. Agriculture, Fishing and Poultry needs water and sewage system. Water is an excellent solvent for a wide variety of substances both mineral and organic; as such it is widely used in industrial processes and in cooking and washing. Oil/Natural gas/Minerals production process, Metal, Paper, Garments, Leather products or other manufactured products required water. Large quantities of water, ice, and steam are used for cooling and heating, in industry and homes.

Water Resources are seas, rivers, canals, lakes, springs, rain, underground water wells and glaciers etc. Water occurs as both "stocks" and "flows". Water can be stored as lakes, water vapor, groundwater or aquifers, and ice and snow. Of the total volume of global freshwater, an estimated 69 percent is stored in glaciers and permanent snow cover; 30 percent is in groundwater; and the remaining 1 percent in lakes, rivers and the atmosphere.

Water supply and distribution network system and Sewer system development, operation, maintenance is the most important public service for well-being of the city duelers. Water Purification by filtration and disinfection, if required- is carried out at water treatment plants. Water from deep water wells does not need purification ant directly pumped into supply network.

Water resource management, clean drinking – water production, Potable Water Distribution and Sewage or Waste-water management, Customer services, Billing, Revenue Collection, Audit and Accounting are the main activities of Water Supply and Sewerage Authority.

Currently I have the opportunity to work as an engineer at Dhaka WASA. Engineers at Dhaka WASA are related to procurement of goods and services for - operation, maintenance, planning development / project works and also providing services to the customers.

**1.1Background / 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 compare the real scenario with the lessons learned in class rooms of University of Dhaka.
* 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 of Business Processes 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.
* To understand and analyze the business process of Dhaka WASA.
* To identify the strategies and policies for implementing automation into all type of management process.
* To find out bottleneck of automation process with effective solutions to overcome the limitations.
* As a case study - try to take a deep look into the automation and already automated processes of Accounting and Billing Departments.
* 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 Business process 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 business process & 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:**

**1.4.1 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.

**1.4.2 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

**1.4.3 Study Area**

The study will be conducted within the organization to study the automation process of Dhaka WASA.

**1.4.4 Data Sources**

For the information of the report mainly both internal and external - primary and secondary sources of data have been collected. But mostly the primary data are used. Primary sources of data consists various data collected by informal interview with the employees. Secondary sources including study on Dhaka WASA automation, information of the websites, publications have been used for this purpose. Some Tertiary sources were also used for information also.

**1.5 Limitation of the study:**

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

* This study has kept limited on analysis. There is no formal test on any hypothesis base as it is a procurement management theme.
* Time is the key constraints of this report.
* To perform employee survey became impossible because I was not directly involved with the Supply Chain Management team; rather I worked with media operation buying team which is a very small team.
* All the Information is not easily accessible or not permitted to disclose according to the company policy, rules and regulations on the disclosure of confidential information.
* It was also difficult to collect information different vendors of automation works.
* I also faced problem in communicating with my university supervisor face to face due to COVID-19 situation.

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.

***SWOT Analysis of Dhaka WASA***

|  |  |
| --- | --- |
| ***Strengths*** | ***Weaknesses*** |
| * **490 deep tube-wells, 264 diesel generators, 4 refinery stations** * **Zonal offices share technical, maintenance, billing and collection functions** * **Use of IT & e-Governance** * **Computerized data base** * **Bottle water supply** * **Operate Medical center and a library** * **Laboratory to test water** * **GIS based MIS system to update all data** * **5 servers & more than 200 computers** |  |

* High dependency on ground water
* Old and damaged pipe
* Lack of sufficient vehicles to manage wastage dumping system
* Less powerful pumping system
* Less employees than necessary
* Slow or late billing
* Gradual increase of system loss
* Inefficiency in quick decision making

***Opportunities***

***Threats***

* **Increase of revenue income**
* **Water supply project using river meghna**
* **Dhaka** **city water hindrance removing project (tk. 146 crore)**
* **Eviction of illegal possession**
* **Pumping system to ensure drainage**
* **All zonal offices of DWASA are brought under network**
* Declining  of water layer
* Shortage of water
* Illegal surface drains
* Increase of due bills
* Unplanned urbanization
* Increasing population and demand
* Lack of water sources (surface & ground)

***Major Problems of Dhaka WASA***

***System Loss:***

In a given time the difference between total water production and total bill made is called the system loss. The technical reasons behind it are – leakage in water line, not working meters these problems create mechanical system loss. Administrative system loss are – illegal connection, weak billing system etc. Dhaka WASA has taken significant steps to reduce the system loss. Various steps in revenue billing and collection process have brought least success in reducing the system loss. According to water production and billing the total present system loss is 35.65%. DWASA yearly system loss is shown in a graph below –

***Steps to Reduce System loss:***

To make logical reduction of system loss Dhaka WASA is continuously taking contract billing and collection and other necessary activities. Dhaka WASA zones 3, 4 and 5 are already leased to establish it as a service oriented commercial organization.

***Water Shortage***

***Causes*** ***of Water Shortage***

1. Incapability of Dhaka WASA to ensure water production and infrastructure development for water distribution to fulfill the increasing demand with the unnatural increase of population.
2. Water production system is deep tube well basis that is not capable of distributing.
3. It is difficult to meet up the demand of increasing population depending on tube-well technology.
4. Presently 84% water of Dhaka city is being distributed from deep tube-well or ground water. For mechanical reason it is needed to excavate deep tube-well and ensure 2000 feet distance from one another as it decreases production of water if placed in short distance.
5. Continuous water lifting causes decrease of water level as well as decrease the capacity of deep tube-well in water lifting.
6. Inadequate preserving capacity and defecting old water lines hindrance proper water distribution. As a result, in dry season WASA cannot supply adequate water in compare to demand.

***Controlling Water Quality:***

Dhaka WASA regularly examines ground and surface water quality by its quality control and research department. To prevent the pollution of ground water, chlorination system is running in every water source. Moreover, the surface water also chlorinate after purifying.

Dhaka WASA also examine the arsenic of ground water and also the poisonous chemical of water like chromium, cadmium, lead, zing, mercury, aluminum monthly. Moreover, Ammonia, Nitrate, Phosphate, sulfate, BOD and COD of water also examined in case of necessity. Presently Dhaka WASA has no scope to examine all those. So they take the help of BUET, Bangladesh Industry Research, Atomic Power Commission and Soil Wealth Institution.

To check out the distributed water Dhaka WASA collect water source and distribution line and examine these in Quality Control and Research Department. If the tests give negative report WASA takes necessary steps to solve the problems. Except water sources and distributing lines, the ground and roof tanks of customers can also be polluted by poisonous bacteria. Dhaka WASA propagates in media and advertises to raise awareness among the customers. Dhaka WASA and Ministry of Environment has a mutual committee to check out all the sources and distributing lines of water monthly and takes necessary steps operated by the committee.

***Sewerage System:***

For a healthy city life a proper sewerage system is indispensible. Since 1923 sewerage system started to develop gradually in Dhaka city. All the areas of Dhaka city could not brought under this facility because of lack of wealth. Mirpur, Mohammadpur, Shaymoly, Kallayanpur, Uttara and Baridhara including a large part of northern zone of Dhaka city were out of the facility of sewerage system. A big plan is taken to include these areas and provide sewerage service. A short description of sewerage system in Dhaka is given below –

Sewerage Purification Plant 1

Sewerage Lift Station 29

Sewerage lines 882 km

Sewerage Connection 60277

***Existing Sewerage problems:***

Empty plastic bottles, poly bags and various solid wastages create obstacles in manhole and sewerage line and dirty water come out of it. Moreover, illegal surface drain connected with sewerage line which causes severe pollution. To solve these problems Dhaka WASA has taken various steps including awareness building among mass people that nor to throw waste in manhole and connect illegal surface drain with sewerage line. For this Dhaka WASA advertise in radio, television and in newspaper. Sewerage lines were established in old Dhaka many years ago which is now insufficient and imperfect in compare to demand. High rise buildings have brought natural and environmental change. From this perspective, reconstruction of water and sewerage lines became an important issue.

Sewerage system is so expensive that many areas of Dhaka city in still out of this facility. But Dhaka WASA has taken effective steps to construct this system all over the city.

***Drainage System:***

Dhaka city was established in the reign of Mughols near to Buriganga river about 400 hundred years ago. There were enough canals in Dhaka city from which Paribagh, Dhanmondi, Begunbari, Dholaikhal, Shegunbagicha, Arambag, Jarani, Manda, Kallayanpur, Ibrahimpur, Shutivola ect are mentionable.

These canals were connected with each other and used as the water ways. There were no such mentionable problems of water blockage. In last 50 years various infrastructure development project of Dhaka city filled most of the canals and caused drainage problems.

***Main Reasons of Water Hindrance:***

  Unplanned urbanization.

  Illegal possession of canals, shrinking of canals.

  Insufficient management for solid wastage removal.

  Solid wastes dump in low lands and at the side of drainage line.

  Domestic disposals are thrown directly in the surface drain, manhole, sewerage canals and drainage network.

  Filling up the canals and establishing cross roads by insufficient formation of pipe lines shrink canals.

  Shrinking canals by establishing roads at the side of the canals.

  Internal ponds, canals, channels became filled with soil in Dhaka city.

  The manholes became filled with soil and disposals.

  Sands and various obstacles get into drainage line during the construction of road and foot ways.

  The solid rubbishes of surface drain directly entered into drainage line.

  Ignoring necessary rules and regulations related with drainage system.

  Lack of machineries and vehicle to clean drainage line and box-culvert.

  Less powerful pumping management than produced runs off.

Dhaka WASA established 42 years ago but started to make drainage system in only 17 years before. In 1946 the drainage activities of Dhaka WASA started under Public Health and Engineering Department (DPHE). From 1989 Dhaka WASA conducts the drainage activities. Water blockage of city is decreasing than before.

Water blockage is a big problem for Dhaka city. To eradicate the water blockage Dhaka WASA has taken various steps and improved this condition. Presently Motijheel, Secretariat, Segunbagicha, Kakrail, Bijoynagar, Ramna, Rokeya Sorony and most of the areas of old Dhaka are now free of water blockage. Government took project named “Eradication of Water Blockage in DhakaCity” to reduce water blockage in other parts of the city.

***Dhaka*** ***WASA already accomplished some activities to solve drainage problems –***

* 150.00 km pipe drain cleaning
* 8.60 km pipe drain construction
* 21 km open canal development
* 7 km box-culvert cleaning
* 100 meter box-culvert build up
* Cleaning of 13 canals
* 10pcs KVA generators have been used.

***a)    Permanent Pump Station:***

* 22.00 cubic meter powerful Dholaikhal pump (conducted by Dhaka WASA)
* 10.00 cubic meter powerful Kallayanpur pump station (conducted by Dhaka WASA)
* 22.00 cubic meter powerful Goran pump station (Conducted by Water Development Board)

***b)    Temporary Pump Station (Dhaka WASA):***

* Rampura                :           43, 5 cusec pump

5, 25 cusec pump

* Kamlapur highway:           25, 5 cusec pump

3, 25 cusec pump

Dhaka WASA also constructed 57 pump stations in different areas of the city comprising Mirpur, Golartek, Hazaribagh, Rayerbazar, Sikdar medical, Soyarighat, Kalunagar etc. In last Dhaka WASA settled 25 pump stations in DND areas to help water development board.

***Existing Drainage System:***

Since 1964 different drainage infrastructure are constructed under small and large projects that can be shown below –

|  |  |
| --- | --- |
| **Storm water line** | **265 km** |
| **Box-culvert** | 8.5 km |
| **Open canal development** | 65 km |
| **Water drainage pumping station** |  |

1. **1.      Kallayanpur**
2. **Dholaikhal**

2

10 cubic cm

22 cubic cm**Areas under drainage system**160 square km

 To solve water blockage in the city street in rainy season Dhaka WASA set-up some temporary pump station. As a result the water blockage of Dhaka city is now in tolerable position.

***Clients’ Complaints and Solution:***

Dhaka WASA collects complaints from its clients of all 11 zones relating water shortage, leakage in water line, bad smell in water, leakage in sewerage line, overflow of sewerage line, water blockage in street etc. Dhaka WASA takes quick initiatives to solve the complaints. It has a trial to solve as much complaints as it can to satisfy clients.

***Critical Assessment***

In the critical assessment of Dhaka WASA we tried to focus on two broad aspects: (i) organization structure and governance; (ii) budget and financial management systems. For each of these dimensions the main constraints are identified and some recommendations are proposed for further development of effectiveness of the organization.

***(i)    Constraints of Organization Structure and Governance of DWASA:***

***Government Interference:***

Although the provisions contained in the Act aim at ensuring full autonomy of DWASA’s management vis-à-vis the Government, institutional backlogs in the application of the Act and Government interference in the decision making process hamper the Board’s autonomy and jeopardize efficient service delivery from the part of DWASA.

***Lack of Rules and Regulations:***

Efficient administration of DWASA is also hindered by lack of rules and regulations that have been approved by the Board but are awaiting Government approval as well. Absence of operational rules and regulations creates a breach for the Government to bypass the Board’s authority especially in what concerns recruitment of the WASA Managing Director (MD) and Deputy Managing Directors (DMD). Government interference in appointment of MD and MD has affected DWASA management since the appointees are often on secondment from the civil service rather than being recruited from the private sector and hardly complete a full three years mandate.

***Remuneration/Promotion is not merit-based:***

According to the Act the Board has the authority to create new posts for officers and staff of DWASA and also to define the level of salaries and benefits. This provision however has not been applied either since the salary and benefits of DWASA staff follow the Government structure; hence remuneration and promotion mechanisms are not merit-based but seniority driven with negative effects on the incentives and the performance of the employees.  The Board’s authority in recruiting new staff from the open market is also limited by the influence of the Trade Unions which limits the availability of qualified technical staff within WASA.

***Board can adjust only 5% of tariff:***

In principle the Act gives to the Board the authority to impose or adjust tariffs though in practice this is another area that falls under the realm of Government approval. This reduces the Authority’s ability to adjust tariffs and to achieve full recovery of its operational costs. The Board enjoys full autonomy to adjust tariffs up to a maximum of 5% only in case of increase in the electricity tariff.

***Zones’ management is not integrated:***

Besides government interference, DWASA efficient management is also hampered by its internal articulation into 7 zonal offices to which operation and maintenance functions and billing and collection activities have been decentralized. Although decentralization of responsibilities to local offices may be justified from the point of view of increased efficiency in service delivery due to spatial proximity to consumers, the performance of the zonal offices has been far from efficient. DWASA’s zone offices have a dualistic structure since operation and maintenance activities are under the responsibility of 7 MODS (Maintenance, Operation and Distribution Services) offices which report to the Operation and Maintenance Division, while billing and collection activities are performed by 7 zone revenue offices which report to the Commercial Management unit of the Finance and Accounts division. As a result, though the MODS and revenue offices share the same premises, the zone’s management is not integrated nor coordinated with serious consequences on the quality of service delivery. In addition neither the MODS nor the revenue offices are held accountable for their performance vis-à-vis their central office thus leading to an inefficient decentralization of responsibilities.

***Large Revenue Leakage:***

Efficiency in service delivery varies across zones and in some of them billing and collection has been contracted out to staff cooperatives with significant improvements in collection efficiency. Nonetheless, DWASA as a whole suffers from large revenue leakages which are due to both technical and administrative reasons. On the technical side physical leakages are due to poor quality of materials and insufficient maintenance and repair works while on the administrative side there is significant fraud and corruption from the part of the revenue inspectors. Delayed billing is quite common in some zones as it allows revenue inspectors to grant discretionary reductions over the accumulated bill in exchange for bribes with negative effects on both consumer welfare and DWASA revenues.

***Weak Capacity of Officers and Staffs:***

A major constraint to the efficient functioning of DWASA is the weak capacity of its staff both technical and administrative. This is due to the management inability to recruit new staff and to the absence of a human resources development policy on recruitment and training needs. The DWASA training center, that was setup in 1980 on the basis of the recommendations of an IDA Appraisal Mission. Nowadays, however, the training center is not effective in providing training as it suffers from lack of financial and human resources, poor career plan for trainers and lack of facilities, equipment and transport for field training.

***(ii) Constraints of Budgeting Process and Financial Management:***

***Lack of efficient Allocation of Scarce Resource:***

In the case of DWASA, the external audit report shows that the financial statements produced by the Accounting and Finance Division of DWASA are perceived more as a ritual annual presentation of financial information about operating receipts and expenditures, assets and liabilities rather than as a tool for efficient allocation of scarce resources. The information contained in the financial statements is often incorrect so that revenues and profits are overstated while expenditures and liabilities are understated, thus failing to provide a true and fair view of the DWASA fiscal situation.

***Budget approval in not in the hand of Dhaka WASA Board:***

According to the Act the Board has the power to approve both the Annual and the Supplementary Budget of DWASA, but in practice the final approval is given by the Ministry of Finance and the budget is then finalized in a tripartite meeting among the Ministry of Finance, the Administrative Ministry and DWASA.

***Budget Process follows Incremental Approach:***

The budget process in DWASA follows an incremental approach3, it is not led by the definition of strategic targets, both physical and financial, to be achieved by the organization. There is no midterm review of the budget execution nor monitoring mechanisms of the revenues and expenditures. Similarly, at the end of the fiscal year there is no comparison of  the budgeted and actual figures, and no explanation is provided in case of significant discrepancies between the two figures. Finally, in spite of the Act requiring the Board to publish the Annual Report within six months from the end of the fiscal year, this document has been overdue since 2002. This points to lack of accountability of DWASA management for the utility performance.

***Revenue Income – expenditure disparity:***

Over the last few years DWASA has been able to finance its operating expenditures out of own revenues, while capital expenditures are partly financed out of DWASA own revenues and partly out of the Annual Development Plan (ADP) allocations. The current budget and the capital expenditure from revenues accounts are held by the Administration and Finance Division (A&F) of DWASA, while the development budget is maintained by the Planning and Monitoring unit under the Resource Planning and Development Division (RPD). The development budget is entirely financed out of ADP funds which usually consist of both Government funds and foreign borrowing in the form of multilateral and bilateral financing4. Government funds officially take the form of loans, but they are hardly repaid thus representing *de facto*a grant to the utility. Nonetheless, it is difficult to gauge the extent of Government support to DWASA development budget as domestic and foreign financing are consolidated and DWASA accounting division does not provide separate records for the central government share on ADP funds. This information would be relevant in order to assess DWASA’s financial autonomy also because the utility apparently does not benefit from any other Central Government subsidy.

***No association from Govt. in case of Supplementary Budget:***

During the fiscal year DWASA may resort to the supplementary budget procedure in the event expenditures exceed the amount estimated in the budget. When this is the case, the additional expenditures are usually financed out of DWASA revenues, unless the corresponding outlays are financed out of ADP funds, in which case is GOB to provide the corresponding resources. In any case the supplementary budget is to be approved by the Government.

***Delayed Audit Report:***

DWASA financial statements are subject to independent audit. According to the DWASA Act the audit report should be submitted within two months from the end of the fiscal year, but usually the submission is delayed. Comments from the auditor point out to weak capacity within DWASA as far as accounting of assets and liabilities is concerned as well as management of foreign exchange risk in case of foreign borrowing. Apparently there is no obligation for DWASA to incorporate the auditor’s comments and to publish the adjusted financial statements; this affects negatively the transparency of the budget process and financial performance of the utility.

***Foreign Borrowing & Debt Management:***

Another serious concern about DWASA financial management is related to its foreign borrowing and debt management procedures. As of 30 June 2005 DWASA foreign borrowing consisted of the following: four IDA credits on account of water supply loans (i.e. 1st, 2nd, 3rd and 4th credit); two ADB loans on account of Dhaka Urban Infrastructure Improvement Project (DUIIP) and Integrated Flood Protection Project (IFPP) and SIDA Generator Loan. These funds are usually re-lent by the Central Government to DWASA at higher interest rates and shorter maturity than those for the original loan. Auditing of DWASA’s financial statements reports significant delays in repayment of these loans5 as well as irregular booking of payments on account of interests in some cases6. As a result, arrears in principal repayment lead to a buildup in interest liabilities with subsequent increase in debt service, while incorrect recording of loan repayments provides a misleading picture of the actual liabilities of DWASA.

***Lack of Computerization:***

Finally, the lack of computerization of the financial management system is another serious impediment to the efficient budget process. Budget data are still recorded in the manual ledger in the accounting and finance department, while at the zonal level information on billing and collection is kept in the consumer ledger which is not reconciled with the general ledger. Financial reports are prepared by spreadsheet which is a lengthy procedure.

***Recommendations***

***Use Participatory Approach:***

Since the main constraints on the institutional asset of DWASA are political in nature, any reform path to overcome these limitations has to be built on a participatory approach to promote ownership of reform and to generate the necessary support from the part of the Government.

***Consensus*** ***Building:***

The milestones detailed above are quite ambitious, their achievement has to be based on consensus building at different levels:

(i)                 DWASA staff be actively involved in the elaboration of the reform program. Consultation with the MD and DMDs is crucial to identify an agreed path of reform;

(ii)               Trade Unions play an important role in DWASA management and they can be powerful allies in the implementation of reforms. Consultation with their representatives is a key factor especially on issues concerning the new recruitment policy and remuneration mechanisms.

(iii)             Raising civil society’s awareness about the right to safe water supply and cost effective management of the utility which benefits consumers’ welfare.

***Adoption of new Organization Chart:***

Amendment of the DWASA Act along the lines suggested by the institutional development specialist1 especially in what concerns elimination of the clause requiring government approval of the first DWASA organization chart. This would allow DWASA to adopt a new organization chart which is more suited to the needs of a commercial organization.

***Allow Participation of Stake Holders:***

Adoption of the new organization chart inevitably leads to a redefinition of the current articulation of DWASA in zonal offices. Specific options for reform will be based on inputs from consultations with the stakeholders, but one of the main objectives of reform should be the creation of fully accountable zones from a financial and operational point of view. This implies unification of the zones management under only one manager which is responsible for the zone’s performance vis-à-vis the DWASA central office. The number of zones may be increased as well as their competencies though the central DWASA office should keep overall responsibility for DWASA strategic investments, financial performance and quality of service delivery.

***Rearrangement of Staff Competencies:***

Rearrangement of staff competencies with the organization’s requirements also in light of the new organization chart. This requires provision of technical assistance to DWASA for the actual implementation of the new chart, design of curricula, job description and matching of the human resource needs of DWASA with the existing staff.

***Merit-based Recruitment and Promotion:***

Adoption of a merit-based recruitment and promotion system that provides employees with the right incentives and introduction of a performance-based salary scale.

***Code of good Conduct:***

Adoption of a code of good conduct for DWASA staff and of a system of penalties/incentives for zones performance in collection of bills.

***Setup Human Resource Development Unit:***

Elaboration of a human resources development policy is an integral part of the institutional reform of DWASA. In this respect technical assistance can be provided to the authority to setup a human resource development unit in charge of: assessing DWASA’s recruitment needs; conducting a training needs assessment and identifying training courses to be provided on a regular basis.

***Strengthening Training Center:***

The most important requisite for sustainability is to enable DWASA to attract and retain qualified trainers and to ensure availability of financial resources to fund training activities. In order to retain qualified trainers a specific career path should be developed which includes financial incentives. Nonetheless, as it may be difficult for DWASA to develop a separate remuneration package for trainers, an alternative option might be to develop partnership agreements with local and/or foreign institutions and universities by means of which training can be provided to DWASA staff either in-house or through study tours. The advantage of this solution is that it would reduce to a minimum the burden on DWASA from running its own training center as this would also raise some concerns with respect to its funding. In fact, though during project implementation the training center can be funded out of the project loan proceeds, once the project is completed, DWASA should take over the financial burden of the center.

***Recruit Qualified Staff and Ensure Accountability:***

Therefore, implementation of the reform initiatives suggested in the previous section represents an enabling condition for improvement of the budget process and financial management of DWASA. Ability of the DWASA management to recruit qualified staff from the open market would certainly benefit the accounting and finance division, which at present is lacking any qualified accountant. Moreover, increased accountability of DWASA management for the financial results of the utility would provide additional incentives thus improving the quality of financial reporting.

***Introduce Result Oriented Budget:***

Reforming the budget process to introduce results-oriented budget mechanism by which planned current and capital expenditures are functional to the achievement of the management’s long term vision of DWASA. This requires dismissal of the current incremental budget approach and building in the accounting division the necessary capacity to produce reliable budget estimates;

***Reforming the Accounting System:***

Reforming the accounting system in order to unify the capital budget (i.e. capital expenditures from revenue and development budget) and to provide separate information about the extent of Government budget support to DWASA;

***Capacity*** ***Building*** ***in Debt Management:***

Capacity building in debt management especially in what concerns monitoring debt service payments and reliable projection of future debt service liabilities to be incorporated into the budget document. DWASA management should play an active in role in the elaboration of the utility borrowing strategy also with respect to the renegotiation with the central government of the re-lending terms as well as rescheduling/write off of the most expensive loans which absorb an excessive share of financial resources.

***Regular Training:***

Providing regular (refreshing) training to both the existing and new staff in the new accounting practices and the computerized management information system;

***Computerization of Financial Management:***

Computerization of the financial management and budget system in order to expedite to process of budget reporting and to link the different WASA zone offices to the central office. This step is even more important in light of the likely increased decentralization of the DWASA duties to its zonal offices;

***Be Accountable to Ministry of Finance:***

Making the DWASA management accountable to the Ministry of Finance for the financial results of the authority by making compulsory publication of the Annual Report;

***Conclusion:***

From the overall discussion it can be said that, Dhaka Water Supply and Sewerage Authority (DWASA) as an autonomous institution providing water supply, sewerage and drainage service to almost 12 million people of the Dhaka mega city. Its activities are not faultless because of financial, technical and technological inability. Even though, there is a regular increase of Dhaka WASA geographical are, water supply network, drainage network and other activities. Various initiatives including strong monitoring have been taken to ensure rapid completion 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 e3fficient management system. Less intervention of government 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.

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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"

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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