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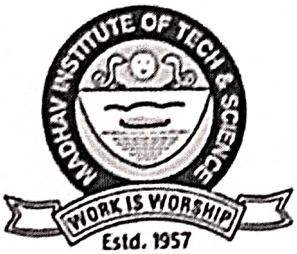

Internship Report On

Software Development Engineer (Full-Stack Java) Internship at

Madhya Pradesh State Electronic Development Corporation (MPSEDC)

An internship report submitted in partial fulfilment of the requirement for the degree of

BACHELOR OF TECHNOLOGY

INFORMATION TECHNOLOGY

Submitted by:

Eshan Sharma

0901IT181035

Subject - Internship/Project (DLC-9)

Faculty Mentor:

Dr. Saumil Maheshwari, Assistant Professor, Department of Information Technology

Submitted to:

DEPARTMENT OF INFORMATION TECHNOLOGY

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR - 474005

MAY-JUNE 2022

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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CERTIFICATE

This is certified that **Eshan Sharma (0901IT181035)** has submitted the internship report for the **SDE Full-Stack (Java) internship at MPSEDC** under the mentorship of **Dr. Saumil Maheshwari,** in partial fulfilment of the requirement for the award of degree of Bachelor of Technology in **Information Technology** from Madhav Institute of Technology and Science, Gwalior.

Saumil 26-05-22	26.5.22	
Dr. Saumil Maheshwari	**Dr. Akhilesh Tiwari**	**Mr. Nikhil Dubey**
Assistant Professor	Professor and HOD	Assistant Director
Information Technology	Information Technology	MPSEDC

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DECLARATION

I hereby declare that the work and details being presented in this internship report, for the partial fulfilment of requirement for the award of the degree of Bachelor of Technology in Information Technology at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the faculty mentorship of **Dr. Saumil Maheshwari,** Assistant Professor, Department of Information Technology.

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else apart from MPSEDC.

Date: 26/5/22

Place: GWALIOR

Eshan Sharma

0901IT181035

IV Year

Information Technology

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ACKNOWLEDGEMENT

It gives me immense pleasure to thank a large number of individuals for their cordial cooperation and encouragement which has contributed directly or indirectly in preparing this report. The full semester industrial internship has proved to be pivotal to my career and learnings. I am thankful to my institute, Madhav Institute of Technology and Science to allow me to continue my disciplinary/interdisciplinary project as a curriculum requirement, under the provisions of the Flexible Curriculum Scheme (based on the AICTE Model Curriculum 2018), approved by the Academic Council of the institute. I extend my gratitude to the Director of the institute, Dr. R. K. Pandit and Dean Academics, Dr. Manjaree Pandit for this.

First of all, I would sincerely like to thank my department, Department of Information Technology, for allowing me to explore this project. I humbly thank Dr. Akhilesh Tiwari, Professor and Head of Department, Information Technology, for his continued support during the course of this engagement, which eased the process and formalities involved.

I would like to express my gratitude to my internship supervisor Dr. Saumil Maheshwari assistant professor, Department of IT for his guidance and feedback which made everything clear to me to complete this report. At first, I was so confused that whether I would be able to make a fruitful report but with his assistance, I found a way to do everything immaculately and in time. He kept me on track to complete this report and his suggestions and feedback were very dynamic in making this report as impeccable as possible.

Moreover, I must show my gratitude to my supervisor at Madhya Pradesh State Electronics Development Corporation, Mr. Manish Singh, Java Team Lead of Center of Excellence who willingly took my responsibility and gave me a lot of time and shared his working experience with me. His guidance showed me a way not only to understand the office culture but also how to deal with all the co-workers of the organization and meet the client demands with great team-work.

A very special gratitude goes to, Mr. Vinay Pandey (Deputy Director) for his kind support and timely feedback regarding the guidelines and deadlines of internship completion.

I would also like to express my sincere thanks to the team at MPSEDC, especially Mr. Harsh Tiwari (Java Developer) who helped me during my work tenure and made my experience an unforgettable one. People from these departments helped me to gain more practical knowledge which made my internship journey more fruitful.

I would like to express my gratitude to Mrs. Awantika Varma (Manager, Project Lead MP Tenders) for her support, guidance and encouragement which enabled me to go above and beyond during the duration of the Internship. She was instrumental in counseling, guiding and mentoring on very key concepts like effective communication, handling workload, presenting your points to supervisors and many others. I am extremely grateful to her, contribution to the internship experience is immense.

I would like to extend my gratitude to Mr. Nand Kumarum (IAS, Managing Director) for providing me this wonderful opportunity to experience and work at Madhya Pradesh State Electronics Development Corporation. His vision and guidance enabled me to gain practical knowledge which made my internship journey more fruitful.

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EXECUTIVE SUMMARY

This internship report stresses on the work experience I have gathered as an Intern at Madhya Pradesh State Electronics Development Corporation from 18th January 2022 until 30th May 2022. In this report, I have mainly incorporated my experience at the Center of Excellence Full Stack Development (Java Stack), where I also have provided details of my 4 months' work experience at CoE along with a comprehensive job description, of where I had to work on different projects. In this report, I have included a list of all my learning in technical learning and soft skills learning. Then I talked about the projects given, and the process followed.

In the report I have included screenshots of the projects I have worked on and a walkthrough of the problems I faced and how did I resolve them. I have included some observations and recommendations regarding the internship and internship process which might be helpful in streamlining the process.

The internship's objective is to enable a student to understand and learn the working of a professional environment, project, and workflow which has been successfully achieved in the duration of the internship. This report will serve as good information for the mentors, future interns, and anyone who would like to learn and understand the process of internship at MPSEDC. Madhya Pradesh State Electronics Development Corporation has a good internship program.

Chapter 1: Organizational Overview

Background:

MPSEDC is a corporation of the state working towards implementation of e-Governance projects in the State and also for promotion, implementation and investment in IT, ITeS & ESDM. Sector as a single point of Contact for any IT, ITeS & ESDM business opportunity in Madhya Pradesh with core activities like:

- State Data Centre (SDC) to help the departments/organizations rendering IT related services through reliable hosting, managing IT risk and providing continuous connectivity support.
- MPSWAN, a GoI initiative of providing last mile connectivity up to block level in the state.
- MP Tenders Project using online platform (GePNIC) being developed and maintained by NIC.
- Promote Investment of IT/ESDM Parks in the state by providing Raw Land, Built-Up Space & Subsidies.
- Single Citizen Data Base and Aadhaar Project implementation
- Center of Excellence Support for other departments in IT related processes in project mode

Mission:

To bring overall perceived improvement in delivery of government services through e-governance and bring IT Industries in the State of Madhya Pradesh by:

- Attracting IT Industry in the state of Madhya Pradesh: The IT industry grew in tier I cities Due to congestion and infrastructural problems it has started looking at tier II cities for expanding operation and reducing cost. we intend to capitalize on this development and promote investment in Indore, Gwalior, Bhopal and Jabalpur.
- Developing Common Infrastructure such as State Wide Area Network [SWAN], State Data Centre, so that all the departments are able to utilize these services without bothering about the maintenance of these complex facilities to bring e-Governance services at the door step of the common citizen.
- Providing IT solution to Govt Departments-including IT Consultancy, Software, Hardware, Networking and System Integration services.
- To create brand Madhya Pradesh.

- To function as InfoTech Engine of the State thereby encourage Information Technology related activities and innovations in the state.
- To propagate IT investment policy of the State.
- To implement IT and ESDM projects on PPP model.
- To provide IT & mobile based applications solutions delivering citizen centric services.
- To empower & facilitate Government organizations/departments/agencies by providing IT inputs/solutions and to assist them in computerization and networking.
- To provide Consultancy Services to the Government organizations/departments/agencies and to charge for the service, if necessitates.
- To undertake all works related to the promotion of Information Education & Communication and Usage of Information Technology (IT), Information Technology enabled Services (ITeS), Information and Communication Technology (ICT) and Electronics in the State.
- To co-ordinate with investors and industry, trade organizations and financial institutions in public and private sector so as to promote growth in the IT sector.
- To use IT for Good Governance.
- To work as IT consultant of the state.
- To facilitate Skill Gap Training.
- To facilitate use of Hindi language in IT related projects.
- To ensure ready to use Workable Human Resource in the field of IT in the Government.
- To undertake any other function(s) as may be assigned by the State Government.

Vision:

To Strengthen & Enhance Madhya Pradesh's visibility on the Global IT Map by Using IT and Cyber Space as engines for rapid, inclusive and substantial growth; thereby creating world class IT infrastructure to leverage Madhya Pradesh in growth of our national economy.

Department:

Center of Excellence Support for other departments in IT related processes in project mode. Daily working involves understanding the requirements of other departments and delivering software-based products regarding the same. I was working in CoE as a Full Stack Java Developer.

Chapter 2: The Internship

The Internship at glance:

I was assigned to work on Java Full Stack Development in Center of Excellence (CoE). I had to learn about 3 tier architecture, working on Presentation layer with HTML, CSS and Angular JS, Application layer with Java, Spring Boot framework and Data layer using MySQL and Hibernate ORM. I read and understood Functional Requirement Specification Documentation.

I worked on Rural Engineering Services Work Management System bug fixing, Narmada Valley Development Work Management System bug fixing, Rural Roads Development Authority Work Management System Billing module (1.5, 1.6 and 1.7) and MPMSME Startup Portal Funding Assistance pages.

My role and responsibility were to create and test end to end application for which I made HTML pages, styled them using CSS, added functionality to the HTML form using Angular Js, handled Data using Java and Spring boot framework, created and designed Databases to store and manage data.

For bug fixing I was tasked to find vulnerabilities in the form of null pointer exceptions, invalid type casting, removing/replacing deprecated method/functions, adding exception handling to prevent unhandled exception errors and man-in-the-middle attacks.

Software and tools Used:

Programming languages –

1. **Java** - Java is a high-level programming language, primarily class-based and object-orientated programming language which is designed, to have as few implementation dependencies as feasible. Java is also a standard-reason programming language intended to permit programmers to write once and run everywhere (WORA), which means that compiled Java code can run on all platforms that assist Java without the need to recompile the code again and again. Java applications are first compiled to bytecode that can run on any Java virtual system (JVM) no matter the underlying computer architecture be it ARM, x86, or any other. The syntax of Java is just like C and C++, however, has fewer low-stage centers than either of them. The Java runtime gives dynamic competencies (inclusive of reflection and runtime code amendment) which can be typically now not available in traditional compiled languages.

2. **HTML** - The HyperText Markup Language or HTML is the same old markup language for files designed to be displayed in an internet browser. It is able to be assisted by means of technologies consisting of Cascading Style/fashion Sheets and scripting languages consisting of JavaScript.
3. **CSS** - CSS handles the appearance and experience a part of an internet web page. With the usage of CSS, you may manipulate the color of the textual content, the style of fonts, the spacing among paragraphs, how columns are sized and laid out, what background pictures or shades are used, format designs, and variations in display for unique devices and display screen sizes in addition to a variety of different results.
4. **Angular Js** - AngularJS is a structural framework for dynamic internet apps. It helps you to use HTML as your template language and helps you to increases HTML syntax to express your software's additives simply and succinctly. AngularJS's records binding and dependency injection get rid of a great deal of the code you would otherwise write.
5. **MySQL** - MySQL is a relational database management system (RDBMS) developed through Oracle this is primarily based on structured query language (sql). A database is a structured series of facts. it could be whatever from a easy buying list to a photograph gallery or an area to maintain the widespread quantities of data in a company network.

Frameworks –

1. **Spring boot framework** - Spring Boot makes it smooth to create stand-alone, manufacturing-grade Spring Boot programs. It Primarily focuses on application or spring programs that you may "just simply run". We take an opinionated view of the Spring platform and third-party libraries so that you can get commenced with minimal fuss, maximum Spring Boot applications require minimum Spring configuration.
2. **Spring data** - Spring data's undertaking is to offer an acquainted and steady, Spring-based programming model for information access while at the same time nevertheless keeping the unique developments of the underlying data store. It makes it smooth to apply data access technologies, relational and non-relational databases, map-reduce frameworks, and cloud-based data offerings.
3. **Spring security** - Spring security is a framework that makes a specialty of supplying both authentication and authorization to Java programs. like any Spring initiative, the actual strength of Spring security is observed in how effortlessly it could be prolonged to satisfy custom necessities functions complete and extensible aid for both Authentication and Authorization.

4. **Hibernate ORM** - Hibernate ORM permits builders to more without difficulty to write packages whose information outlives the software technique. As an object/Relational Mapping (ORM) framework, hibernate is involved with records persistence because it applies to relational databases (through JDBC).
5. **Thymeleaf** - Thymeleaf is a modern-day server-facet Java template engine for each internet and standalone environment. Thymeleaf's primary purpose is to convey stylish natural templates on your development workflow — HTML that may be efficiently displayed in browsers and additionally work as static prototypes, taking into account stronger collaboration in improvement teams.

Libraries –

1. **jQuery** - jQuery is a light-weight, "write much less, do much-more", JavaScript library. The motive of jQuery is to make it plenty simpler to apply JavaScript to your website. jQuery takes quite a few commonplace tasks that require many lines of JavaScript code to perform and wraps them into techniques that you may call with a single line of code.
2. **Maven automation tool for Java projects** - Maven is a project control and comprehension tool that gives builders a whole build whole of lifecycle framework. Improvement team can automate the task's construct infrastructure in nearly no time as Maven makes use of a general directory format and a default construct lifecycle.

Server –

1. **Apache Tomcat server** - Tomcat server is the servlet container in addition to the webserver wherein you may set up all of your internet programs and also can control more than one deployment through the use of Tomcat manager. Tomcat manager indicates the status of all of the deployments and offers you the choice to begin, stop or reload the deployed record.

Tools –

1. **SonarQube** - SonarQube is a device that empowers all builders to put in writing cleaner and more secure code. be a part of an Open network of greater than 200k dev group downloads. decorate Your Workflow with non-stop Code high-quality & Code safety hundreds of computerized Static Code evaluation policies, shielding your app on more than one front, and guiding your team.

2. **MySQL Workbench** - MySQL Workbench is a unified visible tool for database architects, builders, and DBAs. MySQL Workbench offers information modeling. SQL improvement, and complete management equipment for server configuration, consumer management, backup, and lots extra. MySQL Workbench is present on windows, Linux, and Mac OS X.

Integrated Development Environment (IDE) –

1. **Eclipse** – The Eclipse is IDE (integrated development environment) and specifically, eclipse is primarily based on Java programming language to be carried out on this platform. There are numerous plug-ins and different extra plug-ins may be established within the platform. Superior customer programs may be developed. To perform programming in Eclipse a JDT is used.
2. **Spring Tool Suite** - Spring boot tool Suite four makes it smooth to get started out. Immediate and smooth-to-use integration of the Spring Initializer and the well-known Spring publications permits you to move from having nothing to a fully-functional Spring Boot app in seconds. Navigating your spring code knowledge and speedy navigating source code is important for coding.

Version Control –

1. **Tortoise SVN** - TortoiseSVN is owned by Apache ™ Subversion (SVN) ® consumer and it works using a windows shell extension. Key features on TortoiseSVN are it is intuitive and smooth to apply as SVN does not require the Subversion command-line client to run. Another wonderful feature of TortoiseSVN is, it is free to apply and use, even in a business environment.

Responsibilities and Description of the Internship:

As an Intern my primary responsibility was to learn. I learned almost everything I could in the short duration of 4 months in the organization.

My responsibility was to read and understand Functional Requirement Specification (FRS) Documentation, design Database with tables and relations according to the FRS, have a conversation with my industry mentor regarding the same, incorporate the suggestions made by industry mentor.

After I have an understanding of the requirements of the project/module assigned, start working on the UI (Presentation Layer), then create the Database (Data Layer), then start working on the logic through which data will travel to and fro from Presentation layer to Application Layer and vice versa.

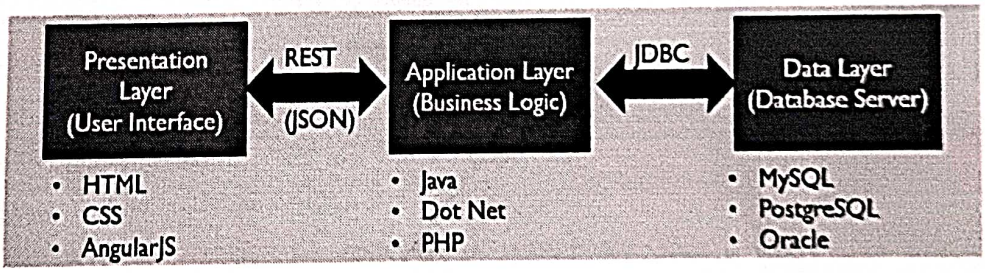
After the Module is completed, it is subject to test case from the developer's perspective, to check the primarily if the methods are working as intended.

After testing from my perspective and approval from industry mentor, the code is committed from my local working repository to the main central repository.

The testing team runs, various system tests on the Code committed.

If the code fails testing team's test, it is sent back to the developer for bugs to be fixed. If it passes then the code is pushed to the production environment.

In this way a concept/requirement in the mind of the client gets converted into actual useable product.



Timeline at Internship:

18th January 2022 – Internship Starts

3rd February 2022 – Understanding project requirements, understanding and gathering information on all the tools to be used.

18th February 2022 – Assigned Bugs fixing, setup of SonarQube completed and bug fixing on Rural Engineering Services Work Management System.

5th March 2022 – Assigned Bugs fixing on Narmada Valley Development Authority Bugs, completed and submitted Rural Engineering Services Work Management System Bugs.

20th March 2022 – Assigned work in Rural Road Development Authority in Billing module 1.5.

4th April 2022 – Assigned work in Rural Road Development Authority in Billing module 1.6.

19th April 2022 – Assigned work in Rural Road Development Authority in Billing module 1.7 and MPMSME Startup Portal Financial Assistance (startup and incubator page)

4th May 2022 – Financial Assistance Module Submitted and started working on presentation and Internship report.

19th May 2022 – Winding up report, presentation, provisional certificate submission and working on knowledge transfer.

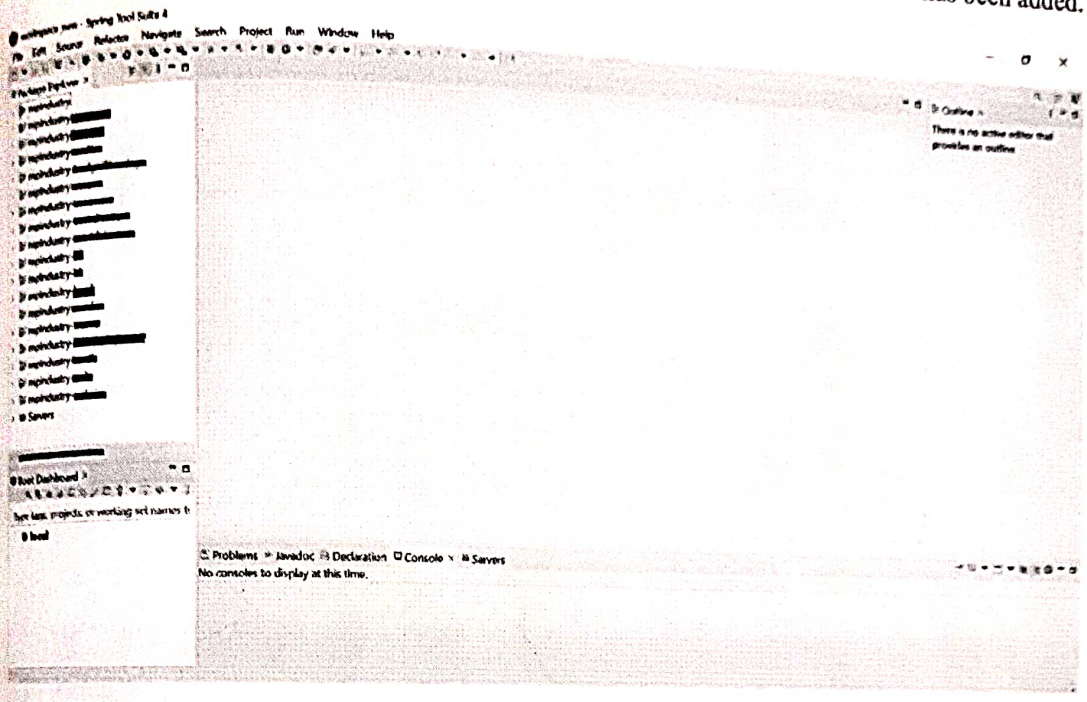
30th May 2022 – Internship ends.

Other Learnings:

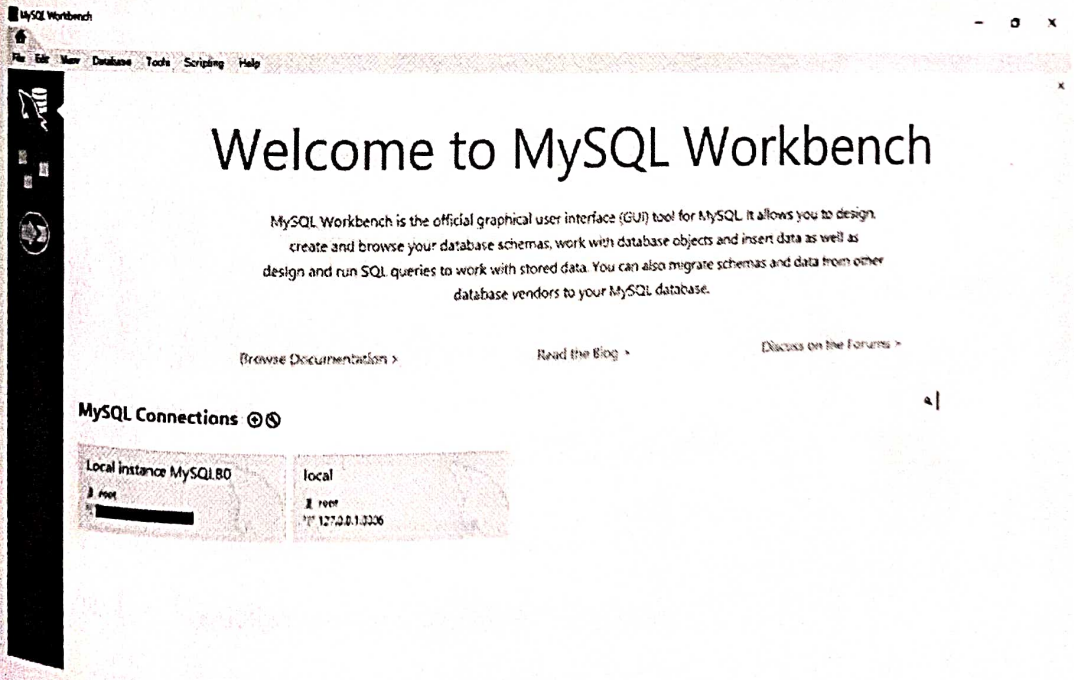
1. Building things is Hard, there are a lot of moving parts and attention to details is paramount in enterprise level applications.
2. Nothing is impossible, especially in technology.
3. Learning technology is like joining the dots. The picture becomes clear, when you understand a bunch of topics then understand their relationship with each other. It just takes time.
4. Befriend the feeling of "feeling lost" and "being anxious". This is because you are being asked to apply concepts and topics which you might be learning but it's okay.
5. Consistency in your approach, patience with yourself and others and persistence in learning new concept is the golden rule in technology.
6. Communication is of the utmost importance; you should be able to explain you thought in a clear and simple manner in both verbal and written communication.
7. I feel inspired and my curiosity towards technology, my love and respect for technology has grown exponentially.
8. I feel inspired as even if you are working on a seemingly small work, your contribution is part of a bigger machine. Your contribution has direct impact on a lot of things you might not even be aware of.

Screenshots:

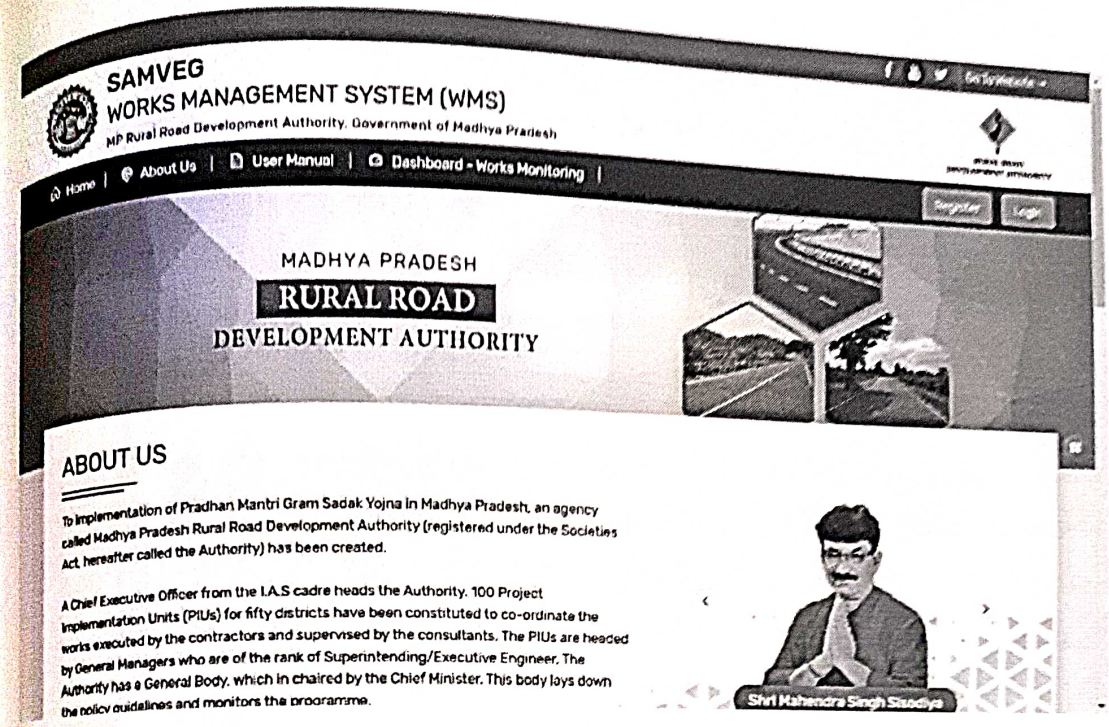
Declaration – I have not included the screenshots of the modules I have worked on, only the front page of the website where I was assigned module and general screenshot of the tools used has been added.



Spring Boot Suite



MySQL Workbench



Madhya Pradesh Rural Road Development Authority (RRDA)

Madhya Pradesh Micro, Small and Medium Enterprises Startup Portal (MPMSME)

Critical Observations and Recommendations:

1. I feel this organization has a lot of potential to would benefits a lot from Interns' new way of thinking, energy and will to prove themselves. Similarly, the interns will gain professional experience and will be industry ready.

2. Project software requirement tools should be standardized so that the project setup time is minimized.

3. Seminars should be conducted where institutes such as Madhav Institute of Technology and Science, Gwalior invites industry experts to talk about the work they are doing. This is open the mind of students to the practical application of the technology they are studying.

CONCLUSION

Getting a chance to work at a State Government Information Technology Corporation like Madhya Pradesh State Electronics Development Corporation was one item on my bucket list when I was an under-graduate degree student. I am so glad that, I was able to complete the final semester of my undergraduate degree working and learning in such an organization. For a young blood who is still inexperienced, working with the innovative minds and experienced professionals was a great experience for me. The office environment and people felt great like home. Along with work, everyone used to have fun, working late and even on holidays with high encouragement because we felt like, we are working not only for the client for also for the nation and its people.

360-degree focus on Technology is done by Madhya Pradesh State Electronics Development Corporation. Though 4 months attachments are not enough for a person to learn all those, but the relationships made there are a lifetime asset who are still with me and willing to help me learn a plethora of topics. It was a great journey learning and working with so many people of different professional background and skillset all in all, I will conclude it has been a great learning opportunity for me.

This has been a great learning experience for my career enhancement and personal growth. Again, I am Thankful to so many people who helped me doing this report.

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APPENDIX

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Eshan Sharma (0901IT181035)

IT 4TH Year

Dept. of Information Technology

Dr. Saumil Maheshwari

Assistant Professor

Dept. of Information Technology

मध्यप्रदेश स्टेट इलैक्ट्रॉनिक्स डेव्हलपमेंट कार्पोरेशन लिमिटेड
Madhya Pradesh State Electronics Development Corporation Limited
CIN : U74210MP1983SGC002298
GSTIN : 23AABCM0089R1Z5
(म.प्र. सरकार का उपक्रम)
(A Govt. of M.P. Undertaking)

Ref/MPSeDC/2022/

Date: 13/05/2022

To whom so ever it may concern

This is to certify that Mr. Eshan Sharma (Enrollment Number -0901IT181035) of Madhav Institute of Technology and Science, Gwalior (MITSG) pursuing BTech in Information Technology branch is pursuing 6 months internship at Madhya Pradesh State Electronics Development Corporation (MPSEDC) from 18th Jan 2022 to 18th July 2022.

During the period till 10th May 2022, his conduct, his efforts, and learning capability were found exceptional. We wish him all the best for his future endeavors.

(Nikhil Dubey)
OIC HR