A REPORT ON
RECRUITMENT INVOICE TOOL

BY

Name(s) of the student(s)	Enrolment/Registration No.
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Prepared in the partial fulfillment of the

Practice School II Course

AT

HCL Technologies, A8/9, sector 60, Noida, Uttar Pradesh

A Practice School II Station of

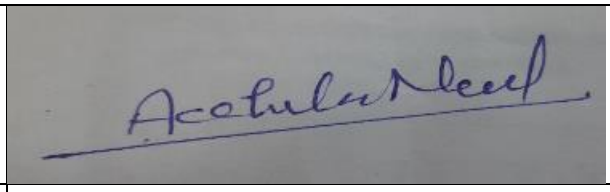
BML MUNJAL UNIVERSITY

(August, 2023)

Certificate of authenticity

CERTIFICATE

This is to certify that Practice School Project of **Ridit Jain** titled **Recruitment Invoice Tool** to the best of my knowledge is a record of bonafide work carried out by him under my guidance and/or supervision. The contents embodied in this report, to the best of my knowledge have not been submitted anywhere else in any form for the award of any other degree or diploma. Indebtedness to other works/publications has been duly acknowledged at relevant places. The project work was carried during **01 June 2023** to **02 August 2023** in **HCL Technologies.**

	
Signature of PS-II Faculty Advisor	**Signature of industry Mentor/Supervisor**
Name: Dr. Ranjib Banerjee	**Name:** Mr. Acchuta Nand. Tripathi
Designation: Assistant Professor	**Designation:** Senior Product Manager
10 August 2023 ***Date***	08 August 2023 ***(Seal of the organization with Date)***

INTERNSHIP COMPLETION CERTIFICATE

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ridit Jain** student of **B.TECH CSE** at **BML Munjal University,** had undergone Internship in our Organization from **1st June, 2023** to **28th July, 2023** and submitted his/her project report to us on **Recruitment Invoice Tool** and the same has been found satisfactory.

His/her conduct and performance were good during the Internship period.

Regards,

Ashish Bhalla
Director – Human Resource
HCL Technologies Ltd

BML MUNJAL UNIVERSITY PRACTICE SCHOOL – II JOINING REPORT

Date: 04 August 2023

Name of the Student	Ridit Jain
Name and Address of the Practice School – II Station	HCL Technologies Limited, A8/9 sector 60, Noida, Uttar Pradesh, 201301
Date of Joining PS-II station as per offer letter	01 June 2023
Actual date of reporting to PS-II station	01 June 2023
Department Allocated	Enterprise Digital Services (EDS)
Name and Designation of the Industry Guide/ IndustryMentor for the Project	Mr. Acchuta Nand. Tripathi (Senior Product Manager)
Industry Mentor Contact No. (If available)	NA
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ACKNOWLEDGEMENTS

The successful completion of this project has been made possible through the valuable support and guidance extended by numerous individuals. It is with heartfelt gratitude that I acknowledge their contributions.

1. I would like to express my gratitude to the Head of the organization, Prof. Shyam Menon, Vice Chancellor, BML Munjal University and Prof. (Dr) Maneek Kumar, Dean, School of Engineering and Technology (SoET), for creating an environment and providing resources that made the Practice School 2 (PS 2) and project execution possible.
2. I am thankful, for the support and guidance from Mr. Alipta Dutta, Dr. Kiran Khatter, Dr. Yogesh Gupta and Dr. Ranbir Singh for their effort in smooth coordination of the PS-2 program at our organization.
3. Special thanks to Mr. Acchuta Nand Tripathi, who played a key role as the expert in charge of the project and provided insights and expertise that helped shape its direction.
4. I can't forget to acknowledge Dr. Ranjib Banerjee, Faculty Mentor from the University for his feedback, encouragement, and unwavering support.

Lastly, I extend my appreciation to my colleagues for their spirit as well as my family and friends, for their unwavering encouragement.

ABSTRACT

This project report introduces the development and implementation of the "Recruitment Invoice Tool" at HCL with the goal of improving the efficiency of the vendor claim process. The tool automates claim submission, approval and payment procedures resulting in reduced processing time and fewer errors. The report provides an account of the stages of the project including requirement analysis, UI/UX design, full stack development and deployment. One noteworthy aspect is the integration of AI models, for generating rate cards. The outcome of the project is a streamlined workflow, improved accuracy, and enhanced user experience. The report encapsulates the application of technology to optimize operational processes and underscores the significance of automation in modern business practices. The project was executed by Ridit Jain under the supervision of Mr. Acchuta Nand. Tripathi and contributes to HCL's commitment to innovation and excellence. This abstract succinctly conveys the project's essence, methodologies, and outcomes, serving as a guide to the report's key aspects.

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A BRIEF INTRODUCTION OF THE ORGANIZATION'S BUSINESS SECTOR

Automation – Automation refers to the utilization of technology to carry out tasks that would typically require involvement. It has the potential to enhance efficiency, quality, productivity, and overall customer satisfaction across a range of sectors such, as manufacturing, banking, healthcare, and education. NASSCOM predicts that automation will be a factor driving India's technology sector in 2023 [1]. The integration of diverse use cases and the realization of value are the expected outcomes.

Cybersecurity – Cybersecurity entails safeguarding data, systems, and networks from cyber threats like hacking, phishing, ransomware attacks and espionage. In today's era cybersecurity is crucial for ensuring the safety and privacy of individuals as well as businesses and governments. As of 2021, the cybersecurity market in India was valued at $10 billion USD with projections indicating growth to over $15 billion USD by 2023 [1]. The National Cyber Security Policy established in 2013 serves as the framework for addressing cybersecurity concerns in India.

Cloud – Cloud computing involves accessing computing services such as servers, storage facilities, database software and analytics via the internet. This model offers scalability, flexibility, cost effectiveness and innovation opportunities, across applications and industries. According to a report, from Business Today, the adoption of cloud technology is playing a role in propelling the IT sector in India. There is a growing demand, for solutions that incorporate cloud, multi-cloud, and edge computing capabilities.

Digital – Digital refers to the utilization of web, social, and analytic technologies to create solutions that enhance customer engagement and business outcomes. It has the potential to transform aspects of business operations such, as marketing, sales, service, product development and supply chain. According to NASSCOM, digital is the focus area for the technology sector in India in 2023. They predict increase in adoption of experiences and immersive technologies in India [1].

Artificial intelligence – Artificial intelligence (AI) on the other hand involves machines simulating intelligent processes like machine learning, reasoning and decision making. AI can drive innovation, growth and have a social impact across various fields including healthcare, education, agriculture, and security. As per IBEF reports India ranks among the top three countries globally in terms of AI research publications and patents. Accenture predicts that by 2035 AI could contribute around 957 billion U.S. Dollars to India's economy [1]. In fact, India is witnessing a surge in AI startups and initiatives leading the race in this field.

OVERVIEW OF THE ORGANIZATION

Brief history – HCL Technologies Ltd., an IT services and consulting company based in Noida has a rich history. It was established by Mr. Shiv Nadar in 1976 as a part of HCL Enterprise, a company renowned for developing India's microcomputer and networking OS. In 1991 HCL Technologies emerged as an entity and ventured into the software services industry. That year it also went public with its public offering (IPO). Over time the company expanded globally and made acquisitions such, as Deutsche Software (1999) Gulf Computers (2001) Capital Stream (2008) Axon Group (2008) Volvo IT (2016) Geometric Ltd. (2016) C3i Solutions (2018) Strong Bridge Envision (2019) and DWS Limited (2020) [2].

Business size – In terms of business size as of December 2022 HCL Technologies boasts a market capitalization of 3.4 trillion rupees ($45.5 billion USD). This places it third among India's IT companies in terms of market value. Additionally, its revenue for the year 2020-21 amounted to $10.7 billion USD with an income of $1.6 billion USD. With operations spanning across 50 countries the company employs around 176,000 individuals as of September 2021[2].

Product lines – HCL Technologies provides an array of products and services, in areas including digital transformation, cloud computing, engineering, cybersecurity, analytics, artificial intelligence, internet of things, blockchain and automation. It caters to industries such, as banking, financial services, insurance,

healthcare, life sciences, retail, consumer goods, manufacturing, energy utilities, public services travel transportation logistics media entertainment communications and education.

Competitors – Some of the major competitors of HCL Technologies are Tata Consultancy Services (TCS), Infosys, Wipro, Accenture, IBM, Cognizant, Capgemini, Tech Mahindra, and L&T Infotech. Some of the ways that these companies are in competition with HCL Technologies are:

- They offer similar IT services and solutions to clients across various industries and geographies, such as application development and maintenance, cloud computing, digital transformation, engineering, R&D, infrastructure management, business process outsourcing, etc.
- They compete for market share, revenue, profit, clients, talent, innovation, quality, and reputation in the global IT industry.
- They have different strengths and weaknesses in terms of their size, scale, growth, margins, diversification, client satisfaction, employee engagement, social responsibility, etc.

Some of the aspects of company-wise competition among HCL Technologies:

- **Profit growth –** Infosys led the year-on-year (YoY) profit growth in Q2 FY23, followed by TCS and HCL Technologies. Wipro performed the worst with a de-growth.
- **Hiring –** Infosys outperformed its competitors by recruiting, over 10,000 employees in the quarter of FY23. TCS and HCL Tech also experienced growth in their workforce although Wipro had higher number of hires during this period.
- **Client addition –** HCL Tech added the greatest number of new clients in four bands of $1 mn+, 10 mn+, 50 mn+ and 100 mn+ in H1 FY20, followed by Infosys, TCS and Wipro [3].

Brief summary of all departments – HCL Technologies has various departments that are responsible for different functions and operations of the company. Some of the key departments are:

- **Business Services –** The Business Services division specializes in offering business process outsourcing (BPO) services, to clients in industries and regions. They provide solutions like finance and accounting human resources, supply chain management, customer service and digital marketing.
- **Engineering and R&D Services –** The Engineering and R&D Services department caters to clients from sectors and technologies by providing engineering, research, and development services. Their solutions encompass product engineering, software engineering, platform engineering, industrial engineering, and embedded systems.
- **IT and Business Services –** The IT and Business Services division extends its offerings of IT and business services to clients, across domains and geographies. Their solutions include application development, maintenance enterprise application services, infrastructure management services, cloud services, cybersecurity services, data analytics services, artificial intelligence services, internet of things services, blockchain services automation.
- **Products & Platforms –** This department provides products and platforms to clients across various industries and technologies. It offers solutions such as DRYiCE (an AI-based automation platform), HCL Commerce (an e-commerce platform), HCL Volt MX (a low-code app development platform), HCL Domino (a business application platform), HCL OneTest (a software testing platform), HCL Sametime (a collaboration platform), HCL Workload Automation (a workload automation platform), and HCL AppScan (a security testing platform) [2].

PLAN OF INTERNSHIP

Start of internship- 1st June 2023 **End of internship-** 2nd August 2023

Branch/department- Enterprise Digital Services (EDS), this is responsible for transformation or improvement in the business operations, culture, and costumer experience of the organization. It involves aligning the digital solutions across all activities, people, and processes to do business digitally and compete

more effectively in the market. It is driven by changes in customer expectations and demands for higher digital experience. It requires cross-collaboration among departments and leadership from C-level executives.

Duties and Responsibility- During my HCL internship, I undertook the "Recruitment Invoice Tool" project, aimed at streamlining vendor claim processes. This role encompassed end-to-end responsibilities, resulting in a successful full stack application. I led requirement analysis, creating Data Flow Diagrams and ER diagrams. Utilizing Figma, I designed an intuitive UI aligned with HCL branding. I implemented frontend using Flutter, developed efficient SQL tables, and integrated AI models for rate card generation. Deployment into HCL's test server was executed with best practices, ensuring smooth transition to the live environment through collaboration with the IT team.

BACKGROUND AND DESCRIPTION OF THE PROBLEM

Introduction:

In the contemporary landscape of organizational efficiency and process optimization, the importance of seamless and streamlined operations cannot be overstated. Within this context, the present project endeavors to address a pressing concern within HCL through the development of the "Recruitment Invoice Tool." This report serves to elucidate the purpose, background, and scope of the project, providing a comprehensive understanding of the problem at hand and the subsequent methodology employed for its resolution.

Purpose of the Report:

The fundamental purpose of this report is to chronicle the development and implementation of the Recruitment Invoice Tool, a pivotal project aimed at enhancing the efficiency of the vendor claim process at HCL. This document aims to provide a detailed account of the project's conception, design, and

development phases. By documenting these aspects, the report intends to showcase the practical application of skills and techniques applied in this project.

Background and Literature Survey:

In today's changing business world effectively managing vendor claims is crucial, for operations. However manually handling tasks like invoicing, claim submissions, approvals and payments can be time consuming and resource intensive. Not that but it also introduces the risk of errors and delays. To overcome these challenges many industries have embraced the concept of automated tools for claim processing.

Research shows a growing interest in leveraging technology to streamline and improve the accuracy of vendor claim processes. These automated tools have proven to enhance accuracy reduce processing times and bring transparency to claim workflows. They incorporate elements such, as user interface design, database management and even artificial intelligence models to validate rate cards.

Immediate Problem and Reasons for Interest:

The Recruitment Invoice Tool was created in response, to the problem of inefficiency and potential inaccuracies with the processing of vendor claims, at HCL. The need for a more streamlined, accurate, and time-efficient solution led to the project's initiation. The existing manual process was susceptible to errors, lacked real-time tracking, and could lead to discrepancies in vendor payments, impacting relationships and overall operational effectiveness.

The rationale for the keen interest in this project is twofold. Firstly, the tool aligns with HCL's commitment to technological innovation and operational excellence. Secondly, automating and enhancing the vendor claim process directly contributes to smoother interactions between HCL and its vendors, ultimately fostering better business relationships and organizational efficiency.

Method of Attack or Treatment:

The approach taken to address the problem encompasses a comprehensive strategy involving various stages. This includes detailed requirement analysis, design of user interfaces for optimal user experience, establishment of efficient database structures, integration of artificial intelligence models for rate card generation, and seamless deployment on HCL's production server. By adopting a holistic methodology, the project aims to not only address the immediate concerns but also to create a sustainable solution that aligns with industry best practices.

Outline of the Report:

This report is structured to provide a clear and chronological account of the project's journey. It will cover the requirement analysis and design phase, detailing the creation of Data Flow Diagrams (DFDs) and Entity-Relationship (ER) diagrams. The development phase, encompassing frontend, backend, and AI model integration, will be elaborated upon. The report will conclude by providing information, about how the Recruitment Invoice Tool has been implemented and its overall influence, on HCLs vendor claim process.

MAIN TEXT:

Assumptions Made:

Throughout the project, we took into account the considerations to guide the development of the Recruitment Invoice Tool:

1. **Data Quality:** We assumed that the data provided for invoices and vendor claims would be precise and kept up to date. Any discrepancies or errors, in the data could potentially impact the tools functionality and reliability.

2. **Stakeholder Engagement:** We assumed that both internal users and external vendors would actively engage with the tool. We expected that the user interfaces, ease of use would encourage participation and adherence, to the automated process.
3. **Server Infrastructure:** It was our understanding that HCLs production server had capacity and capability to host and maintain the tool without compromising performance or security.
4. **Seamless Integration:** We expected that all the different parts of the tool such as, the user interface, the system, the database, and the AI model will work perfectly and would come together smoothly without causing any compatibility problems. This would also result in reducing the complexity of troubleshooting during development.
5. **Minimal Disruption to Workflows:** We assumed that implementing the Recruitment Invoice Tool wouldn't interfere with any other operational processes, within HCL.

Roles and Responsibilities:

The Recruitment Invoice Tool includes user roles, with responsibilities are as follows:

1. **Vendors:** Vendors are responsible for submitting claim through the tool by providing accurate information about the hired person in HCL.
2. **Source Validation Team**: This team reviews the claim requests to ensure their authenticity and cross check the information provided with the company's records. They play a role in guaranteeing the accuracy of each claim.
3. **HR Team:** The HR Team carries out the verification of the hired individuals. They Evaluates details submitted by vendors such as specific skills (vanilla, cloud, AI/ML) and experience.
4. **Finance Team:** The Finance Team is responsible for creating rate cards based on factors like region, experience level and importance to the company. They ensure invoicing according to these rate cards.

System Architecture:

The Recruitment Invoice Tool incorporates a scalable system architecture to ensure operations and efficient interactions among its various components. The architecture consists of the following elements:

1. **Front-End Interface:** The front-end interface of the application allows vendors and internal teams to seamlessly interact with the tool.
2. **Middleware or APIs:** To facilitate communication and integration, between modules and external systems, the system architecture includes middleware or APIs. This enables data exchange between the Recruitment Invoice Tool and other systems like HR databases, financial software, or external verification services.
3. **Centralized Database:** All necessary information, including vendor details, claim requests, verification status, rate cards and dispute resolution records are stored in a database.
4. **Verification Module:** This module handles the verification process by allowing the Verification Team to validate claim requests and classify them as verified or rejected.
5. **HR Verification Module:** The HR Verification Module facilitates verification conducted by the HR Team to ensure that hired individuals are suitable for their roles.
6. **Finance Module:** Responsible for generating rate cards based on predefined criteria and managing the invoicing process.
7. **Rate Card Generation:** Generating rate cards is a part of the Recruitment Invoice Tool ensuring that vendors are accurately invoiced. This process involves steps to guarantee precision:

   1. **Content extraction:** The curriculum vitae (CV) of the hired person is processed by an AI model integrated into the system. The AI model extracts relevant information such as qualifications, skills, experience, and other pertinent details from the CV.

2. **Automatic Rate Card Generation:** Based on the extracted information, the AI model automatically generates a preliminary rate card. It applies predefined algorithms and criteria to calculate the rate card values. It considers factors like the region of the hired person, their experience, and importance to the company.

3. **Store in Database:** on approval store the data in the database.

Description of activities outlined:

1. **Requirement Analysis and Design Phase:**

- Collaborated with stakeholders to gather requirements and understand the intricacies of the existing vendor claim process.
- Created a detailed synopsis outlining the project's scope, objectives, and key functionalities.
- Developed comprehensive Data Flow Diagrams (DFDs) to visualize the flow of data and interactions within the application.
- Designed an Entity-Relationship (ER) diagram to model the database structure and relationships.

2. **User Interface Design:**

- Utilized Figma, a collaborative design tool, to create an intuitive and user-friendly interface for the application.
- Ensured a seamless and visually appealing design that aligned with HCL's branding.

3. **Full Stack Development:**

- Implemented the frontend of the application using modern technologies Flutter which is based on Dart.
- Designed and developed SQL tables to store and manage the necessary data efficiently.

- Developed the backend using python.
- Integrated AI models generation of rate cards.

4. **Deployment and Production:**

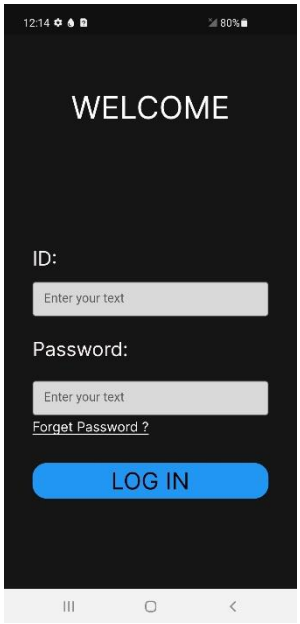
- Applied best practices to deploy the application on HCL's test (development) server.
- Ensured proper configuration, security measures, and optimization for performance.
- Collaborated with the IT team to address any deployment challenges and ensure a smooth transition to the live environment.

Results Obtained/Illustrations:

The successful implementation of the Recruitment Invoice Tool is evidenced through its functional components and outcomes:

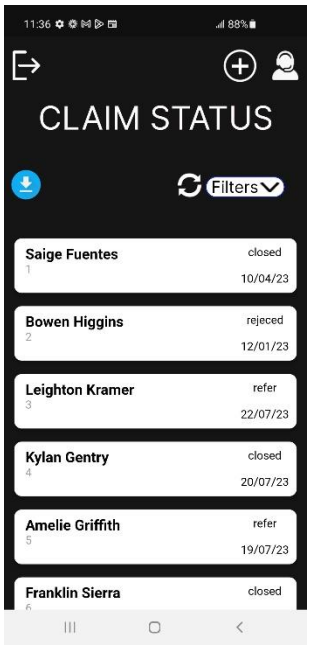
1. **User Interface Screenshots:**

   Screenshots depicting the intuitive user interface of the tool, showcasing the step-by-step claim submission process and user interactions.

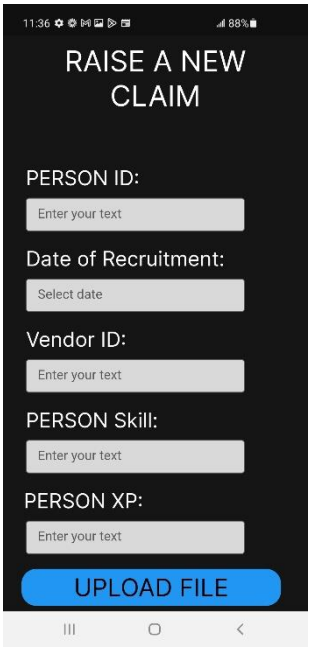


Login Page

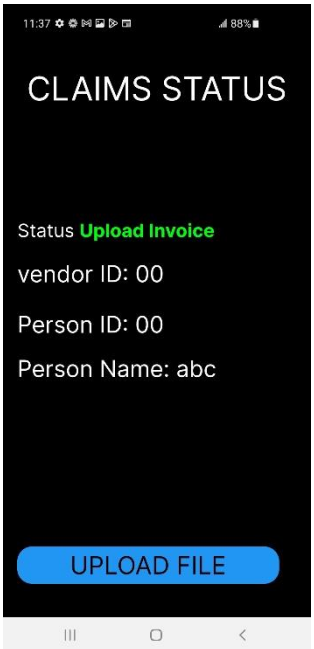
Forgot Password Page



View all Claim Page

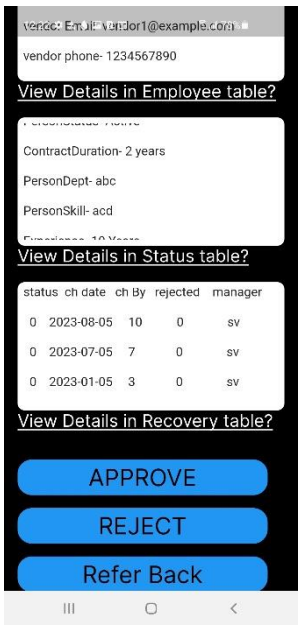


Raise a New Claim Page



View Claim Status Page

Menu Buttons to access different Table.

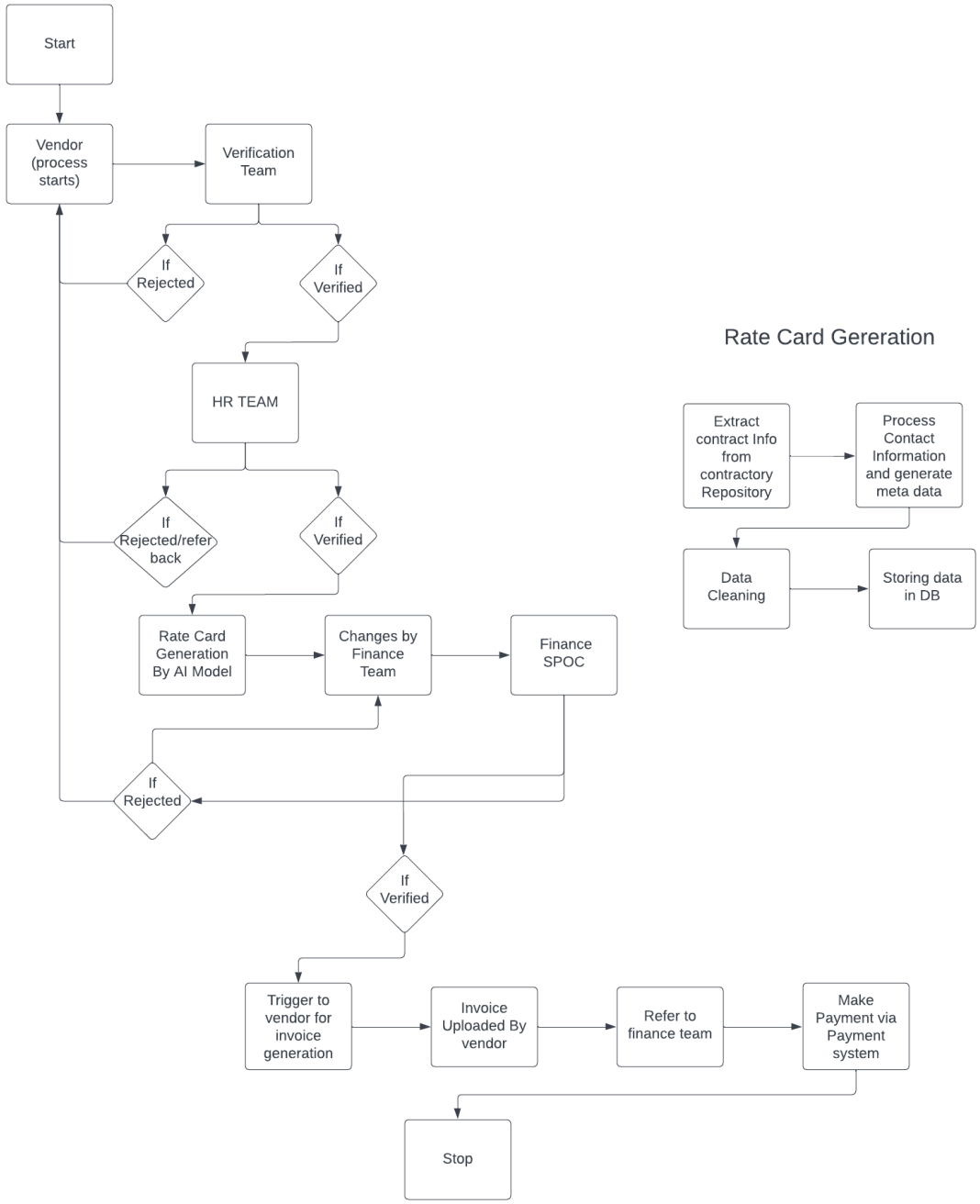


Details of a particular Claim and options to take action.

In case of refer back, remark is necessary.

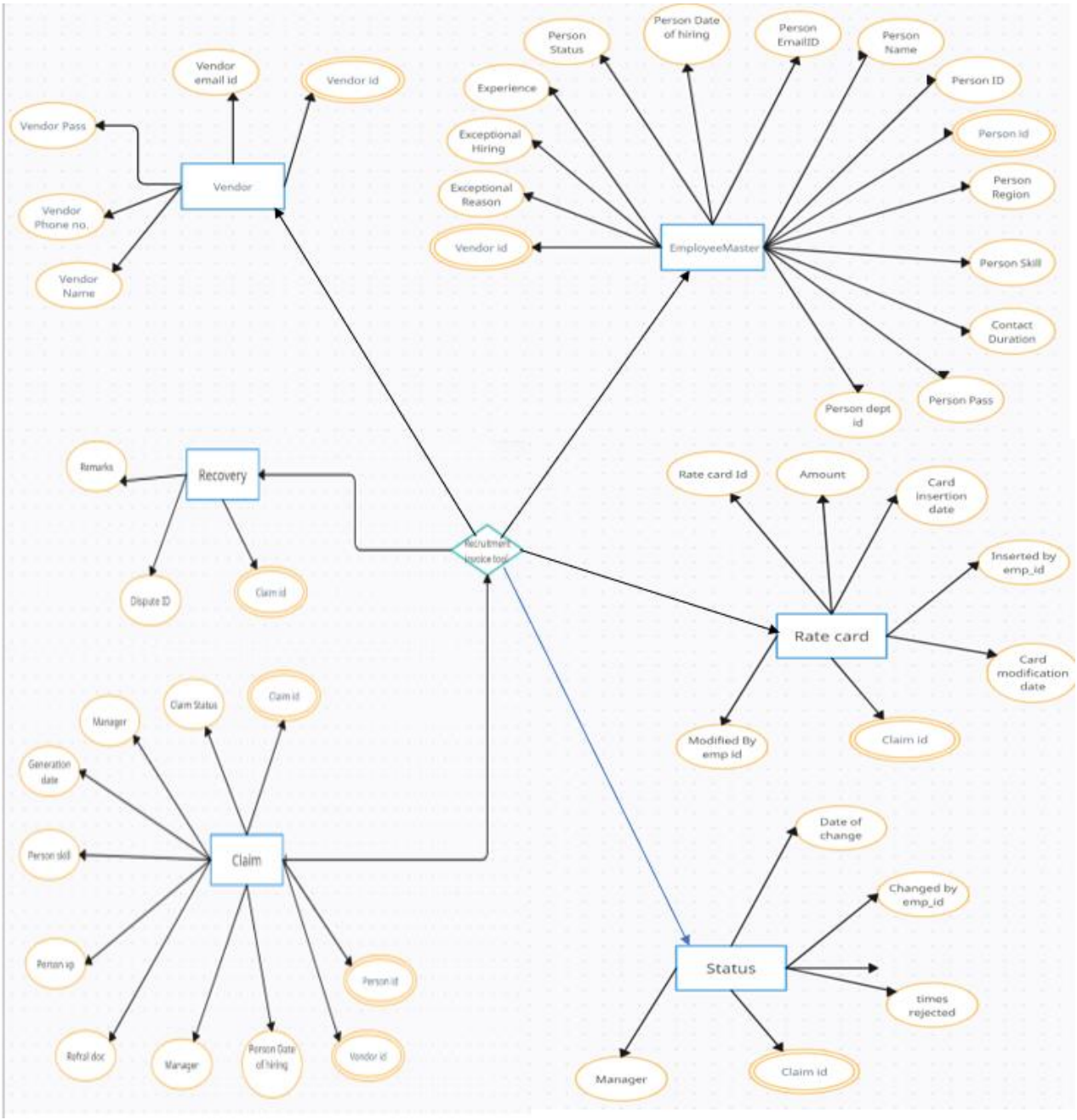
2. Data Flow Diagram:

Following is depicting the intuitive user interface of the tool, showcasing the step-by-step claim submission process.



3. Entity-Relationship (ER) Diagram:

The ER diagram illustrating the database structure, highlighting the relationships between different entities such as vendors, claims, approvals, and payments.



Discussion and Interpretations:

The conversation, during the project mainly focused on what it means and how it can be improved. The fact that the tool was successfully implemented showed that using automation to improve business processes is an option. The analysis of the results indicated that by simplifying the process of making claims efficiency increased and relationships with vendors improved.

During the discussion we also talked about challenges such as user adaptation to the new process and possible technical issues. We even touched on how this tool could be applied to other areas of operation.

To sum up, the project's execution and results demonstrated the positive impact of technology driven solutions can have an impact on optimizing workflows. It highlighted the practicality of automation and designing, with users in mind which sets a precedent for improvements, in efficiency.

Outcomes:

- **Vendor Claim Process Streamlining:** The Recruitment Invoice Tool that was developed has effectively streamlined the vendor claim process resulting in reduced processing time and fewer manual errors.
- **Enhanced User Experience:** The user-friendly interface, designed using Flutter has greatly enhanced user interactions. This has garnered feedback, from both users and external vendors.
- **Efficient Data Management:** The claim related data is efficiently managed in SQL tables allowing for smooth retrieval and accurate processing.
- **AI Driven Rate Card Generation:** An integrated AI model contributes to the generation of rate cards expediting the claims process.
- **Optimized Deployment:** The project was successfully deployed on HCLs Test server ensuring functionality and scalability in a real-world environment.

- **Enhanced Transparency:** The automated system provides visibility into the status of claims improving communication between HCL and vendors.
- **Valuable Insights:** Through this project experience we gained insights into practical applications of full stack development, UI/UX design, database management and deployment procedures.

Conclusions and Recommendations:

To sum up the creation of the Recruitment Invoice Tool has brought about improvements, to the vendor claim process at HCL. This successful project implementation highlights how technology driven solutions can simplify workflows. The streamlined submission of claims, utilization of AI, for rate card generation and a user-friendly interface all work together to enhance efficiency and precision.

Based on the outcomes of the project we can make several recommendations to further refine and expand the tool:

1. **User Training and Support:** Provide comprehensive training and support for users to ensure effective utilization of the tool. Regular feedback sessions can help identify areas for improvement and user preferences.
2. **Real-time Analytics:** Implementing real time analytics and reporting features will provide stakeholders with insights into claim processing trends, potential bottlenecks, and opportunities for optimization.
3. **Scaling and Performance:** As usage increases it is crucial to monitor the tools performance and make necessary optimizations to ensure reliable performance.
4. **Feedback Mechanism:** Establishing a feedback mechanism for users and vendors will allow us to gather insights into their experiences with the tool and obtain suggestions for improvements.

5. **Functional Collaboration:** Encouraging collaboration between technical experts and domain specialists is essential, in ensuring that the tool remains aligned with the evolving needs of the business.

REFERENCES

Cole, M. A. (1981). The quality and process of the internship experience. *Professional Psychology*, 125-570.

[1]hcltech. (n.d.). *about us*. Retrieved from https://www.hcltech.com/about-us

[2]hcltech. (n.d.). *digital workspace*. Retrieved from https://www.hcltech.com/digital-workplace

Li, D. &. (2014). An investigation into energy-saving programming practices for android smartphone app development. . *Proceedings of the 3rd International Workshop on Green and Sustainable Software*, 46-53.

Muthukumar, N. &. (2012). *A Study on Quality of Work Life at HCL Technologies Limited.* Chennai: International Journal of Management Research and Reviews.

[3]owler. (n.d.). *HCLTech*. Retrieved from https://www.owler.com/company/hcltech

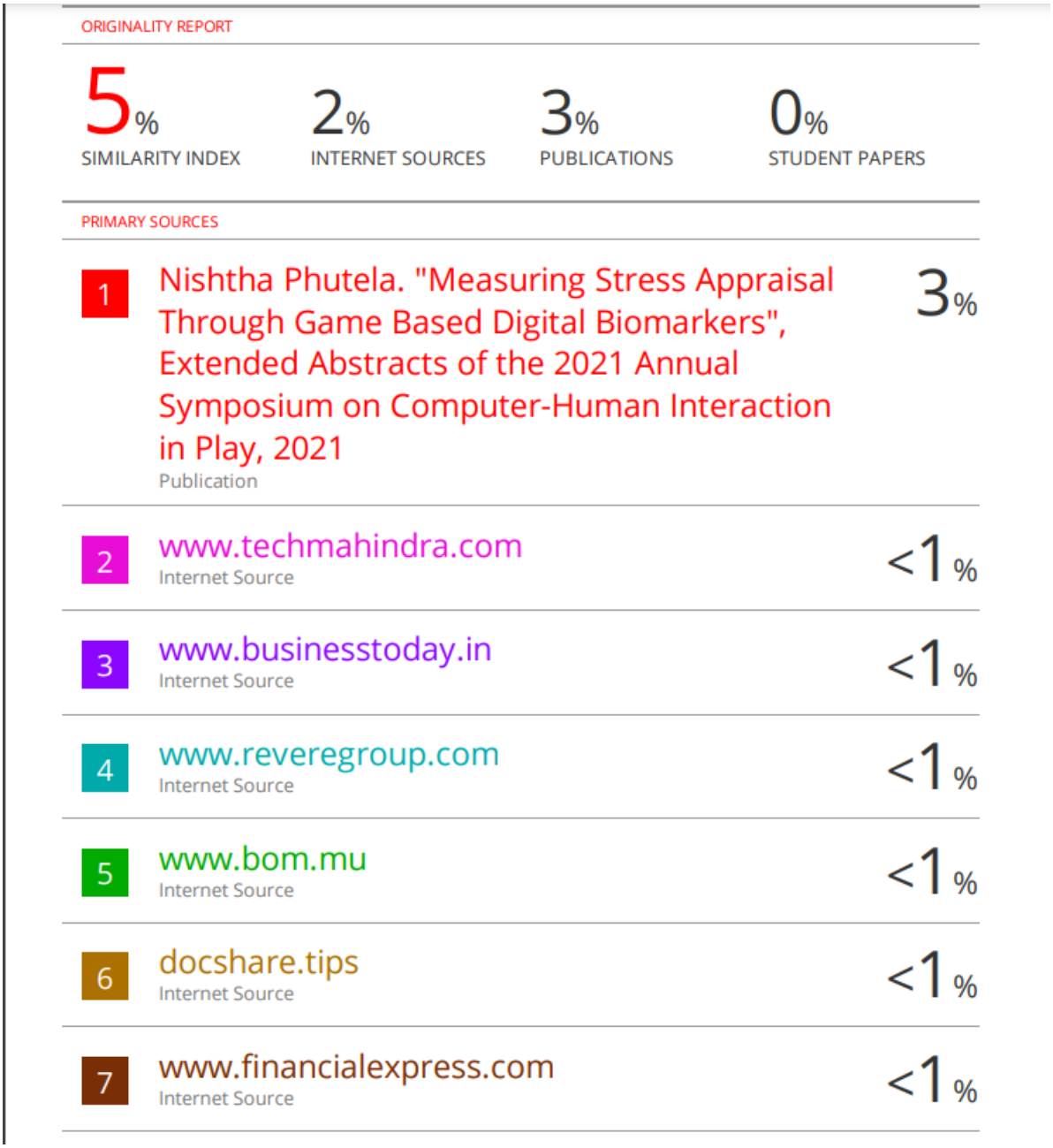
Segal, M. R. (n.d.). *Machine learning benchmarks and random forest regression.*

Singh, M. (2009). *Customer value via an Intranet: A case application of B2E at HCL Technologies.* 497-501: International Journal of Information Management.

Theodorsen, T. &. (USA). *Mechanism of flutter.* VA: Langley Field.

Toncar, M. F. (2000). The overseas internship experience. *Marketing Education*, 54-63.

PLAGIARISM REPORT



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