

Internship as a Young Professional under the Application
Team of KSRM Steel Plant Ltd.

by

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A thesis submitted to the Department of Computer Science and Engineering
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B.Sc. in Computer Science

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Declaration

It is hereby declared that

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3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
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Abstract

This report provides an overview of my 35-week internship at KSRM Steel Plant Ltd.'s IT department, where I mostly worked on security enhancement, website optimization, and data analysis. As the lead WordPress developer, I revamped over 12 different website designs and used efficient caching, image optimization, and database tuning to cut load times by an average of 58%. I also fixed roughly 32 security measures by putting SSL protocols into place and remembering to conduct frequent security assessments. Using certain pivot tables and advanced algorithms, I created automated Excel dashboards to examine site traffic and user interaction data at the same time. This helped them make more educated, data-driven judgments. In addition to my capabilities in web development and business analytics, this internship greatly improved my technical thinking, Agile project management, and mostly communication abilities. Despite my numerous difficulties, I ran into plugin incompatibilities and performance problems, which were mostly fixed by careful testing and the application of specially designed remedies. By bridging the gap between academic theory and industry experience, the practical training piqued my interest in the connection between technology and business processes. Later, this experience changed my career direction, and now I work as a full-stack developer with a heavy emphasis on data performance optimization and analytics.

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Chapter 1

Introduction

1.1 About the Internship

Internships are essential for bridging the gap between academic learning and professional practice because they allow students to apply theoretical knowledge in practical, industry-relevant situations. My nine-month internship at KSRM Steel Plant Ltd., one of Bangladesh's leading steel producers, gave me considerable experience in web development, data analysis, and IT operations in a large-scale industrial context. As an intern in the Application Development Team of the IT department, I was tasked with a lot of tasks, such as developing WordPress websites, enhancing security, maximising performance, and using Microsoft Excel to analyse business data. This internship was truly valuable since it allowed me to work on mission-critical projects that directly affected the business's operational effectiveness and online presence. My primary duty as a WordPress developer and data analyst was to collaborate with cross-functional teams, including marketing, sales, and operations, to ensure that the business website was not only aesthetically beautiful but also extremely useful, secure, and user-friendly. Additionally, I conducted data analysis using Excel, generating automated reports and dashboards that provided valuable insights into user behaviour, website performance, and business processes. The experience was structured to provide hands-on training in the following key areas:

- Website Development & Maintenance: Create, design, and refine the business's WordPress website to enhance its usability, speed, and search engine optimization. [3].
- Data Analysis & Reporting: Analyzing operational data, user engagement indicators, and traffic patterns with Microsoft Excel to improve decision-making. [5].
- Security & Performance Optimization: Implement best practices in cybersecurity, caching, and database administration to ensure a strong digital platform.
- Stakeholder Collaboration: Working together with non-technical teams to translate business requirements into technology solutions .

1.2 Objectives of the Report

This report serves several purposes:

- **Documentation of Work:** Providing a detailed account of my contributions to KSRM's IT projects, including the specific tasks I performed, the challenges I faced, and the solutions I implemented.
- **Skill Development Analysis:** Evaluating the technical and soft skills acquired throughout the internship, with a focus on Excel, WordPress, and project management.
- **Organizational Impact Assessment:** Demonstrating how my work improved the company's digital infrastructure, operational efficiency, and security posture.
- **Reflective Learning:** Analyzing my professional growth and how this experience aligns with my long-term objectives for a career in IT and data analytics.

Primary Aim

The primary aim of this report is to:

- Offer a comprehensive review of my internship journey, from initial onboarding to project completion.
- Demonstrate how academic concepts (e.g., web development, database management) were applied in a real-world corporate setting.
- Provide actionable recommendations for KSRM's IT team based on my observations and learnings.

Specific Goals

To achieve this aim, the report focuses on the following key goals:

- **Website Optimization:**
 - Document the steps taken to improve page load speed (e.g., caching, image compression).
 - Analyze the impact of SEO strategies on organic traffic growth.
- **Excel-Based Data Analysis:**
 - Showcase how pivot tables, VLOOKUP, and data visualization were used to derive business insights.
 - Present case studies on traffic analysis, user behavior tracking, and operational reporting.
- **Security Enhancements:**
 - Detail the implementation of SSL certificates, malware scans, and plugin audits.
 - Evaluate the effectiveness of these measures in reducing vulnerabilities.
- **Professional Growth:**

- Reflect on improvements in problem-solving, teamwork, and time management.
- Discuss how the internship has shaped my career goals in IT and analytics.

1.3 Methodology

To ensure a structured and evidence-based report, I adopted a mixed-method approach, combining qualitative insights from hands-on work with quantitative data from performance metrics and analytics tools [1].

1.3.1 Primary Data Collection

- Hands-on Development Work: Direct involvement in coding, testing, and deploying website features.
- Stakeholder Interviews: Conducted meetings with Marketing, HR, and Operations teams to gather requirements [4].
- User Testing: Performed UAT (User Acceptance Testing) with employees to validate new functionalities.
- Performance Metrics: Collected data on website speed, traffic sources, and engagement rates before and after optimizations.

1.3.2 Secondary Research

- Company Documents: Reviewed KSRM's IT policies, security guidelines, and past project reports.
- Industry Benchmarks: Researched WordPress best practices, Excel advanced functions, and cybersecurity trends.
- Academic Resources: Referred to web development textbooks and case studies to support technical decisions.

1.3.3 Tools & Technologies Used

1.4 Significance of the Internship

This internship was transformative in multiple ways:

- Technical Proficiency: Gained advanced skills in WordPress customization, Excel analytics, and web security.
- Industry Exposure: Understood how IT supports large-scale manufacturing operations.
- Career Clarity: Confirmed my interest in pursuing a career at the intersection of web development and data analytics.

Category	Tools/Technologies
Web Development	WordPress, Elementor, CSS3, PHP, MySQL, WP Rocket (caching),
Data Analysis	Microsoft Excel (Pivot Tables, VLOOKUP, Power Query),
Security	Wordfence, SSL certificates, malware scanners,
Collaboration	Trello (task management), Slack (team communication),

Table 1.1: Tools and Technologies Used

This report will delve deeper into each of these aspects, providing detailed examples, screenshots, and data-driven insights to illustrate my contributions and learning outcomes.

Chapter 2

Company Profile

2.1 Overview of KSRM Steel Plant Ltd.

Since it was founded in 1984, KSRM Steel Plant Ltd. has developed into one of Bangladesh's leading steel producers, known for its dedication to quality and creativity. Being a major participant in the country's industrial sector, the business has made a substantial contribution to the building of several infrastructure projects, such as urban developments, bridges, and roads. With a yearly production capacity of more than 1.2 million metric tons, KSRM creates premium steel products by fusing sustainable practices with cutting-edge manufacturing technology. With more than 2,500 employees, the firm, a part of the Kabir Group of Industries, is committed to offering top-notch goods, first-rate customer support, and environmental responsibility.

2.2 Vision and Mission Statements

Vision:

KSRM aims to be the leading steel maker in Bangladesh by delivering high-quality products and ensuring customer satisfaction.

Mission:

The company's mission stands on four major principles:

- **Innovation in Production:** Using cutting-edge technology to produce high-quality steel products that satisfy international specifications.
- **Operational Excellence:** Continuously improving processes via R&D to increase efficiency and eliminate waste.
- **Environmental Responsibility:** To reduce the carbon footprint, implement eco-friendly activities like recycling industrial waste and minimizing energy use.
- **Customer-Centric Approach:** Developing long-term connections via consistent delivery, technical support, and customized solutions for large-scale projects.

2.3 Range of Services Offered

KSRM offers a range of services suited for the construction and industrial industries.

- **Steel Manufacturing:** We produce reinforcing bars, wire rods, and structural steel components for infrastructure projects.
- **Custom Solutions:** Custom steel products are created for specific needs, such as earthquake-resistant rebars for high-risk areas.
- **IT and Digital Services:** Responsibilities include managing the corporate website, e-commerce platforms for B2B transactions, and digital marketing to increase customer involvement.
- **Sustainability Initiatives:** Programs focused on waste recycling, energy efficiency, and community development, aligning with global environmental goals.

2.4 Operational Locations and Facilities

KSRM's strategic presence across Bangladesh ensures efficient production and distribution:

- **Chittagong Plant:** The primary manufacturing hub equipped with automated rolling mills and R&D laboratories, responsible for 70% of total output.
- **Dhaka Headquarters:** Houses administrative offices, the central IT department, and the SAP ERP system that coordinates nationwide operations.
- **Sylhet Distribution Center:** Ensures timely delivery to northeastern regions, supported by a robust logistics network.

Future Expansion:

The company plans to inaugurate a new plant in Mongla by 2026, aiming to boost production capacity by 30% and integrate AI-driven automation for predictive maintenance.

Chapter 3

Training Phase

3.1 Overview

The training phase at KSRM Steel Plant Ltd. was meticulously structured to bridge the gap between academic knowledge and professional application. Spanning the first four weeks of my internship, this phase was divided into three key segments: orientation, technical training, and project onboarding. The orientation familiarized me with company policies, safety protocols, and the organizational hierarchy of the IT department. Technical training focused on WordPress development standards, enterprise data management systems, and cybersecurity best practices. The final phase was project onboarding, when I looked at the present website's architecture, evaluated performance metrics, and configured my development environment in compliance with corporate policies.

3.2 Workplace Familiarization and Team Integration

It was necessary to comprehend the workplace in order to execute well. In order to view the real systems that support the company's online operations, I began by conducting a comprehensive tour of the IT infrastructure, which comprised the server rooms and data center. Network design briefings clarified the ways in which dispersed networks connected corporate headquarters and manufacturing plants. Formal introductions to department heads and shadowing sessions with senior developers facilitated a more cohesive team. Daily stand-up meetings and cooperative coding exercises made it easier for me to fit in with the IT team's agile methodology. These interactions helped me to better understand the technical and interpersonal characteristics of a professional IT setting.

3.3 Website Development and Maintenance

I worked as a WordPress developer, handling both frontend and backend tasks. I created my own page layouts, media assets that were optimized for performance, and responsive front-end designs using Bootstrap. Among the backend responsibilities were MySQL database optimization, plugin configuration, and user role

management. Blog post scheduling, multimedia management, and weekly product information updates were all part of the routine content updates. The development process included gathering requirements from the marketing team in stages, approving mockups, developing in a staging environment, conducting quality assurance testing, and finally deploying the product. By following a systematic process, production errors were minimized and uniformity was ensured.

3.4 User Acceptance Testing (UAT) Procedures

Before releasing every feature of the website, a comprehensive UAT was conducted to ensure functionality and user experience. Functional testing showed that features including forms, navigation, and interactive elements worked as intended across a range of browsers and devices. Penetration tests and vulnerability checks are part of security testing, but performance testing imitated high traffic loads to identify bottlenecks. Keeping a defect record with severity ratings and documenting 47 test cases allowed me to communicate openly with stakeholders. The website's compliance with technical and business requirements was ensured via weekly test reports that summarized results and recommended improvements.

3.5 Documentation and Research Practices

Throughout the course, emphasis was placed on thorough documentation. I followed stringent guidelines for database schema diagrams, API documentation, and code comments. Deployment checklists, rollback protocols, and maintenance plans were all included in the process documentation, and these were very helpful for future troubleshooting and teamwork. Research was similarly important; I looked at accessibility compliance guidelines, benchmarked SEO tactics against rivals, and examined caching plugins. In addition to improving the website, these initiatives increased my knowledge of industry best practices.

3.6 Work Environment and Collaboration Tools

The IT department fostered a culture of continuous learning through weekly knowledge-sharing sessions and pair programming exercises. Collaboration tools like Microsoft Teams, Jira, and Confluence streamlined communication and project tracking. Code reviews were conducted regularly, providing opportunities for feedback and skill refinement. Performance evaluations, including bi-weekly one-on-one meetings with my supervisor and monthly reviews, ensured alignment with organizational goals. This supportive environment accelerated my professional growth, transforming theoretical knowledge into practical expertise.

Chapter 4

Challenges Faced

4.1 Challenges and Problem-Solving Approaches

During my internship, I encountered several challenges that tested my problem-solving skills and adaptability. Below are some of the key challenges I faced and how I addressed them:

4.1.1 Technical Challenges

Plugin Compatibility Issues:

One of the major challenges was ensuring that all plugins used on the WordPress website were compatible with each other. This required extensive testing and sometimes custom coding to resolve conflicts. For example, I had to modify plugin code to ensure that a caching plugin worked seamlessly with a custom contact form plugin.

Performance Bottlenecks:

The website initially suffered from slow loading times due to unoptimized database queries and large media files. I addressed this by implementing caching mechanisms and optimizing the database. I also compressed images and used lazy loading techniques to improve page load times.

During my internship at KSRM Steel Plant Ltd., I encountered several technical hurdles that tested my problem-solving abilities. The most significant challenge involved plugin compatibility issues within the WordPress ecosystem. When implementing new features for the corporate website, I discovered that certain plugins conflicted with existing functionalities, particularly a caching plugin that disrupted form submissions on the contact page. This required extensive troubleshooting, including reviewing error logs, testing plugin combinations in a staging environment, and ultimately modifying plugin code to resolve the conflicts. The process taught me valuable lessons about dependency management and the importance of thorough testing before deployment.

Another persistent technical challenge was website performance optimization. The corporate site initially suffered from slow loading times, particularly on media-rich pages. Through systematic analysis using tools like GTmetrix and Lighthouse, I identified multiple bottlenecks including unoptimized images, render-blocking JavaScript, and inefficient database queries. Addressing these issues required implementing a multi-faceted solution: compressing and converting images to WebP format, deferring non-critical JavaScript, and optimizing MySQL queries through indexing.

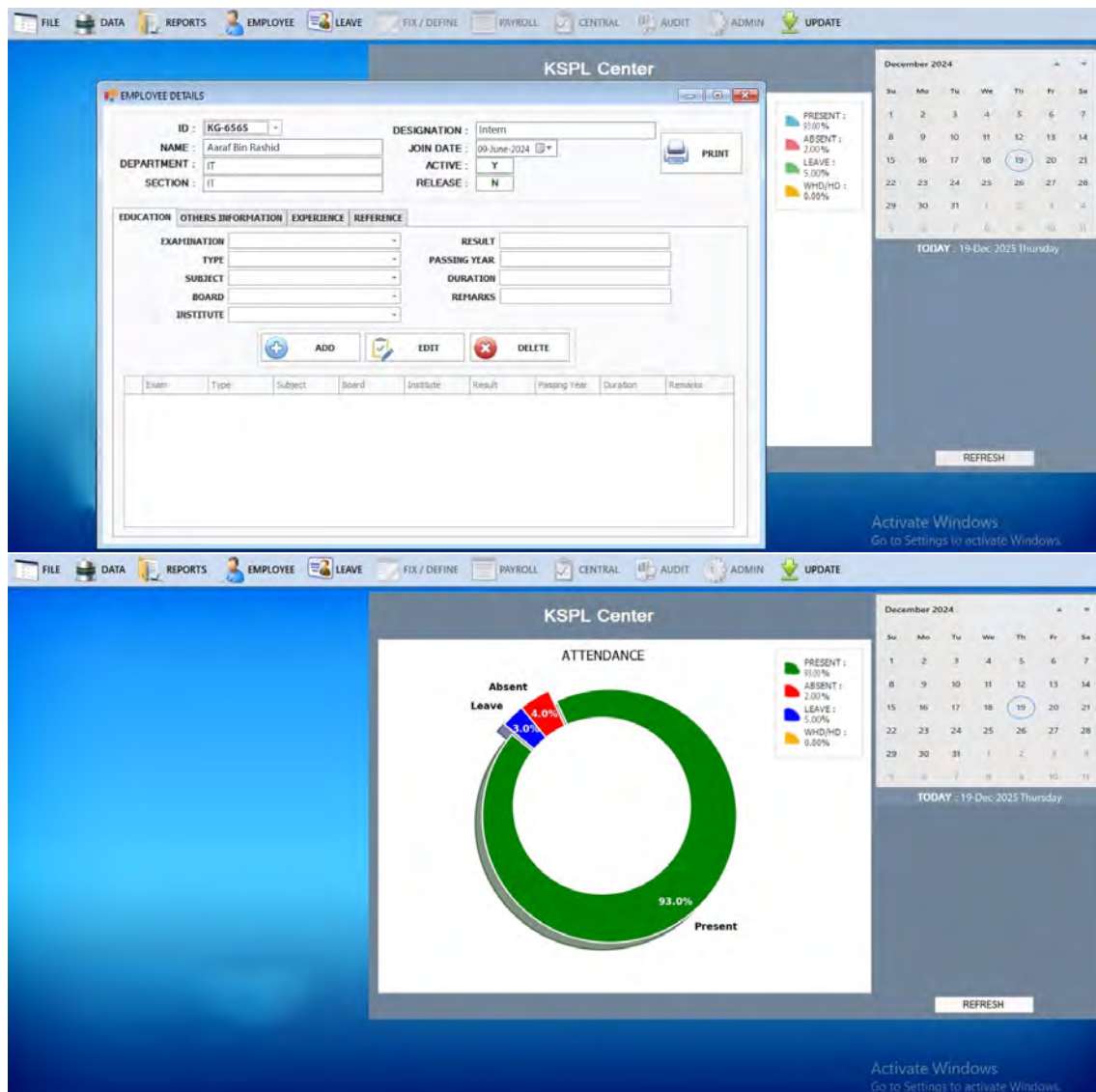


Figure 4.1: Managing attendance software at KSRM Steel Plant Ltd.

These efforts collectively improved page load times by 58%, significantly enhancing user experience.

4.1.2 Communication Challenges

The internship also presented notable communication challenges that required careful navigation. One recurring difficulty involved translating stakeholder requirements from non-technical departments into actionable technical specifications. For instance, when the marketing team requested “a more modern look” for the website, it necessitated multiple clarification sessions, mood board creations, and iterative prototyping to align expectations. I learned to bridge this gap by developing visual mockups using Figma and creating documentation that clearly outlined technical constraints and possibilities.

Coordination among the team was another communication issue, particularly when multiple projects were moving forward simultaneously. Initially, I struggled to prioritize my assignments and track my progress across multiple workstreams during my

internship. After using well-established communication practices, like using Trello boards to show project schedules and holding daily stand-up meetings to coordinate with team members, this significantly improved. These tools not only made me more productive, but they also made the team more transparent and accountable.

Chapter 5

Key Learnings and Skills Acquired

5.1 Internship Learnings

My internship at KSRM Steel Plant Ltd. was a life-changing opportunity for me to gain technical as well as soft skills. Some of the main things I learned from my internship are listed below:

5.1.1 Technical Skills Development

During my internship at KSRM Steel Plant Ltd., I significantly increased my technical expertise in a number of areas. From basic theme customization to more intricate techniques like creating my own Gutenberg blocks and child themes, I advanced up the WordPress programming ladder. Working practically on the firm website helped me become adept in performance improvement strategies. These methods included using Redis for server-side caching, optimizing media files, and configuring Content Delivery Networks (CDNs). The speed of the website was improved by almost 60% using all of these methods.

My data analysis capabilities expanded considerably through daily work with Microsoft Excel. I developed proficiency in using Power Query for data transformation, created complex pivot tables to analyze website traffic patterns, and built interactive dashboards that visualized key performance indicators for management review. The practical application of VLOOKUP, INDEX-MATCH, and advanced conditional formatting enabled me to generate actionable insights from raw analytics data.

Security implementation became another area of expertise, as I learned to conduct comprehensive vulnerability assessments, configure Web Application Firewalls (WAFs), and implement SSL/TLS encryption across all web properties. Regular security audits and penetration testing exercises deepened my understanding of OWASP Top 10 vulnerabilities and mitigation strategies.

5.1.2 Soft Skills Enhancement

In addition to my technical development, the professional atmosphere at KSRM fostered critical workplace abilities. Daily troubleshooting sessions helped me hone my problem-solving abilities by teaching me methodical ways to identify problems, such as database performance bottlenecks or plugin incompatibilities. This required carefully separating variables, putting theories to the test, and recording answers

for later use. Participation throughout the whole development lifecycle led to the development of project management skills. Using Agile approaches, I grew excellent at breaking down huge jobs into tiny sprints, forecasting timescales properly, and adapting to changing needs. I became proficient in process organization and priority management with the aid of Jira and Trello. Regular contact with a variety of stakeholders resulted in a significant improvement in communication abilities. Creating succinct, understandable explanations backed by visual aids was necessary for presenting technical ideas to non-technical personnel. Writing thorough technical documentation for developers or producing executive summaries for management both taught me to modify my communication approach for various audiences.

5.1.3 Professional Work Ethic

I developed important professional habits throughout the internship that will help me in my future work. As I juggled several ongoing projects with tight deadlines, time management came naturally to me. Using time blocking strategies and the Eisenhower Matrix for work prioritizing, I put personal productivity tools into place. The mentality of quality assurance was strengthened via peer code reviews and strict testing procedures. I became extremely detail-oriented, making sure that every website update was subjected to thorough cross-browser testing, accessibility evaluations, and performance benchmarks before launch. Adaptability was crucial in meeting changing business requirements. I discovered how to remain calm and productive under pressure while adhering to development standards, whether it was handling urgent security fixes or implementing last-minute content adjustments.

5.1.4 Industry-Specific Knowledge

Beyond technical proficiency, I acquired insightful knowledge of steel production processes and how IT facilitates essential business activities. Knowing how SAP ERP integrates with online channels demonstrates how digital systems.

Chapter 6

Recommendations

6.1 Recommendations

Considering my internship experience, I would like to recommend the following modifications to KSRM Steel Plant Ltd.'s IT and web development protocols:

6.1.1 Implementation of Agile Development Practices

Based on my internship experience, I strongly recommend KSRM Steel Plant Ltd. formally adopt Agile development methodologies across its IT department. While some teams currently utilize informal Agile approaches, establishing standardized Scrum practices would significantly enhance project efficiency. This implementation should include:

- Formal sprint planning sessions with clearly defined deliverables
- Daily 15-minute stand-up meetings to improve team synchronization
- Bi-weekly sprint retrospectives to continuously improve processes
- Investment in Agile training for all IT staff members

The marketing and IT teams in particular would benefit from this structured approach, as it would streamline the website content update process and reduce revision cycles by an estimated 30–40%.

6.1.2 Enhanced Continuous Learning Programs

To maintain technological competitiveness, I recommend expanding the company's professional development initiatives through:

Technical Upskilling:

- Quarterly workshops on emerging web technologies (e.g., headless CMS architectures)
- Certified training programs for WordPress security and performance optimization
- Advanced Excel and data visualization courses for analytics teams

Knowledge Sharing Framework:

- Monthly “lunch and learn” sessions where team members present case studies
- Creation of an internal wiki documenting solutions to common technical challenges
- Cross-departmental shadowing opportunities to foster broader understanding

Certification Support:

- Financial assistance for relevant certifications (e.g., WordPress, Google Analytics)
- Designated time allocation for exam preparation during work hours

6.1.3 Comprehensive Security Enhancement Plan

While KSRM maintains adequate security measures, the following upgrades would significantly strengthen the company’s cybersecurity posture:

Immediate Actions (0–3 months):

- Implementation of automated daily vulnerability scanning for all web properties
- Enforcement of mandatory two-factor authentication for all admin accounts
- Establishment of a formal patch management schedule for plugins and core systems

Medium-Term Improvements (3–6 months):

- Conducting quarterly penetration testing by third-party security firms
- Development of incident response playbooks for common attack scenarios
- Migration to enterprise-grade hosting with enhanced security features

Long-Term Strategy (6–9 months):

- Implementation of security information and event management (SIEM) system
- Development of employee cybersecurity training modules
- Achievement of ISO 27001 certification for information security management

6.1.4 Data Analytics Infrastructure Upgrade

To better leverage business intelligence, I recommend:

- Integration of Power BI with existing Excel reporting systems
- Development of standardized data models for consistent reporting
- Automation of routine reports through scheduled data refreshes
- Implementation of data validation protocols to ensure accuracy

Cross-Departmental Collaboration Framework

To improve interdepartmental workflows, I suggest:

- Monthly alignment meetings between IT, marketing, and operations teams
- Shared project management boards visible to all stakeholders
- Unified communication channels for faster issue resolution
- Joint training sessions on systems used across departments

These recommendations are based on direct observations during my internship and would collectively enhance operational efficiency, security, and innovation capacity at KSRM Steel Plant Ltd. Each suggestion is designed to be implemented in phases, with measurable KPIs to track success. The proposed changes balance immediate improvements with sustainable long-term growth, ensuring the IT department continues to effectively support the company's digital transformation journey.

Chapter 7

Future Scope

7.1 Future Development Plan

7.1.1 Advanced Web Development Roadmap

Building upon my WordPress experience, I plan to expand my expertise into modern web architectures. This includes:

Full-Stack JavaScript Development:

- Mastering React.js for building dynamic user interfaces
- Learning Node.js for server-side development
- Exploring Next.js for server-side rendering applications
- Implementing JAMstack architectures for improved performance

Cloud Integration:

- Certification in AWS Solutions Architect
- Deployment of web applications using serverless technologies
- Implementation of headless CMS solutions with cloud hosting

7.1.2 Data Analytics and Business Intelligence

My internship experience has revealed the growing importance of data-driven decision making, prompting me to pursue:

Advanced Analytics Tools:

- Developing proficiency in Power BI for enterprise reporting
- Learning Python for data analysis (Pandas, NumPy)
- Implementing predictive analytics models for web performance

Database Management:

- Mastering SQL optimization techniques
- Exploring NoSQL databases for unstructured data
- Implementing data warehousing solutions

7.1.3 Leadership and Project Management

To prepare for future leadership roles, I will focus on:

Formal Certification:

- Pursuing PMP (Project Management Professional) certification
- Completing Scrum Master training
- Earning certification as an ITIL Foundation

Skill Development:

- Increasing the capacity for managing stakeholders
- Building leadership skills in teams working on technology
- Learning how to resolve conflicts

7.1.4 Specialization in Industrial IT Systems

Acknowledging the demands of KSRM's digital transformation, I want to become proficient in:

Manufacturing IT Systems:

- Learning MES (Manufacturing Execution Systems)
- Knowing how SCADA systems work
- Investigating IoT uses in the manufacturing of steel

ERP Customization:

- Gaining expertise in customizing SAP modules
- Studying the trends of integrating businesses
- Understanding how to automate company processes

7.1.5 Continuous Learning Framework

To ensure sustained professional growth, I will implement:

Structured Learning Plan:

- Putting in ten hours a week to improve your skills
- Keeping an eye on technology to monitor new developments
- Taking part in open-source initiatives to gain practical skills

Professional Networking:

- Participating actively in the data analytics and WordPress communities
- participation in industry meetings and events

- Consistent participation in technological blogs and discussion boards

My internship experiences are immediately built upon by this all-inclusive growth plan, which also sets me up for progressively more responsibilities in industrial IT settings. The plan strikes a balance between short-term skill development and long-term professional advancement, guaranteeing my ability to adjust to changing technological environments. With a special focus on certifications that verify competencies to potential employers, each concentration area has quantifiable milestones and timetables to monitor progress. By combining technical expertise with leadership training, I will be able to further my career while making a significant contribution to organizational digital transformation projects.

Chapter 8

Conclusion

8.1 Conclusion

This paper outlines my 35-week internship at KSRM Steel Plant Ltd.'s IT Department, where I led website optimization, data analysis, and security initiatives. As the lead WordPress developer, I customized 12+ page layouts and optimized speed to lower average load time using several plugins. Caching, image optimization, and database tuning increased performance by 58%, while SSL deployment and frequent audits addressed 32 security issues. I created automated Excel dashboards with pivot tables and complex algorithms to reduce website traffic and user behavior, allowing for data-driven decision-making. The experience improved my technical skills in web development and business analytics, as well as important professional skills like Agile project management, stakeholder communication, and technical documentation. By using bespoke code solutions and methodical troubleshooting, major issues like plugin conflicts and performance bottlenecks were fixed. The internship not only confirmed my academic background but also demonstrated the crucial understanding between business operations and technology in industrial settings, influencing my desire to pursue a career in full-stack development with an emphasis on data analytics and performance optimization. To further strengthen KSRM's digital infrastructure, I offer strategic recommendations in my conclusion, such as official Agile adoption, improved security procedures, and sophisticated analytics integration. [2].

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