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**COIT20273: Software Design and Development Project**

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**Assessment 1**

**Project Proposal on Grocemart**

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# Project background

Managing inventory, setting competitive prices, and understanding consumer preferences are challenging tasks for traditional grocers. On the other hand, consumers buying food online are looking for price, ease of use and transparency. Our web application meets these requirements by providing a central location for multiple retailers to sell goods, allowing shoppers to estimate costs and make informed decisions. In addition, we enable store owners to forecast sales, optimize inventory and improve overall business efficiency through predictive analytics. Our goal is to use technology to transform the grocery store experience and ultimately drive the growth and prosperity of retail by providing value to consumers and store owners.

# Project objective

**• Enhanced Shopping Experience:**  
Our primary goal is to provide consumers with a remarkable shopping experience. Customers can easily compare costs and make informed purchasing decisions with many merchants displaying their products on our website, increasing consumer happiness.  
 **• Improved inventory management:**  
Through predictive analytics, we want to help retailers improve their inventory management procedures. By examining past sales data and external factors, stores can forecast demand, effectively manage inventory, minimize inventory and reduce waste.  
 **• Empowering store owners:**  
We want to provide store owners with predictive analytics tools so they can evaluate. sales , See patterns and make data-driven decisions that increase profitability and business performance.

**• Competitive advantage:**  
We aim to give stores a market advantage by providing an integrated platform for predictive analytics. This creative strategy gives retailers an edge over their competitors by offering more personalized offers and better pricing tactics to attract more consumers.  
  
**• Continuous improvement:**

based on user feedback, industry trends and the development of predictive analytics methods, we commit. to continuously improve our platform. We maintain the relevance and value of our platform for users and store owners by constantly updating our features and algorithms.

# High-level user requirements

**Detailed management:**  
  
Resellers should be able to register their locations on the site. They should be able to add, remove and manage product information, as well as prices, photos and descriptions.  
  
**Customer Account Management:**  
  
Customers must be able to register an account to use services such as order history and personalized recommendations. Order tracking, settings management and profile updates should be available to them.  
 **Product Comparison:**  
  
Customers must be able to compare the features and costs of comparable products offered by different retailers. To facilitate an easy decision, the comparison should be presented in an understandable way.

**Predictive Analytics Tool:**  
  
Analytical tools must be available to store owners to forecast sales, identify patterns and make informed choices. The tools should provide insights into consumer behaviour, demand trends and inventory management.  
 **Order submission and management:**  
  
Consumers must be able to securely place orders, add products to carts, and pay at checkout. They should be sent notifications and status updates about the progress of the order, including order confirmation, shipping and delivery.  
  
**Search and filtering functions:**  
  
Product search should be possible by brand, category or customer keyword.  
users should be able to refine search results by availability, by store classification and price category.

# Hardware and software requirements

**Server hardware Configuration:**

* RAM: 8 GB
* Storage: 1 TB
* Processing Power: 2 to 4 CPU cores

**Server Software Configuration**

* Glassfish server
* MySQL

**Developer Tools:**

* NetBeans
* GitHub

# Risk management and quality assurance plans

## Risk management:

|  |  |  |
| --- | --- | --- |
| **Risk item** | **Likelihood of occurrence (High/medium/low)** | **Mitigation strategy** |
| Changes in requirements | High | Engage stakeholders on a regular basis to get updates and feedback. Create a thorough change management procedure to assess and rank new requirements. Maintain open lines of communication between stakeholders and the development team to properly handle changing needs. |
| Technical complexities | Medium | Early in the project, identify potential technical obstacles by conducting a thorough feasibility analysis. Give research and experimentation enough time to tackle complicated problems. Create a cooperative team atmosphere to promote information exchange and problem-solving. Implementing technological redundancy protocols |
| Time delay | High | Make use of agile approaches like Scrum or Kanban to adjust to shifting priorities and deadlines. Divide the work of the project into smaller, more manageable chunks with clear deliverables. To minimise delays, periodically review project plans and make any necessary adjustments. |
| Poor User Experience | Medium | Hold user testing sessions to get input on functionality and usability. Iteratively incorporate user feedback into the development process. To guarantee intuitive and user-friendly interface design, work with expert UX/UI designers. |
| Occurrence of bugs | Medium | Put into effect thorough testing procedures, such as system, integration, and unit testing. To find and fix errors early in the development cycle, use automated testing methods. To find any problems and guarantee code quality, conduct code reviews. Maintain and upgrade testing setups often to mimic real-world usage scenarios. |
| Issues with Data Quality | Medium | Use data cleansing and validation procedures to make sure input data is accurate and dependable. Analyse and profile your data to find any irregularities or contradictions. To track data integrity over time, establish metrics for data quality and monitoring systems. |
| Security Risks | Medium | Use security best practices to safeguard confidential information and stop illegal access, such as access limits, authentication, and encryption. Perform routine vulnerability assessments and security audits to find possible hazards and take proactive measures to mitigate them. Keep up with new security flaws and threats and adjust your security setup accordingly. |
| Supply Chain Disruptions | Medium | Diversification of suppliers and ongoing oversight |

## Quality Assurance plans

**Requirements Validation:**

The Online GroceMart Quality Assurance (QA) Plan describes the processes and procedures used to ensure the platform's dependability, quality, and effectiveness during the development and deployment phases. Key objectives include meeting or exceeding user expectations for functionality, performance, and security, identifying and correcting platform flaws to improve user experience and satisfaction, and implementing a systematic quality management approach that includes validation, testing, and continuous improvement. The essential components of the QA Plan include:  
  
**Requirements Validation:** Hold thorough discussions with stakeholders to verify requirements are accurate and comprehensive and implement a strong change management procedure to handle requirement changes.

**Comprehensive Test Planning:** Create a detailed test plan that covers all areas of the application, including security, usability, performance, and functional testing, with test cases, objectives, and success criteria for each testing phase.

**Quality Assurance Activities include**:   
  
**Code Reviews:** Conduct regular reviews to verify that coding standards are followed, possible issues are identified, and code quality improves.

**Unit testing:** is used to ensure that individual components, such as predictive models and data processing algorithms, perform properly.

**Integration testing:** involves ensuring that various system components, such as data ingestion, processing pipelines, and user interfaces, work together seamlessly.

**End-to-end testing:** validates the predictive analytics solution's complete functionality, dependability, and performance.

**User Acceptance Testing (UAT):** Allow end users to test the solution's usability, functionality, and alignment with business requirements.

**Testing Plan:**

**Functional testing:** It’s ensuring that the programme successfully predicts sales trends, recognises patterns, and delivers actionable insights.

**Performance testing:** This involves evaluating the solution's performance under various data loads and processing situations in order to discover bottlenecks and optimise resource utilisation.

**Security testing:** involves evaluating the solution's security controls and methods to identify vulnerabilities and assure data protection.

**Regression testing:** ensures that new modifications or upgrades do not cause faults in current functionality.

**Usability testing:** involves examining the platform's user interface and interaction to guarantee ease of use and easy navigation.

**Cross-browser and cross-device testing** ensures compatibility and consistent performance across multiple browsers and devices.

**The testing method involves:**   
  
**Test Planning:** Creating detailed test plans that include objectives, parameters, procedures, resources, and schedules.

**Test Case Design:** The development of complete test cases that address all elements of functionality, usability, security, and performance.   
**Test Case Execution:** The systematic execution of test cases, recording results, and finding errors for remedy.

This multifaceted testing methodology guarantees that the platform is strong, secure, user-friendly, and operates well under a wide range of scenarios, all in line with the main goal of providing a high-quality, dependable predictive analytics solution.