

**Industrial Internship (CDC AWS Courses)
BCSE399J**

A REPORT

submitted by

Riya Sharma (21BRS1149)

in partial fulfilment for the award

of

**B. Tech. Computer Science and Engineering
(AI and Robotics)**

School of Computer Science and Engineering



VIT[®]
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

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School of Computer Science and Engineering

DECLARATION

I hereby declare that the project entitled “**Industrial Internship (CDC AWS Courses) BCSE399J**” submitted by me to the School of Computer Science and Engineering, Vellore Institute of Technology, Chennai Campus, Chennai 600127 in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology – Computer Science and Engineering with Specialization in Artificial Intelligence and Robotics** is a record of bonafide work carried out by me. I further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma of this institute or of any other institute or university.

Signature
Riya Sharma (21BRS1149)



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CERTIFICATE

The project report entitled “**Industrial Internship (CDC AWS Courses) BCSE399J**” is prepared and submitted by **Riya Sharma (Register No: 21BRS1149)**. It has been found satisfactory in terms of scope, quality and presentation as partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology – Computer Science and Engineering with Specialization in Artificial Intelligence and Robotics** in Vellore Institute of Technology, Chennai, India.

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aws  certified

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ABSTRACT

In today's rapidly evolving tech landscape, mastery of cloud computing is crucial for businesses looking to succeed in the digital age. This abstract explores the current state of cloud computing, emphasizing both the challenges and the growing need for specialized expertise. It highlights the value of certifications like **AWS Cloud Practitioner** and **AWS Solutions Architect** in helping individuals and organizations navigate this complex field effectively.

The increasing demand for scalable, flexible, and cost-efficient cloud solutions is reshaping how businesses operate. However, challenges such as security vulnerabilities, data breaches, and underutilized infrastructure remain prevalent. These issues often prevent organizations from fully leveraging the benefits of cloud computing, leading to inefficiencies and missed opportunities.

To address these challenges, the abstract emphasizes the importance of **AWS certifications**—particularly **AWS Cloud Practitioner** and **AWS Solutions Architect**—as key pathways to building cloud expertise. These certifications validate candidates' understanding of essential cloud principles, equipping them to design, deploy, and manage secure and efficient cloud environments.

- **AWS Cloud Practitioner:** This entry-level certification provides a foundational understanding of AWS services, cloud concepts, pricing models, and security best practices. It is ideal for individuals starting their journey in cloud computing, offering a broad overview of AWS services and how they can be applied in various business contexts.
- **AWS Solutions Architect:** As a more advanced certification, this credential focuses on designing and deploying robust, scalable, and secure cloud infrastructure using AWS. It equips professionals with the skills needed to build resilient systems, manage complex workloads, and optimize cloud environments for efficiency and cost-effectiveness.

By obtaining these certifications, individuals demonstrate a well-rounded expertise—from basic cloud concepts to advanced architectural design. These credentials not only boost personal career growth but also empower organizations to overcome cloud-related challenges by employing best practices and advanced cloud strategies.

In conclusion, this abstract underscore the importance of addressing cloud computing challenges through professional development and certification. By pursuing **AWS Cloud Practitioner** and **AWS Solutions Architect** certifications, individuals and businesses can enhance their cloud proficiency, unlock new opportunities, and achieve a competitive edge in the fast-paced digital landscape.

1 INTRODUCTION

This report outlines Riya's journey in obtaining the **AWS Cloud Practitioner** and **AWS Solutions Architect** certifications during her **Bachelor of Technology program in Computer Science and Engineering with Spl. in AI and Robotics** at VIT Chennai. Submitted in April 2024, the document highlights her successful acquisition of these certifications, the skills developed, and the projects undertaken throughout her academic experience.

Moreover, the report discusses the importance of these certifications, providing insights into their relevance in the cloud computing landscape. It reflects on the valuable learning experiences Riya encountered during her **Industrial Internship (BCSE399J)** at VIT Chennai, showcasing how these certifications contributed to her professional growth and technical expertise in cloud technologies.

Overview of AWS Cloud Practitioner Certification

The AWS Cloud Practitioner certification serves as a foundational credential for those looking to understand the basic principles of cloud computing and Amazon Web Services (AWS). It covers essential AWS services, fundamental cloud concepts, security practices, and pricing structures, offering a broad introduction for anyone interested in cloud technology. This certification is particularly beneficial for individuals in non-technical roles, such as sales and management, as it demonstrates a fundamental understanding of cloud principles and AWS offerings. In a time when organizations increasingly rely on cloud solutions, acquiring this certification enhances an individual's credibility and showcases their readiness to engage in cloud-related discussions and initiatives.

Overview of AWS Solutions Architect Certification

The AWS Solutions Architect certification targets professionals who wish to specialize in designing and managing cloud infrastructure using AWS. This certification goes beyond basic cloud concepts, focusing on the development of scalable and secure cloud solutions tailored to specific business needs. It emphasizes hands-on experience in building fault-tolerant systems,

optimizing performance, managing costs, and ensuring cloud security. As cloud technology rapidly evolves across various industries, achieving this certification signifies an individual's capability to design effective cloud environments, equipping them with the skills to oversee complex cloud operations—making it a valuable asset for roles in cloud architecture and systems design.

2 AWS Cloud Practitioner (Foundation Course)

Securing the AWS Cloud Practitioner certification marked a pivotal point in my cloud computing journey, providing me with a solid grounding in Amazon Web Services (AWS) and fundamental cloud concepts[1]. Here's a recap of my experience with the AWS Cloud Practitioner certification, including the knowledge I gained.

Understanding AWS Cloud and Its Value

The AWS Cloud Practitioner course introduced me to the expansive AWS ecosystem, highlighting its role as a comprehensive cloud platform offering a wide array of services, such as storage, databases, networking, analytics, and machine learning. I learned that AWS provides scalable solutions and flexibility, enabling organizations to focus on their core operations while adjusting their infrastructure to meet changing demands through on-demand provisioning of virtual servers and Auto Scaling. This ability to customize resources is vital for businesses navigating the fast-paced digital landscape today.

Additionally, I explored AWS's global infrastructure, which ensures redundancy and fault tolerance, reducing the risks of downtime and data loss. The pay-as-you-go pricing model allows companies to pay solely for the resources they consume, aligning IT expenses with actual usage. This adaptability promotes rapid innovation and allows organizations to quickly adopt emerging technologies like machine learning, artificial intelligence, IoT, and serverless computing.

Advantages of AWS Cloud

Throughout the course, I learned about the myriad benefits provided by AWS Cloud, including security, reliability, high availability, elasticity, and agility. AWS's robust security features, encompassing multiple Availability Zones, contribute to high availability and automatic scaling capabilities. I came to understand how AWS allows businesses to swiftly deploy and iterate on applications, significantly enhancing innovation and time-to-market.

AWS's extensive infrastructure and purchasing power create opportunities for cost savings and efficiencies that are difficult to replicate with on-premises solutions. However, I recognized that the total cost of ownership (TCO) for AWS includes various operational and capital

expenses, labor costs, and software licensing costs, necessitating careful financial planning and cost management.

Security and Compliance

A key focus of my training was the shared responsibility model employed by AWS, which stipulates that AWS secures the underlying infrastructure while customers are responsible for protecting their data, applications, and assets. I learned the significance of implementing appropriate security measures, such as encryption and access controls, to safeguard data hosted on AWS.

AWS offers a comprehensive range of security features, including identity and access management (IAM) and compliance certifications. I examined the extensive documentation and resources provided by AWS to assist customers in achieving compliance with industry standards, emphasizing the necessity for customers to understand their responsibilities within the shared responsibility framework.

Technology

The course also explored various deployment methods, such as programmatic access, APIs, SDKs, and the CLI, which enable users to interact with AWS services programmatically. I discovered that the AWS Management Console is a user-friendly interface for managing resources, and I learned about Infrastructure as Code (IaC), which allows the definition and provisioning of AWS infrastructure through code. AWS operates a global network of Regions and Availability Zones, ensuring low-latency access and compliance with data residency requirements. I was introduced to core AWS services, such as Amazon EC2 for computing, Amazon S3 for storage, and networking services like Amazon VPC and Route 53. The diverse deployment models, including cloud-native, hybrid, and on-premises options, illustrate how AWS caters to varied business needs across multiple sectors.

Billing and Pricing

Acquiring knowledge of AWS's pricing models was crucial for my preparation. I learned about On-Demand Instances, Reserved Instances (RIs), and Spot Instances, which provide flexibility in billing for compute capacity. The course emphasized the importance of cost management and resource allocation through features like Consolidated Billing, which enables centralized management of multiple AWS accounts.

To aid in cost optimization, AWS provides support resources such as Cost Explorer and AWS Cost and Usage Reports. I recognized that utilizing these tools is essential for budgeting and maximizing the value of AWS services.

Key Insights and Professional Development

Achieving the AWS Cloud Practitioner certification not only enhanced my understanding of cloud computing but also provided me with industry-recognized credentials to thrive in this dynamic field. The knowledge I gained regarding AWS services, cloud fundamentals, and best practices for designing and managing cloud solutions has proven invaluable. This experience has solidified my expertise in cloud computing and established me as a credible professional within the AWS ecosystem.

In summary, my journey toward obtaining the AWS Cloud Practitioner certification was transformative, equipping me with the skills and insights necessary to excel in the rapidly evolving realm of cloud technology. The preparatory resources [2] I used were instrumental in my success, providing practical, real-world approaches to the exam.

3 AWS Solutions Architect (Global Course)

Obtaining the AWS Solutions Architect certification represented a significant progression in my cloud computing journey, allowing me to deepen my understanding of Amazon Web Services (AWS) and advanced architectural principles [3]. Building upon the foundational knowledge acquired during the AWS Cloud Practitioner certification, this next step enabled me to explore more intricate concepts and practical applications within the AWS ecosystem. Below is an overview of my AWS Solutions Architect certification journey, focusing on the key lessons learned.

Designing Secure Architectures

The initial domain of the AWS Solutions Architect syllabus centered around the creation of secure architectures, emphasizing the importance of implementing robust security measures to safeguard AWS resources. I learned how to establish secure access controls using AWS Identity and Access Management (IAM) and AWS Single Sign-On (AWS SSO), ensuring that sensitive data was protected through best practices like multi-factor authentication (MFA). This foundational knowledge was critical as I explored securing workloads and applications through Virtual Private Clouds (VPCs), utilizing AWS services such as AWS Shield and AWS Web Application Firewall (WAF) to bolster overall application security.

Creating Resilient Architecture

In the second domain, I examined the principles of designing resilient architectures. I grasped the significance of constructing scalable, fault-tolerant systems that maintain performance and availability even in the event of failures. By leveraging AWS services across multiple regions and availability zones, I learned to implement high availability strategies and develop effective disaster recovery solutions tailored to a range of business needs. This hands-on experience proved invaluable, enabling me to create systems capable of withstanding real-world challenges.

Building High-Performance Architectures

The third domain expanded my understanding of high-performance architectures, teaching me to identify and implement storage solutions that meet rigorous performance criteria. I explored services such as Amazon S3 and Amazon Elastic Block Store (EBS), choosing the most suitable options based on scalability and performance requirements. Additionally, I focused on

designing elastic computing solutions that could seamlessly adapt to varying workloads, ensuring efficient resource utilization across different scenarios.

Designing Cost-Effective Architectures

The final domain prepared me for the financial aspects of cloud architecture, teaching me to create designs that balance performance with cost-effectiveness. I gained insights into AWS cost management tools, learning how to optimize storage and compute solutions without compromising quality. The course emphasized the importance of budgeting and resource allocation, ensuring that I could leverage tools like AWS Cost Explorer to maximize the value of AWS services.

Key Insights and Professional Development

Achieving the AWS Solutions Architect certification not only enriched my understanding of advanced cloud architecture but also provided me with industry-recognized credentials to excel in this dynamic field. The knowledge I acquired about AWS services, architectural best practices, and security measures has been crucial to my professional development. This journey has solidified my expertise in cloud computing, positioning me as a credible professional within the AWS ecosystem.

In conclusion, my AWS Solutions Architect certification journey has enhanced the theoretical knowledge I obtained from the AWS Cloud Practitioner curriculum. This progression allowed me to apply those foundational concepts in practical situations, deepening my understanding of cloud architecture and security. The comprehensive study materials [4] and resources [5] I used were instrumental in bridging the gap between theory and practice, providing insights into best practices for designing and implementing solutions. With a strong grasp of AWS services and best practices, I am now better equipped to design, implement, and manage secure, resilient, and cost-effective solutions in the ever-evolving cloud landscape.

4 CONCLUSIONS

In summary, my pursuit of the AWS Solutions Architect certification has been a pivotal and transformative journey, enhancing the foundational insights I acquired from the AWS Cloud Practitioner certification. This experience has significantly broadened my understanding of advanced architectural principles and best practices, empowering me to design and deploy secure, resilient, and cost-effective cloud solutions. The extensive training and rigorous certification process have equipped me with the essential skills to confront real-world challenges in cloud computing, reinforcing my expertise in navigating the AWS landscape.

Moreover, this journey underscores the vital importance of professional certifications in managing the complexities and demands of contemporary cloud architectures. By investing in these credentials, I have not only filled critical knowledge gaps but have also established myself as a credible professional in a competitive field. The AWS Solutions Architect certification exemplifies the significance of lifelong learning and skill enhancement in promoting innovation and facilitating digital transformation.

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