TATA TECHNOLOGIES

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

PROJECT REPORT

INTERNSHIP AT TATA TECHNOLOGIES

PROJECT TITLE: HYUNDAI CLICK TO BUY USED CARS PORTAL

INTERNSHIP DURATION: 28th AUG 2023 - 27th OCT 2023

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Executive Summary

This summary encapsulates the two-month internship at Tata Technologies, where I actively contributed to the "Hyundai Click to Buy Used Cars Portal" project. During this period, my role primarily focused on enhancing the database functionality of the portal to ensure optimal user experience and operational efficiency. The internship provided a valuable learning experience, allowing me to apply theoretical knowledge in a real-world setting and develop practical skills in database management.

Acknowledgements

I extend my sincere appreciation to Tata Technologies for granting me the opportunity to learn and contribute during my internship.

Mr. Navneet Chauhan - Program Manager, Tata Technologies

I am thankful to Mr. Navneet Chauhan for his valuable insights, leadership, and constant encouragement during the internship.

Ms. Anshita Vishwakarma- Database Developer, Tata Technologies

I would like to express my deep appreciation to Ms. Anshita Vishwakarma for her expertise, guidance, and mentorship have been instrumental in shaping the direction of this project and enhancing my learning experience.

Tata Technologies Team Members

I would like to express my appreciation to the entire Tata Technologies team for their collaboration, feedback, and support throughout the project.

Industry Overview

During my internship at Tata Technologies, I gained valuable insights into the dynamic and innovative world of engineering and technology solutions. Tata Technologies, a global leader in engineering services outsourcing and product development IT services, operates at the forefront of the automotive, aerospace, and manufacturing industries. As an intern working in the database domain, I had the opportunity to observe and contribute to the company's pivotal role in shaping the future of these industries.

Project Scope

The scope of the project focused on enhancing the database functionality of the Hyundai Click to Buy Used Cars Portal. The primary objectives were to improve user experience, optimize operational efficiency, and strengthen data security measures. The scope encompassed a range of tasks and initiatives aimed at addressing key challenges and leveraging opportunities for enhancement within the existing database system.

1. Database Analysis and Evaluation

The project commenced with a comprehensive analysis of the portal's existing database infrastructure. This involved evaluating the database schema, data organization, and indexing mechanisms. Through rigorous assessment, the team identified areas for improvement in terms of query performance, data retrieval times, and overall system responsiveness.

2. Performance Optimization:

A significant aspect of the project scope was optimizing the database's performance. This included fine-tuning SQL queries, indexing critical fields, and implementing caching mechanisms to reduce query execution times. Performance optimization aimed to enhance the portal's responsiveness, ensuring swift loading of pages and seamless navigation for users.

3. Data Organization and Storage Optimization:

Efforts were directed towards restructuring the database schema for optimal data organization. This involved normalization of tables, elimination of redundant data, and efficient storage mechanisms. By organizing data systematically, the project aimed to enhance data retrieval efficiency, reduce storage overheads, and facilitate easier maintenance and scalability.

4. Security Enhancement:

Ensuring the security and confidentiality of user data was a paramount concern. The project scope encompassed the implementation of robust security measures, including data

encryption, access control mechanisms, and secure authentication protocols. By fortifying the database against potential threats, the project aimed to instill trust among users and safeguard sensitive information.

5. User Experience Enhancement:

Improving user experience was a central goal of the project. Database enhancements were geared towards enabling advanced search functionalities, personalized user profiles, and seamless integration with other portal features. By ensuring accurate and swift data retrieval, the project aimed to provide users with a user-friendly interface and an intuitive browsing experience.

The project scope encapsulated a holistic approach to database enhancement, addressing performance, security, user experience, and future scalability. By meticulously analysing the existing system and implementing targeted improvements, the project aimed to transform the Hyundai Click to Buy Used Cars Portal into a robust, efficient, and secure platform, providing users with a seamless and enjoyable experience while browsing and purchasing used cars.

Internship Experience

Role and Responsibilities

During my internship at Tata Technologies, I was entrusted with a pivotal role in the database department, where I actively contributed to the Hyundai Click to Buy Used Cars Portal project. My primary responsibilities included:

1. Database Analysis and Optimization:

I conducted in-depth analysis of the existing database infrastructure, identifying bottlenecks and areas for improvement. Through performance profiling and query analysis, I optimized

SQL queries, implemented indexing strategies, and fine-tuned database configurations to enhance overall system responsiveness.

2. Data Organization and Management:

I played a key role in restructuring the database schema, focusing on normalization techniques and eliminating redundancy. This effort resulted in efficient data organization, reducing storage overheads and improving data retrieval times. I also actively managed data updates, ensuring accuracy and consistency across the portal.

4. Collaboration and Communication:

I collaborated closely with cross-functional teams, including developers, testers, and UX designers. Regular team meetings and collaborative problem-solving sessions allowed me to effectively communicate complex database concepts and ensure seamless integration of database solutions with other portal components.

Learning and Skill Development

My internship at Tata Technologies provided a rich learning experience, fostering both personal and professional growth. The experience enabled me to:

1. Apply Theoretical Knowledge:

I had the opportunity to apply theoretical knowledge gained in my academic pursuits to real-world scenarios. Understanding database concepts in a practical setting enhanced my comprehension of complex topics such as query optimization, data normalization, and security protocols.

2. Problem-Solving and Critical Thinking:

Encountering challenges related to database performance and security encouraged me to develop strong problem-solving skills. I honed my ability to analyze issues, identify root causes, and devise effective solutions. This experience enhanced my critical thinking capabilities and equipped me with valuable troubleshooting skills.

3. Teamwork and Collaboration:

Collaborating with professionals from diverse backgrounds taught me the importance of teamwork and effective communication. Engaging in collaborative projects fostered a sense of camaraderie and allowed me to appreciate the synergy that arises from collective efforts.

4. Technical Proficiency:

Hands-on experience with industry-standard database management systems enhanced my technical proficiency. I gained expertise in optimizing SQL queries, implementing encryption algorithms, and ensuring data integrity. These skills are invaluable assets for my future career in the field of database management and technology.

5. Professional Growth:

Beyond technical skills, the internship experience contributed significantly to my professional growth. I learned to manage deadlines, handle pressure situations, and adapt to evolving project requirements, enhancing my overall professionalism and work ethic.

Technical Details

Database Management with DBeaver in CTB1

During my internship at Tata Technologies, I utilized advanced tools and technologies to enhance the database functionality of the Hyundai Click to Buy Used Cars Portal. One of the key tools I employed was DBeaver, a robust and versatile database management software. Within DBeaver, I worked extensively with the databases related to the Click to Buy Portal, specifically in environments known as CTBDev and CTBQA.

1. DBeaver: A Powerful Database Management Tool:

DBeaver proved to be an invaluable asset in my database management tasks. Its intuitive user interface, support for various database management systems, and comprehensive set of features allowed me to work seamlessly with the portal's databases. Through DBeaver, I

accessed, analyzed, and optimized the database structures, ensuring their efficiency and reliability.

2. Managing Queries in CTBDev and CTBQA:

Within DBeaver, I managed a plethora of queries in different environments, such as CTBDev (Development Environment) and CTBQA (Quality Assurance Environment). These environments are essential for software development and testing processes. In CTBDev, I conducted in-depth analysis of queries, identifying areas for improvement and optimization. I collaborated closely with the development team, fine-tuning SQL queries to enhance database performance.

In the CTBQA environment, I executed rigorous testing procedures to ensure the robustness and reliability of the database configurations. I performed extensive query testing, examining their outcomes and identifying any discrepancies. By managing and optimizing queries in these distinct environments, I contributed to the overall enhancement of the Click to Buy Portal's database system.

3. Schema Management and Data Integrity:

Using DBeaver, I actively managed the database schemas in CTBDev and CTBQA. I ensured that the schemas were well-organized, adhering to industry best practices such as normalization to eliminate redundancy and improve data integrity. Regular schema maintenance activities, including indexing and data partitioning, were performed to optimize query performance, ensuring swift data retrieval and seamless user experience.

4. Query Optimization and Performance Tuning:

DBeaver played a crucial role in my efforts to optimize queries. I conducted query profiling, identifying resource-intensive queries and optimizing them to reduce execution times. Techniques such as query rewriting, indexing, and caching were applied to enhance query performance, resulting in faster data retrieval and improved overall system responsiveness.

In conclusion, my hands-on experience with DBeaver and the meticulous management of queries within the CTBDev and CTBQA environments were pivotal in transforming the

database system of the Hyundai Click to Buy Used Cars Portal. These technical endeavors not only improved the portal's performance but also provided me with valuable insights into real-world database management, enriching my skill set and preparing me for future challenges in the field of technology.

Findings and Conclusion

During my internship at Tata Technologies, I had the opportunity to delve deep into the Hyundai Click to Buy Used Cars Portal (https://clicktobuy.hyundai.co.in/#/), actively engaging in the enhancement of its database functionality. Through rigorous analysis and optimization efforts, several key findings were uncovered:

* **User Experience Enhancements:**

One of the primary findings was the significant improvement in user experience. The optimization of database queries and data retrieval processes resulted in faster loading times and seamless navigation. Users could now browse through the portal, view car listings, and access information swiftly, leading to a more satisfying user experience.

* **Streamlined Database Operations:**

By restructuring the database schema and optimizing queries, the overall database operations were streamlined. Data organization and storage efficiency were markedly enhanced, leading to reduced storage overheads and improved system responsiveness. This streamlined operation allowed for the efficient management of the increasing volume of data on the portal.

* **Enhanced Data Security:**

The implementation of advanced security measures, including encryption protocols and access controls, ensured the enhanced security of user data. Sensitive information was safeguarded against potential threats, fostering trust among users and enhancing the portal’s credibility.

* **Scalability and Future Readiness:**

The database system was designed and optimized for scalability, allowing the portal to handle a growing user base and expanding data requirements. This future readiness ensures that the portal can accommodate future updates and additional features without compromising performance or user experience.

In conclusion, the internship experience at Tata Technologies, focusing on the Hyundai Click to Buy Used Cars Portal, was highly rewarding and transformative. Through meticulous analysis, optimization efforts, and the implementation of advanced database management techniques, the portal's performance, user experience, and security were significantly enhanced.

The findings demonstrated the impact of effective database management on the overall functionality of a web portal. By improving data retrieval speed, ensuring data accuracy, and enhancing user security, the Click to Buy Portal became more responsive, user-friendly, and secure, leading to increased user satisfaction and engagement.

Recommendations

* Continuous Monitoring: Implement regular database performance checks to ensure sustained optimization and user satisfaction.

* User Feedback Integration: Collect user feedback for ongoing enhancements, focusing on usability and functionality improvements.

* Mobile Optimization: Prioritize mobile responsiveness to cater to the increasing number of mobile users.

* Data Analytics: Utilize data analytics for actionable insights into user behavior, aiding in strategic improvements.

References

* **Hyundai click to buy website-**
  { https://clicktobuy.hyundai.co.in/#/ }

* **Dbeaver Documentation-**
  { https://dbeaver.io/documentation/ }

* **SQL Queries and Database Management:**
  - W3Schools SQL Tutorial: (https://www.w3schools.com/sql/)
  - Coursera: (https://www.coursera.org/learn/intro-sql)
  - edX: (https://www.edx.org/learn/sql)

These references encompassed a range of SQL concepts, query optimization techniques, and database management strategies. They served as foundational resources for understanding SQL language intricacies and best practices in database management. These references were instrumental in guiding the database optimization efforts and SQL query management during the internship project. They provided essential knowledge and techniques that were applied to enhance the Hyundai Click to Buy Used Cars Portal.

This project report provides a thorough information on how the experience gained during this internship has been invaluable, enriching my skills and knowledge in database management, and preparing me for future challenges in the technology industry.