Industrial Internship Report on

"URL shortner"

Prepared by

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Executive Summary

This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT).

This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks' time.

My project was about URL shortener which convert's the long URL into short URL's.

This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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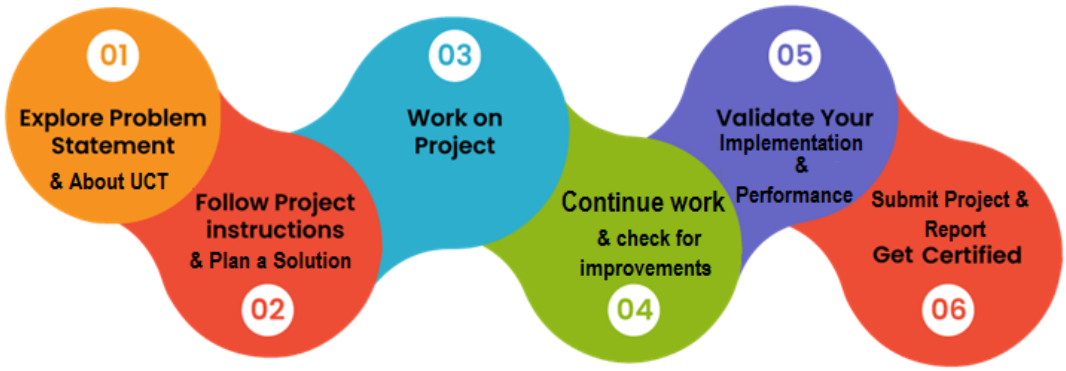
1 Preface

Over the duration of internship , I have been engaged in an enriching internship program aimed at enhancing my skills and knowledge in the field of software development. Through a combination of theoretical learning, practical assignments, and hands-on projects, I have gained valuable experience and insights into various aspects of software engineering and project management. This internship has provided me with an opportunity to apply classroom learning to real-world scenarios, collaborate with industry professionals, and develop essential skills for a successful career in the technology sector.

Relevant internships play a crucial role in career development by providing practical experience, exposure to industry practices, and networking opportunities. Internships offer a platform for individuals to apply theoretical knowledge in real-world contexts, gain insights into industry trends and best practices, and develop essential skills required for success in their chosen field.

The internship program offered by USC/UCT provided me with a valuable opportunity to gain practical experience and exposure to industry-standard tools and technologies. The program offered a structured learning environment and opportunities for personal and professional growth. Additionally, the internship facilitated networking with industry professionals and provided resources and support to succeed in the field.



Throughout the internship, I have gained valuable insights into software development practices, project management techniques, and industry trends. I have learned to collaborate effectively with team members, communicate ideas clearly, and solve complex problems creatively. The hands-on projects and assignments have allowed me to apply

theoretical concepts to real-world scenarios and develop practical skills that are essential for success in the technology industry. Overall, the internship has been a rewarding learning experience that has equipped me with the knowledge and skills needed to pursue a career in software development.

I would like to express my sincere gratitude toward the Up skill campus and UCT. I am truly grateful for the opportunities provided and the knowledge shared during this internship.

To my juniors and peers, I would like to encourage you to actively seek out internships and practical learning opportunities in your chosen field. Internships offer a unique platform to gain hands-on experience, explore different career paths, and develop essential skills for success in the industry. Take advantage of every opportunity to learn, grow, and network with industry professionals. Remember that every experience, whether big or small, contributes to your personal and professional development.

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

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

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

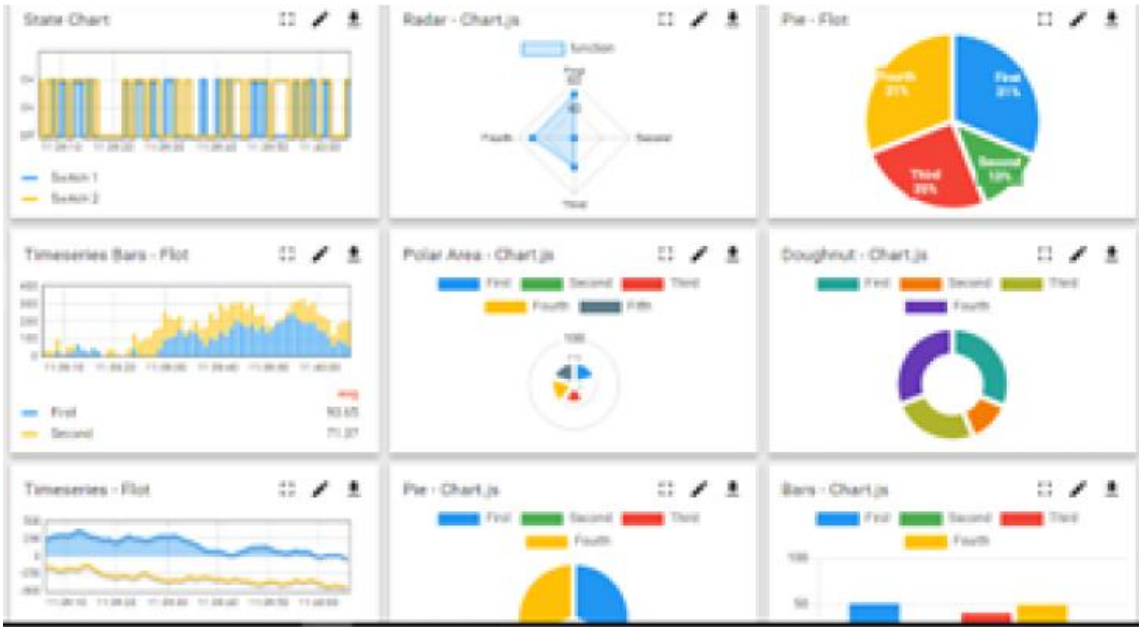
i. UCT IoT Platform (UCT Insight)

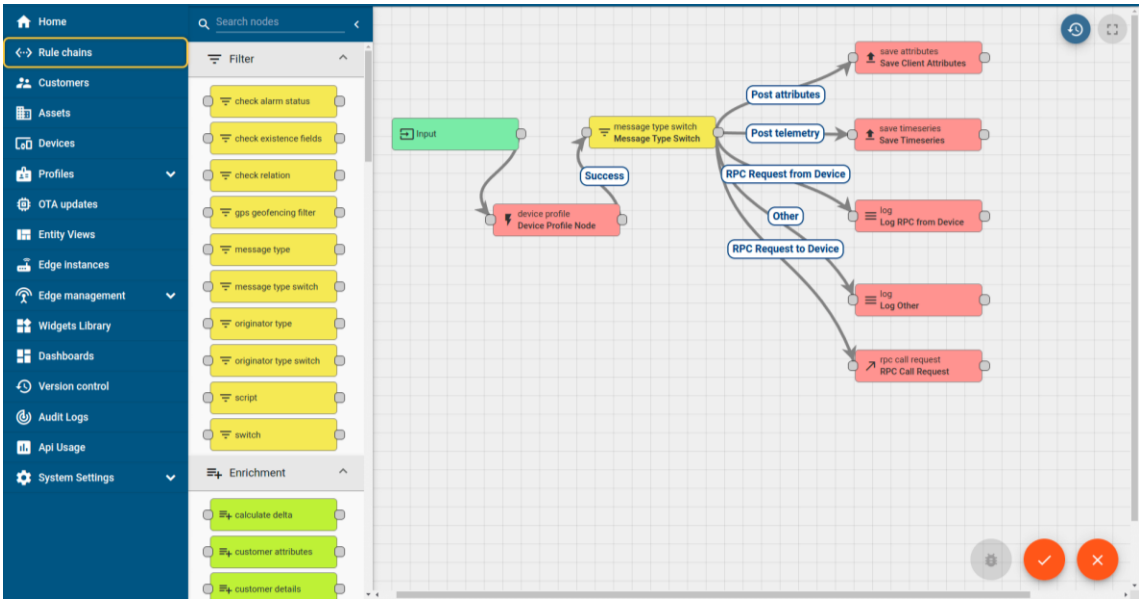
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





ii. Smart Factory Platform (FACTORY WATCH)

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.

Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
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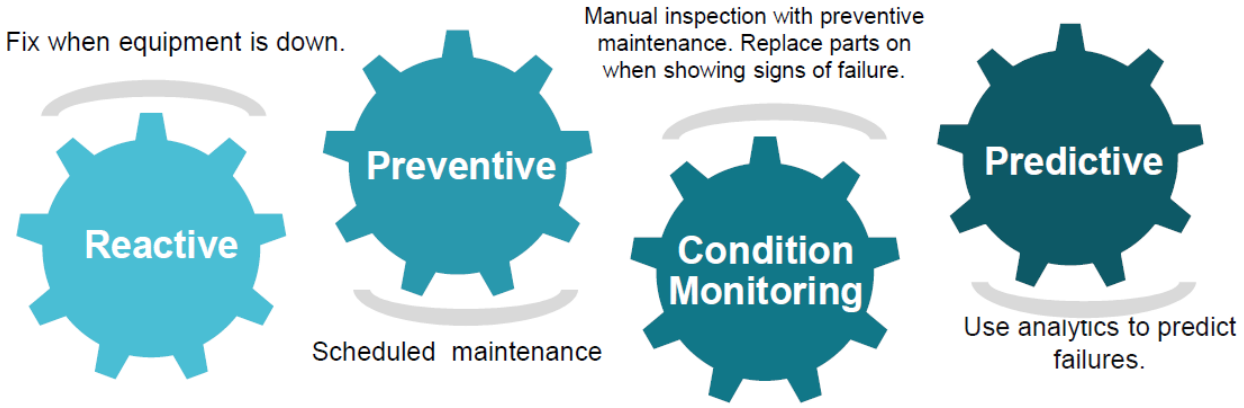
iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN technology and providing solution in Agri-tech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

iv. Predictive Maintenance

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



2.2 About upskill Campus (USC)

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

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

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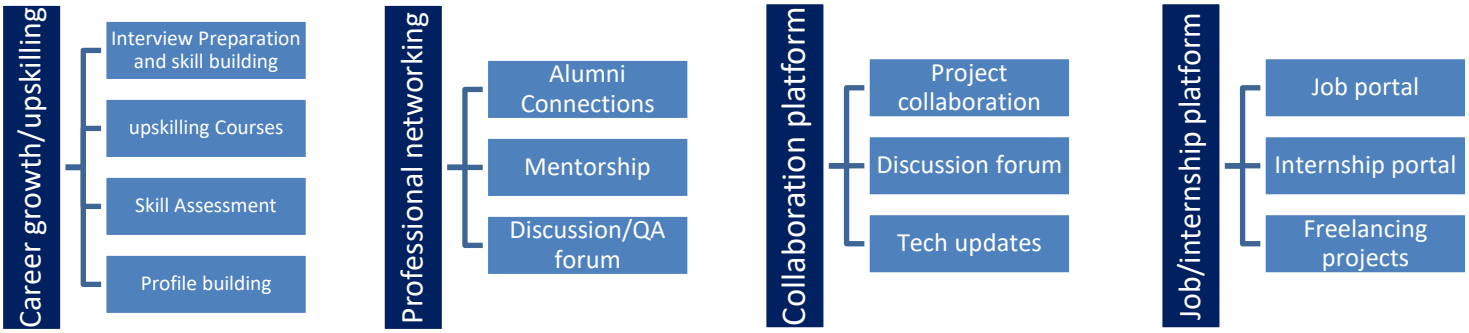
Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

upSkill Campus aiming to upskill 1 million learners in next 5 year

https://www.upskillcampus.com/



2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

2.4 Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.
- ☛ to have improved job prospects.
- ☛ to have Improved understanding of our field and its applications.
- ☛ to have Personal growth like better communication and problem solving.

2.5 Reference

[1] javatpoint

[2] Greeksforgreek

[3] python.org

[4] skatckoverflow

2.6 Glossary

Terms	Acronym
URL	Uniform Resource Locator
IoT	Internet of Things
Flask	A lightweight web framework for Python
USC	**Upskill campus**
UCT	**Uni Coverage technologies Pvt Ltd**

3 Problem Statement

The increasing length and complexity of URLs pose challenges in sharing and managing web links efficiently. Users often encounter difficulties in sharing lengthy URLs, especially in contexts such as social media posts, email communications, and printed materials. Additionally, long URLs can be cumbersome to remember and prone to typos when manually entered.

4 Existing and Proposed solution

Existing URL shortener services offer solutions to the problem by providing tools to convert long URLs into shorter, more user-friendly links. These services typically involve generating a unique identifier or hash for each URL and storing the mapping between the original and shortened URLs in a database. When a user accesses the shortened link, they are redirected to the original URL.

The proposed solution for this project involves developing a URL shortener application using Python, Flask, and SQLite. The application will allow users to input long URLs through a web interface and generate corresponding shortened links.

4.1 Code submission (Github link) :

https://github.com/LaxmiRanjvan/Upskillcampus/blob/main/URLShortner.py

4.2 Report submission (Github link) :

https://github.com/LaxmiRanjvan/Upskillcampus/blob/main/URLShortner_Laxmi_USC_UCT.pdf

5 Proposed Design/ Model

5.1 High Level Diagram

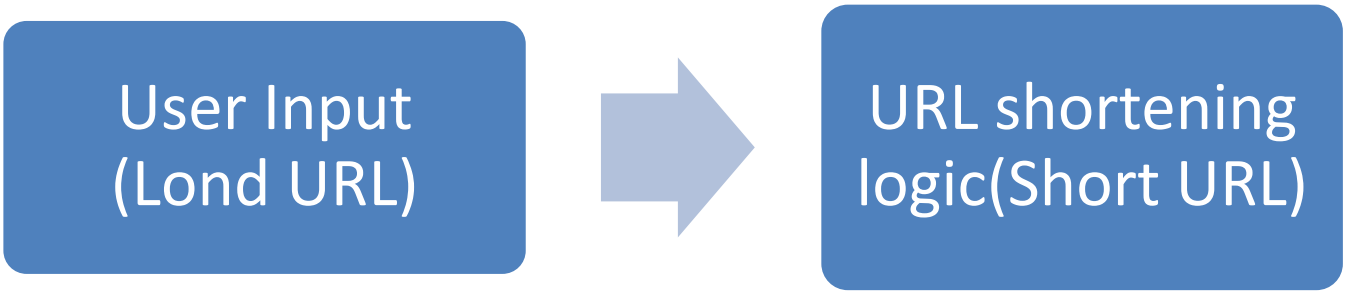


Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

5.2 Interfaces

User Interface:

- The user interface allows users to input long URLs and view corresponding shortened links.
- It consists of HTML forms for inputting URLs and displaying shortened links.

URL Shortening Logic:

- Responsible for generating unique shortened URLs and managing the URL mapping.
- Uses Python functions to generate shortened URLs

Data Flow:

- User inputs long URL via the user interface.
- The URL shortening logic generates a unique shortened URL for the input URL.

6 Performance Test

6.1 Test Plan/ Test Cases

Constraints Identified:

1. Memory Usage: The application should efficiently manage memory resources, especially when handling large volumes of URL mappings in the database.
2. Response Time: The response time of the application should be reasonable, ensuring a seamless user experience.

Test Cases:

1. Memory Usage Test: Input a large number of URL mappings and monitor memory usage.
2. Response Time Test: Measure the time taken to generate a shortened URL and serve the web page.
3. Test Case: Input a valid long URL and verify the generation of a shortened link.
4. Test Case: Access a shortened link and verify redirection to the original URL.

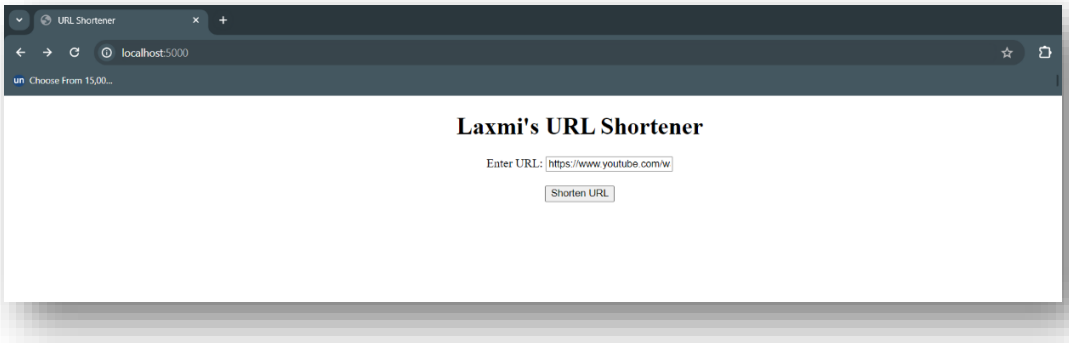
6.2 Test Procedure

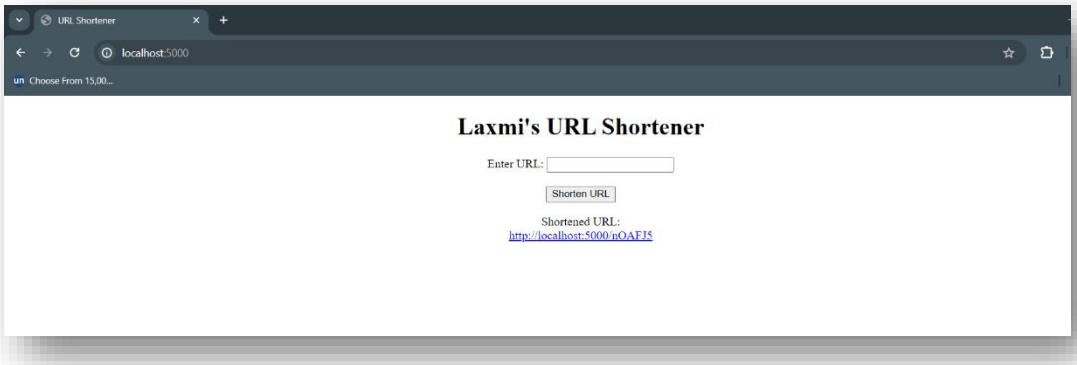
1. Memory Usage Test: Input a large dataset of URL mappings into the application.
2. Response Time Test: Use a timing tool to measure the response time of the application when generating shortened URLs and serving web pages.

6.3 Performance Outcome

1. Memory Usage: The application efficiently manages memory resources by using SQLite, a lightweight database management system.
2. Response Time:The response time of the application is within acceptable limits, with the generation of shortened URLs and page rendering taking only a fraction of a second. This ensures a smooth user experience without noticeable delays.
3. Shortened URL is generated and displayed.

4. Automatically redirected to the original long URL associated with the shortened link.





7 My learnings

Flask is a lightweight and flexible web framework for Python. It's known for its simplicity and ease of use, making it a popular choice for developing web applications, especially those with smaller or medium-scale requirements.

Gain proficiency in developing web applications using the Flask framework.

Learn best practices for implementing URL shorter.

8 Future work scope

- Custom Link Aliases: Users can choose their own shortened link names instead of getting random ones.
- Expiration Dates: Shortened links automatically expire after a set time, ensuring they're only valid for a certain period.
- Analytics Tracking: Users can see statistics on how many times their shortened links have been clicked.
- Scalability: The app can handle more people using it and converting more URLs without crashing or slowing down.