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Challenges and Proposed Solution Towards the Legacy Customer Relationship Management System (CRM) In Pakistan Bank

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Abstract: Customer relationship management (CRM) is a widely adopted concept in various organizations to acquire, retain and retain customers. In the banking sector, CRM plays an important role as it serves as the foundation of banking operations. However, in today's dynamic environment, CRM has evolved beyond sales and marketing, covering a wide range of activities aimed at providing exceptional customer focus and value. This research focuses bank`s legacy of CRM system to integrate it with other banking systems that helps to improve day-to-day operational activities, complying with new policies set by the regulatory authority can be ensured and meet the growing business needs. Which includes Estimated Cost Breakdown, Project Delivered Form, Project Assumption, Project Key Stakeholders Matrix, Project Planning, System (WBS) Work Breakdown Structure, Project Configuration Activities and Project Resources.

Index Terms: CRM, Banking, Government, Business Model, Resources, Cost Breakdown, Planning.

1. INTRODUCTION

Banks in Pakistan have developed their core banking solutions and CRM applications using their in-house software houses and IT staff. The banking sector around the world is evolving rapidly, which requires banks to have reliable and robust technology to support their business. However, there are several challenges associated with developing a CRM system using existing resources, including:

- High cost: Developing a CRM system can be expensive.
- Time consuming: Implementing a CRM system takes a lot of time.
- Data Migration Issues: Migrating existing data to a new system can be difficult.
- Integration Issues: Integrating a CRM system with other existing systems can pose challenges.
- Technical issues: Keeping up with emerging technologies and ensuring compatibility can be difficult.
- Support Issues: Providing ongoing support for a CRM system might be challenging.

With the rise of information systems, there has been a shift towards web-based applications and mobile platforms. The State Bank of Pakistan (SBP) acts as the regulatory authority for conventional and Islamic banking and mandates banks to upgrade or create new modules within specified deadlines. Banks face the challenge of making changes to their systems, considering that different banks use different Core Banking Systems (CBS). Some banks rely on international CBSs such as Symbian and T24, while others have developed their own CBSs. Additionally, expanding operations and opening new branches pose additional challenges. Developing or updating a bank's cloud strategy and

infrastructure requires careful consideration of security and reliability. There are many third-party CRM providers, with a market value of 50 billion USD and CRM software resources of 500 million USD, such as Salesforce, Microsoft Dynamics, Bpm'onlineh, IBM Congnos, Sugar CRM, Insightly, among others.

To ensure a successful CRM implementation, organizations must first determine what customer information they need and how they plan to use it. CRM has gained importance due to economic, technological and social forces that have made traditional business models irrelevant. This paper explores the key factors, including strategies, benefits, challenges, and technologies, involved in developing or updating existing systems to ensure a dynamic and robust customer relationship management (CRM) solution. The solution must be in line with the changing needs of the State Bank of Pakistan (SBP) and effectively address the evolving needs of the banking sector, such as expanding branch networks and meeting customer demands.

2. LITERATURE REVIE

The banking sector, a crucial player in the 21st-century economy, has experienced significant transformations in areas such as employee well-being and sustainable development [12-16]. In Pakistan, there are two primary types of banks: Islamic and conventional, and the country has also established various financial institutions, including private banks, foreign banks, investment banks, specialized banks, and microfinance banks, to foster sustainable economic development [17-18].

CRM has emerged as a key driver of business success, and numerous authors have conducted extensive studies to explore the factors that enhance CRM implementation [5-11]. Their research concludes that organizations must effectively identify and address critical implementation factors to realize the promised benefits and avoid failures. Implementing a CRM package system is a complex process that requires careful management to fully leverage the advantages of CRM software while managing the vast changes it brings.

Regrettably, many organizations do not give adequate attention to customers' demands, desires, attitudes, and trends, resulting in the loss of existing customers and difficulties in attracting new ones [19]. Lack of strategic planning and resource deficiencies contribute to the failure of organizations in gaining customer loyalty [20-21]. CRM has the potential to increase customer satisfaction and promote loyalty [22]. Furthermore, customer satisfaction is a primary goal of CRM, which plays a significant role in achieving mid-term targets like customer holding, fidelity, organizational profitability, and performance [23].

3. PROPOSED METHODOLOGY

The proposed procedure for developing or upgrading Customer Relationship Management (CRM) is described below:

- To follow the requirements of the State Bank of Pakistan (SBP) and implement the circular within the system immediately.
- Achieving cost savings and resource optimization for banks.
- Addressing new challenges and meeting evolving consumer demands.
- Enhancing the efficiency of day-to-day banking operations such as account opening, account maintenance, and other related activities.
- Improving reporting capabilities for both the bank's marketing and sales department as well as State Bank.
- Enhancing customer service and reducing transaction times to match or outperform competing banks.

Estimated Cost Breakdown:

Hardware: Rs. 5,000,000/-

Software Licensing: Rs. 50,000,000/-

Staff and Human Resources: Rs. 30,000,000/-

Miscellaneous Expenses and Utilities: Rs. 10,000,000/-

Total Estimated Cost: Rs. 50,000,000/-

Table 1 Project Delivered Form

Stakeholders	Phases	Deliverables	Artifacts
Plan Promoter	Concept Step	• Account of Task Concept (SOW) • Development Deed • FRP and Offers	
Project Executive/Business Expert	Requirements Step	• Software needs / user accounts • Work Breakdown Structure (WBS)	
Business Expert Group	Study Step	• Operative Measurements • Entity-relationship diagram • Data flow diagram	
Software Architecture Team	Drawing Step	• Detailed design specifications Object diagrams • Detailed data models	• Software Development Plan (Software Project Management Plan) • Baseline project plan • Software Quality Assurance Plan • Configuration Management Plan • Risk Management Plan
Software Development Team	Coding and Debugging Phase	• Coding standards • Unit Tests	• Integration Plan • Detailed DHQA test plan • SQA test cases • Acceptance test procedures user documentation/manual
Software Checking Group	Software Examining Step	• Cohesive Unit • Testing Values • Experimental application • Test stages • Credence test sign-off	• Training plan • Support plan • Issue checklists.
Deployment Team for Software	Installation and Maintenance Step	• Care Terms • Installing App • Before Published Analysis	

Table 2 Project Assumption

Category	Assumptions
References	• All technical staff members will have the necessary qualifications and experience to work on the project. • Recruitment of technical staff will be completed before the start of the project.

	• A worker holding rule will be applied to certify employee holdings. • Schooling areas will be created or made offered to the staff.
Carriage	. • Timely arrival of all job gear, including PC, peripherals and machines, or successful construction of the system as planned.
Estimated cost of the project	• Estimated costs are expected to be in line with actual budgeted costs. • Project training will be managed effectively.
Financial funding to complete the project	Provision of capital for licenses/certificates and other related expenses.
Scope	• Scope is not expected to change after approval of the scope statement by stakeholders. • Additional requirements will not be entertained after finalization of scope.
Schedule: Tasks, durations and dependencies required to make the project done	• Commerce requirements files will be reread and signed off at the moment. • All agile stage will be done as per scope of the project. • All stuff must reach on schedule in the space of the project.
Procedures: How to implement the plan	• Agile methodology will be followed during the implementation process. • Governance guidelines will be followed.
Technology: This includes software development, platforms, environments, networks, firewalls and bandwidth	• Solutions will be developed using computer languages like Java and other supporting languages. • The existing test environment will be used to test the solution.
Project Design and Architecture: Selected architectural approaches and designs	• API architecture will be used. • The solution will be housed in the bank's internal data centers.

3.1 Stakeholders

Stakeholders play a role in the creation of the project and can be classified as internal or external stakeholders. Internal stakeholders should be actively involved in the plan development process, shaping the plan rather than simply following it. An agile project involves a community development stakeholder (identified by an identifier) along with other stakeholders.

3.2 Identify stakeholders.

Internal and external stakeholders'(who are directly and indirectly involved in the project) meetings are divided into two parts.

1) 3.3 Internal and external stakeholders

Table 3 Internal Stakeholders

Key	Job Title	Department	Role	Required in	Expectation
A	Project Manager	PMO	Prepared project Documents, project planning and deliverable	All Activity	Project management within budget and on time
B	Business Manager	Business	Communicated with all interested parties for business requirements.	Initial Activity	Provided business knowledge.
C	Business Analysis	Business	Conducted user requirement gathering and created UML diagrams	Initial Activity	Satisfied the needs of the user.
D	Project Quality Assurance Manager	Quality Assurance	Developed project quality plan.	Testing	Document test cases, usage scenarios and processes
E	SQA Engineer	Quality Assurance	Developed and implemented testing processes for the project to meet client requirements.	Testing	Identified, recorded, well documented, and tracked bugs
F	Project Development Manager	Software Development	Junior staff members are assigned project responsibilities based on individual strengths, skill sets, and knowledge levels.	Development	Interacted with clients to obtain detailed order summaries and define exact requirements for each project.
G	CRM application developer	Software Development	Develop IOS and android app	CRM App Development	Designed and integrated apps with web applications.
H	Software Developer	Software Development	Designed and developed web applications	Web application	Integrate the web application with the database.
I	Database Developer	Software Development	Designed database schema, wrote stored procedures, views, triggers, and functions.	Database design	Performed database architecture design
J	IT Manager	Information Technology	Handle troubleshooting	All Activity	Configured servers
K	Network Engineer	Information Technology	Provided network and system services.	All Activity	Network and system issues are resolved.

Table 4 External Stakeholders

Key	Job Title	Department	Role	Required in	Expectation
A	Real user	All Department	Use	Usage	Feedback
B	The client	Administration	receiver	At the end of the month	Meet user needs.
C	Senior management	Leadership	receiver	Approval & launch	Evaluation of the presentation
D	the seller	Third party	provide	Implementation	Provision of necessary equipment

2) 3.4 Project Key Stakeholder

These are individuals or groups who have significant influence over the project or stand to benefit the most from it. Stakeholders are parties that require extensive communication and management, which can be identified through stakeholder analysis.

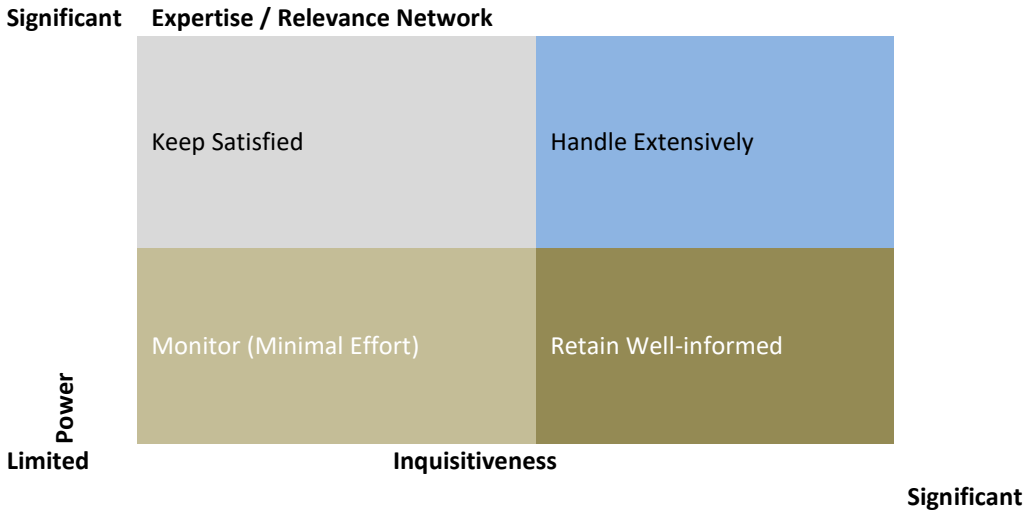
3) 3.5 Project Key Stakeholder Matrix

Table 5 Project Key Stakeholders Matrix

Key	Job Title	Department
A	IT General Manager	Management
B	Assistant General Manager of IT	Management
C	Governance Manager	Governance
D	Database Administrator Head	Data Base
E	Database Administrator Team	Data Base
F	HR Manager	Human resources
G	Security Head and Team	Security
H	Project Quality Assurance Manager	Quality Assurance
I	Project Development Manager	Software Development
J	Project Manager	Management

3.6. Project Stakeholder Control Concern Matrix

Table 6 Matrix for Managing Project Stakeholder Control Concerns



4. PROJECT PLANNING

4.1 Project Baseline and Work Packages

Work packages are identified through collaboration between stakeholders and agreement between designated project team members and external stakeholders. The Work Breakdown Structure (WBS) dictionary provides details of all work packages. The schedule was created based on a detailed WBS and project charter, with input from the project team. The schedule is thoroughly reviewed and approved by the outlet and project manager representative. The project manager will use MS Project to manage the schedule, and any updates or changes will follow the control process. If specified control limits need to be exceeded, a proper modification is needed should be started with the scheme executive. The job manager and relevant group staff would evaluate the impact on period, rate and range. Any changes to baseline will be notified to the project sponsor.

4.2 Project Scope

In start essential requirements of CRM can be taken during meeting which include mobile application testing on Andriod and IOS devices and Windows based system lead project scope.

4.3 Project Scope Management Plan

The main role is depend on Project Managers, which follow details given in WBS dictionaries. Quality control and performance measurement body having sponsors and stakeholders will be approved scope of project. Modification in scope will be depend on users who utilize product and a borad body named Change Control Board (CCB).

4.4 Project Requisite Supervision Strategy

A requisite management plan consists of several parts. It begins with an introduction, explaining the purpose of the project and the importance of managing requirements. The second section provides an overview of requirements management, including responsibilities, workflows, processing tasks, and reporting tools. The third section focuses on requirements management, discussing constraints, assumptions, requirements definition, traceability, workflow, activities, and change management. Traceability ensures tracking throughout the project lifecycle, while workflow

monitors progress and ensures timely reviews. Change management section refers to change management planning. The fourth section includes appendices covering terminology, general terminology, references and validation.

4.5 Project Schedule Management Plan

The schedule is consistent with the WBS, including deliverables, activity sequences, activity durations, and resource estimates. The project team, together with potential customers, will lay the foundation for the schedule and resource allocation. Sponsor will determine final schedule upon completion.

4.6 Project Cost Supervision Strategy

The Project Executive will be liable for project cost reporting and presentation throughout the duration. Monthly project status meetings will review Earned Value Management (EVM) calculations, identify cost deviations and recommend cost adjustments to the sponsor. Cost Performance Index (CPI) and Schedule Performance Index (SPI) will be monitored monthly, with variations of (+/-) 0.1 indicating a precautionary condition and (+/-) 0.2 indicating a critical condition. Any necessary preventive or corrective measures will be implemented.

4.7 Project Quality Management Plan

During lifecycle of project, project manager is responsible to take care of all procedural related documents and quality mentioned in agreed plan. To give more precise quality results to the customers, quality control and assurance tools will be used.

4.8 Project Resource Management Plan

A resource management (RM) plan guides the classification, allocation, management, and release of project resources.

4.9 Scheme Plan with Management and Communication

A comprehensive project communication managing strategy ensures effective communication all over the duration of the project.

4.10 Risk Management for Project Planning

A qualitative method will be used to find and study plan perils. Hazard identification will be proactively performed, and mitigation plans will be developed and implemented from the start of the project. Risk managers will provide regular updates on the status of risks during meetings.

4.11 Project Procurement Management Plan

The Project Manager will manage all purchases, whether local or international, and organize with sellers or traders.

4.12 Project Shareholder Plan

A shareholder plan outlines the procedures, tackles and methods for effectively managing stakeholders.

4.13 SYSTEM RESTRICTIONS:

A. The system requires an intranet (banks internal network) to function.

B. All application screens have mandatory attributes.

C. Data retrieval is limited to a specified date format.

D. User sessions will be terminated after 3 to 4 minutes of inactivity.

E. The desktop application should perform well.

4.14 PROJECT RESTRICTIONS:

A. Time constraints may arise from uncontrolled mandates, senior management requirements, or natural disasters, resulting in potential delays in certification and delivery of project modules.

B. Resource constraints can be caused by team member absence, departure, or lack of technical resources.

5.1 PROJECT ASSUMPTIONS JOURNAL

Table 7 Project Hypotheses Journal

IID	Category	Assumption	Responsibility
1	Budget	**COST ESTIMATE** CRM project costs will be the same as the actual calculated costs.	P-Manager
2	Schedule	**DURATION, WORK REQUIRED TO COMPLETE THE PROJECT:** CRM project staff recruitment process will be completed on time. Each phase of software development will be completed on time. Servers and laptops will be delivered.	P-Manager
3	Methodology	**METHOD PM WILL USE TO COMPLETE THE PROJECT:** The CRM project will follow an agile methodology during implementation.	P-Manager
4	Tools and Technology	**SOLUTION DEVELOPMENT PLATFORM:** CRM project teams will write solution code in JAVA language platform. Testing tools include test tracks and TFS, MTM, or manual test cases.	P-Manager
5	Architecture and Design	**ARCHITECTURE AND DESIGN APPROACH:** The solution will use the MVC design pattern. MS SQL Server will be used for the solution.	P-Manager

5. SYSTEM (WBS) WORK BREAK DOWN STRUCTURE

The complete project must be divided into different phases for efficiency and project monitoring. Following are phases to be completed: Requirement, Analysis, Design, Implementation, Migration of data, and production live.

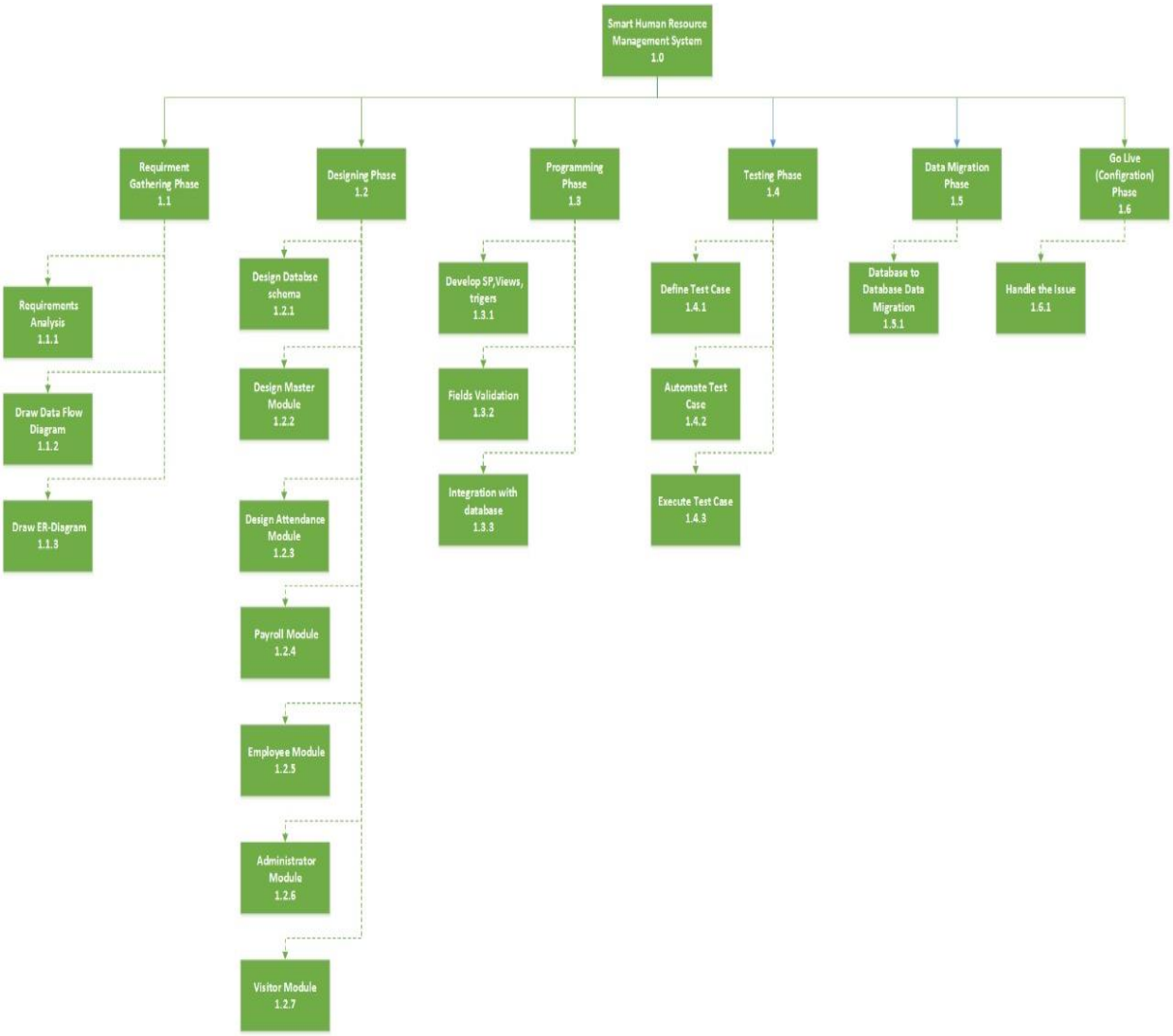


Figure 1 System (WBS) Work Breakdown Structure

5.3 SYSTEM WBS DICTIONARY

To provide a clear definition of the tasks essential to effectively finish a job, a 'work breakdown structure (WBS)' glossary is used. The WBS dictionary includes implementations of all WBS elements.

Table 8 System WBS Dictionary

Levels	Codes	Component Names	Detail of Work	Items	Resources
1	1.0	CRM System	The solution aims to reduce transaction time, human effort and save time.	CRM System	Project Team
2	1.1	Business Requirement Gathering Phase	Collect business knowledge from branch customers.	Business Knowledge	Business Analysis
3	1.1.1	Business Requirement Analysis	Determine the needs of the department.	Business necessity	Business Analysis
3	1.1.2	Create a data flow diagram	Convert business knowledge into a DFD.	System data flow diagram	Business Analysis
3	1.1.3	Draw the system ER-diagram.	Develop a database schema based on table relationships.	Database Schema	Business Analysis
2	1.2	System Design Phase	Design user interface for all modules.	Application design modules	Software developer
3	1.2.1	System Design Database	Identify the data necessary to store and establish internal relationships.	Implement the database schema using MS SQL Server.	Database Developer
3	1.2.2	CRM Account Opening (Non-Financial Activities) Module	Prepare all non-financial screens, including biometrics and debarring lists, Opening an Account	Non-Financial Functional Screens	Software developer
3	1.2.3	CRM Customer Opening (Financial Activities) Module	Develop non-financial screens such as biometrics and debarring lists. Also, create customer opening and customer maintenance screens.	Non-Financial functional screens	Software Developer
3	1.2.4	General Inquiry Module	Design and develop inquiry screens for both financial and non-financial activities.	Inquiry Screens	Software Developer
3	1.2.5	Teller Activities	Prepare financial screen for activities like Pay Cash, Receive Cash, Outward Remittance, Inward Remittance etc.	All financial screens will be generated.	Software Developer
3	1.2.6	Administrator	Declare application rights for groups and individuals.	Group rights, individual rights	Software Developer
3	1.2.7	Reports	Design and prepare report formats for both financial and non-financial management.	Reports	Software Developer
2	1.3	Programming Phase	Develop and integrate the UI with the database.	Establish communication with the database.	Software Developer

3	1.3.1	Develop stored procedures, views, and triggers.	Write queries for the database.	Design the database structure.	Database developer
3	1.3.2	Implement business validation for fields.	Apply authentication based on business needs.	Use JavaScript/JQuery scripts.	Software developer
3	1.3.3	Integrate the system with the database.	Establish connections between UI modules and databases.	Ensure database connectivity within the application.	Software Application
2	1.4	Testing Phase	Subject all modules to the testing process.	Ensure compliance with quality standards.	QA Engineer
3	1.4.1	Create functional and technical test cases.	Write test cases for all modules.	Test Case Creation	QA Engineer
3	1.4.2	Automated test cases	J-Meter and Selenium tools.	Automate test case	QA Engineer
3	1.4.3	Execute test cases manually and through automation scripts.	Execute test cases for all modules.	Bug reporting.	QA Engineer
2	1.5	Data transfer phase	Migrate to the new database structure.	Data transfer	Database developer
3	1.5.1	Perform DB to DB data transfer.	Migrate data from the old database to the new one.	Data transfer	Database developer
2	1.6	System Go Live (Configuration)	Deploy the desktop application to the servers.	Application Servers	Network Engineer/Software Developer
3	1.6.1	Handle system problems.	Troubleshoot web application deployment issues.	Direct application.	Network engineer/ software developer

5.4 VERIFICATION OF SCOPE

Project manager is responsible to present submitted update about project to its stakeholders and senior management. For the completion and transparency of the project management will be approved document and signed.

JOB SCHEDULE MANAGEING PLAN

6.1 schedule management approach

Job plans will be made by ‘MS project 2014, beginning with the deliverables known in the project WBS. The work packages required to complete each deliverable will be defined in the project schedule.

6.2 estimation unit:

A. Project duration will be estimated using work hours.

B. The standard work schedule employs a five-day work week with eight hours of work per day.

6.3 project configuration activities

Table 9 Project Configuration Activities for Detailed Information.

ID	Task	Predecessor(s)
A	System Requirement Analysis	--
B	System data flow diagram	A
C	System ER-Diagram	B
D	System database schema	C
E	Meter module design	D
F	Account Opening Module Design	E
G	Branch Teller module design	F
H	Customer Opening Module Design	G
I	Admin panel design	H
J	Create a user panel design	I
K	Development of system database queries	C
L	Implementation of Fields Business Validation	E, F, J, H, I, J
M	System integration with databases	L
N	Creation of functional and technical test cases	M
O	Creation of functional and technical test cases automation scripts	M,N
P	Manual execution of test cases and execution through automation scripts	N,O
Q	Data migration	P
R	Go Live (Problem Handling)	Q

6.4 Network Diagram

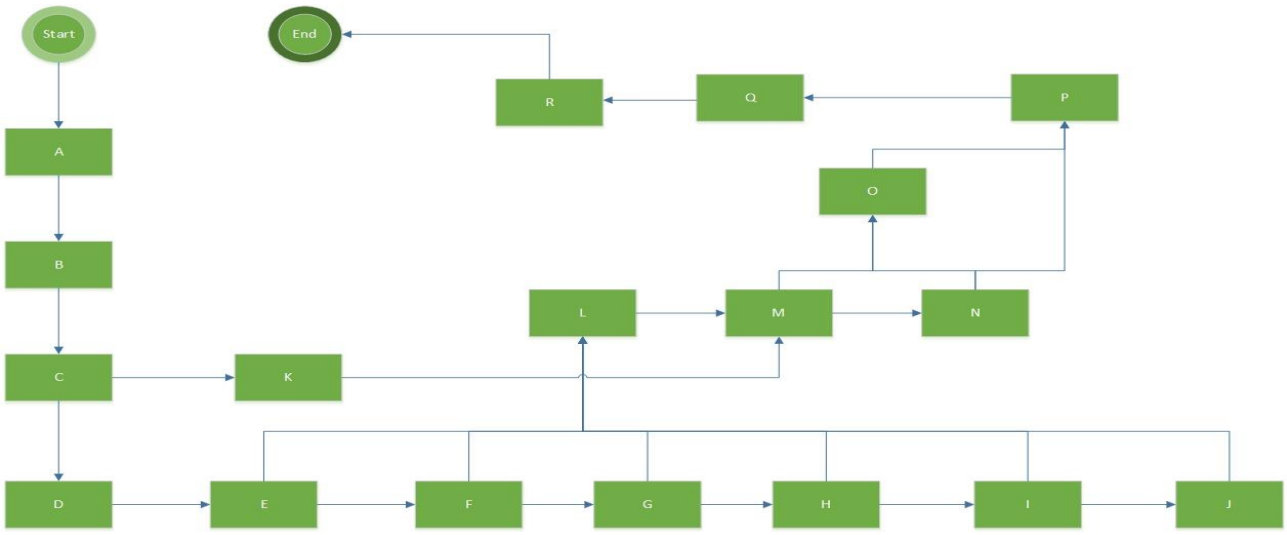


Figure 2 Network Diagram

7. PROJECT RESOUCE MANAGEMENT

7.1 ROLES & RESPONSIBILITIES

Job Title	**Prerequisite**	**Duty**	**Capacity**
DEVELOPMENT MANAGER	BS/MS Computer Science	Analyze and resolve software development issues and requirements. Establish coding and architecture standards. Evaluate performance and facilitate professional development Coordinate development activities to meet stakeholder needs. Lead teams in adopting software engineering best practices.	Self-motivation and excellent problem-solving skills Full lifecycle software development experience
DATABASE DEVELOPER	BS Computer Engineering DB certificate (Optional)	Design and implement entity relationship diagrams (ERD). Evaluate database structure and provide information model specifications. Review internal systems for efficiency and accuracy. Develop and maintain protocols for data management, processing and cleaning Optimize databases and implement database related strategies.	Ability to communicate business needs through non-technical terms Experience in managing large datasets and relational databases

		Retrieve data from various sources and maintain databases	
MOBILE APPLICATION DEVELOPER	BS in Computer Science or Computer Engineering	Integrate mobile applications with web applications. Develop APIs to meet functionality of mobile. Interact with stakeholders to realize needs and user practices. Design and develop mobile applications for both 'Android and iOS' platforms. Implement fresh traits and UI based on 'wireframe models. Ensure efficient and clean code for mobile applications Support the entire application lifecycle.	App upload experience on 'Play Store' and 'App Store' Knack to effort in a team settings Fluency with 'OOP design' values
SOFTWARE DEVELOPER	*BS in Computer Science or Computer Engineering*	Design and develop front-end and back-end software. Integrate the software with the database. Manage software programs and recommend improvements. Test and implement new software programs. Maintain and improve the functionality of the Software	Creation of technical software specifications Problem solving and decision making skills
SQA MANAGER	Bachelors in Compute Science or Computer Engineering	Link and interpret the idea/approach to the team. Prioritize or lead feature and bug tests.	Organizational planning and development skills

	'SQA Certification (Optional)'	Select and use tools and procedures for software testing. Lead, manage and build high performing teams Progress position of morals, mission, and working ways. Gauge test grades, fulfil procedure improvements, and recommend alternative tests.	Leadership, communication, and interpersonal skills
SQA ENGINEER	BS in Computer Science or Computer Engineering SQA Certification (Optional)	Stay up to date on test cases Track QA metrics and provide feedback. Update requirements and technical documentation.	Testing product features and identifying defects Recommending solutions to product problems
IT MANAGER	Masters in Computer Science Bachelors in Computer Science or Computer Engineering MIS Certification (Optional)	Communicate and understand better managers/customer needs. Understand thorny data and constraints. Develop web solutions to save time and rate. Work strictly with section managers to meet network needs. Monitor network technologies to provide technical updates. Develop and manage business continuity risk plans. Update company network plans with new releases.	Excellent communication and problem solving skills. Understanding of network architecture and client/server expertise
NETWORK ENGINEER	Bachelors in Computer Science or Computer Engineering	Network Architecture and System Design	Excellent communication and problem solving skills.

	‘CCNA certification’ optional	Network Help Desk Help	Understanding of network design and client/server technology Ability to work within strict deadlines and boundaries.

8. MANAGEMENT OF PROJECT QUALITY

8.1 Introduction

‘BOK Information Technology SQA Framework’ was developed to manage and ensure software quality at Bank of Karachi (BOK). This standardized process provides stakeholders with objective insight into the process and work product. It serves as a strategic guideline for managers to direct QA efforts.

8.2 Key Stakeholders

The key stakeholders in project quality management are:

- ‘QA (FQA and TQA)’
- ‘Quality Assurance Team Lead (QA TL) and QA Manager (QAM)’
- ‘Developer (dev)’
- ‘Business Analyst (BA)’
- ‘Project Head (Relevant Functional Head)’
- ‘Team Lead (TL) or Project Manager (PM)’
- ‘Configuration Manager (CM) and Release Manager’

8.3 ‘IT Software Quality Assurance Process’

The IT software value surety activity involves of two parts:

- Evaluations and walkthroughs
- Testing and Ratification

8.4 Assessments

The QA TL plans proper analyses (inspections) for each project lifecycle phase with the concurrence of the BA, PM, QAM, and Dev TL. Pass by are scheduled at the beginning of the job and can be done as needed.

8.5 Walkthrough / Inspection

The purpose of walkthrough gates is to identify and resolve problems early in the software development process.

8.6 Plan Test

This phase includes planning the testing process and defining the scope of testing.

Table 10 Activities

Activities	Responsibility
• Request QA resources from the QA Team Lead or Quality Assurance Manager. • Participate in high-level analysis and provide estimates for QA activities. • Create a draft project schedule from a QA perspective. • Identify and communicate issues, risks, and assumptions regarding schedule and requirements to the project manager. • Allocate resources to the project. • Attend requirements analysis and walkthrough sessions to learn about the system. • Review the Business Requirements Document (BRD) and Requirement Specification documents to establish the basis for QA activities. • Start writing test scenarios and cases. • Review and modify the test plan based on feedback from relevant stakeholders.	PM, QAM and QA TL QA TL QA TL, PM QA TL QA TL Relevant QAs, QA TL One-to-one QAs Separate QAs QA TL QA TL

8.7 DESIGN TEST

Table 11 Design Test

Input	Output
• Plan for Testing • Schedule • Requirements	• Case testing • Data Scripts Testing • Environment Testing

Table 12 Execute Test

Activities	Responsibility
• Identify and document test scenarios according to task division. • Review and ensure adequate coverage of test scenarios as per plan. • Update test scenarios based on feedback from QA TL. • Prepare detailed test cases, fill required templates and document mandatory test data when necessary. • Review test cases to ensure correct writing and completion of all mandatory templates as per the process. • After the approval of Project manager, all test details and scenarios will be shared to Business Analyst or Developer or System Architect team with the following. • Build test environment. • Make data scripts depend of test cases.	Relevant QAs QA TL Relevant QAs Relevant QAs QA TL QA TL Relevant QAs QA TL

• Team Lead will test specification with QA.	

8.8 PERFORMANCE TEST

Test runs, test execution and bugs repository will be controlled and managed by MTM and TFS.

Table 13 Input / Output

Input	Output
• Test the environment with the latest build deployed on it. • Make records • Plan for testing and cases tests	• Designs • Scripts for Data • Environment Testing • Issue Note

Table 14 Activities

Activities	Responsibility
• Establish an agreed JAR deployment process across development, quality assurance, and project management teams. • Conduct a test with JAR to ensure testability before deploy. QA engineer will inform all aspects and bug file during testing to developer team and reject build. • Follow bug reporting and identification processes during smoke, functional, and regression test cycles. • Continue this process until acceptance criteria are met.	ITG, CM, QA Respective QAs Respective QAs QA TL, Respective QAs

9. CONCLUSION AND FUTURE WORK

As banking sector is repidly growing industry in Pakistan, with the advancement of digital era banks need reliable and robust technology to support their business. By considering this point we identified different chanllanges like high cost, data migration and technical issues faced by banks at the time of adoption CRM solution and proposed our solution towards the legacy of CRM used in Pakistan. In future we can do more survey and trying to get more best solution that will be adopted by banks in Pakistan that helps to improve day-to-day operational activities.

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