Industrial Internship Report on

"ONLINE EDUCATION PLATFORM"

Prepared by

M S VIBHA

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 (Tell about ur Project) 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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Summary:

The six-week project aimed to optimize and enhance an online education platform through the implementation of cloud computing technologies. The primary objectives were to improve scalability, accessibility, and cost-efficiency while maintaining high levels of security and performance.

Week 1-2: Needs Assessment and Planning

Conducted a thorough needs assessment to identify scalability and performance issues in the existing online education platform.

Collaborated with stakeholders to define project goals, scope, and success criteria.

Developed a comprehensive project plan outlining tasks, timelines, and resource requirements.

Week 3-4: Cloud Migration and Infrastructure Setup

Selected a suitable cloud service provider (e.g., AWS, Azure, Google Cloud) based on project requirements. Migrated existing data and applications to the cloud infrastructure.

Set up virtual machines, databases, and networking components to support the online education platform.

Week 5: Testing, Optimization, and Documentation

Conducted rigorous testing of the cloud-based platform to assess scalability, performance, and user experience.

Week 6: Results

Successfully transformed the platform into a scalable, secure, and cost-efficient solution. The implementation of cloud technologies enhanced accessibility, performance, and security, positioning the platform for future growth and innovation in online education delivery.

Need of relevant Internship in career development:

Relevant internships play a crucial role in career development for several compelling reasons:

- Real-World Experience: Internships provide an opportunity to gain hands-on, practical experience in a specific field or industry. This practical exposure is often far more valuable than theoretical knowledge alone and helps bridge the gap between education and the real world.
- Skill Development: Internships allow individuals to develop and refine essential skills relevant to their chosen career path. These skills can include technical skills, problem-solving abilities, communication skills, teamwork, and time management.
- Networking Opportunities: Internships provide access to industry professionals, mentors, and colleagues. Building a professional network during an internship can lead to valuable connections, future job opportunities, and insights into the industry.
- Resume Enhancement: Relevant internships bolster a resume or CV, making job seekers more attractive to prospective employers. They demonstrate a commitment to the field and provide tangible evidence of one's abilities.
- Career Exploration: Internships offer a low-risk way to explore different career paths and industries. They allow individuals to test the waters and determine if a particular field aligns with their interests and goals.
- Industry Insights: Internships provide firsthand insights into the industry's culture, trends, challenges, and opportunities. This understanding is invaluable when making informed decisions about career paths and specialization.
- Professional Development: Internships often include mentorship and guidance from experienced professionals. This can accelerate learning and personal growth, helping individuals become more competent and confident in their chosen field.

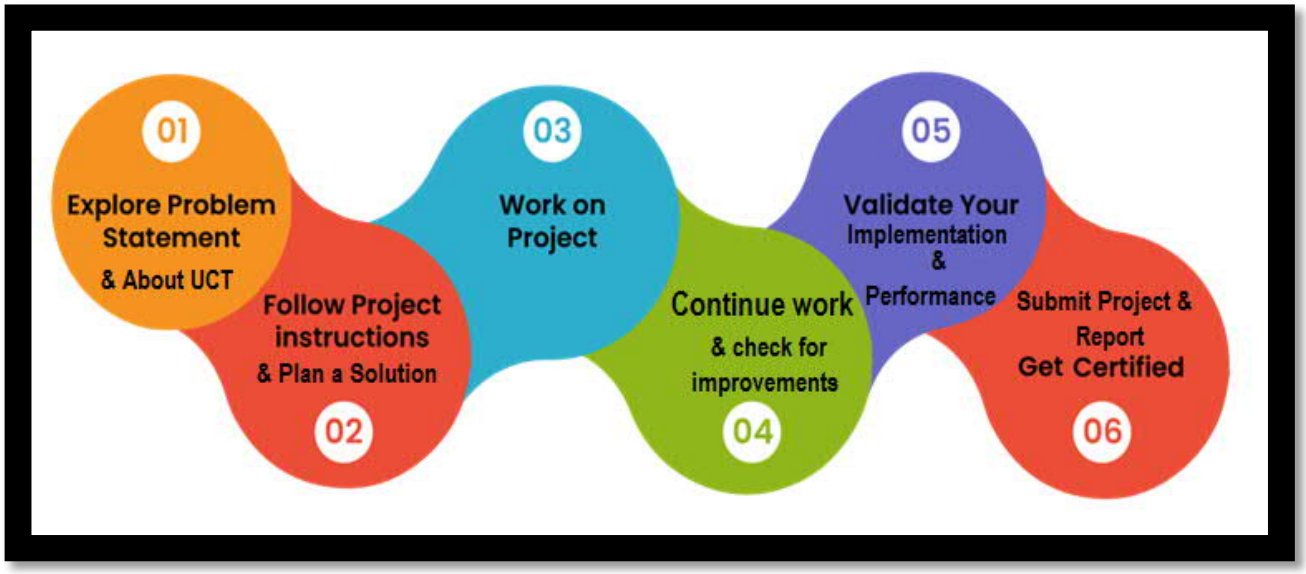
Brief about project/problem statement:

This project provides a comprehensive overview of cloud computing, covering definitions, essential characteristics, key benefits, cloud service models, cloud service brokerage, and cloud deployment models. Cloud computing involves delivering computing resources like servers, storage, and software over the internet. Essential characteristics include on-demand self-service, network access, resource pooling, rapid elasticity, and measured service. Key benefits comprise cost reduction, scalability, accessibility, and streamlined focus on core activities. Cloud service models encompass Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Cloud service brokerage involves intermediaries optimizing cloud service selection and integration. Deployment models include Public Cloud, Private Cloud, Hybrid Cloud, and Multi-Cloud, each catering to different organizational needs. This comprehensive understanding of cloud computing is essential for effective utilization and integration within modern business environments.

Opportunity given by USC/UCT:

- Hands-On Experience: We had the chance to work on real projects and tasks related to their field of study or career interests. This practical experience is one of the primary benefits of this internship.
- Learning and Skill Development: We received training and guidance, which helped acquire new skills and enhance existing ones.
- Networking: Internship provided opportunities to connect with professionals in the industry. Building a network that can be valuable for future job searches and career development.
- Mentorship: These mentors offered guidance, answered questions, and provide valuable insights into the industry and organization.
- Resume Enhancement: The skills and experience gained during this internship has set me apart in a competitive job market.

Planning for the project:



Learnings and overall experience:

- Understanding Cloud Services: Cloud service providers like AWS, Azure, or Google Cloud. You gain an understanding of the services they offer, such as computing, storage, databases, and networking.
- Resource Provisioning: You learn how to provision and manage cloud resources efficiently. This includes launching virtual machines (VMs), configuring storage, and optimizing resource allocation.
- Cost Management: One important lesson is understanding cloud cost structures and how to manage them effectively. You learn to monitor resource usage, set budgets, and use cost estimation tools.
- Scalability and Elasticity: Gained insights into auto-scaling, load balancing, and designing for elasticity.
- Security Best Practices: Security is paramount in cloud computing.
- Cloud Architectures: You explore various cloud architectures like Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) and learn when to use each.
- Collaboration and Teamwork: Working on cloud projects often involves collaboration with cross-functional teams. You learn how to communicate effectively and work together to achieve project goals.
- Continuous Learning: Cloud computing is ever-evolving. You realize the importance of continuous learning and staying updated with the latest cloud technologies and best practices.

Thankyou note:

I wanted to take a moment to express my heartfelt gratitude to Mr. Nitin Tyagi, Mr.Kaushlendra Singh and Mr. Nitin Tyagi for your invaluable guidance and mentorship. Your support has played a pivotal role in my personal and professional development during this internship, and I feel truly fortunate to have had the privilege of learning from you.

Your wisdom, patience, and willingness to share your knowledge have not only enriched my understanding of Cloud computing, but they have also inspired me to strive for excellence in all my endeavors. Your mentorship has been a beacon of light on my journey, illuminating the path toward growth and success.

1 Introduction

1.1 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.

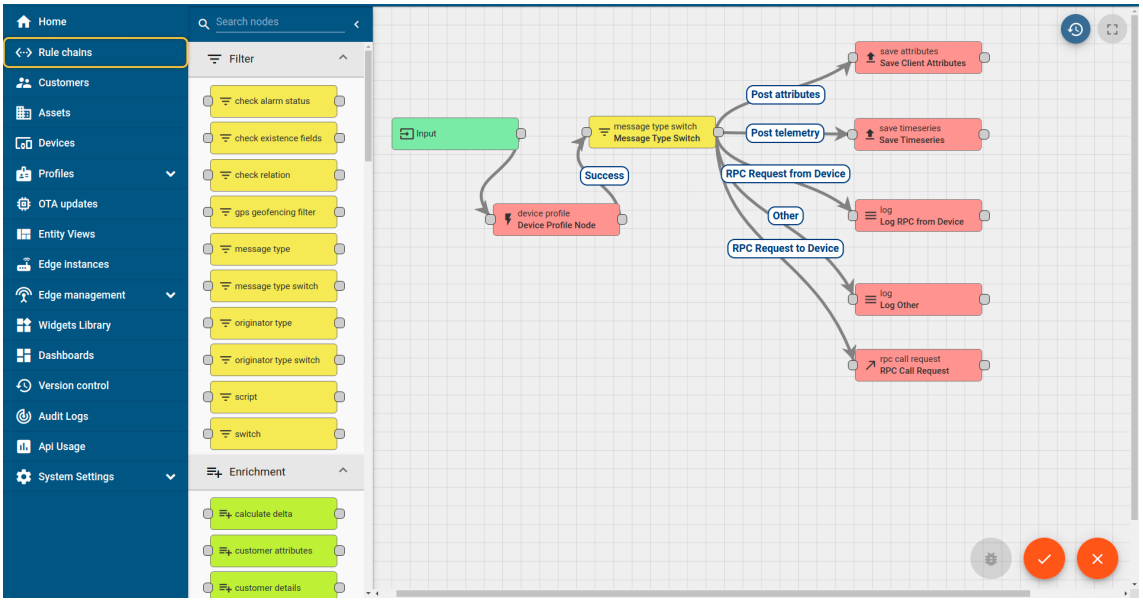
- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA

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 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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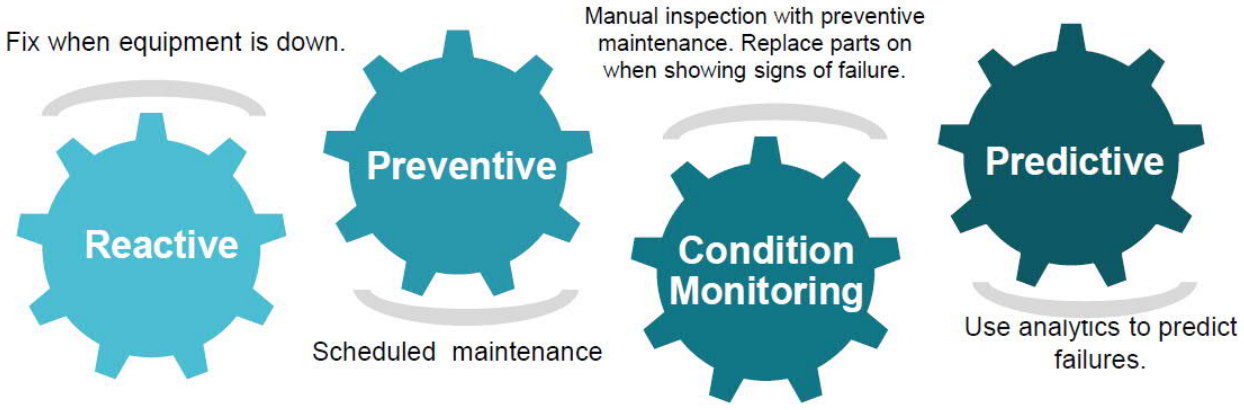
iii. LoRaWAN based Solution

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

iv. Predictive Maintenance

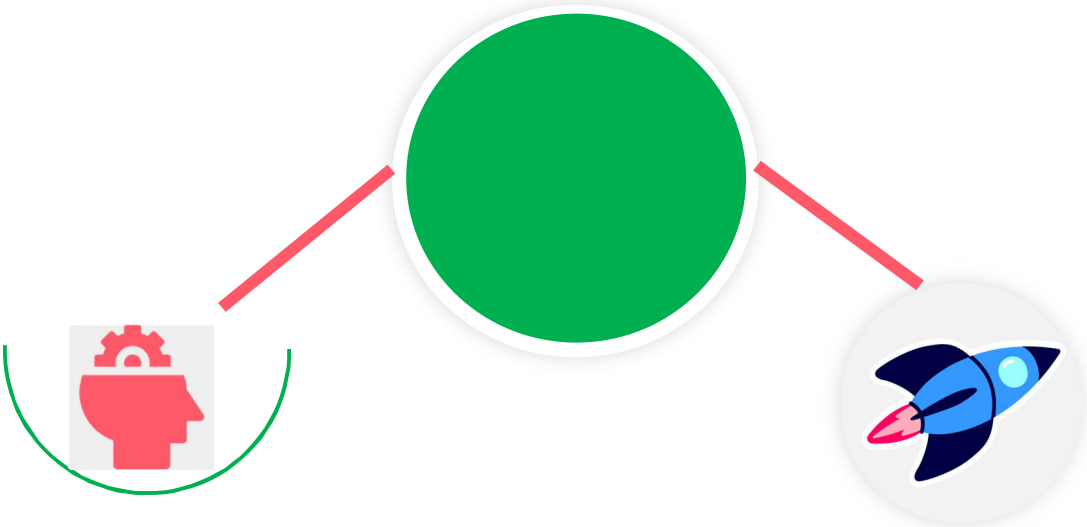
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



1.1 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.

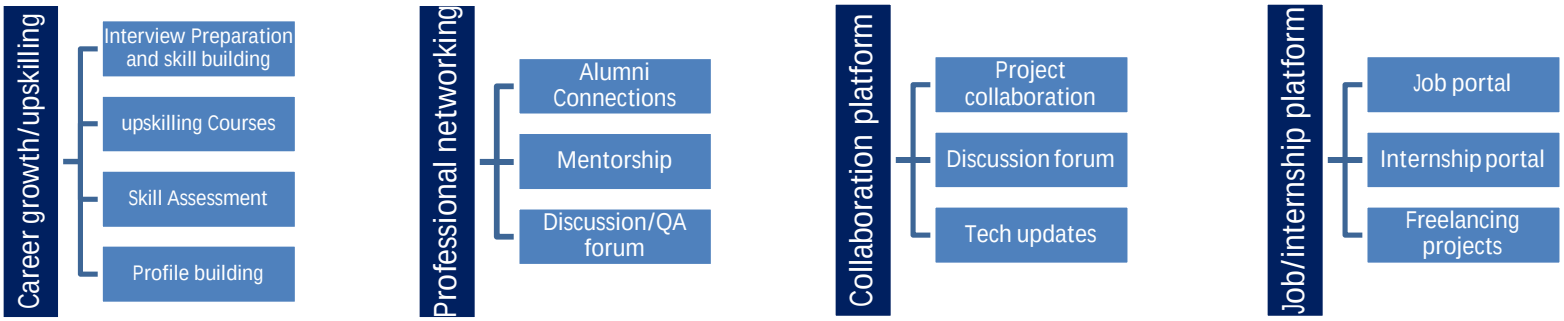
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



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/



1.2 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.

1.3 References

[1]Poonam R.Maska et al, International Journal of Computer Science and Mobile Computing"Technology of Cloud Computing connected to the internet ",Vol.3 Issue.5,May 2014

[2]Bello Alhaji al.;Saudi J. Eng. Technology.; Vol-2 ,I'm):114-118

[3]International Journal of Computer science and Information Security (IJCSIS),Bol.15,No.6,June 2017"Waterfall model and its architecture "

1.4 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.

1.5 Problem Statement

Online Education Platform using Cloud Computing:

Online Learning is the topic related to virtualized distance learning by means of electronic communication mechanisms, specifically the Internet. They are based in the use of approaches with diverse functionality (e-mail, Web pages, forums, learning platforms, and so on) as a support of the process of teaching learning. In this contribution, we give an overview of the current state of the structure of Cloud Computing for applications on e-learning.

2 Existing and Proposed solution

Enhancing Cloud Computing Literacy on an Online Education Platform Target Audience:

The project would cater to a diverse audience of learners, including:

Students: Those pursuing degrees or certifications in computer science, information technology, or related fields. Professionals: Individuals seeking to upskill or reskill in cloud computing for career advancement or transitioning to cloud-related roles. Entrepreneurs: Start-up founders and business owners looking to leverage cloud computing to streamline operations and scale their ventures. Decision-Makers: Managers, executives, and decision-makers aiming to understand the strategic implications and benefits of cloud adoption for their organizations.

Project Elements and Benefits:

- Structured Learning Modules: The project could be divided into well-organized and easy-to-follow learning modules. Each module would delve into specific aspects of cloud computing, ensuring a systematic progression of knowledge.
- Engaging Content Formats: To cater to different learning styles, the project could incorporate a variety of content formats, including text-based explanations, diagrams, infographics, videos, and interactive quizzes. Real-World Examples: Integrating real-world case studies and examples would help learners grasp how different industries and organizations have successfully implemented cloud computing solutions.
- Hands-On Labs and Simulations: Interactive labs and simulations could provide learners with hands on experience in provisioning virtual machines, deploying applications, and managing cloud resources. Discussion Forums and Q&A: An online education platform could host discussion forums and Q&A sessions where learners can engage with instructors and peers to clarify doubts, share insights, and discuss emerging trends. Assessment and Certification: Periodic assessments and a final assessment at the end of the course could help learners gauge their understanding. Earning a certification upon completion could enhance learners' credibility and career prospects

2.1 Code submission and Report submission (Github link)

https://github.com/vibharao2102/onlineeducationplatform/commit/ae658e52fdfd2dd94f6b025be42078fe3a3d5851

3 Proposed Design/ Model

3.1 High Level Diagram

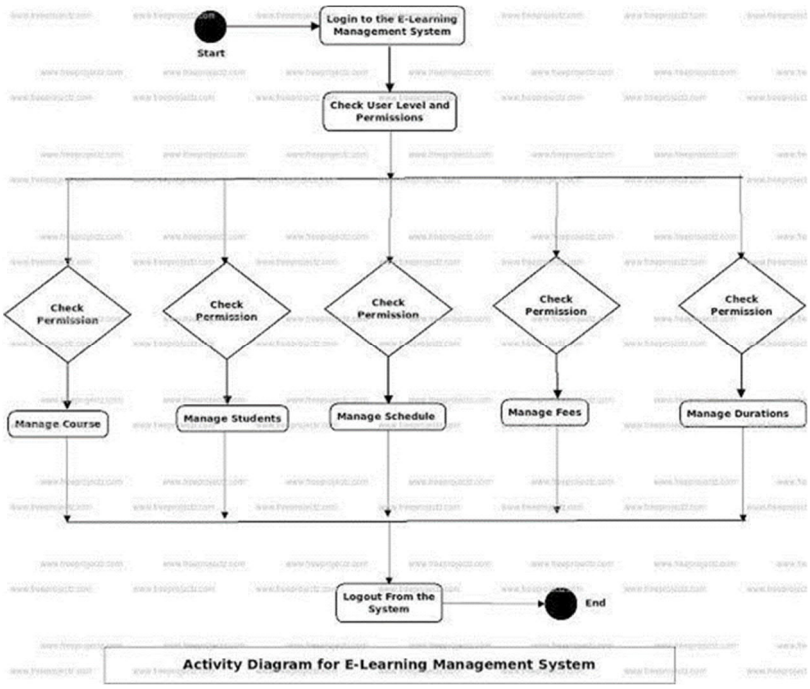


Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

3.2 Performance Test

Unit testing tests the minimal software component, or module. Each unit (basic component of the software is tested to verify that the detailed design for the unit has been correctly implemented. Integration testing exposes defects in the interfaces and interaction between integrated components (modules). Functional testing tests at any level (class, module, interface, or system) for proper functionality as defined in the specification. System testing tests a completely integrated system to verify that it meets its requirements. Alpha testing refers to the system testing carried out by the test team within the developing organizations. Beta testing it is the system testing performed by selected group of friendly customers. Acceptance Testing refers to the System testing performed by the customer to determine

3.3 Performance Outcome

The rise of the cloud computing is also rapidly changing of information technology and ultimately to turning to long-held promise of the utility of computing in a reality. Present the situation of economic will force the different education institutions and the organisations to consider and adopting the cloud solutions. All organisations have keep the reducing gap between the current situation and new development order to continue the offering their services on the sufficient way. The main aim of work was to the identify the architecture which will the using of cloud computing within higher education. We have considered benefits of the cloud architecture. Even though this dissertation could produce potential outcomes following the research question, there were some limitations, which could be improved in future research.

3.4 Summary of Overall Learning and Career Growth Potential

Continuous learning is the cornerstone of my career growth, offering me the adaptability, skill diversification, and problem-solving abilities needed to thrive in an ever-evolving job market. This commitment to lifelong education enhances career resilience, fosters professional growth, and opens doors to new opportunities. It equips individuals with the confidence to take on leadership roles, innovate, and approach challenges with fresh perspectives. Continuous learning also expands professional networks and provides a global perspective, essential in our interconnected world. Beyond career advancement, it brings personal fulfillment and purpose as individuals pursue their passions and interests. In summary, embracing continuous learning is not only a path to career success but a lifelong journey that enriches both personal and professional aspects of my life.

3.5 Future work scope

Technology Advancements: The rapid evolution of technology continues to create new career opportunities. Fields like artificial intelligence, machine learning, blockchain, and quantum computing are expected to see significant growth.

Data and Analytics: Data-driven decision-making is becoming increasingly important across industries. Careers related to data analysis, data science, and data engineering are expected to be in high demand.

Cybersecurity: As cyber threats continue to evolve, the need for cybersecurity professionals is growing. Roles in cybersecurity, including ethical hacking and security analysis, are likely to expand.

Sustainability and Green Tech: Careers in sustainability, renewable energy, and green technology are gaining prominence as organizations and governments prioritize environmental responsibility.