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# INTRODUCTION

This document carefully evaluates different solution options, including the possibility of maintaining the status quo and determining the most beneficial path forward based on a comprehensive set of evaluation criteria. Anchored by the "do nothing" approach as our baseline, we embarked on an analytical journey to present a three to five-year Return on Investment (ROI) forecast, providing a solid foundation for our solution recommendation.

Our analysis encompassed a diligent construction of a Risk Log, detailing project-specific risks with their potential impacts and likelihoods, accompanied by strategic mitigation plans tailored to our unique requirements and solutions. Furthermore, we outlined a suggested implementation/deployment strategy that considers the intricacies of system integration within Scotia Bank's operations. Finally, we developed a testing strategy and approach; while a complete test plan was not within the scope, we ensured all the necessary components were included, including testing stages, defect handling protocols, and critical signoffs.

# SOLUTION SELECTION

## Evaluation of Solution 1 - Adding the UPI Option in the Existing Scotia Bank Mobile App

* **Scalability:**Solution 1's modular architecture makes expanding to handle a rising user base and more transactions simple without completely redesigning the system.
* **Profitability:** Incorporating UPI into the Scotia Bank app leverages the current user base to boost transaction volume and fee income, augmenting the service's overall profitability.
* **User Acceptance:**High user acceptability is expected when a user-focused design combines a real-time validation system, a guided interface that goes step-by-step, and a seamless user experience.
* **Cost:** Because Solution 1 builds on the current app architecture, it is less expensive than creating a new platform from the ground up.
* **Accuracy:**Since errors are less likely to occur and user trust is increased, the system's real-time input validation guarantees excellent transaction accuracy.
* **Compatibility:**Solution 1 ensures continuous compatibility with existing systems and procedures by adding features to the present app.
* **Performance and Responsiveness:**The solution focuses on performance optimization, implying that the software will be quick and responsive, resulting in a great user experience.
* **Stakeholder Satisfaction:** A well-executed UPI integration is intended to match the demands of diverse stakeholders, ranging from customers seeking convenience to shareholders seeking financial rewards, resulting in high stakeholder satisfaction.

## Evaluation of Solution 2 - Launching an Independent UPI Application

* **Scalability:** Starting from the ground up, the app's infrastructure may face initial scalability challenges as user adoption grows.
* **Profitability:** Despite the potential for long-term income growth, high upfront research and marketing costs may delay profitability.
* **User Acceptance:** The app's user experience and distinctive features that set it apart from rivals will be critical factors in determining its popularity with users.
* **Cost:**  A standalone app requires a significant financial commitment because of the costs associated with development, infrastructure, and user acquisition.
* **Accuracy:** The app may have more issues initially because it is a new product, which could compromise transaction accuracy until it is fixed through updates.
* **Compatibility:** It will take a lot of resources to make sure the app functions on different devices and operating systems.
* **Performance and Responsiveness:** While maintaining good performance as the programme grows may be complex, optimizing for it from the start is essential.
* **Stakeholder Satisfaction:** Although the software has the potential to generate significant returns over the long term, stakeholders may be wary due to the associated risks and expenses.

## Evaluation Criteria Table

|  |  |  |  |
| --- | --- | --- | --- |
| **SOLUTION CRITERIA** | **SOLUTION 1** | **SOLUTION 2** | **SOLUTION 3** |
| Scalability | 8 | 6 | 0 |
| Profitability | 7 | 5 | 0 |
| User Accepatance | 9 | 6 | 0 |
| Cost | 7 | 4 | 0 |
| Accuracy | 9 | 6 | 0 |
| Compatibility | 8 | 5 | 0 |
| Performance and Responsiveness | 8 | 7 | 0 |
| Stakeholder Satisfaction | 7 | 5 | 0 |
| **TOTAL** | **63** | **44** | **0** |

## ROI Calculation

The Return on Investment (ROI) is a financial term used to assess an investment's efficiency or compare many assets' efficiency. It calculates the amount of return on an investment in relation to the cost of the investment. To calculate ROI, divide an investment's benefit (or return) by its cost, and the result is stated as a percentage or ratio.

The variables used in this ROI calculation for all the Solutions are as follows:

**Project Costs:**

* Initial Costs: Include costs for software and integration, research and development, hardware investments, marketing and promotions, legal and compliance, and expert services.
* Operational Costs: Comprise training costs, maintenance costs, additional staff, increased overhead, operational risk, and contingency funds.

**Benefits/Savings:**

* Direct Benefits: These are quantifiable and include transaction fees, market expansion, and operational efficiency gains.
* Indirect Benefits: These are qualitative or long-term benefits and include customer satisfaction, brand value, employee efficiency, and market competitiveness.

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Having compared all the 3 possible solutions above, we will move forward with Solution 1, where Scotia Bank integrates UPI into its existing app. It will increase user satisfaction rapidly, is cost-effective, and taps into the existing customer base's comfort zone. The seamless addition of UPI is like a familiar room's facelift that looks good and adds value. It is a strategic move, aligning with the bank's innovation and customer service ethos. It is poised to enhance profitability and stakeholder contentment without the hefty price tag of starting anew.

# RISK METHODOLOGY

## Risk Categories

**Technology Risk:**

System Integration: Challenges in integrating UPI with Scotiabank's existing systems.

Cybersecurity: Increased vulnerability to cyber-attacks and data breaches.

System Downtime: Risks of system failures or downtime affecting transactions.

**Operational Risk:**

Process Adaptation: Difficulties in adapting existing operational processes to the new system.

Human Error: Errors due to lack of familiarity with UPI among staff.

Vendor Dependence: Reliance on third-party service providers for UPI technology and support.

**Compliance and Regulatory Risk:**

Regulatory Compliance: Ensuring adherence to regulations in different jurisdictions.

Data Privacy: Compliance with data protection laws and customer privacy requirements.

Cross-Border Transactions: Managing regulations related to international transactions via UPI.

**Strategic Risk:**

Market Acceptance: Risk that customers may not readily adopt UPI for banking transactions.

Competitive Response: Responses from competitors to Scotiabank's adoption of UPI.

Technology Obsolescence: The risk that UPI technology becomes outdated due to rapid technological advancements.

## Risk Analysis

**Technology Risk:**

System Integration:

Impact: High (40 points)

Likelihood: Medium (25-75%)

Cybersecurity:

Impact: High (40 points

Likelihood: Medium (25-75%)

System Downtime:

Impact: Medium (25 points)

Likelihood: Low (25% or less)

**Operational Risk:**

Process Adaptation:

Impact: Medium (25 points)

Likelihood: Medium (25-75%)

Human Error:

Impact: (10 points)

Likelihood: Medium (25-75%)

Vendor Dependence:

Impact: Medium (25 points)

Likelihood: Medium (25-75

**Compliance and Regulatory Risk:**

Regulatory Compliance:

Impact: High (40 points)

Likelihood: Medium (25-75%)

Data Privacy:

Impact: High (40 points)

Likelihood: Medium (25-75%)

Cross-Border Transactions:

Impact: Medium (25 points)

Likelihood: Low (25% or less)

**Strategic Risk:**

Market Acceptance:

Impact: High (40 points)

Likelihood: Medium (25-75%)

Competitive Response:

Impact: Medium (25 points)

Likelihood: High (Greater than 75%)

Technology Obsolescence:

Impact: Medium (25 points)

Likelihood: Medium (25-75%)

## Risk Monitoring and Control

**Risk Monitoring**

For Scotiabank’s adoption of UPI, risk monitoring will be a continuous and dynamic process. The bank will establish a regular monitoring schedule to review and evaluate the status of each identified risk, including those that are newly emerging. This will be facilitated by a comprehensive risk monitoring system, which could include software tools for real-time tracking and dashboards for quick reference. The Risk Management Officer will play a key role in this process, ensuring that all risks are logged, analyzed for changes in probability and impact, and that this information is accurately reflected in risk reports. These reports will be used to keep all stakeholders, including project teams and senior management, informed and ready to take action when necessary.

**Risk Control**

Controlling risks in the UPI adoption project involves implementing the risk response plans that have been developed. This will include both proactive strategies to mitigate risks before they occur and reactive strategies to address any issues that do arise. The project manager, in collaboration with the risk owner for each risk, will ensure that mitigation strategies are executed according to plan and will adjust those plans as necessary based on the effectiveness of the controls and changes in the project’s environment. The finance team will ensure that the expenditures for risk mitigation are within the allocated risk budget, and the internal audit team will periodically review the risk control measures to assess their effectiveness and compliance with internal and external standards.

## Roles and Responsibilities

**IT Project Manager**

* **Planning**: Develops and manages the project plan, ensuring milestones and objectives are clearly defined.
* **Coordination**: Coordinates between different teams to ensure project tasks are executed efficiently.
* **Risk Management**: Oversees the identification, assessment, and mitigation of project risks.
* **Communication**: Serves as the primary point of communication for project updates and issues.

**Chief Information Security Officer (CISO)**

* **Security Strategy**: Develops and implements the overall cybersecurity strategy to protect the UPI system.
* **Risk Assessment**: Identifies and evaluates information security risks associated with the UPI adoption.
* **Policy Development**: Establishes security policies, standards, and procedures.
* **Incident Management**: Leads the response to any cybersecurity incidents, ensuring minimal impact on operations.

**Compliance Officer**

* **Regulatory Compliance**: Ensures the UPI platform complies with all relevant financial and data protection regulations.
* **Monitoring**: Keeps track of changing regulations and implements necessary changes in the UPI system.
* **Training and Awareness**: Conducts compliance training for staff and raises awareness about regulatory requirements.
* **Reporting**: Reports on compliance issues to the management and regulatory bodies as required.

**Operations Manager**

* **Process Integration**: Manages the integration of UPI into existing operational processes.
* **Operational Efficiency**: Ensures the smooth operation of UPI services with minimal downtime.
* **Vendor Management**: Oversees third-party service providers and vendor relationships related to UPI.
* **Performance Tracking**: Monitors operational metrics to ensure that the adoption of UPI meets performance standards.

**Chief Marketing Officer (CMO)**

* **Marketing Strategy**: Develops strategies to market the new UPI service to customers.
* **Customer Engagement**: Drives customer engagement and adoption of the UPI platform.
* **Brand Management**: Ensures that the UPI service is aligned with the bank's brand and value proposition.
* **Market Analysis**: Analyzes market trends to guide marketing strategies and improve customer satisfaction.

## Risk Budget

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Event** | **Risk Mitigation Cost** | **Contingency Planning Cost** | **Total Potential Cost** |
| System Integration Complexity | $50,000 | $20,000 | $70,000 |
| Cybersecurity Threats | $75,000 | $25,000 | $100,000 |
| Regulatory Compliance Breaches | $60,000 | $30,000 | $90,000 |
| Operational Disruptions | $40,000 | $15,000 | $55,000 |
| Market Reluctance to Adopt UPI | $50,000 | $20,000 | $70,000 |
| **Total Risk Budget** | **$275,000** | **$110,000** | **$385,000** |

## Timing

During the planning stage of Scotiabank's UPI adoption, a risk mitigation plan is created to identify, analyze, and prepare for potential risks. Throughout execution and monitoring, identified risks are logged, with the Risk Log updated regularly to reflect changes. Weekly project team meetings focus on discussing the Risk Log, and updates are communicated to stakeholders. Risk identification and management is an ongoing process, with continuous monitoring and regular reviews of risk strategies to maintain effectiveness. After project completion, a review documents lessons learned in risk management, providing valuable insights for future initiatives.

## Scoring, Interpretation and Thresholds

For Scotiabank adopting Unified Payments Interface (UPI), let’s establish a scoring system, interpretation guidelines, and thresholds for managing risks:

**Scoring**

Impact scoring for risks ranges from low (score of 10 for minor disruptions) to high (score of 40 for major disruptions affecting project outcomes). Likelihood scoring assesses the probability of occurrence: low (25% or less), medium (25-75%), and high (over 75%). The risk rating is calculated by multiplying the impact score by the likelihood percentage. For instance, a high-impact (40) risk with medium likelihood (50%) yields a risk rating of 20.

**Interpretation**

Risks are categorized into three zones: Low-Risk (scores 1-20) where risks are typically accepted with minimal intervention and monitored to ensure they stay low; Medium-Risk (scores 21-60) which necessitates defined mitigation strategies, active management, and regular reviews for effectiveness; and High-Risk (scores 61-120) demanding immediate attention, possible escalation, and detailed response plans with allocated resources for effective mitigation. Each zone guides the intensity and nature of the management response required to handle the risks efficiently.

**Threshold**

**1. Threshold to Communicate an Identified Risk**

* **Rating Value**: 20
* **Interpretation**: Any identified risk with a score equal to or greater than 20 should be communicated to the project team and key stakeholders. This ensures that all relevant parties are aware of potential risks that have reached a level of concern.

**2. Threshold to Move an Identified Risk to the Risk Log**

* **Rating Value**: 40
* **Interpretation**: Once a risk is identified with a score equal to or greater than 40, it should be moved to the Risk Log. This indicates that the risk requires active management and possibly mitigation planning. It is at this stage that the risk is formally tracked and reviewed on an ongoing basis.

**3. Threshold to Communicate a Risk that Has Been Moved to the Risk Log**

* **Rating Value**: 60
* **Interpretation**: Any risk that is being managed within the Risk Log and reaches or exceeds a score of 60 should be escalated and communicated immediately to higher management and possibly the board. This level indicates a serious concern that may need strategic decision-making or reallocation of resources to manage effectively.

## Risk Log

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID No.** | **Rank** | **Risk Description** | **Category** | **Root Cause** | **Triggers** | **Potential Responses** | **Risk Owner** | **Probability** | **Impact** | **Status** |
| 1 | High | System integration complexity | Technology | Incompatibility between UPI and existing banking systems | Initiation of integration phase | Engage with integration specialists, conduct pilot testing | IT Project Manager | Medium (50%) | High (40) | Open |
| 2 | Medium | Cybersecurity threats increase | Technology | New attack vectors specific to UPI transactions | Launch of UPI services | Implement advanced cybersecurity measures, regular audits | Chief Information Security Officer | Medium (50%) | High (40) | Open |
| 3 | High | Regulatory compliance breaches | Compliance and Regulatory | Lack of clarity in international UPI transaction regulations | Expansion to new markets | Continuous legal review, compliance training programs | Compliance Officer | Low (20%) | High (40) | Open |
| 4 | Medium | Operational disruptions | Operational | Changes in internal processes due to UPI adoption | Implementation of UPI transaction processes | Process reengineering, staff training | Operations Manager | Medium (50%) | Medium (25) | Open |
| 5 | High | Market reluctance to adopt UPI | Strategic | Customer resistance to new technology | Marketing campaign start | Market research, targeted marketing strategies | Chief Marketing Officer | Medium (50%) | High (40) | Open |

# IMPLEMENTATION STRATEGY

## Big Bang Implementation Strategy for launching stand-alone Scotia UPI Application App:

Implementing the Big Bang scenario in launching the separate Scotia UPI system includes a well-grounded plan and execution. These include developers, testers, UI/UX designers, security experts, and project managers constituting the cross-functional team. Frequent meetings are held to communicate project rationale, leading to the development of continuous communication channels with stakeholders. A site appraisal is part of infrastructure readiness which entails a technical review of the existing systems and liaising with contractors. This includes testing instruments and security assessments about data migration and its consistency. This involves user education, training, and subsequent documentation with a built-in help desk for post-transition support. Iterations are based on small parallel runs plus continuous users’ commentaries. Regression and performance testing are part of final testing and quality assurance. Scheduled Go Live includes setting a go-live date, simultaneous deployment, and real-time monitoring. After that, post-implementation review and continuous improvement ensure the launch's success, with benefits like single-user experience, ease of management, and cost savings. The challenges include possible big problems and lack of rollback options.

* **Team Formation and Roles:**  
  We will create a cross-functional team where developers, testers, UI/UX designers, security experts, and project managers will participate. The critical positions mentioned here are the project manager, technical leads, security officer, and user experience lead. The responsibilities of each team member will be carefully outlined to promote effectiveness in collaboration.
* **Stakeholder Alignment:**  
  Organize stakeholder meetings to inform the rationale behind the big bang launch. Talk about issues, highlight the advantages of the project, and set up a standard view of the UPI application. Ongoing alignment of the project will be ensured by establishing regular communication channels.
* **Infrastructure Readiness:**
  + **Technical Assessment:**  
    Conduct a detailed review of existing infrastructure to establish potential problems and improvements requisite for UPI adaption. It assesses server capability, network abilities, as well as database suitability.
  + **Vendor Coordination:**  
    Seek an engagement with third-party suppliers and check the compatibility of their system with UPI application requirements. Set up SLAs, keep communication lines open, and resolve matters as they occur.
* **System Integration and Testing:**
  + **Comprehensive Integration:**Develop a process for cross-functional communication and a communications architecture that spans the entire organization. Different automated testing tools are used in the testing process, which focuses on the program's functionality, security, and performance under consideration.
  + **Security Testing:**  
    Conduct thorough security tests like a pen test or audit and identify vulnerabilities’ solutions. Ensure that data transmission is secure through an installed encryption protocol upholding the industry's approved information assurance standards.
* **Data Migration and Validation:**
  + **Data Migration Plan:**  
    Develop a comprehensive blueprint for migrating user information and account details into the prevailing UPI framework. Set up verification controls to confirm the correct migration of the accurate information. The process of securing user data will minimally put the operations down.
  + **User Education:**  
    Create a simple handbook explaining the users’ ways of transferring their information. Tell users what sources their individualized data is located under the new UPI.
* **User Training and Documentation:**
  + **Training Programs:**Prepare and conduct user’s training, including the clients and support specialists. The training will include using the UPI app, how to secure it, and where to get assistance.
  + **Helpdesk Setup:**  
    Set up a support desk resourced to handle user queries and post-transition issues. Offer various modes of seeking help for the users, such as live chat, email, and phone support, among others.
* **Parallel Run and User Feedback:**
  + **Limited Parallel Run:**Carrying out short-parallel testing of the UPI application with coexisting systems to uncover the problems. Enable the provision of continual feedback by users. A few people will be included during this phase to keep the effect minimal.
  + **Continuous Improvement:**  
    Achieve an iterative approach for agile bug fixes and customer-oriented change. Frequently update users and make them part of the feedback/revision cycle.
* **Final Testing and Quality Assurance:**
  + **Regression Testing:**  
    Perform a last round of testing with both regression and confirmation tests. Ensure strict quality standards to enforce the application’s reliability.
  + **Performance Testing:**  
    Test the ability of the system to withstand the anticipated demands. Ensure responsiveness and reliability of application in user interventions by optimizing its performance.
* **Scheduled Go-Live:**
  + **Launch Date Determination:**  
    Establish an agreed-upon release date after assessing the system’s preparedness and receiving user input. Design an effective communication strategy, including communication for the awareness of all users, stakeholders, and the public regarding the official launch.
  + **Simultaneous Deployment:**  
    Deploy UPI application on every platform so users can access all services simultaneously—real-time monitoring of launch.
* **Real-time Monitoring and Support:**
  + **Monitoring Tools:**  
    Include in the design, live monitoring tools for checking up on the app’s responsiveness, how it is used, and security. Keep a watch out for unforeseen problems and act swiftly.
  + **Proactive Support:**  
    Train the customer care representatives to respond to queries, rectify glitches and institute pre-emptive help desks for users. Support lines need to be effective and streamlined in their operations.
* **Post-Implementation Review and Continuous Improvement:**  
  Carry out an in-depth assessment of the launch to determine its success. Learn what worked and why it worked to improve user experiences for the next version or cycle of development.
* **Benefits of Big Bang Rollouts:**
  + **Unified User Experience:** Offers a uniform user experience across the board.
  + **Simplified Management:** Facilitate project management by eliminating the need to monitor many release dates.
  + **Cost Savings**: It eliminates the cost of running different systems simultaneously.
* **Challenges:**
  + **Risk of Large-Scale Issues:** This often includes matters that could pose problems for an entire group of users at once.
  + **Limited Rollback Options:** Rollbacks have only a few options available, we must be well-planned planned accompanied by extensive testing.

Phased implementation strategy for adding the UPI option in the mobile app  
A methodical phase-wise approach to integrating the UPI feature into the Scotiabank mobile application begins with strategic planning, preparation, architecture, and design stages. Detailed design and development include UI creation, back-end integration, and module development. Testing and optimizing input processing, error handling, and performance optimization constitute the final process. The integration stage entails interacting with external agents and sealing a consensus over accurate data. The go-live process comprises deployment and post-launch tasks like training and monitoring users. This approach includes scope out of review, which verifies rejected items, and an impact analysis that considers both positive and negative impacts. A risk mitigation review enables continual and effective management of risks.

* **Phase 1: Planning and preparation** stage, where the project starts with a launching event that forms a dedicated team in charge of specific duties. During this process, a comprehensive requirement analysis is conducted to identify possible risks and develop an effective risk mitigation strategy. Setting up infrastructure and resources includes configuring development and test environments and having available tools tested for proper functionality.
* **Phase 2:** We will concentrate on the **high-level architecture** concerned with formulating the high-level design, client-server model, UI module, error handling, and backend integration. Initial client-server integration begins to establish a secure connection as the development of modules commences at the beginning of coding procedures. In this, scalability issues and a question of the architecture’s ability to grow along with the number of users should also be addressed.
* **Phase 3:** In detailed **design and development**, the creation of user-friendly interfaces precedes integrated backend links connecting the Mobile app to Scotia back-end systems. In module development, there will be implementations and tests of handling the UPI transaction with errors, among other essential aspects. Attention to data flow guarantees smooth communication of information between the mobile application, outside services, and systems implemented by the bank.
* **Phase 4: Testing & Optimisation**: User Input Validation, Error Handling Implementation & Performance Optimisation. Backend integration also secures communication while user interface design is finalized. Validation algorithms and error handling are thoroughly tested, and performance optimizations are designed to improve the system’s performance.
* **Phase 5:** Finally, there is integration for API purposes **and finalization.** The mobile app integrates data synchronization mechanisms to maintain up-to-date transaction data between it and other external systems. It includes the process of smooth information interoperability with outside organizations.
* **Phase 6: Deployment and post-deployment** considerations comprise making an elaborate plan for the non-glitch operation of all UPI mechanisms. User training will also be essential to prepare both the users and the customer support to understand and appreciate the new features. The Go-live process occurs with scrutiny; then, post-launch follow-ups such as continuous monitoring, collecting feedback, and implementing improvements based on the conclusions obtained.
* **Impact Analysis Review:** At this level, one assesses the costs and benefits of implementing UPI. Included are the effects on customers’ satisfaction, advantages in dealing with competitors, ease of operations, compliance with regulations, ability to retain customers, creation of extra revenues, and transaction simplicity. However, we will review to see how we could improve the good elements and tackle the negative ones.
* **Risk and Mitigations Review:** This is meant to reassess and update the risk mitigation plan. It entails reassessing the identified risk, seeing that the mitigation strategy is appropriate, and examining newly developed risks. Management constantly monitors the efficacy of a planned process with constant risk reviews.

## Do-Nothing Implementation Strategy for Scotia Bank UPI Option

The “do nothing approach” implies keeping the situation within Scott Bank, with no introduction of the UP approach. All systems, including Interac payment, customer communication channels, and all their products, will not be changed. The high-level design emphasizes the continuation of operations and, therefore, lacks exploration or adoption of a new digital payments system. It states that the current technology structure of the bank, as well as its transactions, cannot be updated with UPI changes in the future. Potential risks of the impact analysis are customer dissatisfaction, increased operational cost, reduced market positioning and lost opportunities. These mitigation approaches involve improving the Interac platform, getting customer feedback, dynamic analysis of the markets, and keeping pace with the latest digital payments development. This preventive policy envisions adjusting one’s steps with emerging customers’ tendencies and technology changes.

* The “Do Nothing” approach involves Scotia Bank sticking to the status quo and relying on the Interac payment interface with its established interaction channels. No integration of any kind in the UPI system and the same operations as lending and investing will be done.
* Regarding the technological state of the bank, there have been no changes in the current infrastructure, including software solutions, interfaces, and end-user services. Both transactional procedures and digital functionalities remain with Interac without the inclusion of any UPI update.
* **IMPACT ANALYSIS:**
  + **Customer Expectations:** This is a serious risk, especially if it involves tech-savvy consumers who expect the latest innovation like UPI from the bank. This could cause the gradual erosion of the customer base.
  + **Operational Costs:** Avoiding integration with UPI would seem to have initial gains for savings, but this could ultimately result in more manual interventions, higher maintenance for upgrading of Interac, and demanding customer service, which would increase the operational cost for the whole project’s life cycle.
  + **Market Position:** Some of these competitors may incorporate UPI integrated system and provide more services than Scotia Bank leaving the latter at a disadvantage, losing its market edge.
  + **Revenue Generation:** Hence, the bank might not reap some of the income related to UPI capabilities, which can also hinder profit growth.
* **RISKS:**
  + **Loss of Tech-Oriented Clientele**: Competitors with various digital payment alternatives may steal their tech-savvy customers, resulting in an adverse situation for these institutions.
  + **Technological Obsolescence:** The swiftly changing digital banking environment could render the technologies at Scotia Bank outdated.
  + **Missed Revenue Opportunities:** Revenue models and partnerships related to UPI are avoided as this could have been circumvented.
* **MITIGATION:**
  + **Interac Optimization:** Upgrade and improve the current Interac to achieve functional similarities with the modern UPI system.
  + **Active Feedback Mechanisms:** Offer regular questionnaires and response mechanisms in line with customer tastes, adapting minor amendments on present services upon responses.
  + **Dynamic Market Analysis:** Form a task force to monitor the digital payment trends to keep the bank updated on new developments, even without a direct UPI integration.

# TESTING STRATEGY

## Solution #1

**Scope:**

The document will be reviewed by the project team, including developers, testers, and project managers. Additionally, stakeholders from Scotia Bank may also review the document to ensure alignment with business requirements. The document will be approved by the project manager in collaboration with key stakeholders from Scotia Bank.

Software Testing activities carried out with timelines:

Testing activities will be conducted throughout the development lifecycle:

* Unit testing: It includes verifying UPI fund transfer functionality, validate user interactions in the dedicated UPI section, and ensuring error handling provides clear and informative messages. These tests will be carried out concurrently with development.
* Integration testing: After the completion of unit testing, within 1-2 weeks.
* System testing: After integration testing, within 2-3 weeks.
* User acceptance testing (UAT): Prior to release, within 2-3 weeks.

**Test Approach:**

* Process of testing: Testing will follow a phased approach, starting from unit testing and progressing to system testing and UAT.
* Testing levels: Unit Testing, Integration Testing, System Testing, User Acceptance Testing (UAT)
* Roles and responsibilities of each team member:
* Developers: Responsible for unit testing Address defects and assist in troubleshooting.
* Testers: Conduct integration, system, and UAT testing Log defects.
* Project Manager: Overall coordination and monitoring.
* Business Analysts: Validate business requirements.
* Types of Testing:
* Functional testing - Verify that the UPI fund transfer feature in the Scotia Bank mobile app performs as expected, correctly initiates transfers, validates recipient details, and confirms payments.
* Performance testing (non-functional testing) - validate the scalability of the new feature to ensure the Scotia Bank mobile app can manage a growing number of UPI transactions, providing users with a smooth and responsive experience during fund transfers without any issues.
* Security testing (Non-functional testing)- Validate the robustness of security features in place, including encryption and authentication, to safeguard user data and prevent unauthorized access during UPI transactions in the Scotia Bank mobile app.
* Integration testing - Ensure smooth interaction between the Scotia Bank mobile app and external UPI service providers, as well as the bank's backend systems, to makes sure a secure and reliable connection for UPI fund transfers.
* User Acceptance Testing (UAT): Involve actual users in testing the UPI fund transfer feature, obtaining feedback on the user interface, transaction flows, and overall user experience to ensure it meets user expectations and preferences.
* Regression Testing: Confirm that existing functionalities within the Scotia Bank mobile app are not negatively impacted by the integration of the UPI fund transfer feature, ensuring a stable and consistent user experience across all features.
* Testing approach & and automation tool if applicable:
* Manual testing for unit, integration, and system testing.
* Automation tool (e.g., Selenium) for repetitive and regression testing.
* Adding new defects, re-testing, Defect triage, Regression Testing, and test sign-off:
* New defects are logged promptly with detailed information.
* Re-testing will be conducted after defect resolution.
* Conduct defect triage meetings to prioritize and assign defects.
* Regression testing after each code change.
* Test sign-off will be done after successful completion of UAT.

**Test Environment:**

There are four environments required, development Environment, Testing Environment, UAT Environment, and Production Environment. Also Test in different mobile devices (iOS and Android) and network conditions, to ensure the UPI feature is robust across different scenarios. Regular backup of data is recommended and there should be a restore strategy in place in case of data corruption or loss.

**Testing Tools:**

Automation Tool Selenium can be used for UI testing. Jira can be used for test case management. License and other requirements need to be defined based on team size and testing needs.

**Release Control:**

A detailed release management plan outlining version history will be created for each change. Major versions for significant changes, minor versions for feature additions, and patch versions for bug fixes.

**Risk Analysis:**

Identified risks:

* Technical Issues and Outages
* Security Breaches.
* User Error
* Compliance Challenges
* Third-party Dependencies

Mitigation plan:

* Conduct regular extensive testing, including penetration testing and load testing, to identify and address technical vulnerabilities.
* Update security procedures regularly to stay ahead of evolving threats. Implement robust security mechanisms.
* User-friendly interfaces with clear instructions.
* Solid vendor relationships with backup plans

**Review and Approvals:**

* Conduct regular review meetings with stakeholders and Sign-off by business, project management, and development teams.
* A summary of review changes should be traced at the beginning of the document along with an approved date, name, and comment.

Note: This test strategy plan is a high-level document. Detailed test plans and test cases will be created during the testing process.

## Solution #2

**Scope:**

The document will be reviewed by the Quality Assurance team, Project Manager, and Business Analyst. The document will be approved by the Project Manager and Business Stakeholders.

Software Testing activities carried out with timelines:

* User Identification and Registration: 5 days
* In-depth each feature of the new application: 30 days

**Test Approach:**

We will follow an Agile methodology with sprints lasting two weeks. Daily stand-ups will be conducted to discuss progress, and challenges, and plan for the day.

* Testing Levels:
* Unit Testing
* Integration Testing
* System Testing
* User Acceptance Testing (UAT)
* Roles and Responsibilities of Each Team Member:
* QA Lead: Overall test strategy, planning, and coordination.
* Testers: Execution of test cases, defect logging, and reporting.
* Developers: Support in defect resolution.
* Product Owner: Participation in UAT and acceptance of the final product.
* Types of Testing:
* Functional Testing - Validates that each feature of the Scotia UPI application, from user registration to bill payments, performs according to design specifications.
* Security Testing - Ensures that the Scotia UPI application is fortified against potential threats, safeguarding user data and preventing unauthorized access.
* Performance Testing - Evaluates the Scotia UPI system's responsiveness, scalability, and reliability under various usage scenarios, ensuring optimal performance during transactions and interactions.
* Usability Testing - Assesses the user interface and experience in the Scotia UPI app, ensuring it is intuitive and user-friendly for seamless navigation and interaction.
* User Acceptance testing – To make sure that the new app is user-friendly and meets customer expectations.
* Regression Testing - Verifies that recent updates or additions to the Scotia UPI application do not adversely affect existing functionalities, ensuring the overall stability of the system.
* Testing Approach & Automation Tool if Applicable:
* Manual testing for functional and security aspects.
* Automated testing using Selenium for regression testing.
* JIRA for defect tracking and project management.
* Adding New Defects, Re-testing, Defect Triage, Regression Testing, and Test Sign Off:
* Defects logged in JIRA.
* Re-testing within the same sprint.
* Defect triage meetings to prioritize and assign.
* Regression testing before each release.
* Test sign-off after successful completion of all test cycles.

**Test Environment:**

Each type of testing will be conducted in different environments like Development Environment, Testing Environment, Staging Environment, Production Environment

Regular backups of test data before major testing phases will be taken and restore data from backups in case of data corruption.

**Testing Tools:**

* Automation and Test Management Tools Needed for Test Execution:
* Selenium for automation.
* JIRA for test management.
* Number of Open-Source as Well as Commercial Tools Needed:
* Selenium (open source)
* JIRA (commercial)

**Release Control:**

* Release Management Plan with Appropriate Version History:
* Version control using Git.
* Clear documentation of changes in each release.
* Test execution for all modifications in a release.

**Risk Analysis:**

List All Risks:

* Security breach due to external attacks.
* User adoption challenges.
* Technical performance issues.
* Regulatory changes.

Mitigation Plan:

* Strict security protocols.
* Marketing and education efforts for user adoption.
* Continuous performance testing.
* Regular monitoring of regulatory changes.

**Review and Approvals:**

All These Activities Are Reviewed and Signed Off By the business team, Project management, and Development team. A summary of review changes will be documented at the beginning of the document along with an approved date, name, and comments.

Note: This test strategy plan is a high-level document. Detailed test plans and test cases will be created during the testing process.

## Solution # 3 – Do Nothing

**Scope:**

Testing the "Do Nothing" method in Scotiabank involves verifying that the existing systems, processes, and interfaces continue to function as intended. The goal is to ensure that there are no unexpected issues, disruptions, or vulnerabilities that could arise from maintaining the status quo.

The testing document will be reviewed by the Testing Team Lead, Project Manager, and representatives from the Business and Development teams. The document will be approved by the Project Manager in consultation with the Business and Development teams.

**Test Approach:**

* Process of testing: Manual testing with a focus on existing systems and interfaces related to the Interac payment system.
* Testing levels: System Testing, Integration Testing, and User Acceptance Testing.
* Roles and responsibilities of each team member: Test Lead, Testers, Business Analysts, and Development Representatives will be responsible for this testing.
* Types of Testing: Functional Testing, Security Testing, Performance Testing, User Experience Testing.
* Testing approach & and automation tool if applicable: Manual testing approach. No automation tools are planned due to the nature of the "Do Nothing" approach.
* Adding new defects, re-testing, Defect triage, Regression Testing, and test sign-off: New defects are logged through a centralized system. Re-testing was performed after defect resolution. Defect triage meetings are held bi-weekly. Regression testing is conducted after each modification. Test sign-off criteria include completion of all test levels and resolution of critical defects.

**Test Environment:**

Requirements:

* Hardware: Standard banking system infrastructure.
* Software: Current versions of all applications associated with the Interac system.
* Network: Stable and secure network environment.

Test data backed up regularly. The restoration strategy involves ensuring data integrity during the testing process.

**Testing Tools:**

No automation tools are planned. Test management tools for tracking test progress and defects No open-source or commercial tools are deemed necessary for this approach.

**Release Control:**

Detailed release management plan including version history provided to ensure accurate test execution for all modifications in each release.

**Risk Analysis:**

List all risks:

* Customer dissatisfaction
* potential revenue loss,
* technological obsolescence.

Plan to mitigate the risks:

* Enhancing and optimizing the Interac system
* Conducting frequent customer surveys
* Maintaining a task force dedicated to monitoring digital payment trends.

**Review and Approvals:**

All these activities are reviewed and signed off by the business team, project management, development team, etc. Regular review meetings scheduled involving the Business team, Project Management, and Development team. Documented changes discussed during reviews. Approvals were obtained with dates, names, and comments.

# RACI MATRIX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task** | **Abimbola Sanni** | **Bhupinder Singh** | **Geethu Joy** | **Yash Surti** | **Maheep Kaur** |
| Raci Matrix | **R** | A,I,C | I,C | I,C | I,C |
| ROI & EVALUATION CRITERIA | **R** | A,I,C | I,C | I,C | I,C |
| RISK LOG | A,I,C | I,C | I,C | R | **R** |
| IMPLEMENTATION STRATEGY | A,I,C | R | I,C | **I,C** | I,C |
| TESTING STRATEGY | A,I,C | I,C | R | I,C | I,C |

# REFERENCES

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* Sharma.G, (n.d), Test and Debug: Ensuring a Seamless UPI Application, Retrieved from <https://devpathshala.com/test-and-debug-ensuring-a-seamless/>