TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

LGED	Local Government Engineering Department
DSS	Department of Social Service
BREB	Bangladesh Rural Electrification Board
DPDC	Dhaka Power Distribution Company
MoA	Ministray of Agriculture
UDD	Urban Development Directorate
CARE	Co-operation for American relief everywhere
DG Food	Director General Food
CSR	Corporate Social Responsibility

EXECUTIVE SUMMERY

Main purpose of my internship had exposed to the job world. Being an intern the principal challenge was to make an interpretation of the theoretical and practical idea into real life experience. This internship program helped me to get and arrange detail learning at work duty. Internships experiences encounters made me increasingly focused in the activity advertise. In addition, picking up presentation and involvement in the field, I have been giving a chance to check whether the specific professional field is the correct one dependent on getting individual involvement in the field. This Internship has helped me for developing the employer-valued skills, for example, cooperation, correspondences and attention to detail. It has illuminated me with the environment of professional development practice of software companies.

During my Intersnhip at Arc Bangladesh Limited, I have learned more about my field and industry, applied knowledge learned in the classroom, gained valuable work experience that will help me to decide if this is the right path for me. Before going to Arc Bangladesh Ltd, I had no idea about real world working environment, teamwork or working procedure. After Joining with the team as an intern and countinuing working, I have learned a lot about real life development environment of an IT firm.

This Internship paogram helped me to gain improved skills and and I did learn how to apply them. I have learned professional communications, taking constructive criticism moreover It helped me to belief I am more important than I think, that helped me to boost by confidence.

With the software development team of Arc Bangladesh Limited, I did testing of two components and was involved with the development team for I component. In this report I will illustrate, the working process, methodology and real experience I have learned from my Internship

Chapter 1

Introduction

1.1 Background

The internship job program has turned into the extension for the individuals who need to enter to corporate dimension from the University life, through this entry level position, I need to know the genuine workplace that was particularly not the same as my course think about. During my internship, I got a chance to work in the department to know about how a software company develops the product as applications used by various stakeholders. All my experience helped me realize parts like grouping work, workenvironment, peering support, carried out in the organization. Thus, the internship duration provided me with the opportunity to broaden my knowledge, acknowledge mys trengths/weakness that would be more helpful to shape up my career in the future.

From the student point of view, an internship helps with vocation advancement by giving real work encounters that give understudies chances to investigate their interests and create proficient abilities and skills.

Daffodil International University (DIU) gives that heavenly chance to their students of including an internship inside their bachelor program. I am being one of the fortunate ones to study in DIU and give me the open door at Arc Bangladesh Ltd., to finish my internship. The desires were high and now nearly nearing the finish of this intern position, I should concede that it was extremely a wonderful experience.

1.2 Objectives

As fractional satisfaction of the necessities of the Department of Software Engineering, Faculty of Science and Information Technology, Daffodil International University, I had relegated to Arc Bangladesh Limited, Development Department for the internship program. The essential goal of the internship is to create an intensive comprehension of the work environment relationship, performing the exercises and connecting with myself in the workplace. As it were, it was more to get the practical implication of the considerable number of studies, theories that I had gained so far. This would assist me with paving a route towards development in my scholarly and personal development.

Apart from general objectives, the specificobjectives has highlighted below:

- To acquire exposure in the working environment resulting in the development ofpractical knowledge and confidence
- To learn and apply the theoretical knowledge practically in the workplace.
- To develop interpersonal, managerial and communication skills.
- To come up with the possible strategies to gain competitive advantage.
- To be a valuable asset for the organization by contributing positive aspects
- To fulfill the partial requirements for the Bachelor of Software Engineering program of Daffodil International University.

1.3 Scope

This report has made only for academic purpose and it also to fulfill the requirement for internship affiliation. I prepared this report under the super supervision of Mr. Iftekharul Alam Efat, Lecturer (Senior), Software Engineering Department, Daffodil International University. My Internship experience will play a vital role to implement my theoretical knowledge and geta practical knowledge from any organization; therefore, I can implement this internship experience in future work area. In this report, I tried to illustrate the overall procedure of Software Development System in a corporate environment I went through.
I also illustrated and documented Arc BangladeshLimited's Mission & Vision, Management, Partner, Clients, Company Culture, Technolgy, development methodology, my role and activities with the team etc.

Chapter 2

Company Overview

2.1 Company Overview

Arc Bangladesh Limited have established by a group of IT experts having fruitful records of accomplishment of giving items and executing substantial IT application and other related development projects in Bangladesh. One of Arc Bangladesh's quality lies on its capacity to gather the best rate group of specialists in the fields of IT in general and Geographic Information System (GIS), AM/FM, Land Information System (LIS), digital mapping. Arc Bangladesh has developed quickly through ordinary task extension. At present, it is giving assorted proficient administrations through six practically task divisions and segments. At present, through these divisions and areas, Arc Bangladesh is keeping up a payroll of 12 consultants and experts, specialized and sub-experts and other care staff either as a perpetual or project-based employment plan. Details information of Arc Bangladesh Linited has given in the following table.

Table 2.1: Company Overview

COMPANY OVERVIEW	
Company Name	**Arc Bangladesh Ltd.**
Address	6/5 (1st Floor), Block: B, Lalmatia, Dhaka-1207, Bangladesh
Age of Firm	2005 (Incorporate in 2008)
Phone	+880-2-9116835
Incorporation No.	72689 (731)/08
Trade License	DSCC Trade License No. 0112214
BIN	001124105
TIN	542004228461
Email	info@arcbangladesh.com
Contact Person	Md. Mostaque Ahamed, Chairman (Mob: 01713 118493)
ISO 9001 : 2015 Certification	1806060800105

2.1 About

Companys' range of abilities incorporates long periods of joined involvement in city and utility tasks, information systems, software development, geospatial and related technologies. These empower to optimize the solution implementation and extreme rate of profitability. In this era of expanding focused weight inside the utility business, we comprehend the need to take care of issues with the equivalent or less staff and spending plans.

Proceeding with deregulation is causing a revolution for vast and small organizations alike. While customary geospatial technology providers have invested impressive energy and cash endeavouring to serve just the simple vast associations, who has taken a gander at the issues and worries from a littler organization, see? Overall, Arc Bangladesh aggregate arrangement approach dispenses with the requirement for substantial Information Systems' staff, minimizes expenditures and empowers speedier start-up and activity. This implies a very coordinated arrangement that takes care of explicit issues for less cash. Systems and services of Arc Bangladesh has represented the best innovative technologies in geo-preparing, arrange displaying and imaging. This company grasps the most present industry principles in information trade, open frameworks, social and item database innovation, distributed computing and graphical user interfaces.

However, what truly isolates Arc Bangladesh Ltd., from others is their accentuation on aggregate client benefit. They have a straightforward but vital overriding company goal: clients for life - long-term customer or client connections by means of remarkable service and support. In conclusion, we offer the absolute most focused rates in the business. Exceedingly focused valuing combined with our administration and support gives a bundle that we accept is unparalleled in the business. Get in touch with them today to take in more about their products or potentially services.

Their unique experiences and skills, total solution approach and focus on their clients have enabled them to double revenues every year since their inception.

2.1.1 Mission and Vision

Arc Bangladesh has a basic and clear mission to help take care of issues, upgrade efficiency and enhance consumer loyalty for foundation utility clients and districts through the practical use of geospatial and related innovations or technologies.

2.1.2 Location

Address: House No: 6/5 (1st floor), Block-B, Lalmatia
Dhaka-1207, BANGLADESH
Phone: +880-2-91 1 6835,
E-mail E-mail: info@arcbangladesh.com
Website: www.arcbangladesh.com

2.1.3 Management

Arc Bangladesh's business has managed by a 3-members board of direc-tors, where the Managing Director of the Board acts as the Chief Executive Officer of the company.

Table 2.2: Management of Arc Bangladesh Ltd. company

Management Personnel of Arc Bangladesh Ltd.		
Sl.	**Name/Designation of Staff**	**Qualifications**
1.	Md. Mostaque Ahamed -Chairman	M.Sc. in Mathematics, Dhaka University, over 10 years experiences in AM/FM/GIS, LIS, MIS, M&E and other systems or software applications.
2.	Md. Shamim Hasan -Managing Director	M.Sc. in Statistics, JU, more than 10 years of practical experiences in AM/FM/GIS having MCSD and Ersi Certification, Digital Mapping Systems having particular experiences in development of Interfaces under ArcMap, Map Objects & ArcInfo
3.	Md. Zakir Hossain Chowdhury -Director	B.Sc. in Computer Science, Bangalore University, India. 16 Years of ICT Experience on large-scale web-based application development, mobile application development and MIS/M&E.
4.	Md. Azibar Rahman Socio-Economic Expert	MSS (Political Science), Tejgaon University-College, Dhaka under National University, 2004 BSS, Govt. Ananda Mohan University-College, Mymensingh, 1998 Diploma in Civil Engineering, Dhaka Polytechnic Institute, 1983
5.	Md. Mohafez Ali Agricultural Scientist	PGD on Agriculture from Germany Master of Science on Agriculture, Bangladesh Agricultural University Bachelor of Science on Agriculture, Bangladesh Agricultural University
6.	Ehsan Uddin Ahmed Chief Technology Officer (CTO)	M.Sc. in Computer Science and Engineering (August 2011), Daffodil International University, Dhaka. B.Sc. in Computing and Information Systems (May 2007), London Metropolitan University

2.1.4 Partner

ArcGlS offers a one of a kind arrangement of abilities for applying location-based examination or analysis to any business practices. Increase more noteworthy bits of knowledge utilizing contextual tools to visualize and analyze the information. Team up with others and offer your bits of knowledge by means of maps, applications, and reports.

TerraGo GeoPDF (Developed by TerraGo Technologies, USA):
TerraGo Technologies geospatial cooperation application and GeoPDF maps and imagery are among the most generally adopted solutions for delivering, access, refresh and share geospatial data and applications with anybody, anywhere. TerraGo arrangements empower enterprises to broaden trade and endeavour geo-referenced maps, symbolism, sound, video and other insight in

associated or offline environments. Trusted by government offices and organizations around the world, TerraGo arrangements drastically increment the utilization of geospatial information all through and between undertakings, giving predominant profit for the geospatial venture through more organizational efficiency, efficiency and responsiveness.

STATISTICA (Developed by TIBCO Software Inc., USA):
STATISTICA solution has developed to complete things, to give the quickest rate of return, best value, and interestingly USefUI and compelling systematic, information the board, designs, and introduction apparatuses to make predictable value rapidly for you and your association and applications.

Photomod (Developed by JSC Racurs, Russia):
The PHOTOMOD application family involves a wide scope of items for the remote detecting and handling of photogrammetric information. This state-of-the-art application permits the extraction of geometrically accurate spatial data from all monetarily accessible kinds of symbolism, regardless of whether gotten by film or computerized cameras, I-JAS, high-goals satellite scanners or synthetic gap radars.

Monnit (Developed by Monnit Corporation, USA):
Monnit is the pioneer in Low-Cost Remote Monitoring Solutions and Wireless Sensing system, enabling to screen the business or home from anyplace. Monnit Corporation was set up to gain by the developing pattern of interfacing with, checking and controlling machines and other "things" in their environment. Their experiences in innovation creation, assembling, showcasing and deals give us the abilities and aptitudes expected to build up the establishment to be THE ease remote sensor accomplice of decision.

Dynamsoft (Developed by Dynamsoft Corp. *Canada):
Dynamsoft gives an enterprise-class based adaptation control application, TWAIN SDK and other report imaging SDKs, with various ages for every item. Today numerous fortune 500 companies including HP, IBM, Intel, and Siemens trust Dynamsoft software for variant control and TWAIN scanning SDK development.

CYME - Distribution System Analysis:
The world-class CYME control framework analysis application is a robust, complete suite of advanced simulation component for helping transmission, dispersion and modern power engineers. CYME has intended to help address the intricate and developing difficulties of the electrical architects that help control organize arranging and activity. Since 1986, the CYME application has used for a huge number of transmission, conveyance and industrial projects.

ActualMap and AspMap (Developed by VDS Technologies, USA):
AspMap is a set of ASP.NET delineate which can put mapping applications under the control of anybody with access to a Web program. ActualMap is a set of superior, .NET mapping controls for installing maps in work area applications.

Table 2.3: Partner / Reseller

Partner / Reseller	
1.	Microsoft https://www.microsoft.com
2.	esri https://www.esri.com
3.	VDS TECHNOLOGIES GIS & Mapping Components http://www.vdstech.com
4.	DAT/EM Systems International http://www.datem.com
5.	DevExpress https://www.devexpress.com
6.	ENVI http://www.harrisgeospatial.com/SoftwareTechnology/ENVI.aspx
7.	StatSoft STATISTICA https://www.tibco.com/products/tibco-statistica
8.	SPSS https://www.ibm.com

2.2 Organ-gram

By uniting and underwriting significant encounters, Arc Bangladesh Limited has developed through typical activity extension. Currently Omni Dot Com Ltd. provides diverse professional services through its four functionally operation sections each of which managed by an experienced manager. Following the chart, this chart illustrates the organogram of the company.

Organ-gram

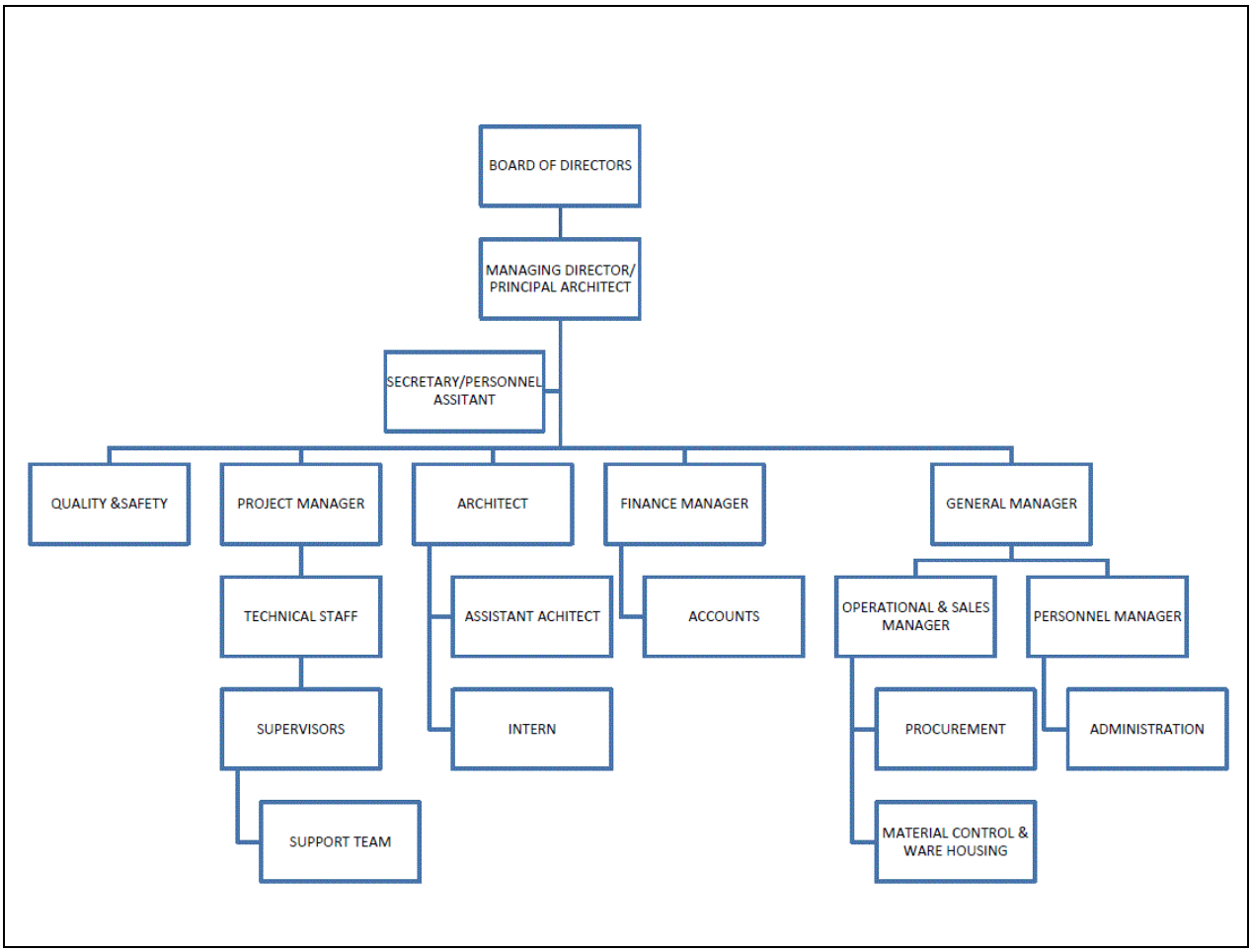


Figure 2.1: Organogram of Arc Bangladesh Ltd.

2.3 Group Office & Other Concerns

Omni Dot Com Ltd. is a sistern concern of Arc Bangladesh Ltd. Omni Dot Com Ltd. company's quality lies on its capacity to gather a best rate group of specialists in the fields of data innovation as a rule and Software Development, Management Information System (MIS), computerized mapping, specific in expansive volume information handling, Website Development, etc. By combining and promoting our profitable encounters has developed quickly through typical task extension. As of now, it is giving different expert administrations through four divisions and segments.

Omni Dot Com Ltd. has a straightforward and clear mission in tackling issues, upgrade efficiency and enhance consumer loyalty for government and non-government creating organizations through cost-effective system and related technologies.

The organization is specialized in following areas:

- Customized Software Development
- Large Scale Data Processing
- Government and bi-lateral donor assisted public and private sector development ICT projects - planning, design and study; project implementation, supervision and motoring.
- GIS Mapping & Survey
- Website Development

Table 2.4: Group Office of Arc Bangladesh Ltd

Group Office of Arc Bangladesh Ltd	
Company Name	Omni Dot Com Ltd.
Present Address	House No: 6/5 (1st floor), Block-B, Lalmatia, Dhaka-1207.
Tel	8100385, 9116835
Fax	880-2-9116835
Trade License	DCC Trade License No. 0112213
VAT	Area Code: 90403, VAT Reg. No. 9131070054
Income Tax Certificate	TIN No. 001-201-7520
E-mail	info@omni-bd.com
Web	www.omni-bd.com
Contact Person	Mostaque Ahamed, Managing Director, (Cell No. 017-13-118493)

2.4 Products

Arc Bangladesh does not have any customized products; we provide IT based solution & consultancy. Some of the consulting services and solution provided by our organization are given below.

- Consultancy Services for Preparation of a Master Plan for the Rural Electrification (RE) Program in Bangladesh for BREB
- Consultancy Services for GIS (Geographical Information System) Based Distribution Network System and Preparation of a 20 years Master Plan for DPDC"
- Consultant Services for Resources Mapping of Selecting Beels through PRA and Professional Documentation, Mapping and Printing under Beel Development Activities of HFMLIP under Haor Flood Management Livelihood Improvement Project (LGED)
- Consulting Services for Impact Assessment of Integrated Agricultural Productivity Project (IAPP)
- Preparation of Development plan for Fourteen Upazilas (Package-2)

- "Design and development of MIS/GIS based Ground Water Viewer"
- Web based GIS development and Google Earth linking
- Data Entry & Scanning of New LC Establishment forms for 2014 Cohort by Double Entry System Under ROSC-II Project
- Data Entry of Project Document
- Develop Food Grain Movement Manual, Development of Least Cost Route, Stock in Transit, Movement Programming Software and Reviewing of Godown and Transit Loss.
- Piloting of Database development, Scanning and data update of social cash transfer program
- Development of Web-GIS Application on LC Mapping for ROSC-II Project (Phase-I)
- Data Entry & Scanning of New LC Establishment Forms for 2014 Chohot by Double Entry System under ROSC-II
- Computerized Data Entry for Farmer's Database Development for Integrated Agricultural Productivity Project (IAPP)
- Data Entry & Scanning of LC Profile and Monitoring Checklist for Full Validation for New LC in 100 Upazila (Partial) Under ROSC-II Project
- Data entry and Scanning of LC Profile, New Student, LC, CMC and Teacher Application Forms by Double Entry System under ROSC-II Project.
- Supply of goods, Software and related services for Sessional Courses
- Data Entry for ROSC Form-1, ROSC-10 for preparing ACF for 2nd semester (July-December) of 2011
- SQL Server Based Data Entry Software for ROSC-II
- Development of online software for monitoring of PLCEHD-2 Project under Bureau of Non-Formal Education
- Customized GIS Training using ArcGIS 10
- Digitization of City Maps of 41 Ward
- Supply, Installation and Training of Software's based on Structure & RCC
- Supply, Installation and Training of STATISTICA 10 (Data Miner), Platform-All
- Supply, Installation and Training of STATISTICA 10 (Data Miner), Platform-All.
- Preparation of Development Plan of Cox's Bazar Town and Sea Beach upto Tekna
- Supply and installation of ArcGIS
- Data Entry, Editing and Checking for ROSC-1, ROSC-10 forms
- Student Monitoring Data for Preparation of ACF of July December 11 Semester Under 122 Upazilla
- Developing a National Management Information System (MIS) for Water Supply and Sanitation in Bangladesh
- Providing services for Data Entry and Image Processing of different documents of several sections of RAJUK under the Management Information System (MIS) division of RAJUK

- Recognition of Latitude, Longitude and Elevation above mean ocean level utilizing RTK GPS of 1000 perception wells and furthermore gathering of water level information from 100 sub-districts Arrangement of area guide and last report with this information data
- Barisal Divisional Structure Plan, Master Plan and Detail Area Plan Preparation Project
- Digitization of Mouza Sheets including Editing, Appending, Edge Matching to produce Pourashava wise Mouza Map
- Detail Route Survey for Construction of Gas Distribution Network
- Preparation of Structure Plan, Master Plan and Detailed Area Plan for the Extension of Khulna Master Plan Area upto Mongla Town
- Banglalink Geo marketing survey, Phase II & III
- Software Supply & Training
- Base map for Barisal, Khulan & Rajshahi City Corporation
- Base map for Dhaka City Corporation & it's Surroundings
- Slums of Urban Bangladesh
- Preparation of Detailed Area Plan (DAP) of "Group-E" for Dhaka Metropolitan Development Plan (DMDP) Under RAJUK

2.5 Clients

Arc Bangladesh worke with different government organizations and provides the IT soltions. Following is a list of some of our project, job description, and client name and project duration.

Table 2.5: Clients of Arc Bangladesh Ltd

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
1.	Consultancy Services for formulation of a Master Plan for the Rural Electrificatio n (RE) project in Bangladesh for BREB	• Define the physical appropriation offices required by year and by every pb, for example, dissemination lines, essential substations (33/11 kV) and matrix substations (132/33 kV), to meet both the development of the current framework and the associations with the 'unserved' populace; • Identify the likely areas of new sub-stations, including framework sub-stations, thinking about future load development (in two stages of 5-year interim, totaling 10 years) and present these in PBS key maps; • Estimate, year and PBS astute, purchaser association development; • Estimate year astute monetary arrangement for usage of the charge advancement program;	BREB	March 2018 – Sep. 2019

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
		• Identify the suggestions for the budgetary execution of every pb given the dimension of proposed advancement and prescribe measure to empower money related soundness of both the individual PBSs and the BREB system overall; • Plan proposals and submit reports to BREB covering all parts of the Provincial Charge program for Bangladesh throughout the following 10 (ten) years; • Sort out somewhere around 2 (two) workshops for dispersing results of the master plan strategy and study;		
2.	Consultancy Services for GIS Based Distribution Network System and formulation of the 20 years Master Plan or strategy for DPDC"	• Pre-Survey of Distribution System, preparation of Line Sketch, Single Line Diagram, up-gradation of Database and Plan for Immediate Renovation and Expansion Works of 11 kV level and below (Feeder wise) • GIS Based Mapping and Engineering Analysis • Preparation of Enterprise Web GIS and Desktop based GIS • Preparation of application software containing the following module • Viewing and search /querying • Layer Management • User Management • Report generation and printing • GIS Web Based Software and Desktop based Software Functionalities • GIS Survey works • Prepare System specification of hardware & software tools and technology • Preparation of Master Plan • Capacity Building of DPDC Personnel – (i) Local Training (ii) On Job Training (iii) Overseas Training (iv) Pilot project • Support Services	DPDC	Jan. 2017 - Dec. 2019 Ongoing
3.	Consultant Services for Resources Mapping of	• Collection of CS/RS Mouza from DLRS Office • Scanning of Mouza Maps by 300 dpi resolution by Dram Scanner • Validation of filtered or scanned	LGED	June 2016 - May 2017

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	Selecting Beels through PRA and Professional Documentation, Mapping and Printing under Beel Development Activities of HFMLIP under Haor Flood Management Livelihood Improvement Project (LGED Part) (HFMLIP), Package No: LGED/HFMLIP/RM-01/15-16, LGED/HFMLIP/RM-02/15-16, LGED/HFMLIP/RM-03/15-16 and LGED/HFMLIP/RM-04/15-16.	pages/pictures/different records etc. with unique archives. • GCP Collection (4 GCP's for each Mouza) from field by RTK GPS for geo-referencing the collected mouza maps • Geo-referencing the mouza maps with the help of collected GCPs • Digitization of mouza maps and prepared base maps & area demarcation map for 13 selected sub-projects under Package-01. • Identify & demarcation of the existing water bodies like haors, beels and khals on mouza through topographic survey through PRA & field survey on original mouza maps. • Digitalized all water bodies, infrastructure, socio-economic structure, settlement area, agricultural land variety, and physical features. • Base Map preparation emphasizes on water bodies, cultivated area, fisheries area and communication facilities. • Prepare separate resource Maps indicating their leasing status, ownership status, including expiry dates and legal disputes of beels, khals and haor, Current use of lands, silting condition etc. • Conduct PRA to identify resource availability, recommend possible usage and their applicability. • Preparing report on resource management, condition, status etc. with fact sheet.		
4.	Consulting Services for Impact Assessment of Integrated Agricultural Productivity Project (IAPP)	• Develop a detailed rigorous methodology & to be finalized through consultation with PMU; • Conduct impact assessment keeping in view the Results Framework/Tools as defined in the Project Appraisal Document (PAD) and Development Project Proposal (DPP), • Project interventions assessed on the basis of related indicators (Result Framework) comparing with baseline as well as project targets taking into account of nil the activities by the implementing	BADC, MoA	Apr 2016 – Oct-2016

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
		agencies; • Assess the linkages among research and extension agencies; • Produce a clear set of lessons learned that can benefit the project for the next phase; • Identify major success arid weaknesses (if any) of the project implementation and suggest remedial measures and Assess impacts for individual households on food security and livelihood improvement; • Quantitative analysis of the shift in cropping pattern arid adoption of new production technologies as a result of the project; • Quantitative analysis of the improvement in availability and use of quality seed following from of the multiple project interventions bearing on this; and Analysis of the operational experience of utilizing the Livelihood Field School model for dissemination of improved crop, fisheries and livestock practices. • Analyze arid to document-in a productivity & gender perspective-the results and life lessons learned from using the Livelihood Field School (LFS) approach I) Asses the. LFS formation process as well as sustainability of the ITS; • Asses LFS training approach; • Asses, Success of the LFS in which farmers acquired the knowledge and skills to improve their production, income through application of their gathered knowledge.		
5.	Preparation of Development plan for Fourteen Upazilas (Package-2)	• Digitization and geo-reference of Mauza maps of the project area • Project limit outline • Implementation of the survey or study has been included the land information, use survey, topographic survey, physical survey, squatter survey and slum data. • GIS database working for a few topical maps. Such as administrative, street organizes, water bodies, family, waste, foundation, utility services instructive organization, healthcare facilities and so on.	UDD	Jan 15 - Sep 16 Ongoing

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
		• RTK-GPS survey for installation of BM pillars • Spot level survey, contour generation using RTK-GPS etc. • Traffic volume survey, informal sector survey • drill 98 borehole boreholes with SPT in all investigated area during the preparation of geological/geomorphological maps • Site selection for borehole drilling & numbers, PS logging, MASW and SSMM, Microtremor array and Single microtremor • Soil sampling: SPT should conduct at each 1.5m interval depth. When SPT N values exceed 100 times in consecutive 2/3 measurements, SPT can stope. Disturbed samples have to be collected during SPT for physical soil test (grain size analysis, natural moisture contents, unit weight, specific gravity, atterberg test for clayey soil) in laboratory: Cyclic trixaial test for soil liquefaction analysis should conducte in each study area. Geology Department, Dhaka University has the equipment for cyclic triaxial testing. • PS logging analysis: Waveform data, travel curve data with Vp, and Vs are shall be iduring analysis. Depth interval should be 1m CDMP has provided PS logging equipment to Geology Department, Dhaka University. Consultant can take support from Geology Department for conducting PS logging. • Single Microtremor measurement: Measurement should conducte during night or quiet time for measuring more than 5 minutes continuous recording. The results should be assessed considering geomorphology and soil layers comparing with Vs data.		
6.	"Design and development of MIS/GIS based Ground Water Viewer"	• This is an interactive mapping application provides access to ground water datasets and live groundwater data logger. The viewer contains several GIS datasets relating to water resources.	Source and Services	January 2014 to June 2015
7.	Web based	• Development of Web based GIS application and	CARE	Aug 14-

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	GIS development and Google Earth linking	linking relevant GIS/GPS data with Google Earth.		Oct 14
8.	Data Entry & Scanning of New LC Establishment forms for 2014 Cohort by Double Entry System Under ROSC-II Project	• Data Entry and Scanning of various ROSC Forms	ROSC-II, LGED	Jul 14 -Sep 14
9.	Data Entry of Project Document	• Data entry of 1200 Project Documents	Planning Division	Jul 14 - Nov 14
10.	Develop Food Grain Movement Manual, Development of Least Cost Route, Stock in Transit, Movement Programming Software and Reviewing of Godown and Transit Loss.	• Stock taking of the researches/studies in the relevant fields; • Develop a manual for public food grain movement; • Developing movement programming software and least cost route; • Assessment of stock in conduction; • Audit the current arrangements for suitable godown and travel misfortunes for open sustenance grains and to propose sensible reasonable limit; • Training for the pertinent authorities will's identity essentially in charge of usage/assistance of the study yields;	DG Food	May 14 - July 15
11.	Piloting of Database development, Scanning and data update of social cash transfer program	• Database design • Data migration • Form scanning • Photo capture • Data update	DSS	Jun 14 - Jul 14

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
12.	Development of Web-GIS Application on LC Mapping for ROSC-II Project (Phase-I)	• LC Monitoring through GIS Mapping	ROSC-II	May 14 - Sep 14
13.	Data Entry & Scanning of New LC Establishment Forms for 2014 Chohot by Double Entry System under ROSC-II	• Data Entry and Scanning of various ROSC Forms	ROSC-II	May 14 - July 14
14.	Computerized Data Entry for Farmer's Database Development for Integrated Agricultural Productivity Project (IAPP)	• Farmer's Database Development for 5 lac farmers	IAPP Ministry of Agriculture	Apr 14 - Sep 14
15.	Data Entry & Scanning of LC Profile and Monitoring Checklist for Full Validation for New LC in 100 Upazila (Partial) Under ROSC-II	• Data Entry and Scanning of various ROSC Forms	ROSC-II	Dec 14 - Feb 14

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	Project			
16.	Data entry and Scanning of LC Profile, New Student, LC, CMC and Teacher Application Forms by Double Entry System under ROSC-II Project.	• Design and Development of Database LC Profile, New Student, LC, CMC and Teacher • Design and Development of Forms for Data Entry and Picture Capture for LC Profile, New Student, LC, CMC and Teacher • Design and development of Reports	ROSC-II, LGED	Jul 13 -Oct 13
17.	Supply of goods, Software and related services for Sessional Courses	• Supply Installation and Training on Sessional Courses	CUET	Jun 12 - Aug 12
18.	Data Entry for ROSC Form-1, ROSC-10 for preparing ACF for 2nd semester (July-December) of 2011	• Design and development of web based MIS software • Data entry (80000 Student profile entry, 560000 Monitoring data update Award Confirmation Form (ACF) preparation) • Incorporating Business rues to validate the data sets • Design and development of integrated reporting tools of the proposed MIS • Conducting training and Technology Transfer. • Conducting UAT, Unit Test, Load Test etc. • Compilation and installation of required statistics and data sets.	ROSC, LGED	Jan 11 - Mar 11
19.	SQL Server Based Data Entry Software for ROSC-II	• Design and Development of Database • Design and Development of Forms for Data Entry and Picture Capture • Design and development of Reports	ROSC-II, LGED	Dec 12 - Dec 13
20.	Development of online software for monitoring of	• Design, Development and Quality Control of online software • Analyzing data sets of PLCEHD-2 • Incorporating Business rues to validate the data	PLCE HD-2, LGED	Sep 12 - Sep 12

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	PLCEHD-2 Project under Bureau of Non-Formal Education	sets • Design and development of integrated reporting tools of the proposed MIS • Conducting training and Technology Transfer. • Establishing frame work the online software • Conducting UAT, Unit Test, Load Test etc.		
21.	Customized GIS Training using ArcGIS 10	• "Customized GIS Training using ArcGIS 10" under the Programme" Integrated Geological Mapping of the Chalanbil Area to Unveil the Quaternary Records and Climatic Changes"	GSB	Aug 12 - Sep 12
22.	Digitization of City Maps of 41 Ward	• Review of available database, Maps and reports on land use, physical facilities, water supply & sanitation, drainage, slum and squatters etc. • Implementation of survey or studies has included the land survey, topographic survey, physical survey, squatter survey and slum. • GIS database building for several thematic maps e.g. administrative, road network, water bodies, household, drainage, infrastructure, utility services educational institute, health facilities etc. • Spot level survey, contour generation etc. • 41 Ward Map preparation.	CCC	Jul 12 -Dec 12
23.	Supply, Installation and Training of Software's based on Structure & RCC	• Supply, Installation and Training of Software's based on Structure & RCC	CUET	Jun 12 - Aug 12
24.	Supply, Installation and Training of STATISTIC A 10 (Data Miner), platform-All	• Supply, Installation and Training of STATISTICA 10 (Data Miner)	RU	Apr 12- Jun 12
25.	Supply, Installation and Training of STATISTIC	• Supply, Installation and Training of STATISTICA 10 (Data Miner)	BUET	Mar 12 - Apr 12

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	A 10 (Data Miner), Platform-All.			
26.	Preparation of Development Plan of Cox's Bazar Town and Sea Beach upto Tekna	• Development of a tourism master plan for Cox's Bazaar • Digitization and GIS database of 130 Mauza Sheets • GIS database building of 62,000 structure • DGPS cap tuning of 115 BM Points using RTK-GPS. • 55,900 Spot level survey, contour generation etc. • Household level socio-economic survey, data entry and processing • Analysis of borehole boreholes with SPT in all investigated area during the preparation of geological/geomorphological maps • Site selection for borehole drilling & numbers, PS logging, MASW and SSMM, Microtremor array and Single microtremor • PS logging analysis: Waveform data, travel curve data with Vp, and Vs are shall be iduring analysis. Depth interval should be 1m CDMP has provided PS logging equipment to Geology Department, Dhaka University. Consultant can take support from Geology Department for conducting PS logging. • Bathy and lithological data analysis	UDD	Mar 09 - Jun-11
27.	Supply and installation of ArcGIS	• Arcinfo (concurrent or single use) including Maplex for ArcGIS, ArcScan for GIS, ArcPress for GIS, Street Map for GIS	Forest Dept.	Mar-12
28.	Data Entry, Editing and Checking for ROSC-1, ROSC-10 forms	• 80000 Student profile entry • 560000 Monitoring data updates • Award Confirmation Form (ACF) preparation.	LGED	Jan-12 - Ongoing
29.	Student Monitoring Data for Preparation of ACF of July	• Data entry of LC Application Form • Data entry of CMC Application Form • Data entry of Teacher Application Form • Proof print, proof reading and editing of above mention data	PMT, LGED	Feb 11 - Apr 11

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	December 11 Semester Under 122 Upazilla	• Database delivery to LGED		
30.	Developing a National Management Information System (MIS) for Water Supply and Sanitation in Bangladesh	• Design and development of integrated MIS-GIS combined software • Review of existing MIS of water supply and sanitation of DPHE and related organizations working in WSS sector; • Identifying water and sanitation variables e.g. water coverage, water quality, water discharge, ground water table, rainfall water coverage, etc.; • Design and development of relational water sanitation information base with E-R diagram; • Data collection, data entry (all digitally available data from relevant agencies); • Supply and installation of required GIS layers and Map Integration Technology; • Preparation of system's user manual and training and technology transfer for in-house Capacity Building; • Procuring Hardware and software for National MIS and GIS cell; • Development of data sharing Protocol	PSU, LGD	Nov-11 - Nov-12
31.	Providing services for Data Entry, Archiving and Image Processing of various documents of different section of RAJUK(partly) under Computerization & Management Information System (MIS) in	• Scanning of 18 lac page document • Develop a Digital Archives for RAJUK	RAJUK	Sep-10 - Mar-11

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	RAJUK (under the package SD2)"			
32.	Detection of Latitude, Longitude and Altitude above mean sea level using RTK GPS of 1000 observation wells and also collection of water level data from 100 upazila Preparation of location map and final report with all these data information	• Preparation of base map of the project area • RTK and Static GPS Survey for measuring x, y and z • Survey of water level data form observation wells of BADC • Plotting deep tube well maps with mean sea level • Cantor map generating using mean sea level and water level data. Training on RTK GPS technique • Preparation of ground water zoning maps using survey data sets.	BADC	Apri-10 - June-10
33.	Barisal Divisional Structure Plan, Master Plan and Detail Area Plan Preparation Project	• Digitization and GIS database building of 72 Mauzas • GIS database building of 55,000 structure • DGPS cap tuning of 8o BM Points using RTK-GPS. • 45,800 Spot level survey, contour generation etc. • Household level socio-economic survey, data entry and processing	EPC/UDD	Jan 07- Jun 07
34.	Digitization of Mouza Sheets including Editing, Appending, Edge Matching to	• Collection of Mouza Sheets form DLRS • Scanning of Mouza Sheets • Digitization of Mouza Sheets • Editing, Appending, Edge matching • Layout design of Municipality Map		

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
	produce Pourashava wise Mouza Map			
35.	Detail Route Survey for Construction of Gas Distribution Network	• Conducting Topographic Survey, preparing index Mouza Maps showing Land Acquisition Area, preparing list of Land use and Conducting Route Survey and Inventory for Khulna, Bagerhat with Mongla, Satkhira, Jessore, Magura, Narail, Kustia, Jhenidha, Chuadanga, Meherpur. • Data Entry & Processing of collected data.	Petrobangla	Jul 08 - Nov-09
36.	Preparation of Structure Plan, Master Plan and Detailed Area Plan for the Extension of Khulna Master Plan Area upto Mongla Town	• Digitization and geo-reference of Mauza maps of the project area • Project boundary delineation • Implementation of survey/studies including land use survey, topographic survey, physical survey, slum and squatter survey. • GIS database building for several thematic maps e.g. administrative, road network, water bodies, household, drainage, infrastructure, utility services educational institute, health facilities etc • RTK-GPS survey for installation of BM pillars • Spot level survey, contour generation using RTK-GPS etc. • Traffic volume survey, informal sector survey	JV of EPC-SCPL/ KDA	Jul 07 -Jul 08
37.	Banglalink Geo marketing survey, Phase II & III	• Capturing of GPS reading of 3300 spot of 797 locations around Bangladesh. • GIS database building as point layers with attribute of 3300 points. • 20000 nos. of digital photograph capturing of 3300 spots. • Socio-economic survey of 3300 spots • Data entry and processing	Banglalink	Jun07-Aug07
38.	Software Supply & Training	• GIS database building of 15 District • 50,000 Points capturing as GPS track of high pressure TITAS transmission line. • Capturing GPS value of 13 DRS, and 5 TBS of Titas distribution Line. • Customer level survey for consumer satisfaction assessment. • Data entry and processing	TITAS GAS T & D co. Ltd.	Sep 07-Dec 07

Sl. No.	Title of the Project/ Assignment/ Job	Job Description	Client	Period of Work
39.	Base map for Barisal, Khulan & Rajshahi City Corporation	• Preparation of Base map for Barisal, Khulan & Rajshahi City Corporation • Textual data entry and processing	Ericsson	Jan 07- Feb 07
40.	Base map for Dhaka City Corporation & it's Surroundings	• Preparation of Base map for Dhaka City Corporation & it's Surroundings • Textual data entry and processing	Ericsson	Jan 07 - Feb 07
41.	Slums of Urban Bangladesh	• Slums of Urban Bangladesh Mapping and Census, 2005: 2006 • Survey of Utility facilities and socio-economic condition of slum dwellers	CUS, NIPORT, Measure Evaluation, USAID	May 2005-2006
42.	Preparation of Detailed Area Plan (DAP) of "Group-E" for Dhaka Metropolitan Development Plan (DMDP) Under RAJUK	• 8000 socio-economic questionnaire surveys of infrastructure, utility facilities and socio-economic condition • Data entry & report generation	RAJUK/ Sheltech Ltd.	May 05 - July 05

2.6 Summary

Arc Bangladesh company's services speak to the best innovations in geo-handling, organize displaying and imaging. We grasp the most present industry measures in information trade, open frameworks, social and item database innovation, graphical UI and distributed computing.

However, what truly isolates Arc Bangladesh Ltd., from others is their accentuation on aggregate client benefit. They have a straightforward but vital overriding company goal: clients for life - long-term customer or client connections by means of remarkable service and support. In conclusion, we offer the absolute most focused rates in the business. Exceedingly focused valuing combined with our administration and support gives a bundle that we accept is unparalleled in the business. Get in touch with them today to take in more about their products or potentially services.

Their unique experiences and skills, total solution approach and focus on their clients have enabled them to double revenues every year since their inception.

Chapter 3

Company Culture & Carrying Out

3.1 Department Overview

Arc Bangladesh works in diver's field of IT. Its areas of expertise have been isolated in five sections for better administration. Every division has its very own ability. For a specific occupation, in the vast majority of the cases group has organized in Matrix design. Followings are the rundown of its departments.

- Geospatial Solutions and Services
- Information System and Software Development
- Data Processing and Database Development
- Surveys and Data Capture
- Other Consulting Services

3.1.1 Geospatial Solutions and Services

Actualizing spatial information the board and GIS projects implementing AM/FM projects for Utility Network Systems (gas, water, lectricity, telecom) Spatial information transformation - filtering/digitizing of paper maps and highlight catch from satellite/ethereal symbolism Developing work area, portable and web GIS and software professional and specialized staff at client projects.

3.1.2 Information System and Software Development

Turnkey usage of software advancement projects business prerequisite investigation and planning particulars Desktop/web application improvement and arrangement program coding, troubleshooting, testing utilizing most recent industry-standard techniques and innovations System documentation, client manual, preparing, Re-building and movement of heritage programming frameworks Web improvement and facilitating of dynamic sites creating WebGlS and web outline.

3.1.3 Data Processing and Database Development

Preparing plans and schedules for data processing projects Building project, business and survey databases — data models, database, data entry/validation applications Data processing, statistical analysis and reporting

3.1.4 Surveys and Data Capture

GPS/TS reviews and geo-referencing of maps and symbolism Cadastral, geographical and landuse overviews Engineering course and utility system configuration studies Facilities, foundation and conveyance areas mapping Field examination and financial information accumulation Converting study information into GIS or CAD groups

3.1.5 Other Consulting Services

Land use, characteristic assets and natural overviews Socioeconomic, people group and market study Project scooping, possibility and configuration thinks about Project checking, assessment and effect evaluation Preparation of speculation ventures proposition appropriate for government and worldwide contributor subsidizing.

3.2 Working Team

Table 3.1: Working Team

Working Team		
Sl.	**Name**	**Responibility**
1	Md. Shamim Hasan	Team Leader
2	Md. Imrul Hasan	Lead GIS specialist
3	Ehsan Uddin Ahmed	System Architect
4	Abdul Mannan	System Analyst
5	Khandokar Tamirul Islam	Database Development Specialist
6	Badar Uddin al- Hossain	Domain Expert
7	Md. Nahid Arefin	Associate GIS Experts
8	Abdullah Al Mamun	Associate GIS Experts
9	Fariha Nehrin Mili	Associate GIS Experts
10	Aqib Bin Hasan	Associate GIS Experts
11	Muhammad Rakibull Hassan	Developer
12	Rifaul Karim	Developer
13	Nazmul Huda	Developer
14	Md. AL – Mamun	Developer

3.3 Working Environments & Protocols

Working people spend right around 33% of their lives at their work environment with a noteworthy piece of their profitable lives is devoted to their associations. Representatives are an important human asset, and their capacity to capacity to the best of their abilities is resolved in addition to other things by the earth they exposed to at work.

Working environment in ABL is focused on using the ability of its resources, while ensuring all facilities that could be provided to ease the work. The organization has office room in three floor. Each department has its own team within the same floor. The organization is a Great Place to Work that emphasises the followings for its employees

- Treats employees with respect
- Adopts greater flexibility
- Ensured appreciation of good work

- Instill a culture of teaching over reproaching
- Embraces diversity
- Encourages cooperation over competition
- Involves Employees in CSR Initiatives

Arc Bangladesh has a set of rules that describe the standard way to approach a task for individual departments. Administrative protocols perform tasks in accordance organisation's policies, procedures and expectations. There are guidelines of operation in production, communication or operation. The ability to interact quickly and efficiently is considered, these guidelines provides tremendous benefits to our business or organization.

3.3.1 Rules & Regulations

ABL has defined policies to guide employees on their roles, regulation and responsibilities, as well as the company's overarching business principles, ethics and beliefs. For compliance reasons of company culture, written policies and procedures also adopted to help protect company from potential legal action

3.3.2 Employee Position Descriptions

The role of every employee has defined, including their level of responsibility, amount of authority for decision-making, overarching goals and specific tasks. In addition, a method describes how to monitor performance and deve employelopes through training.

3.3.3 Personnel Policies

Business hours, terms of employment (hiring and termination), wages or salary (and bonuses, if any), insurance and health benefits, paid vs. unpaid vacation days, sick leave, and retirement is clearly stated.

3.3.4 Organizational Structure

A chart clearly states each person's name and title showing how each person fits into the structure of the organization.

3.3.5 Disciplinary Action

All issues are aboutof honesty, performance, safety and misconduct, and determine what constitutes a violation of company policy, as well as how employees will be disciplined if they violate certain rules.

3.3.6 Safety

Industry best practices are used, and relevant local, state and Government laws as guidelines to create rules detailing what safe behavior at work looks like, how to use safety equipment, how to report safety hazards, etc.

3.3.7 Technology

There are policies about what's acceptable and what's not in regards to Internet, email and social media usage for personal purposes at work.

3.3.8 Privacy

By establishing a policy and the agreement, this company protects employees, the company and your customers that encourage transparency and trust with us.

3.3.9 Credit

We determine the terms of opening an account and building good credit with your company. Set an acceptable amount of time for payment, and establish consequences when payment is overdue or not received.

3.3.10 Confidentiality

We protect sensitive information, and be sure to cover relationships with vendors, customers and other suppliers.

3.3.11 Motto of the Organization

ABLs motto is to represent systems and services that are most effective technologies in geo-processing, network modeling and imaging. We embrace the most current industry standards in data exchange, open systems, relational and object database technology, graphical user interfaces and distributed computing.

3.3.12 Handling Clients

Most of the clients of ABL are different Government departments. Handling of the particular project, the project submission of experssion is being innterest. Afterwords, it is defined and documented in each stage about communication and management and deliverables of client.

3.3.13 Facilities

Facilities are determined in terms and condition of employment recrument policies. For a particular Application or Project facilities that will be provided in each stage by both parties are clearly stated and documented in each stages

3.4 Comparative Analysis of Office Culture

Arc Bangaldesh Ltd. located at Lalmatioa. The office consists of three floors. Each department has fully furnished with all IT equipment, faclilities and working environment required. From top management to buttom level, communication has maintained through defined procedure. Job responsibilities and reporting authority of each employee is clearly stated. All other corporate culture maintained.

3.4.1 Mixed up with Office Culture

After recruitment, an employee mixed up with office culture and with its employees easily. ABL has a common diner and prayer place. It helps to spend time with each other amongst departmental employees. Weekly and monthly meeting is arranging to get project status, openion and recommendation of employees. Everyone at ABL is cordial to accept new emloyees with the team, share knowledge and maintain a good office culture.

3.4.2 Entertainments & Refreshments

ABL provides all refreshment for its employee for entite working hours. Moreover, it provides lunch facilities for its employee. The organization provides yearly tour and participe in different religious and national occasion.

3.4.3 Escalating Motivation & Capability

For capacity, building different training has provided by the organization. Employees motivated for better work by promotion, financial benefit and awards.

3.5 Internee Life Cycle

Throughout the course of my internship, I had given the opportunity to see what it takes to develop and implement a Software and alsoits implementing. I had assigned to work with the development and implementation team to ensure that I cover every aspect of corporate development culture. I had responsibility of testing and development. I was able to gain a better understanding of how software development had done in a business organization. Working with the development team was a great learning experience for me in not only choosing a career path, but also learning strengths and weaknesses about myself. I know that the details that I learned through my experiences with Arc Bangladesh Limited will be very valuable in my immediate future when choosing a career path.

3.5.1 Getting Started

Since I have planned to get an Internship from a reputed IT organization, I did communicate with my friend to get me informed of an IT firm from where I can get my Internship. I came to know about ABL from a fried of mine. I did contact with the personnel of ABL and get informed that, they did have intern in their organization before from differenet Universities and in a current project, there is a possibility to get my intern done. I did submit my interest by mail to the Human Resource department. I was lucky to get an appointment from the organization within the next two weeks.

3.5.2 Recruiting Policies

After the interview, I told to submit all my required documents to the HR department, which I did on time. After a month, I did get a mail with attachment of “Intership Appointment Letter”. I have accepted as an intern for six months with the development team of an ongoing project.

Recruiting Policies

Internship Joining Letter

Ref: ABL / 2018/ IRF/ 09/01

Date: September 04, 2018

Shikha Rani Sarkar

Sreefaltaly,kaliakair,Gazipur

Dear Shikha Rani,

We are pleased to confirm your appointment as an intern position as Software Developer in our Organization. This appointment will begin on September 05, 2018. Your duties and assignments for this position will be those described to you in your orientation and with the Internship Acceptance Letter. You will be working closely with the development team. The appointment will continue at least through March 05, 2019, contingent upon your working progress and satisfactory performance.

If you have any questions, please feel free to contact with us. We are very pleased that you have decided to join Arc Bangladesh Ltd. We look forward to seeing you and offer a very warm welcome.

Sincerely,

Md. Shamim Hasan

Managing Director

Arc Bangladesh Ltd.

ARC BANGLADESH LTD.

Arc Bangladesh Ltd. | 6/5 Lalmatia, Block- B, Dhaka-1207, Bangladesh, Tel: 9116835, Fax:+880 2 9116835, Email: info@arcbangladesh.com

Figure 3.1: Recruiting Policies

3.5.3 Professional Environment

Arc Bangladesh Ltd., has a professional workplace full of highly competent, respectful, mature, and accountable employees working towards a common goal. At ABL employees are enthusiastic about reporting to work every day since the work environment is a positive one that includes company's location, facilities, culture, interactions between employees and employers, and growth opportunities. Professional environment tends to exhibit a common set of traits that foster excellence, productivity and camaraderie. At ABL following professional environment criteria has observed,

- Positive values
- Relaxed and productive atmosphere
- Commitment to excellence
- Open and honest communication
- Cooperation, support, and empowerment
- Sense of humor
- Compassion, respect, and understanding
- Flexibility
- Positive reinforcement
- Emphasis on health, family, and environment

3.6 First Day at Office

When I got my joining date, I was extremely glad, yet as the date came closer, I was somewhat apprehensive. Numerous inquiries involved my cerebrum like in what manner will be the air of the workplace, will I have the capacity to modify with the associates, will I have the capacity to function admirably and completer targets, and so on. I came in at about 9:00 am on the first day and my boss welcomed me warmly, introduced me to my colleagues and Managing Director. He showed me where my desk was and told me that he and my colleague would help me get started. He was very helpful and I sat next to him for the morning and just watched what he did. At lunch, my boss and the staff of the office invited me to lunch. I was so nervous; I could hardly eat a thing! We were gone for about 1-1.5 hours and just talked about the company, my studies, etc. After lunch, my boss took me on the tour of our floor. Introduced me to everyone, showed prayer place, all that good stuff and me where the kitchen was, how the coffee machine worked, where the copy machine was. My boss left at 3pm, so I had some time to myself to figure out the new computer system and just look around. My day ended at 5.00pm. It was a great first day.

Chapter 4

Techonology Employing

4.1 Technology Employing

Arc Bangladesh systems and services represent the most effective technologies in geo-processing, network modeling and imaging. We embrace the most current industry standards in data exchange, open systems, relational and object database technology, graphical user interfaces and distributed computing.

4.2 Fundamental Technologies

Arc Bangladesh is growing by consolidating and capitalizing its experiences. Since inception, we have successfully completed a large number of projects with distinction of quality and innovative approaches. A brief description of fundamental technology used by Arc Bangladesh organization has given below.

Table 4.1: Fundamental Technologies

Item	Description
Microsoft Visual Studio.NET 2015	Microsoft Visual Studio.NET 2015
Android Studio	Android Studio 3.0.1
Microsoft SQL Server 201 6	Microsoft SQL Server 201 6 Standard Edition
Oracle 1 lgR2/12c	Oracle 1 lgR2/12c Developer Edition
SAP Crystal Report	Crystal Report for VS 13
DevExpress 201 7	Dot Net UX Development Tool
AspMap	AspMap 4.9
Microsoft Office 2013	Office with MS Project and MS Visio
ArcGlS Advance	30 set
Server	Enterprise Edition
Eardas Imagine, Idrisi	GIS application especially used for rastering the data management facility. Widely used in the field of Land and Agriculture, Oil & Gas exploration etc.
Auto CAD	Widely used in industry standard Computer Aided Drafting (CAD) application, specially used for engineering design & drawing.
DATE-M	Photodramatic Image Processing
ENVI	Geospatial Analytical Software
Statistica	Statistical Data Analysis
SPSS	Statistical Data Analysis

4.3 Supportive Technologies

ArcGlS offers a unique set of capabilities for applying location-based analytics to your business practices. Gain greater insights using contextual tools to visualize and analyze your data. Collaborate with others and share your insights via maps, apps, and reports.

TerraGo GeoPDF (Developed by TerraGo Technologies, USA):
TerraGo Technologies geospatial collaboration software and GeoPDF maps and imagery are among the most widely adopted solutions to produce, access, update and share geospatial information and applications with anyone, anywhere. TerraGo solutions enable enterprises to extend, exchange and exploit geo-referenced maps, imagery, audio, video and other intelligence in connected or offline environments. Trusted by government agencies and businesses worldwide, TerraGo solutions dramatically increase the use of geospatial data throughout and between enterprises, providing superior return on geospatial investment through greater organizational efficiency, productivity and responsiveness.

Statistica (Developed by TIBCO Software Inc., USA):
STATISTICA solutions has developed to get things done, to provide the fastest return on investment, best value, and uniquely USefUI and effecfive analytic, data management, graphics, and presentation tools to create predictable value quickly for you and your organization and applications.

Photomod (Developed by JSC Racurs, Russia):
The PHOTOMOD software family comprises a wide range of products for the remote sensing data photogrammetric processing. This state-of-the-art software allows the extraction of geometrically aCCU- rate spatial information from almost all commercially available types of imagery, whether obtained by film or digital cameras, I-JAS, high-resolution satellite scanners or synthetic aperture radars.

Monnit (Developed by Monnit Corporation, USA):
Monnit is the leader in Low Cost Remote Monitoring Solutions and Wireless Sensing, allowing you to monitor your business or home from anywhere. Monnit Corporation had established to capitalize on the emerging trend of connecting to, monitoring and controlling machines and other "things" in our environment. Our backgrounds in technology creation, manufacturing, marketing and sales provide us with the talents and skills needed to establish the foundation to be THE low cost wireless sensor partner of choice.

Dynamsoft (Developed by Dynamsoft Corp. *Canada):
Dynamsoft provides enterprise-class version control software, TWAIN software development kits (SDK) and other document imaging SDKs, with numerous generations for each product. Today many Fortune 500 Companies including HP, IBM, Intel, and Siemens trust Dynamsoft solutions for version control and TWAIN scanning SDK development.

CYME - Distribution System Analysis:
The excellent CYME power system is a robust, comprehensive suite of advanced simulation tools assisting transmission, distribution and industrial power engineers. CYME has designed to help address the complex and emerging challenges of the electrical engineers that support power network planning and operation. Since 1 986, the CYME software has been used for thousands of transmission, distribution and industrial projects around the world.

ACtUaI Map & Asp Map (Developed by VDS Technologies, USA)

Table 4.2: Supporting Technologies

Microsoft https://www.microsoft.com
esri https://www.esri.com
VDS TECHNOLOGIES GIS & Mapping Components http://www.vdstech.com
DAT/EM Systems International http://www.datem.com
DevExpress https://www.devexpress.com
ENVI http://www.harrisgeospatial.com/SoftwareTechnology/ENVI.aspx
StatSoft STATISTICA https://www.tibco.com/products/tibco-statistica
SPSS https://www.ibm.com

4.4 Technology in Use

All fundamental and supporting technology are used in varous projects. Among technology used some of the importen tools are Microsoft Visual Studio.NET 2015, Android Studio, Microsoft SQL Server 201 6, Oracle 1 lgR2/12c, SAP Crystal Report, DevExpress 201 7, AspMap, ArcGlS Advance, Eardas Imagine, Idrisi, Auto CAD, DATE-M, ENVI, Statistica, SPSS, TerraGo GeoPDF, Statistica, Photomod, Monnit, Dynamsoft, CYME, ACtUaI Map & Asp Map.

4.5 Logistic Support

Our head-office have well-furnished facility (4000 sft), with latest ICT infrastructure (hardware, software and communication systems) and office equip-ment and logistics. We have three separate labs equipped with special-ized equipment and software: Software Development Unit Geospatial Solution and Services Unit Data Processing Unit Available ICT and Surveying Facilities.

4.5.1 List of Logistics and Utility Facility

Logistics management is the part of Arc Bangladesh Limiteds management that plans, implements, and controls the efficient, effective forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. Followings are the list of Logistic and utility facility that this organization have.

Table – 4.3: List of Logistics and Utility Facility

List of Logistics and Utility Facility		
Sl.	**Item**	**Key Tech. Spec.**
1	Multimedia projector	Clear Color display
2	Photocopier	A3 size, 12ppm
3	Motor Vehicle	Toyota Corolla X Fielder Toyota Corolla G To Ota SUV
4	IP PABX	Yeastar S 100 (1 00 Extension)
5	Internet Line	TelNet Communication 15mbps
6	Telephone lines	Digital lines with ISD/NWD
7	Binding machine	Manual ring/spiral binding equipment
8	Large Format Lamination Machine	HYMI (Roll Size 40 Inch)

4.5.2 Availability of Survey Facilities

The mapping and geospatial analysis are multidisciplinary tasks that have become more accessible in recent years because of advances in technology and cost reductions in survey systems. The complex relationships that exist in survey require advanced, integrated analysis techniques to enable organization and others to visualize patterns and, in so doing, allow inferences to be made. Effective mapping, analysis, and visualization are particularly important. Because many organizaion are not mapping professionals, they may not adequately consider the links between data collection, data analysis, and data visualization. Projects often start with clear goals, but may be hampered by the technical details and skills required for maintaining data quality through the entire process from collection through analysis and presenta tion. Having well established survey facilities have a better impact on success of our organizations. Followings are the list of our survey facility.

Table 4.4: Availability of Survey Facilities

Availability of Survey Facilities		
Sl.	**Item**	**Key Tech. Spec.**
1	RTK GPS 080,	5 sets
2	Total Station (Dadi, Kolida)	5 Sets
3	Plotter	2 Sets
4	Echo Sounder (D380)	1 Sets
5	Sub Meter GPS	3 Pieces

4.5.3 Hardware Facilities

Followings are the list of hardware facilities Arc Bangladesh have to support its Software Development Unit & Geospatial Unit.

Table 4.5: Hardware/Software Facilities - Software Development Unit

Hardware Facilities - Software Development Unit			
Sl.	**Item**	Qty	**Key Tech. Spec.**
1	Server	3	HP Proliant; OS: Windows 2012 Server/ Linux
2	Workstation	25	Intel Core i5/i7 5th/6th/7th Generation
3	Laptop/ NoteBook	1 0	Hp/FujitSU/ASUS
4	Networking		Router: MikroTik, EdiMax Wireless Router
5	Laser Printer	6	A3 Size B/W 2 qty A4 Size Color Laser 1 qty A4 Size B/W 3 qty
6	A4 Size Color Laser	1	qty
7			

Hardware Facilities - Software Development Unit			
Sl.	**Item**	Qty	**Key Tech. Spec.**
8	Scanner	Size:	Sheetfeed
9	UPS	3	1 500 VA

Table 4.6: Hardware/Software Facilities - Geospatial Unit

Hardware Facilities - Geospatial Unit			
Sl.	**Item**	Qty	**Key Tech. Spec.**
1	Server (Data Server)	2	HP Proliant; OS: Windows 2012 Server.
2	Laptop/ NoteBook	1 0	HP/Fujitsu/Asus
3	Workstation	25	Intel Core i5/i7 5th/6th/7th Generation
4	Color Printer	3	Size: A3, Technology: InkJet
5	Laser Printer	3	Size: A4, Resolution: 1200 dpi, Technology:
6	Scanner	3	Laser, Memory: 12 MB Canon imageFORMULA DR-2010C

Chapter 5

Project Exertion / My Project Involvement

5.1 My Project Involvement

I joined with development & testing team of an ongoing project. The title of the project is "Design, Development and Comissioning of GIS Based Property and Infrastructural Asset Management System". This project has five components for Paurashava.

- Holding Tax Management System
- Trade License Management System
- Infrastructural Asset Management System
- Payroll
- Financial Management System

I was assigned to test and document Holding Tax Management System & Trade License Management System. I did some development and database design task for Infrastructural Asset Management System as well. The domain knowledge needed to test those components was introduced to me by demonstrating several presentations of several task with real data. I also got help from several types of document that was generated as an optput of several stages.

5.2 Knowledge Sharing

In a software development firm, a project has several stages involving different types of expertise. In each stage, a document has generated as a stage deliverable. In SDLC, there are different stages of completing a product/ project, similarly in industry-oriented project there are several stages with output. Those output of stages has beenn discussed with domain expert to begain activities for the next step. I came to that from development perspective a project generally has several stages and deliverables. For the purpose of Testing & Development, following documents has provided to me with detailed presentation.

- Terms of Referenece and Scope of the Component
- System requirement Specification (SRS)
- Non- Functional Prototype
- Data Model & Structural Metadata Document
- Test Document

Technology Learned

Since, I have joined with an ongoing project where I have worked with testing several modules of the project. I have assigned to work with database and development team as well to do some predefined task. Ï have gained Domain knowledge about following Technical Platform

- Design and Develop web Application using Microsoft Visual Studio 2015
- Implement Database using Microsoft SQL Server 2014

- Work with technologies including HTML5, CSS3
- Design Prototype using Axure
- Prepare Test Document

5.3 Project Name: Holding Tax Management System

Lately, alongside the quick advancement of land industry, land impose has turned into a vital wellspring of nearby expense income. Nevertheless, in light of the fact that the land business charge classifications are different and impose joins are confounded, land assess combination the executives turns into the pattern of the Times. Usage of the land impose "mix" is important to enhance the logical, institutionalized and heightening administration dimension of the land charge, which is investigation of the executives example of advantageous dependent on PC the board, data sharing, interface caught, chain the executives, division coordination and joint control. Taking deed assessment and land utilization impose as a chance, this paper begins from the point of view of the reconciliation of accumulation assets; ceaselessly fortify division coordination to thoroughly push mix of land charge and tax management.

5.3.1 Project Plot & Requirements

I had briefed with the terms of reference of the project. A document entitled “ToR” describes detail scope of the component. From that document, I did get the idea of a high-level requirement of that component.

5.3.2 Solution Providing

In this section, I will illustrate systematic task I was assigned. Following documents have provided and explained to be before beginning testing. This has given me a clear idea about the component and its each task that I will test.

- Terms of Referenece and Scope of the Component
- System requirement Specification (SRS)
- Non- Functional Prototype
- Data Model & Structural Metadata Document
- Test Document

I have briefly described the content of “Terms of Referenece & Scope of the Component”in previous section. I will briefly illustrate the rest of the steps and its content that was provided to me before beginning testing and development.

5.3.3 Tax Payer Information

A taxpayer is an individual or association subject to make good on a regulatory obligation. Citizens have an Identification Number, a reference number issued by an administration to its citizens.

5.3.4 System requirement Specification (SRS)

System requirement Specification (SRS) document contains functional identification and procedure of each task has solved of particular components. I have briefed about each task of that component and its analytical solution. Follwing is a requirement specification content of a Holding Information task

Table 5.1: System requirement Specification- Tax Payer Information

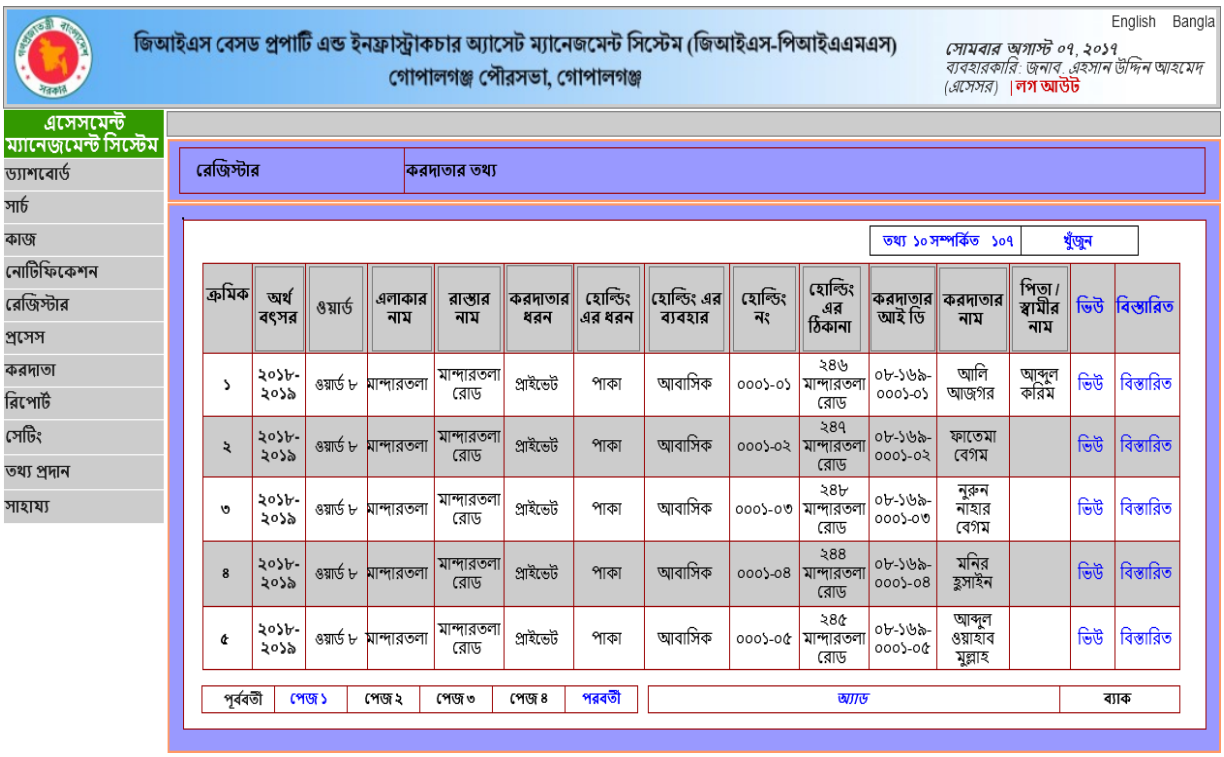
<table>
<tr><td colspan="3">Requirement Specification</td></tr>
<tr><td>Requirement Name (En)</td><td colspan="2">Taxpayer Information</td></tr>
<tr><td>Requirement Name (Bn)</td><td colspan="2">করদাতার তথ্য</td></tr>
<tr><td>Requirement Type</td><td colspan="2">Input</td></tr>
<tr><td>Description/ Business Logic</td><td colspan="2">Taxpayer basic information will will be displayed and managed from here. All other configurable content will be defined before like Taxpayer Type, Holding Type, Holding Usage will be configured previsusly.</td></tr>
<tr><td>Requirement Content</td><td colspan="2">
<table>
<tr><td colspan="3">Requirement Content</td></tr>
<tr><td rowspan="2">N°</td><td>করদাতার তথ্য</td><td>Taxpayer Information</td></tr>
<tr><td>Bangla</td><td>English</td></tr>
<tr><td>1</td><td>অর্থ বসর</td><td>Financial Year</td></tr>
<tr><td>2</td><td>ওয়ার্ড</td><td>Ward</td></tr>
<tr><td>3</td><td>এলাকার নাম</td><td>Area Name</td></tr>
<tr><td>4</td><td>রাস্তার নাম</td><td>Road Name</td></tr>
<tr><td>5</td><td>করদাতার ধরন</td><td>Taxpayer Type</td></tr>
<tr><td>6</td><td>হো‌ল্ডিং এর ধরন</td><td>Holding Type</td></tr>
<tr><td>7</td><td>হো‌ল্ডিং এর ব্যবহার</td><td>Holding Usage</td></tr>
<tr><td>8</td><td>করদাতার নাম</td><td>Taxpayer Name</td></tr>
<tr><td>9</td><td>পতা / স্বামীর নাম</td><td>Father/ Husband Name</td></tr>
<tr><td>10</td><td>হো‌ল্ডিং নাম্বার</td><td>Holding Number</td></tr>
<tr><td>11</td><td>করদাতার আই ডি</td><td>Taxpayer ID</td></tr>
<tr><td>12</td><td>হো‌ল্ডিং এর ঠকিানা</td><td>Holding Address</td></tr>
</table>
</td></tr>
</table>

Requirement Specification	
Requirement Name (En)	Taxpayer Information
Requirement Name (Bn)	করদাতার তথ্য
Requirement Type	Input

5.3.5 Non- Functional Prototype

Non-functional prototype contains a static demo of all task of the component with detaile layout design and data. From this prototype design of a specific task is identified. I was briefed about the purpose of the prototype and layout of Information content.

Non- Functional Prototype | **Taxpayer Information**



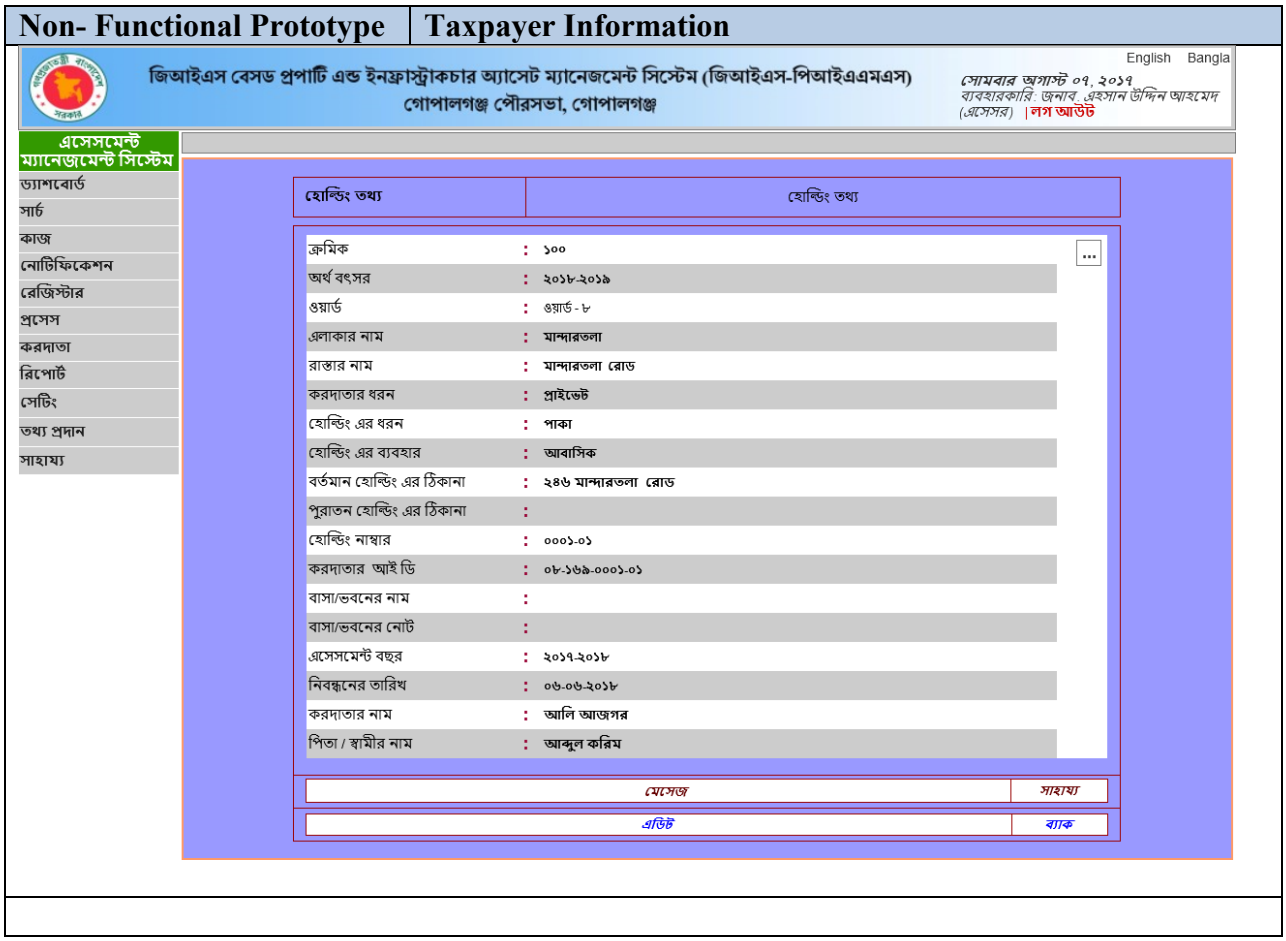


Figure 5.1: Non- Functional Prototype - Tax Payer Information

5.3.6 Data Modeling and Stractural Metadata

Data Model and Structural Metadata Document contains listing of all tables along with each table column name, data type, key, attribute, example and aliase. I had briefed about data modeling technique and documentation procedure.

Table 5.2: Data Modeling and Structural Metadata - Tax Payer Information

Data Modeling and Stractural Metadata	Taxpayer Information

Table Name		HoldingPrimaryInformation				
No.	**FIELD_NAME**	**DATATYPE**	**KEY**	**ATRIBUTE**	**Example**	**Aliase**
1	HoldingId	INT IDENTITY(1,1)	PK	NOT NULL		
2	HoldingNO	NVARCHAR(20)		NOT NULL		
3	HoldingNoOld	NVARCHAR(20)		NULL		
4	HoldingName	NVARCHAR(100)		NOT NULL		
5	HoldingNote	NVARCHAR(250)		NULL		
6	PouroshovaId	INT	FK	NULL		
7	WardId	INT	FK	NOT NULL		
8	MohollaId	INT	FK	NULL		
9	RoadId	INT	FK	NULL		
10	HoldingUsage TypeId	INT	FK	NULL		
11	HoldingRegistration Date	DATE		NULL		
12	CreateBy	NVARCHAR(50)		NOT NULL		
13	CreateDate	DATETIME		NOT NULL		
14	UpdateDate	DATETIME		NOT NULL		
15	UpdateBy	NVARCHAR(50)		NOT NULL		

5.3.7 Developed System - Interface

Development team has all documents and functional requirement prepared by ayatem architect team and database designer. The system was implemented using Microsoft .Net Framework (C#). For relational database management system Mysql 2014 was uned. Followings figures are the Graphical User Interface of Taxpayer Interface.

Developed System	Interface (Taxpayer Information)

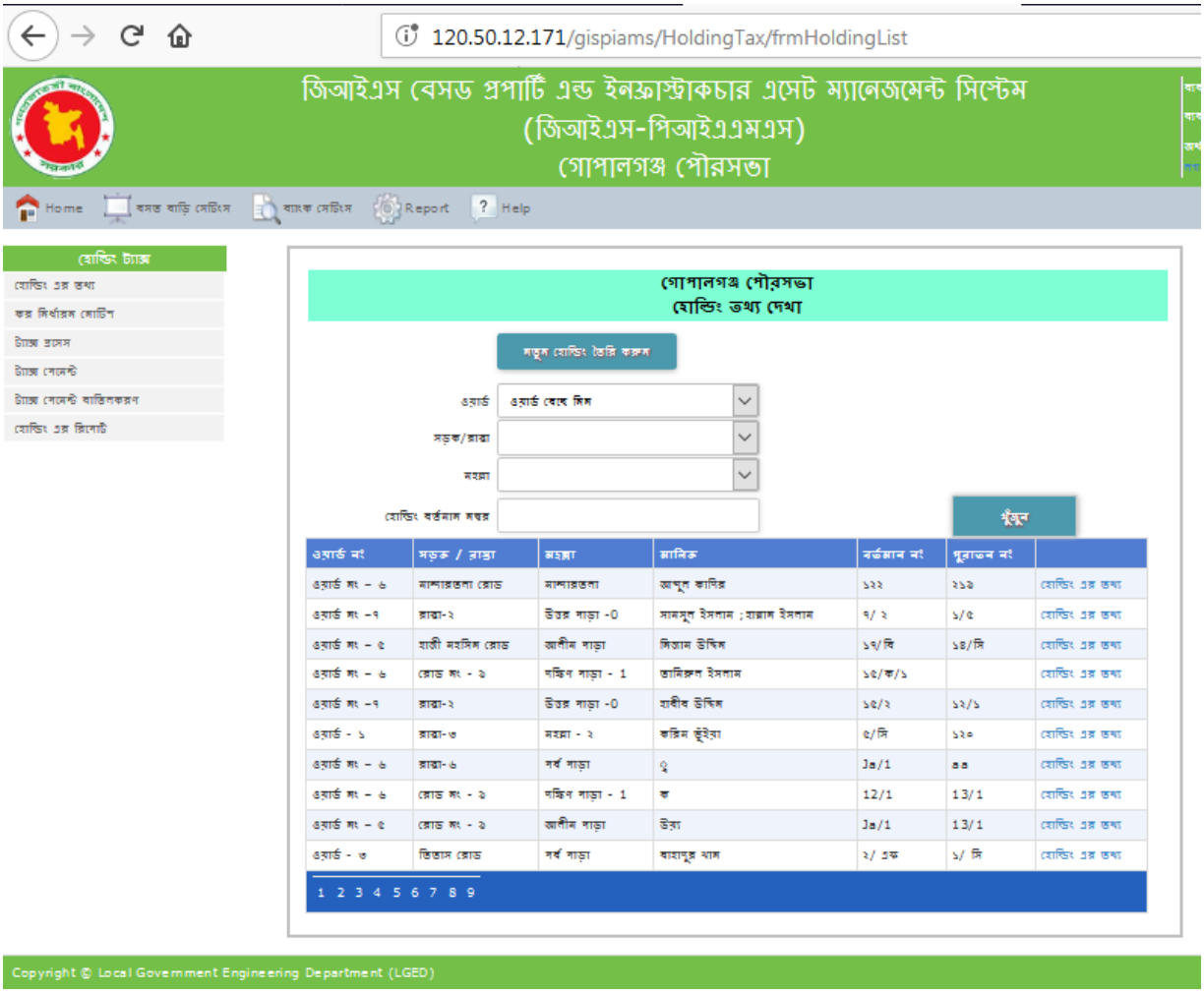


Figure 5.4: Taxpayer Information - Developed System Interface

Developed System	Interface (Taxpayer Information)

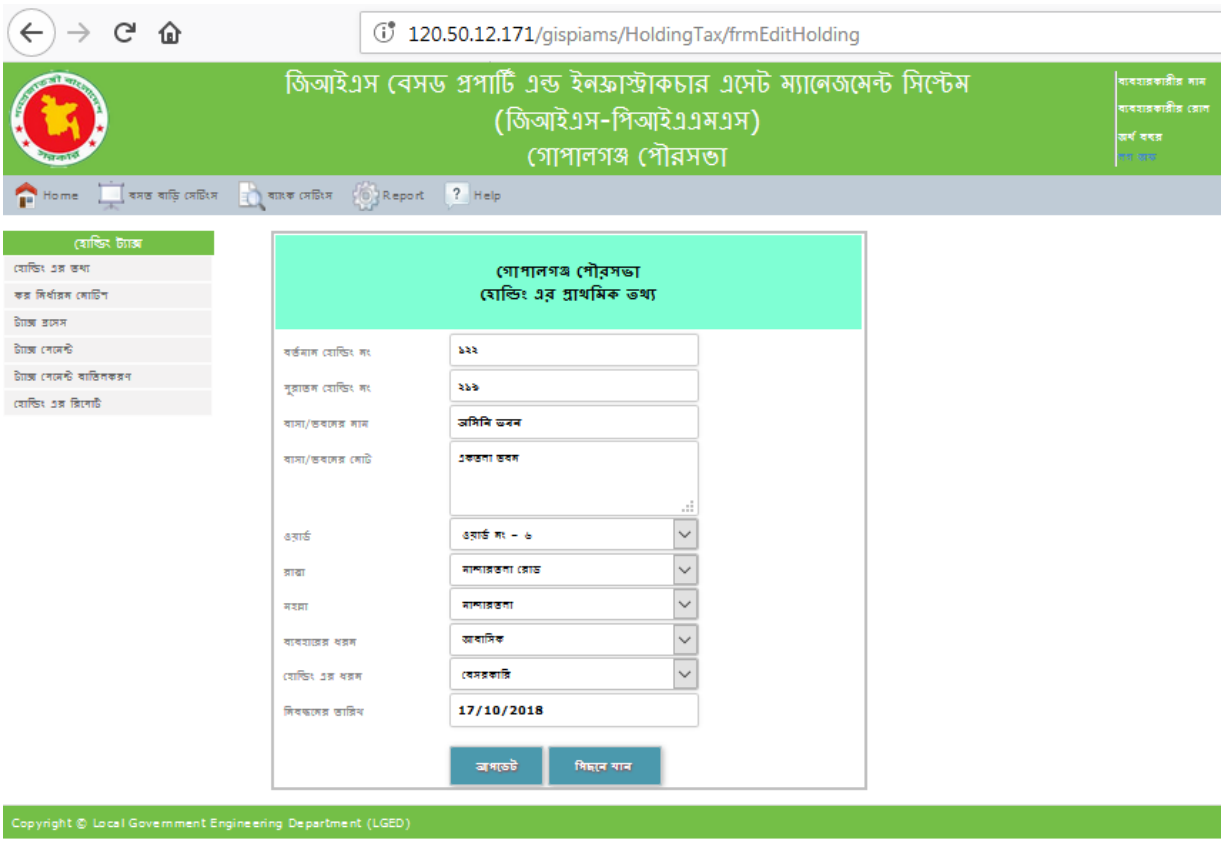


Figure 5.5: Taxpayer Information - Developed System Interface

5.3.8 Challenges

It was quite a challenge for me to get along with all the procedural steps, realize the system and do the testing, development and data modeling appropriately. However, I was interested to learn and with the co-operation of my team members, I was able to work accordingly. In the next component, I have described the testing methodology and demonstrated that how I did get along with testing procedure.

5.3.9 Technical Findings

Most of the technical requirements of the "Holding Tax Management System" had covered by the document provided to me. Requirement needed to cover by me was only complete Test Document.

5.3.10 Completion & Delivery

I have completed Test Document of "Trade Licence Management System". In the next section I will illustrate the methodology followed to accomplish Testing of a System.

5.4 Project Name: Trade License Management System

5.4.1 Testing

Software Testing Methodology is defined as strategies and testing types used to certify that the Application Under Test meets client expectations. Examples of testing methodologies are Unit Testing, Integration Testing, System Testing, Performance Testing etc. I have been taught to test a particular task of an application performing the following steps.

5.4.2 Test Case Description

Atest case description defined System Name, Test case ID, Test case Name, Test case description
Tester Name, Test date and Precondition. It is the basic identification of a task to be tested. Following table contains description of "Trade License Application".

Table 5.3: Trade License Application - Test Case Description

Trade License Application		
N°	**Particular**	**Description**
1	System	GIS based Property and Infrastructure Asset Management Systems (GIS-PIAMS)
2	Test case ID	2.1.1
3	Test case Name	Trade License Application
4	Test case description	This test case will save Trade License Application

Trade License Application		
N°	**Particular**	**Description**
5	Tester	Shikha Rani Sarkar
6	Test date	07/10/2018
7	Precondition	Must log in to the system

5.4.3 Test Data

Test Data have a great impact on the testing phase. Writing test datais almost as important as the testing process itself. The activity of writing test data helps to think through the details and ensures you're approaching the tests from as many angles as possible. The value of having test data long-term is that anyone can go in and retest using the test case. Test cases are powerful artifacts that are beneficial to future teammates, as well as a good source of truth for how a system and particular feature work. Following table contains the Test Data for "Trade License Application"

Table 5.4: Trade License Application - Test Data

Trade License Application				**Test Data**		
N°	**Field**	**Required**	**Valid data example**	**Invalid data**	**Test Data**	**Observation**
1	Applicants Name	Y	Alphabetic Input	Blank Record	Name of a person	Alphatic value accepted
2	Gender	Y	Selection	N/A	Male	Selected data accepted
3	Father Name	Y	Alphabetic Input	Blank Record	Name of a person	Alphanumeric value accepted
4	Mother Name	Y	Alphabetic Input	Blank Record	Name of a person	Alphabetic value accepted
5	Husband/ Wife	Y	Alphabetic Input	Blank Record	Name of a person	Alphabetic value accepted
6	Mobile No	Y	Numeric Input	Alphabetic Input	Mobile No	Numeric value accepted
7	N-ID	Y	Numeric Input	Alphabetic Input	N-ID	Numeric value accepted
8	Previous Step	Y	Button Click	No action	N/A	Moves on Click
9	Next Step	Y	Button Click	No action	N/A	Moves on Click

5.4.4 Test Details

Test Details guides tester through the steps of the test. Test Description is a set of step-by-step instructions to verify task to be tested behaves as it is required to and log its result. Followings are the systematic test details of "Trade License Application"

Table 5.3: Trade License Application - Test Details

Trade License Application		**Test Details**		
	Step N°	**Expected Result**	**Actual Result**	**Result/Status**
Step 1	**Step 1:** Open Firefox or Opera browser write down the url and press Enter	Log in page of the GIS-PIAMS will be displayed which will take input of User Id and Password	Page displays	Ok
Step 2	**Step 2:** Enter User Id and Passowrd Click on sign up	Dashboard of the designated personnel will be displayed with authorized menu	Dashboard of the designated personnel displays	Ok
Step 3	**Step 3:** From Configuration Menu Click on "Application"	A page will be displayed containing all record of "Application" (If there are any)	A page displayes containing applicants record	Ok
Step 4	**Step 4:** Click on "Add New" Button	A page will open containing input interface for "Application"	A page displayes containing input content for Äpplication	Ok
Step 5	**Step 5:** Provide required information as stated in Test Data Section 7.1.2 (Application Test Data)	Input interface will accepts tested data	Input interface accepts tested data	Ok
Step 6	Step 6: Click on Nest Button	A new interface will appear for additional requirement of Application information	A new interface appears and taked additional requirement of Application	Ok

Trade License Application		**Test Details**		
	Step N°	**Expected Result**	**Actual Result**	**Result/Status**
			information	
Step 7	Step 7: Click on Next Button	Clicking on next buttin takes user to the next interface if there are interface for required information	Clicking on next buttin takes user to the next interface if there are interface for required information	Ok
Step 8	**Step 8:** After providing required test data click on "Save" button	A message will confirm the saving of record inserted, page will be refreshed to take new input	A message confirms that record has been saved	Ok
Step 9	**Step 9:** Repeat Step 5-8 with different test data	A message will confirm the saving of record inserted, page will be refreshed to take new input	A message confirms that record has been saved and page in refreshed and ready to take new input	
Step 10	**Step 10:** Click on "Back" button	System will show the listing content of "Application"	System shows the listing content of "Application"	OK
Step 11	**Step 11:** Click on "Back" button	Dashboard of the designated personnel will be displayed with authorized menu	Dashboard of the designated personnel displayes with authorized menu	OK

5.4.5 User Interface

While documenting test result, it is important for tested to have an interface accompanied within each test case. It helps to evaluate the record are being tested. Following is user interface of developed "Trade License Application" which will be included with Trade License Application Test Case.

Trade License Application	User Interface

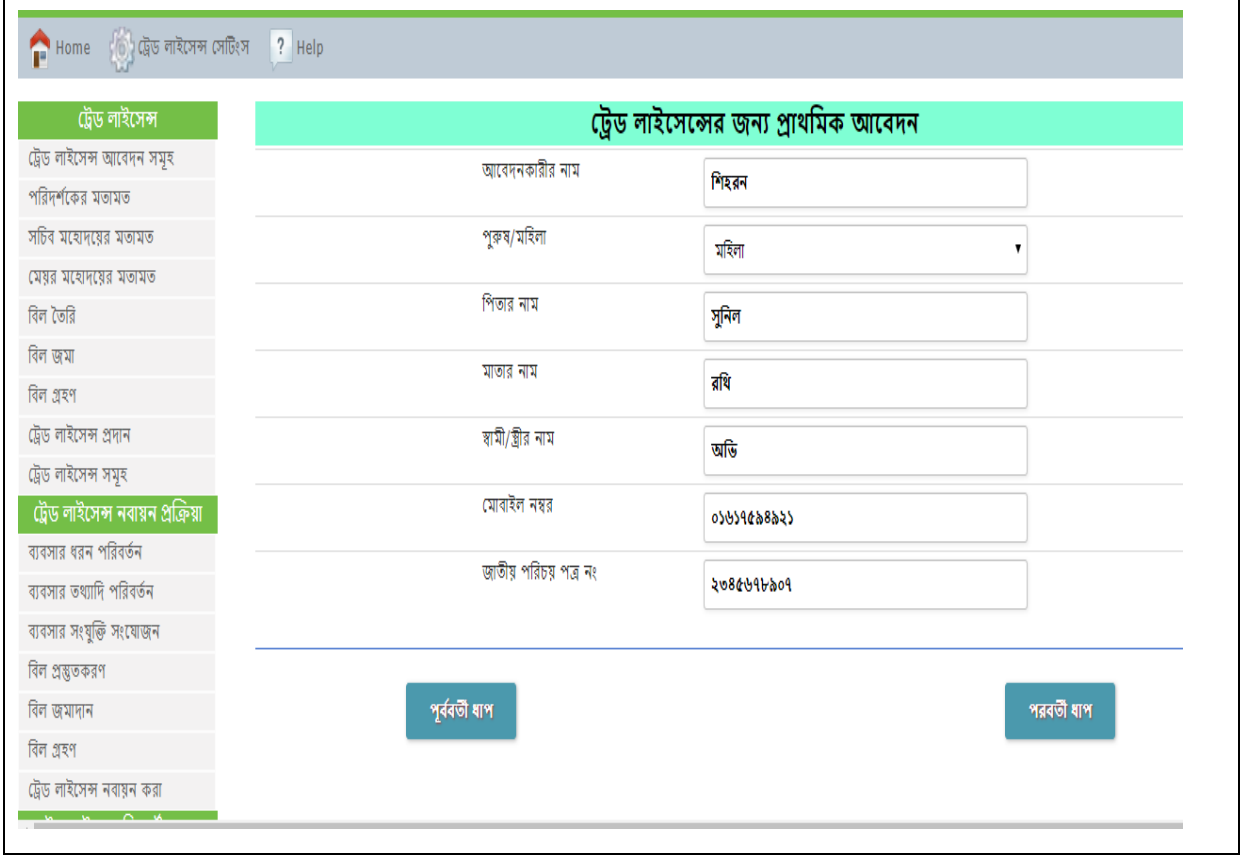


Figure 5.6: Trade License Application - Developed System Interface

5.5 Project Name: Infrastructural Asset Management

5.5.1 Design Guideline Provided / Solution Providing

I did work with the development team for this component. Before development, I was introduced with the following document. The system architect and databade developer prepared those documents. Those documents help me to get a clear understanding of what need to be developed and all its functional requirement and quality attributes.

- Terms of Referenece & Scope of the Component
- System requirement Specification (SRS)
- Non- Functional Prototype
- Design Guideline Provided
- Data Model & Structural Metadata Document
- Technology and Tools to be used

5.5.2 Terms of Referenece & Scope of the Component

I have been briefed scope and requirements of the component that was identified in the document "Terms of Referenece & Scope of the Component". This doment contains high level definition of the project requirement. Based on this document and various types of user requirement session other documents and Database are designed. Those documents and Database are delivered to the Development unit to begin development. In the next sectios I will illustrated the document and I have provided before development work initiated.

5.5.3 System requirement Specification (SRS)

The System Requirement Specification describes detail functional requirement a particular task needs to be achieves and its business logic. I was briefed about the entire functional requirement of the component step-by step. Amongst other item SRS also contains a mock screen for the Graphical User Interface to be developed. Following is an example of particular content of SRS document I have been provided.

Table 5.4: Infrastructure Asset Management System - System Requirement Specification

Infrastractural Asset	**Road**
Requirement Name (En)	Road
Requirement Name (Bn)	□□□□□□
Requirement Type	Input (Save related Information)

Infrastractural Asset	**Road**
Requirement Name (En)	Road
Requirement Name (Bn)	□□□□□□
Requirement Type	Input (Save related Information)
Description/ Business Logic	Following Information will be surveyed and saved. Each record of asset has its own lifetime starts from its being from as an entity. Each asset has contain detail information in form of inventory listing. Those information will be tagged within each piece of asset and will be available in GIS interface.

Infrastractural Asset		**Road**
No.	**Attribute(En)**	**Attribute(Bn)**
1	Ward	ওয়ার্ড
2	Area	এলাকা
3	Mouza	মৌজা
4	Asset Code	অ্যাসটে কোড
5	Invent Id	ইনভন্টে আই ডি
6	Road Id	রাস্তার আই ডি
7	Road Name	রাস্তার নাম
8	Road Type	রাস্তার ধরন
9	Road Category	রাস্তার কটোগরৌ
10	Surface Type	সারফসে টাইপ
11	Condition	অবস্থা
12	Chain age Id	চইেনজে আই ডি
13	Chain age Length (Meter)	চইেনজে লংেথ (মটিার)
14	Average Width (Meter)	গড় প্রশসথতা (মটিার)
15	Average Length (Meter)	গড় দইরগ (মটিার)
16	Area	এরয়িা
17	Road Start and end point	রাস্তার শুরু ও শষে
18	Depth	ডপেথ
19	Type	টাইপ

5.5.4 Non- Functional Prototype

A prototype of the system has designed that guided the developers. The prototype contains interface design, menues, records, buttons, message to be displayes, navigation link all all other design related content. The development operate the prototype go get an understanding the task to be developed. The ptototype contained all the interface of the system which guided developers to develop the system. Following is an example of a particular interface from the prototype.

5.5.5 List of Asset Type

Non- Functional Prototype | **Asset Type**

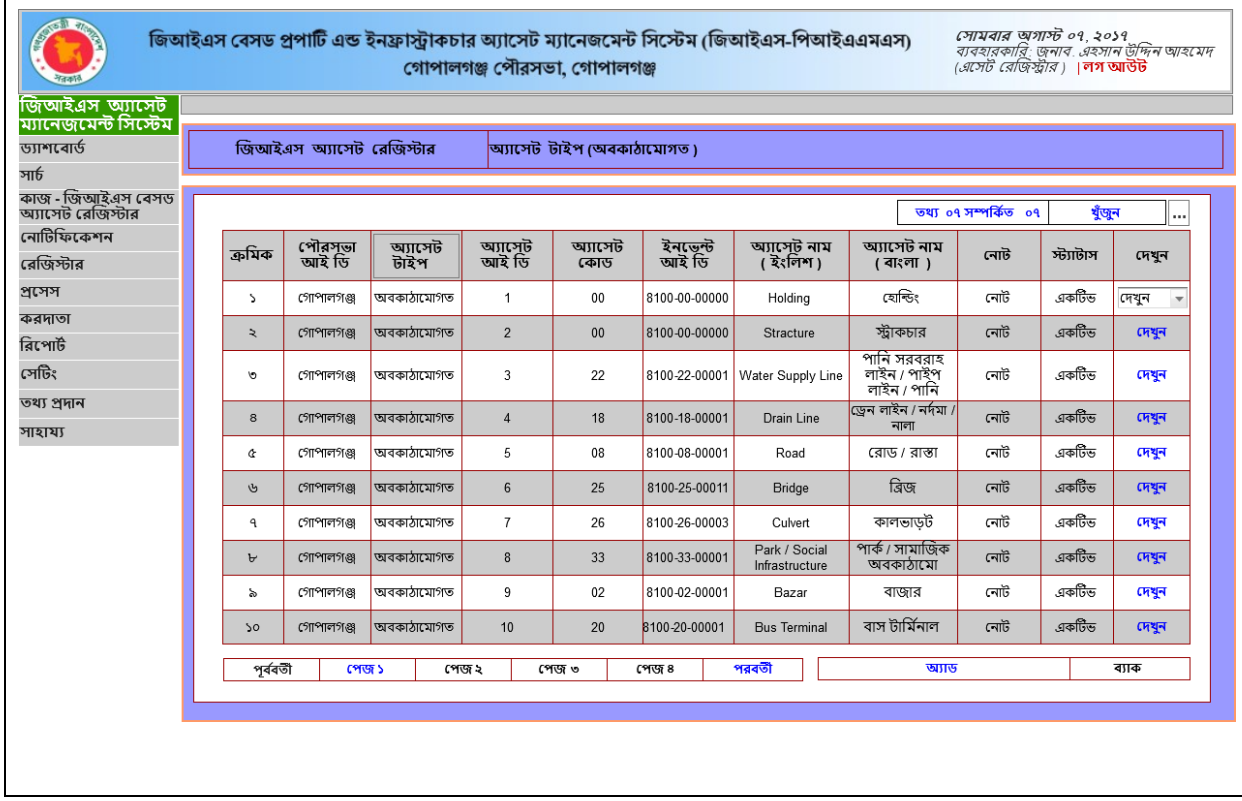


Figure 5.7: Non- Functional Prototype – List of Asset Type

Non- Functional Prototype	Asset Type

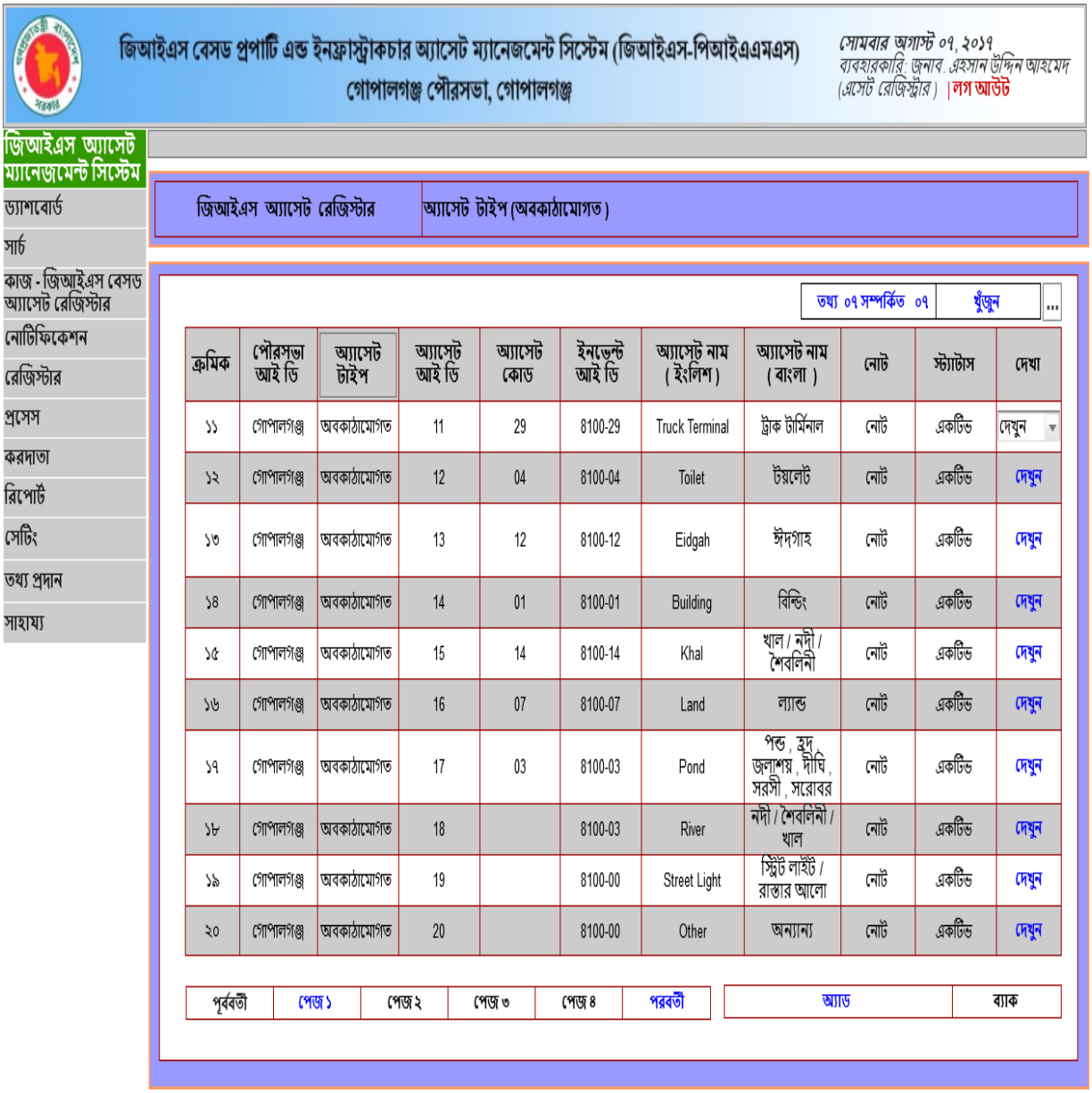


Figure 5.8: Non- Functional Prototype – List of Asset Type

5.5.6 Asset Type Entry

Non- Functional Prototype	Asset Type Entry

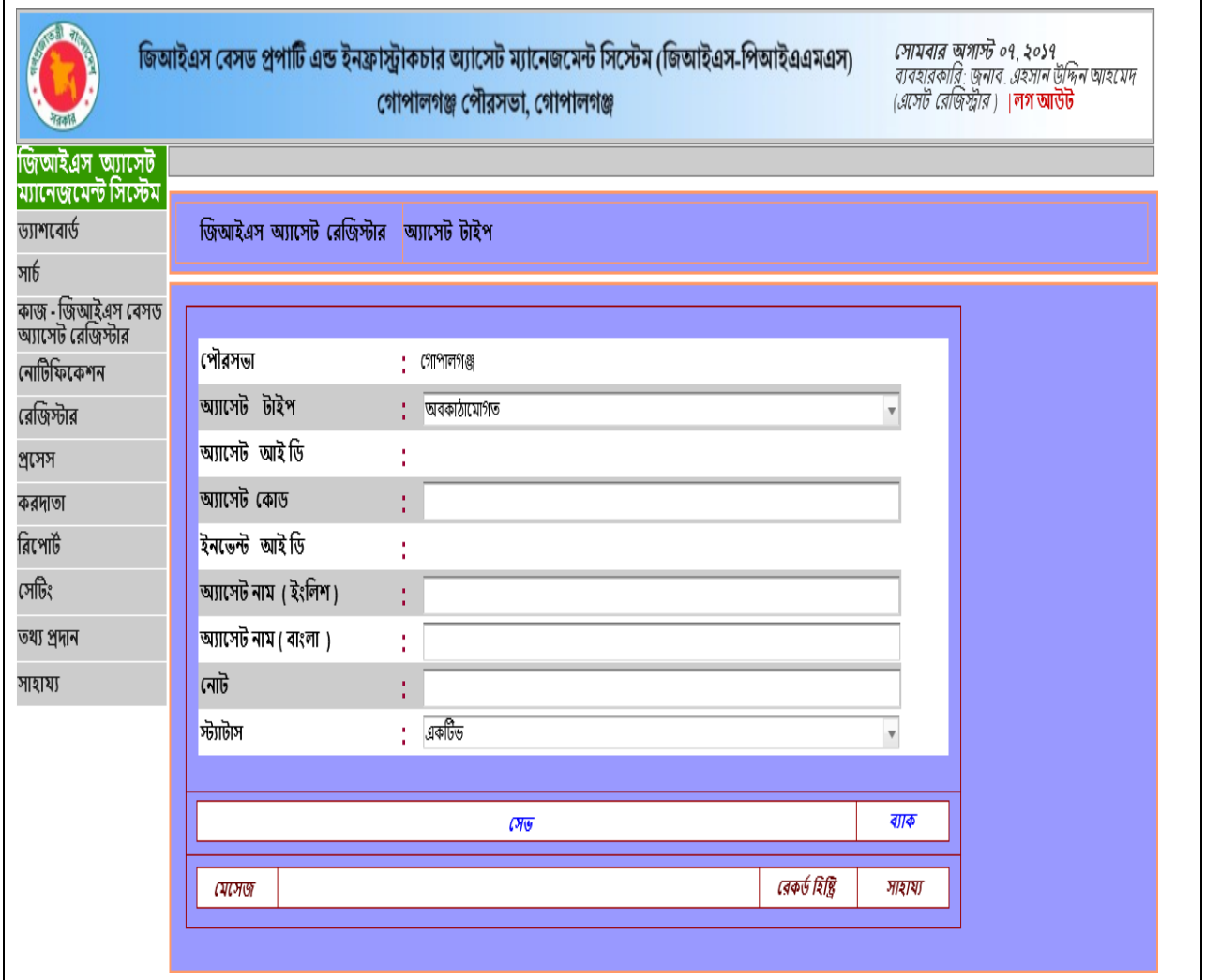


Figure 5.9: Non- Functional Prototype – Asset Type Entry

5.5.7 Road - List

Non- Functional Prototype	Road - List

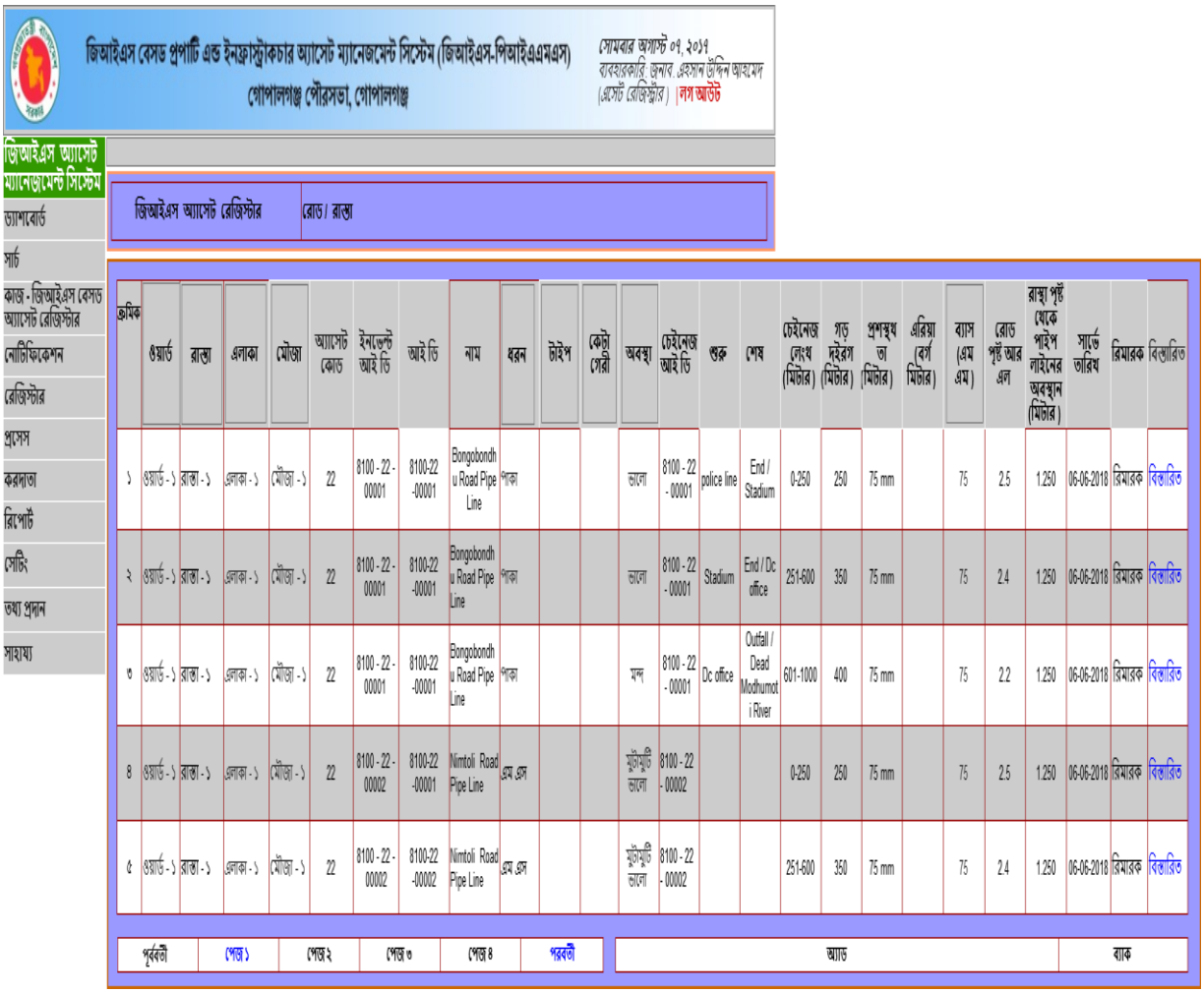


Figure 5.10: Non- Functional Prototype – Road - List

5.5.8 Road - View

Non- Functional Prototype	Road – View

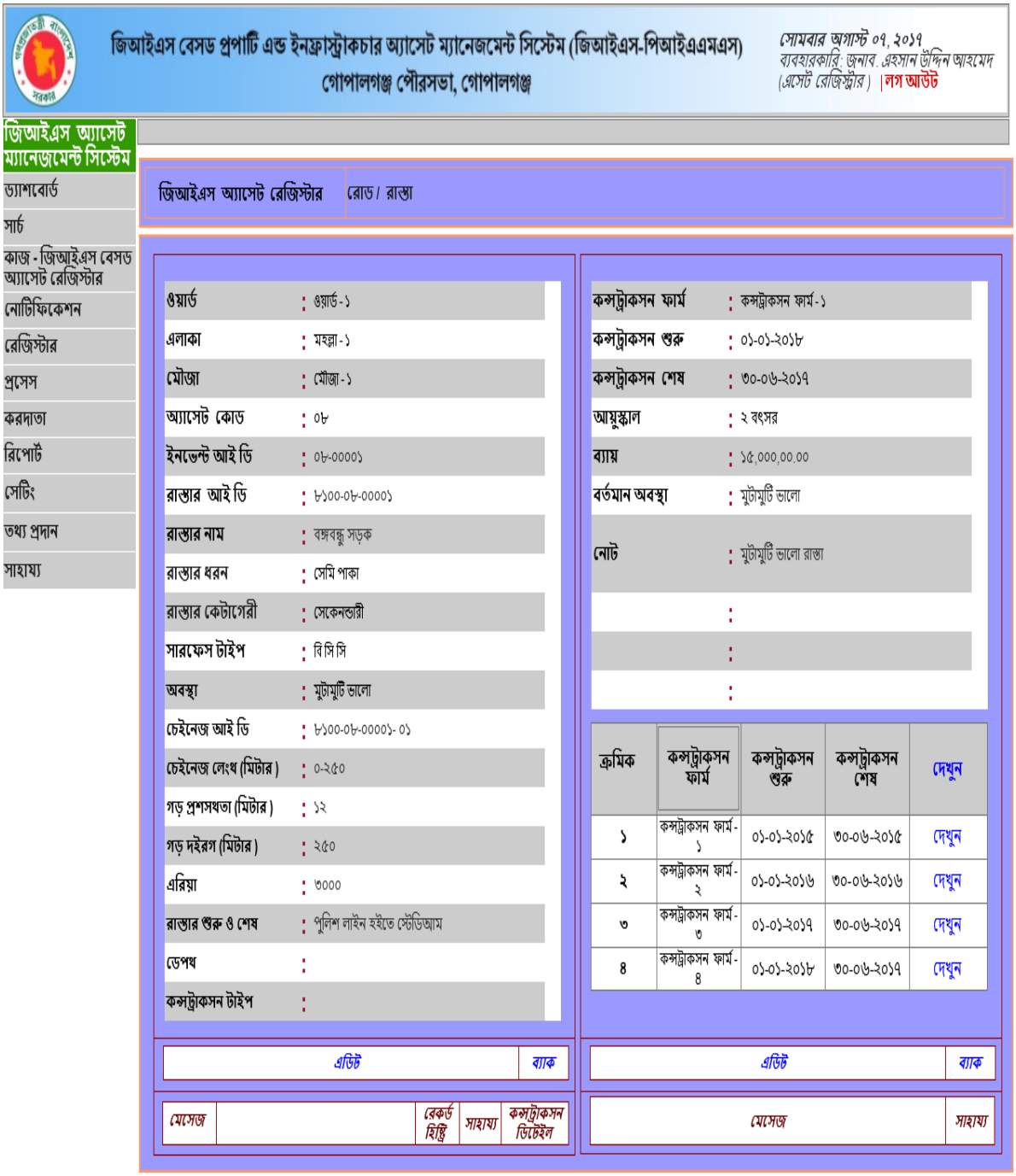


Figure 5.11: Non- Functional Prototype – Road View

5.5.9 Road - Entry

Non- Functional Prototype	Road – Entry

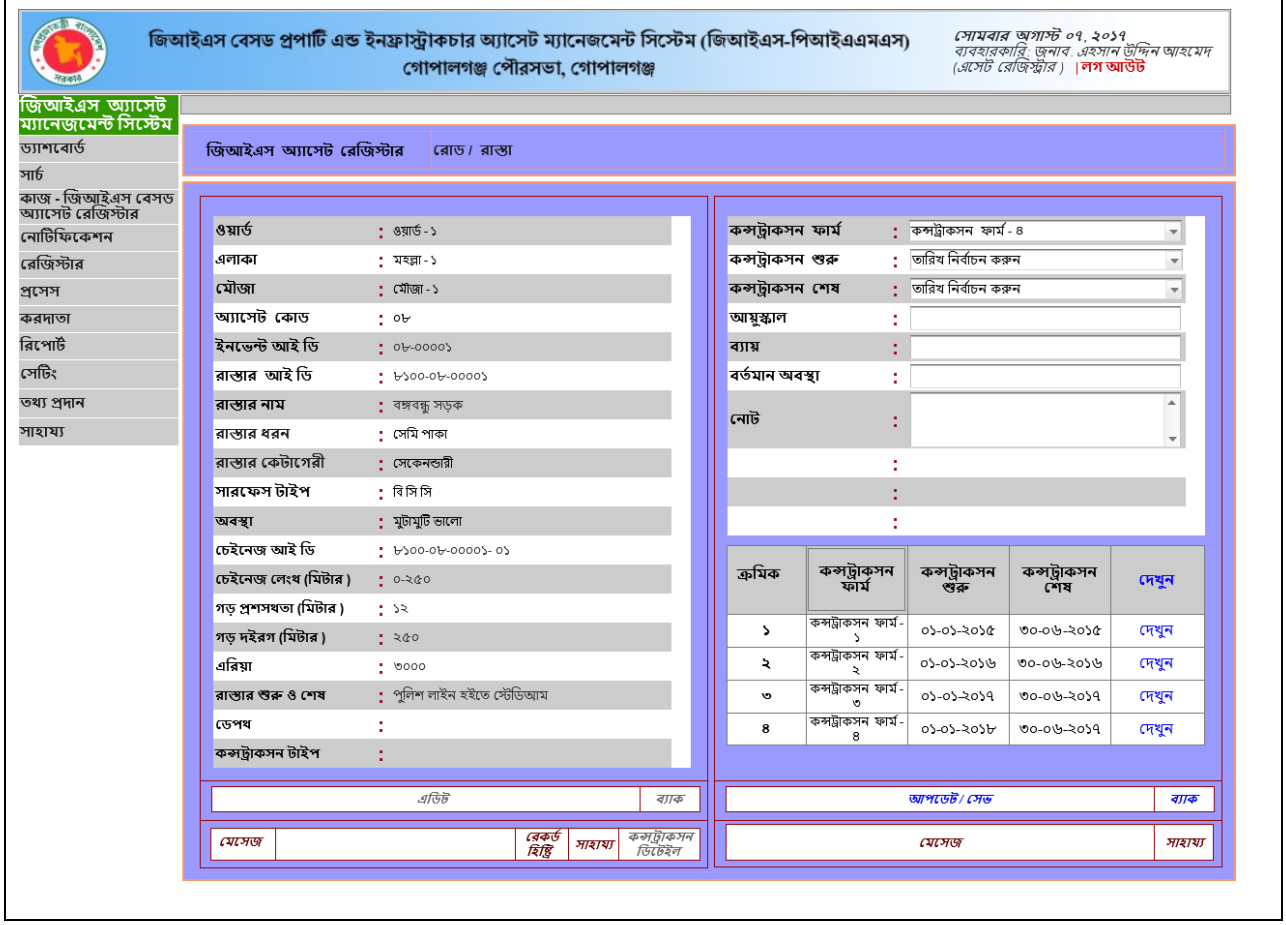


Figure 5.12: - Non- Functional Prototype – Road - Entry

5.5.10 Data Model & Structural Metadata

Data Model and Structural Metadata Document contains listing of all tables along with each table column name, data type, key, attribute, example and aliase. I was briefed about data modeling technique and documentation procedure.

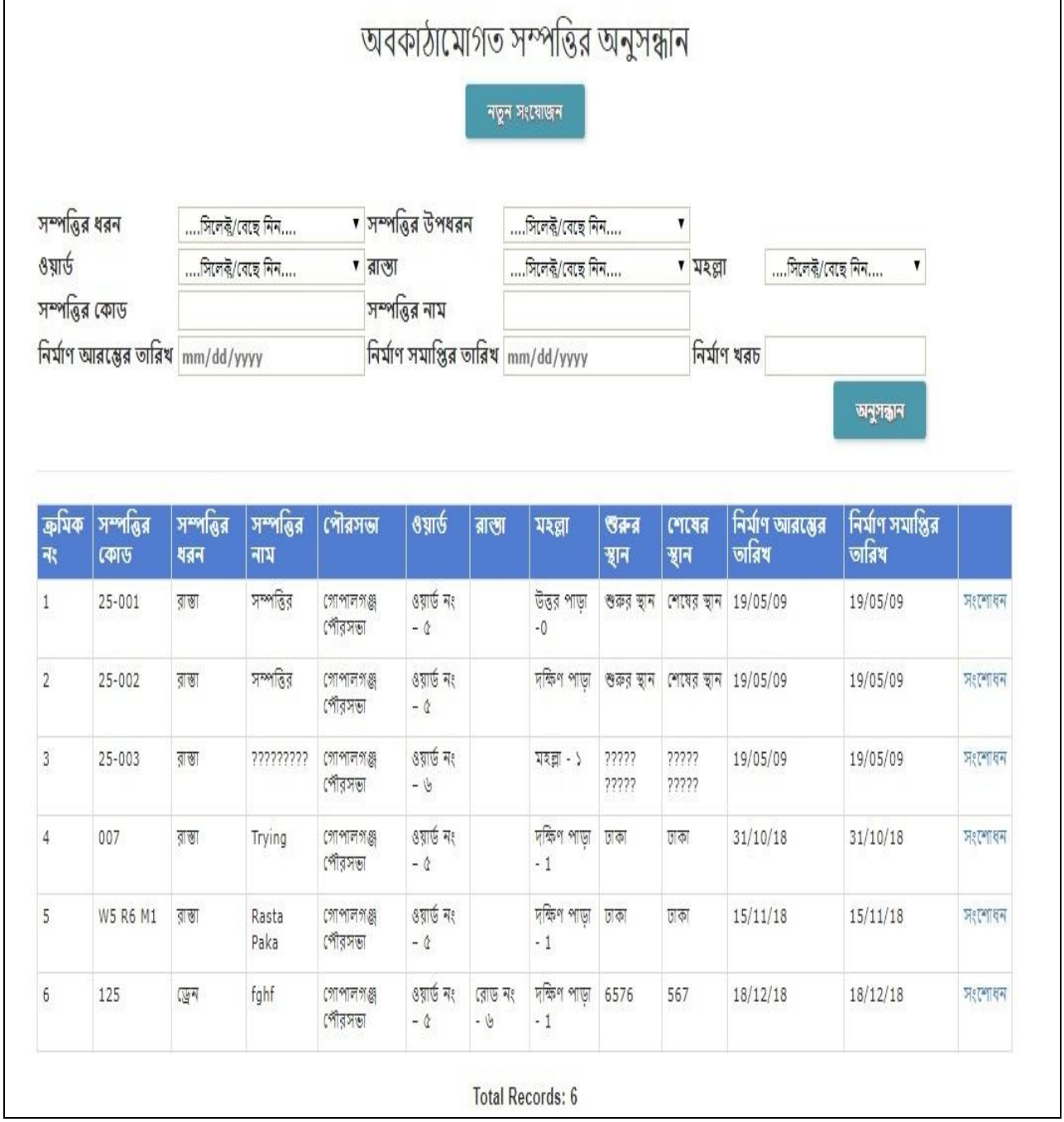
Table 5.5: Infrastructure Asset Management System - Data Model & Structural Metadata

Data Model & Structural Metadata	**Road**

Table Name		**Road_Information**				
No.	**FIELD_NAME**	**DATATYPE**	**KEY**	**ATRIBUTE**	**Example**	**Aliase**
1	Ward	INT IDENTITY(1,1)	PK	NOT NULL		
2	Area	NVARCHAR(20)	FK	NOT NULL		
3	Mouza	NVARCHAR(20)	FK	NULL		
4	AssetCode	NVARCHAR(100)	FK	NOT NULL		
5	InventId	NVARCHAR(250)	FK	NULL		
6	RoadId	INT	FK	NULL		
7	RoadName	INT	FK	NOT NULL		
8	RoadType	INT	FK	NULL		
9	RoadCategory	INT	FK	NULL		
10	SurfaceType	INT	FK	NULL		
11	Condition	Text		NULL		
12	ChainageId	NVARCHAR(50)		NOT NULL		
13	ChainageLength	NVARCHAR(50)		NOT NULL		
14	AverageWidth	NVARCHAR(50)		NOT NULL		
15	AverageLength	NVARCHAR(50)		NOT NULL		
16	Area	NVARCHAR(50)		NOT NULL		
17	RoadStartandendpoint	NVARCHAR(250)		NOT NULL		
18	Depth	NVARCHAR(50)		NOT NULL		
19	Type	NVARCHAR(50)	FK	NOT NULL		

5.5.11 Developed System Interface

Infrastractural Asset Management	Developed System Interface



ক্রমিক নং	সম্পত্তির কোড	সম্পত্তির ধরন	সম্পত্তির নাম	পৌরসভা	ওয়ার্ড	রাস্তা	মহল্লা	শুরুর স্থান	শেষের স্থান	নির্মাণ আরম্ভের তারিখ	নির্মাণ সমাপ্তির তারিখ	
1	25-001	রাস্তা	সম্পত্তির	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৫		উত্তর পাড়া -0	শুরুর স্থান	শেষের স্থান	19/05/09	19/05/09	সংশোধন
2	25-002	রাস্তা	সম্পত্তির	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৫		দক্ষিণ পাড়া	শুরুর স্থান	শেষের স্থান	19/05/09	19/05/09	সংশোধন
3	25-003	রাস্তা	?????????	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৬		মহল্লা - ১	????? ?????	????? ?????	19/05/09	19/05/09	সংশোধন
4	007	রাস্তা	Trying	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৫		দক্ষিণ পাড়া - 1	ঢাকা	ঢাকা	31/10/18	31/10/18	সংশোধন
5	W5 R6 M1	রাস্তা	Rasta Paka	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৫		দক্ষিণ পাড়া - 1	ঢাকা	ঢাকা	15/11/18	15/11/18	সংশোধন
6	125	ড্রেন	fghf	গোপালগঞ্জ পৌরসভা	ওয়ার্ড নং - ৫	রোড নং - ৬	দক্ষিণ পাড়া - 1	6576	567	18/12/18	18/12/18	সংশোধন

Total Records: 6

Chapter 6

Experience & Achievements

6.1Overcome Problems and Difficulties

Since I have never been in a real world industry based software development environment, I did face several types of problem in the beginning. I overcome those problems with the help of my team member and with my keen interest of learning.

The biggest challenge I have faced in my Internship is lack of experience. The System Development required lot of requirement documentation and use of different tools that requires more experience.

Second problem I have faced is the understandin of all required document properly. The need of those documents for development and testing sometimes seemed extraneous to me. Studying those documents and discussing with team members, I came to realize their necessity.

Third problem I have faced is team composition. Working within a new environment and with different team members seemed a challenge to to in the beginning. I overcome this problem establishing a good rapport with team member. Another challenge I have to face is long working hours. I work 6 days in a week and Friday is an only free day. Moreover, if there are deadline I have to work more than working hours.

6.2 Working Practices

Arc Bangladesh limited follows defined practices that have generally written outlining how to perform a task with minimum risk to people, equipment, materials, environment, and processes. Its job procedures are a series of specific steps that guide a worker through a task from start to finish in a chronological order. It also gives People the opportunity to use their skills, provide clear expectations, support team, encourage people to contribute ideas and get involved in decisions

6.3 Technological Enhancement

I came to know how corporate development firm deal with development practices. I came to know abou some other technical tool while working in an environment whwre multiple developers are developing in a single platform, for example, version control is used to track of different developer's task. A single server side database version is used for all database development activities.

6.4 Non-Technical Growth (Soft Skills)

Through this intern course, I have build up a habit of getting up early in the morning, work all day and retun home in the evening. With my intern continues I did all other usual task that I have

done before except regular class in the University. I have learned a great deal about socialize with people.

6.5 Achievement

Followings are all the things Ican gain from an internship:

- New and improved skills and how to apply them
- Professional communications
- Networking
- Taking constructive criticism well
- Work hard no matter what i am doing
- Independence
- Making connections
- Self belief

Chapter 7

Conclusions and Recommendations

7.1 Findings and Contributions

While studying in the University, some theoretical subject seemed bored to me. I was not able to conceptualize their necessity in Software Engineering. Doing my intern in corporate level, I came to realize the necessity of all those theratical subject taught. I came to know the importance of having good analytical, mathematical and good programming ideas.

7.2 Recommendations for Future Works

I strongly recommend students to get an Intern Program. Our University can help us to get Internship in corporate level. I strongly belief, if any any student tries to have a good communication with development company, there is high chance for them to get Internship program in corporate level.

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