Industrial Internship Report on

Url Shortener

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 url shortener 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

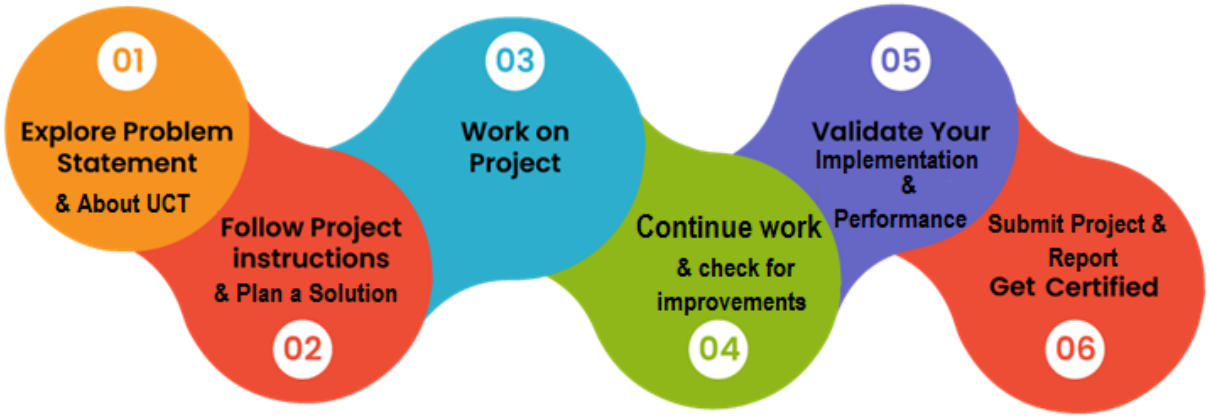
During the 6 week internship period I worked with various python modules and worked with many applications like flask etc to create a url shortener. Sql is used to store the original url and to keep track of the number of times the new url was used.

Internship provides you with real world exposure and equips you with more than just technical skills.

I was given the task of creating a application that takes a url shortens in and stores the original url in a database.

USC/UCT has allowed me work on different projects and build a network to improve my career.

How Program was planned



While working on this project i learned about various different modules and different application like Flask, sql etc.

Thank to Abdelhadi Dyouri who have helped you directly or indirectly.

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.

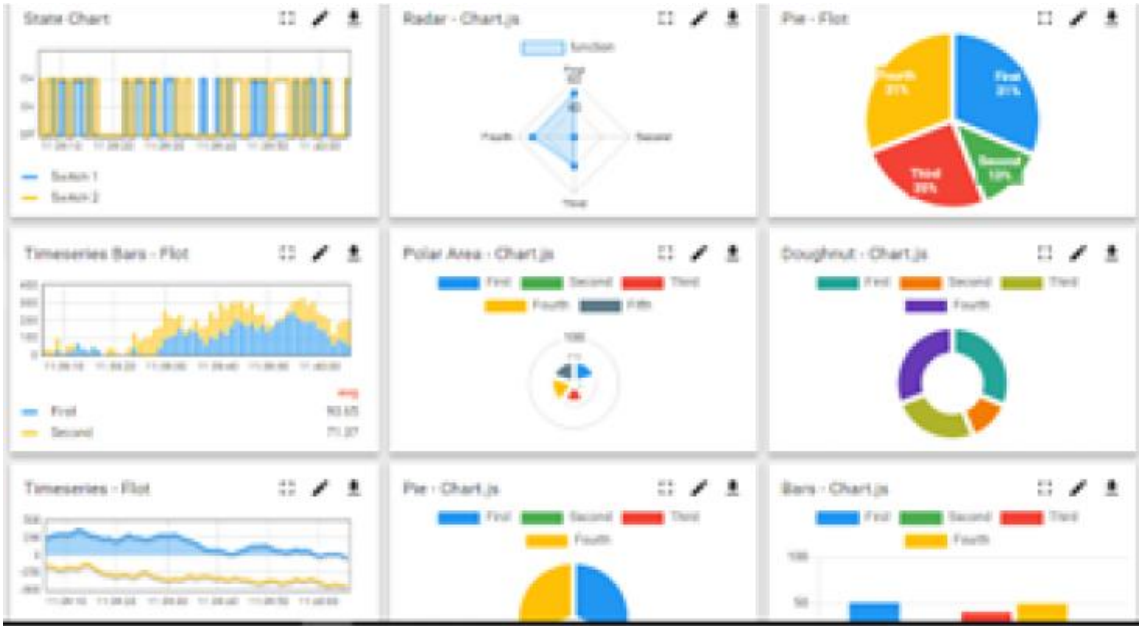
i. UCT IoT Platform (UCT Insight)

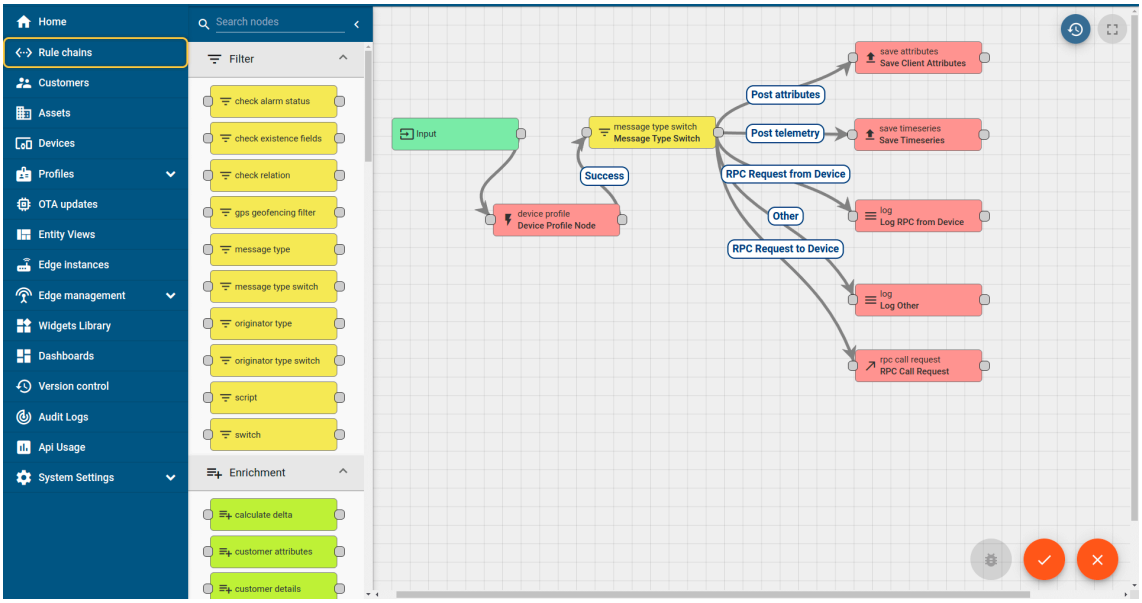
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- 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


State Chart
Radar - Chart.js
Pie - Plot
Timeseries Bars - Plot
Polar Area - Chart.js
Doughnut - Chart.js
Timeseries - Plot
Pie - Chart.js
Bars - Chart.js


Home
Rule chains
Customers
Assets
Devices
Profiles
OTA updates
Entity Views
Edge instances
Edge management
Widgets Library
Dashboards
Version control
Audit Logs
Api Usage
System Settings
Search nodes
Filter
check alarm status
check existence fields
check relation
gps geofencing filter
message type
message type switch
originator type
originator type switch
script
switch
Enrichment
calculate delta
customer attributes
customer details
Input
message type switch
Message Type Switch
Success
device profile
Device Profile Node
Post attributes
Post telemetry
RPC Request from Device
Other
RPC Request to Device
save attributes
Save Client Attributes
save timeseries
Save Timeseries
log
Log RPC from Device
log
Log Other
rpc call request
RPC Call Request

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.

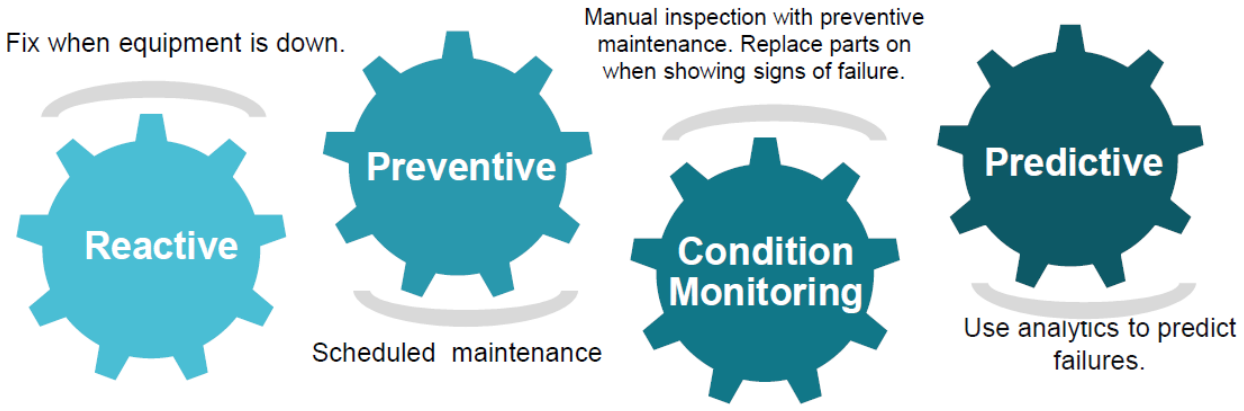
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1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

iii. based Solution

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

iv. Predictive Maintenance

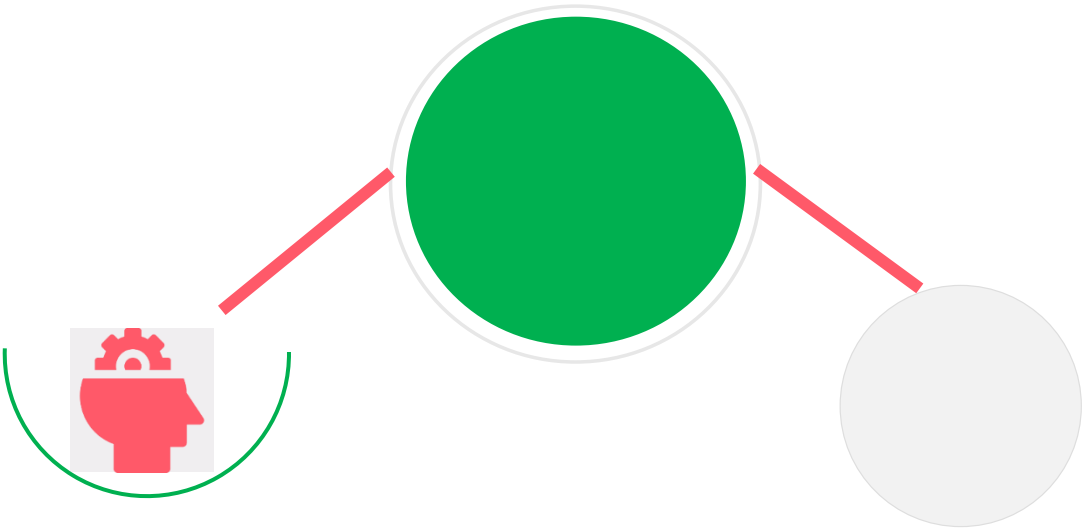
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



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.

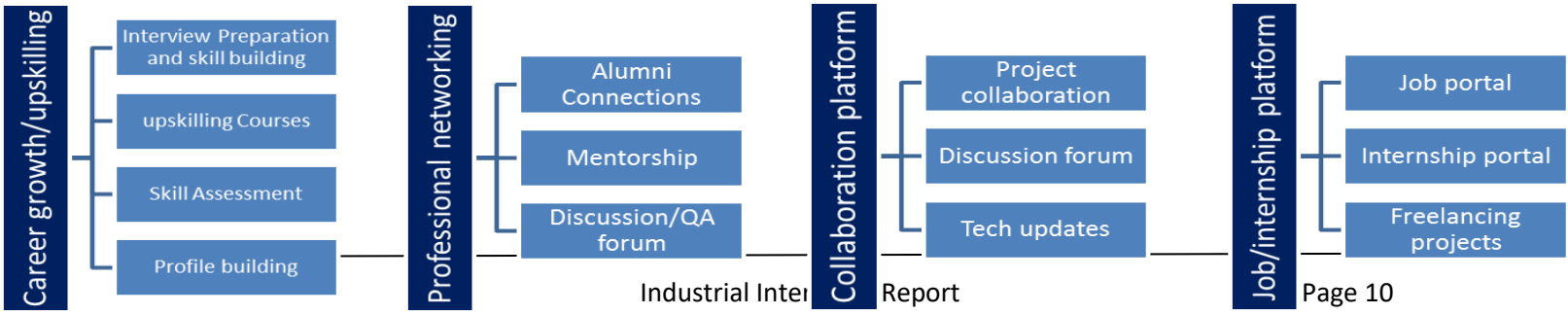
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



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] https://medium.com/

[2] https://techbyexample.com/url-shortner-system-design/

[3] https://systemdesign.one/url-shortening-system-design/

3 Problem Statement

- URL Shortener:

  Description: The URL shortener is a Python project that converts long URLs into shorter, more manageable links. It takes a long URL as input, generates a unique shortened URL, and redirects users to the original URL when the shortened link is accessed.

  Scope: The scope of this project involves designing a user interface to input long URLs and display the shortened links, implementing a database to store the mapping between original and shortened URLs, and developing functions to generate unique shortened URLs and handle redirection.

4 Existing and Proposed solution

Provide summary of existing solutions provided by others, what are their limitations?

What is your proposed solution?

What value addition are you planning?

4.1 Code submission (Github link) :

https://github.com/Rohitkujur620/upskill_campus

4.2 Report submission (Github link) :

https://github.com/Rohitkujur620/upskill_campus

5 Proposed Design/ Model

Given more details about design flow of your solution. This is applicable for all domains. DS/ML Students can cover it after they have their algorithm implementation. There is always a start, intermediate stages and then final outcome.

5.1 High Level Diagram (if applicable)

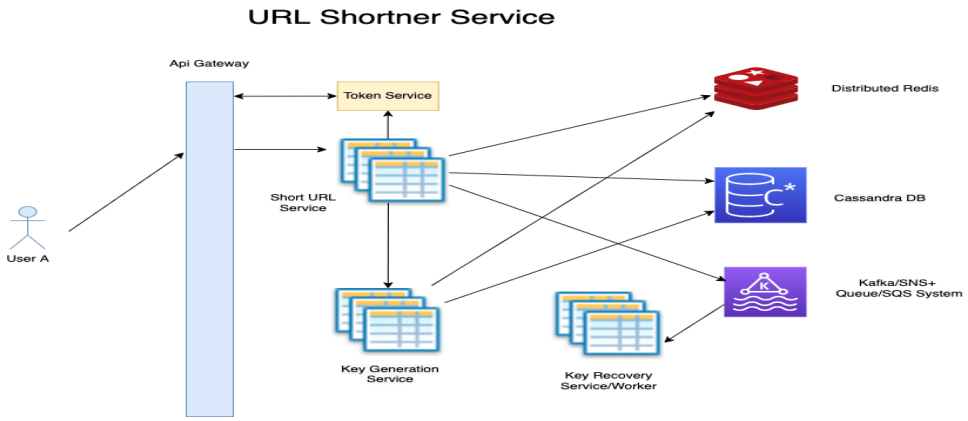
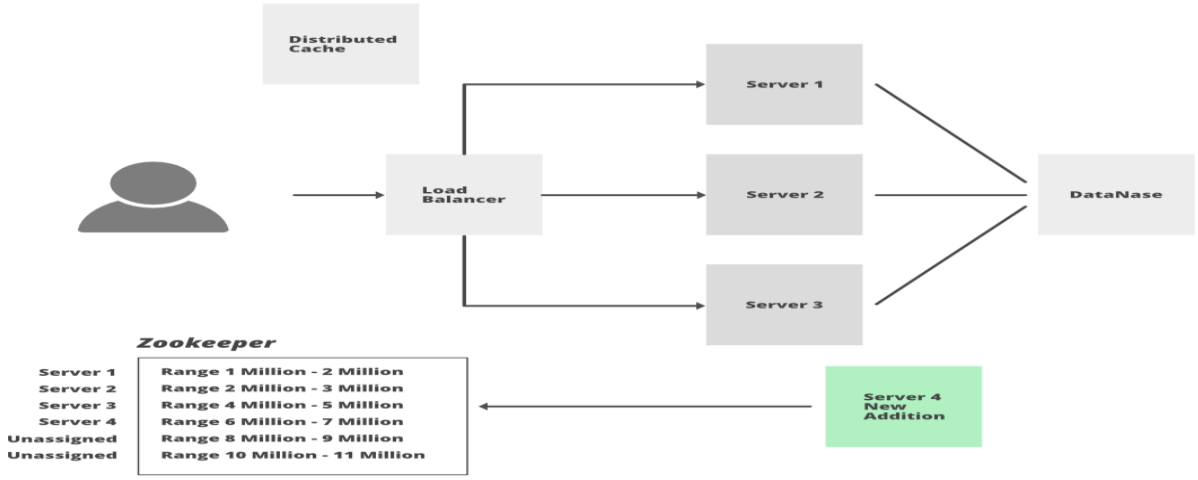


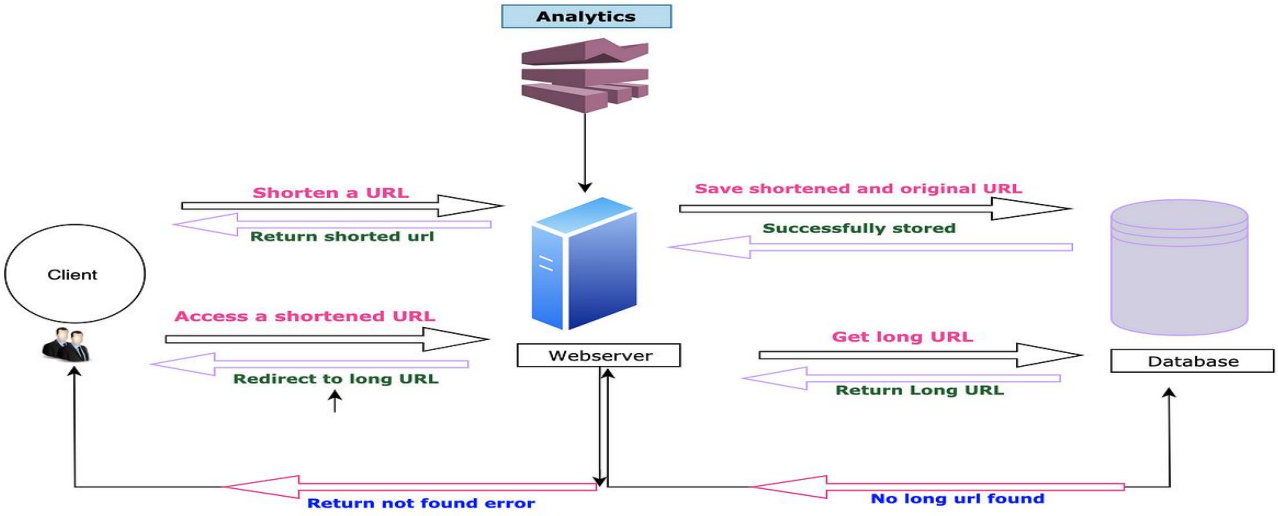
Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

5.2 Low Level Diagram (if applicable)



5.3 Interfaces (if applicable)

Update with Block Diagrams, Data flow, protocols, FLOW Charts, State Machines, Memory Buffer Management.



6 Performance Test

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

Here we need to first find the constraints.

URL Length Limitations: Shortened URLs are restricted in length to ensure they remain compact and easy to share. The maximum length of a shortened URL may vary depending on the URL shortener service used.
Character Set Limitations: Some URL shorteners limit the characters allowed in the shortened URLs. For example, they may restrict the use of special characters or disallow certain symbols that can cause issues in URL handling.
Expiration Time: URL shorteners often set an expiration time for shortened URLs to manage database size and prevent outdated links. After the expiration time, the shortened URL may become inaccessible.

Custom Alias Restrictions: While some URL shorteners allow custom aliases (customized shortened URLs), they may impose restrictions on the length, characters, or availability of certain words or phrases to avoid misuse or conflicts.

Rate Limiting: To prevent abuse or overloading of the URL shortener service, rate limiting may be imposed on API requests, shortening URLs, or accessing analytics data.

Analytics Limitations: URL shorteners may limit the level of link analytics available for free users, providing more comprehensive analytics to premium users.

Security Measures: URL shorteners implement security measures to protect against malicious activities, spam, and phishing. This may include scanning URLs for potentially harmful content or disallowing certain types of URLs.

Service Availability: URL shortener services may have downtime or limited availability due to maintenance or server issues. Users should be aware that the service might not be accessible 100% of the time.

Data Retention Policy: URL shortener services may have data retention policies, determining how long they store link analytics data and other user-related information.

Privacy Concerns: Users of URL shorteners should be aware that shortened URLs can be shared and accessed by others, which may impact their privacy and tracking.

Limited Error Handling: Some URL shorteners might not provide detailed error messages or feedback when an error occurs during URL shortening or redirection, which can make troubleshooting difficult.

No Guarantee of Permanence: URL shortener services may not guarantee that shortened URLs will remain valid indefinitely. If the service goes offline or shuts down, the shortened URLs may become unusable.

7 My learnings

During this internship i learned about uniconverge technologies about its contribution in the IOT field and the various career opportunities it provides . It helped me build a network with various people In the industry. I also learned about real world application of various topics like data science , Python , cyber security etc.

8 Future work scope

Due to the time limitation I could not the feature of **Customization of URLs**. The best URL shorteners all allow you to customize your shortened URLs. This means you can make your URLs more relevant, or use different links in multiple ads or social media posts to compare click-through rates.