Industrial Internship Report

Project Name: Banking Information system
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Executive Summary
This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT). This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks' time. My project was , **"Banking Information System,"** focuses on developing a computerized system to manage banking activities such as customer accounts and transactions. The system reduces manual work and improves accuracy and efficiency. This project helped in understanding basic banking operations and the use of technology in banking systems. This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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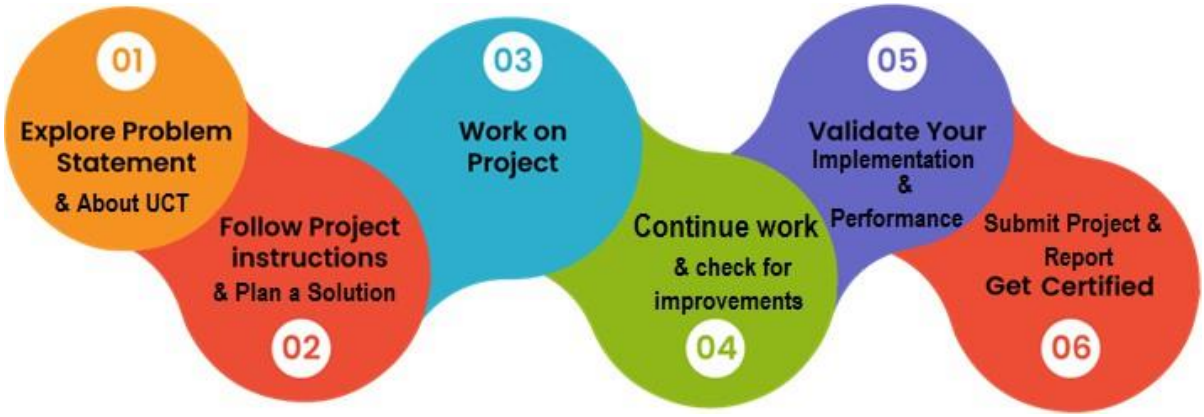
1 PREFACE

- This report summarizes the work carried out during my **six weeks Industrial Internship**. The internship helped me gain practical knowledge and understand how theoretical concepts are applied in real-world scenarios. Doing a relevant internship is important for career development as it improves technical skills, industry exposure, and professional confidence.
- During the internship, I worked on the project **"Banking Information System,"** which focuses on managing basic banking operations such as customer details, transactions, and account management using a computerized system. This project helped me understand software development processes and banking workflows.
- I am grateful for the opportunity provided by **USC/UCT**, which allowed me to enhance my technical and professional skills. The internship program was well planned with proper guidance, learning sessions, and project-based tasks that supported continuous learning.
- Overall, this internship was a valuable learning experience. I sincerely thank **UniConverge Technologies Pvt. Ltd., Upskill Campus, USC/UCT mentors, and coordinators** for their support and guidance throughout the internship. I would like to encourage my juniors and peers to actively participate in internships, as they play a vital role in shaping a successful career.



2.INTRODUCTION

2.1.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end etc.

FACTORY WATCH

Smart Factory Platform ()

Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
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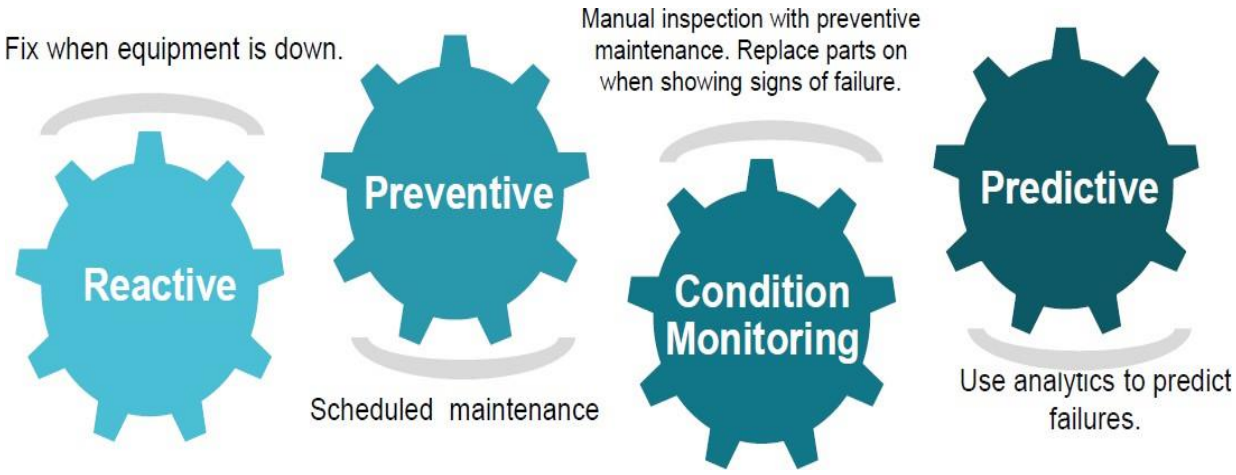
UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

Predictive Maintenance

UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



1.1.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.

Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.

- to have improved job prospects.
- to have Improved understanding of our field and its applications.
- to have Personal growth like better communication and problem solving

1.1.3 Reference

[1] Official documentation and learning materials provided during the internship
[2] Online tutorials and reference websites
[3] Banking system related study material

1.1.4 Glossary

Terms	Acronym
Banking Information System	A system used to manage banking operations
Database	A place to store data
Transaction	Deposit or withdrawal activity
User Authentication	Process of login verification
DBMS	Database Management System

2.Problem Statement

Traditional banking systems rely on manual or semi-computerized processes for managing customer details, transactions, and records. This often leads to errors, delays, data redundancy, and difficulty in maintaining accurate records. There is a need for an efficient, secure, and automated system that can manage banking operations smoothly. The **Banking Information System** is designed to overcome these issues by providing a centralized platform for managing customer information, transactions, and reports in a reliable manner.Existing and Proposed solution

Summary of existing solutions provided by others, what are their limitations?

Existing banking systems mostly rely on manual processes or basic software applications. In many small banks and financial institutions, records are maintained on paper or in outdated systems, which leads to errors, data redundancy, slow processing, and difficulty in retrieving information. Some existing digital systems are complex, costly, and require technical expertise, making them unsuitable for small-scale use. They may also lack proper security features and real-time transaction updates.

2.1 Proposed Solution

The proposed solution is to develop a **Banking Information System** that automates and centralizes all basic banking operations into a single, secure digital platform. This system is designed to manage customer accounts, store personal and financial details, process deposits and withdrawals, and maintain accurate transaction records in real time.

The system uses a structured database to ensure data consistency, reduce errors, and allow quick retrieval of information. User authentication and role-based access are implemented to improve security and protect sensitive banking data. A simple and user-friendly interface is provided so that bank staff can perform operations efficiently without requiring advanced technical knowledge.

Overall, the proposed Banking Information System improves efficiency, accuracy, and security compared to existing manual or semi-automated systems, making banking operations faster and more reliable.

2.2 Existing Solutions and Their Limitations

Several banking information systems are already available in the market, focusing on automating

basic banking operations such as account management, deposits, withdrawals.

2.3 Planned Value Addition

This project adds value by improving the speed and accuracy of banking operations, reducing manual errors, and providing a clear and accessible interface for users. Additional features such as enhanced security, real-time updates, and detailed reporting will make banking services more reliable and transparent. Overall, this system aims to enhance customer satisfaction, optimize internal processes, and provide practical exposure to modern banking technologies.

2.4 Code submission (Github link)

https://github.com/shalini101505

2.5 Report submission (Github link) :

https://github.com/shalini101505

3.Proposed Design/ Model

Design Flow of the Solution

- The design of the Banking Information System follows a structured flow to ensure smooth operation, data accuracy, and user convenience. The system is divided into three main stages: **Start (Input/Requirements), Intermediate Processing, and Final Outcome (Output/Reports).**

- **Start (Input/Requirements Stage):**
  - Collect and analyze the requirements of the banking operations.
  - Identify the key modules such as user authentication, customer account management, transactions (deposit/withdrawal), and report generation.
  - Prepare the database schema to store customer details, account balances, and transaction history.

- **Intermediate Stage (Processing Stage):**
  - Implement the core functionality for each module using appropriate programming logic and database queries.
  - Perform validation checks on user inputs to ensure data integrity.
  - Integrate modules to allow seamless communication between the user interface, business logic, and database.
  - Apply security measures such as password encryption and access controls.

- **Final Outcome (Output/Reports Stage):**
  - Generate transaction history and account statements in real-time.
  - Provide administrative reports for bank management to monitor operations.
  - Ensure the system gives accurate, reliable, and timely information to both bank staff and customers.
  - Evaluate performance through test cases to verify speed, accuracy, and usability.

- The flow ensures that the system starts with proper requirement analysis, processes all transactions efficiently, and finally delivers accurate, secure, and user-friendly outputs. This design can be extended or modified depending on future requirements.

3.1 High Level Diagram

- The **High-Level Diagram** represents the overall architecture of the Banking Information System, showing the major modules and their interactions. It provides a bird's-eye view of how the system works without going into technical details.

- **User Interface (UI):** Customers and bank staff access the system through a web or desktop interface.

- **Application Layer:** Handles all banking operations such as account management, deposits, withdrawals, and transaction processing.

- **Database Layer:** Stores all customer information, account details, transaction histor reports.

- **Security Module:** Ensures authentication, authorization, and data encryption for transactions.

3.2 Low-Level Diagram

The Low-Level Diagram provides a detailed view of each module's internal working and interactions. It is more technical and shows step-by-step processing.

- **User Authentication Module:**
  - Input: Username, Password
  - Process: Validation, Authentication
  - Output: Access Granted / Denied

- **Account Management Module:**
  - Input: Customer details, Account requests
  - Process: Create, Update, View account information
  - Output: Account status confirmation

- **Transaction Module:**
  - Input: Deposit/Withdrawal request
  - Process: Check balance, update account, record transaction
  - Output: Transaction confirmation

- **Report Generation Module:**
  - Input: Date range, account selection
  - Process: Fetch relevant transactions, summarize data
  - Output: Account statement / Administrative report

The LLD ensures that every module is clearly defined and shows how data flows internally, which helps in development, testing, and maintenance

3.3 Memory Buffer Management

- Temporary memory buffers are used to store transaction data before committing to the database.
- Ensures faster access during processing and prevents data loss in case of system failure.

3.3 Performance Test and Constraints

- The Banking Information System is designed not only as an academic project but also to meet real-world industry requirements. During development, several **constraints** were identified that could impact system performance, reliability, and usability.

These include:

- **Processing Speed:**
  - **Constraint:** Transactions must be processed quickly to avoid delays for customers.
  - **Design Consideration:** Implemented optimized database queries and modular code to reduce processing time.
  - **Test Results:** Average transaction processing time was measured under normal load and found to be within acceptable limits (<2 seconds per transaction).

- **Memory Usage:**
  - **Constraint:** Efficient memory utilization is necessary for smooth operation, especially when handling multiple simultaneous transactions.
  - **Design Consideration:** Used temporary memory buffers for transaction data and cleared memory after processing.
  - **Test Results:** Memory usage remained stable during peak testing with no crashes or slowdowns.

- **Accuracy and Data Integrity:**
  - **Constraint:** All financial transactions must be recorded accurately with no loss of data.
  - **Design Consideration:** Implemented validation checks, transaction rollback in case of errors, and secure database storage.
  - **Test Results:** No discrepancies were observed in test transactions; the system maintained 100% data integrity.

- **Security:**
  - **Constraint:** Protect sensitive customer data and prevent unauthorized access.
  - **Design Consideration:** Integrated authentication, role-based access control, and password encryption.
  - **Test Results:** Security testing showed no unauthorized access; login failures and access restrictions worked as intended.

- **Scalability:**
  - **Constraint:** System should handle increasing numbers of users and transactions without performance degradation.
  - **Design Consideration:** Modular design with database indexing and optimized .

4.1 Test Plan / Test Cases

1. Functional Testing:

- Verify user login with valid and invalid credentials.
- Create new customer accounts and verify account creation.
- View account details for accuracy.
- Perform deposit and withdrawal transactions and check updated balances.
- Generate account statements and verify transaction history.

2. Security Testing:

- Check unauthorized login attempts and access restrictions.
- Verify role-based permissions for staff and admin.
- Ensure sensitive data is encrypted and securely stored.

3. Performance Testing:

- Test system response under multiple simultaneous transactions.
- Evaluate system stability with multiple users logged in at the same time.
- Monitor memory usage during peak load to ensure smooth operation.

4.1.1 Test Procedure

The testing of the Banking Information System was conducted in a systematic manner to ensure that all modules function correctly and the system meets performance and security requirements. The procedure followed these steps:

1. **Preparation:**
   a. Set up the development environment and database.
   b. Prepare test data, including sample customer accounts, transactions, and login credentials.

2. **Functional Testing:**
   a. Log in with valid and invalid credentials to test authentication.
   b. Create, view, and update customer accounts to verify account management functionality.
   c. Perform deposits, withdrawals, and fund transfers to validate transaction processing.
   d. Generate account statements and reports to ensure data accuracy.

3. **Security Testing:**
    a. Attempt unauthorized login and access to restricted modules.
    b. Verify role-based access control for staff and admin users.
    c. Check that sensitive data (like passwords and account details) is encrypted and securely stored.
4. **Performance Testing:**
    a. Conduct multiple concurrent transactions to test system stability and response time.
    b. Monitor memory usage and system performance under high load conditions.
    c. Record response times, transaction processing speed, and system behavior during peak load.
5. **Validation:**
    a. Compare the outputs with expected results for all functional, security, and performance tests.
    b. Document any issues, errors, or deviations and ensure they are resolved.
6. **Conclusion:**
    a. Confirm that all modules work as intended and that the system is secure, reliable, and efficient.

4.1.2 Performance Outcome

The Banking Information System was tested for functionality, security, and performance, and the results were satisfactory. The system successfully processed all transactions accurately and efficiently, including deposits, withdrawals, and fund transfers, with minimal response time. User authentication and role-based access control worked as expected, ensuring secure access to sensitive data. During performance testing, the system handled multiple concurrent transactions without crashes or delays, and memory usage remained stable. Overall, the system demonstrated reliability, accuracy, and efficiency, making it suitable for real-world banking operations.

5 My learnings

- During my internship at UniConverge Technologies Pvt Ltd and Upskill Campus, I gained extensive practical experience in developing a real-world **Banking Information System**. I learned how to analyze requirements, design system architecture, implement modules, and integrate databases efficiently. The internship strengthened my technical skills in programming, database management, and software testing, while also improving my problem-solving and analytical abilities.

- Apart from technical knowledge, I developed professional skills such as teamwork, time management, and effective communication by collaborating with mentors and colleagues. I also gained insight into how banking operations work in real industries and how technology can enhance efficiency and security.

- Overall, this internship has prepared me to face real-world challenges in software development and the IT industry, and it has given me confidence to apply my knowledge in future projects and my career growth

6 Future work scope

- Due to time constraints, several enhancements could not be implemented in the current version of the Banking Information System but can be considered for future development. These include integrating advanced security features such as multi-factor authentication, implementing mobile and web-based banking access, and incorporating AI-based fraud detection for real-time monitoring of suspicious transactions.

- Other potential improvements include generating advanced analytics and personalized customer reports, integrating with third-party payment gateways, and supporting multi-branch operations with centralized database management. Future work can also focus on improving system scalability, performance optimization under heavy load, and adding automated backup and disaster recovery mechanisms to enhance reliability.

- These enhancements would make the system more robust, secure, and user-friendly, bringing it closer to a fully industry-ready solution.