



A report on

Faculty Development Program on

Microsoft Azure and Advanced Teaching Techniques

Organized in association with

Commonwealth Educational Media Centre for Asia - CEMCA

New Delhi

&

Andhra Pradesh Information Technology Academy-APITA,

Vijayawada

Venue: RGM College of Engineering & Technology, Nandyal.

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ACKNOWLEDGEMENT

We earnestly acknowledge the immense contribution of Dr. Madhu Parhar, Director of Commonwealth Educational Media Centre for Asia (CEMCA), and Mr. Saurabh Mishra, Programme Officer (Skills) of Commonwealth Educational Media Centre for Asia (CEMCA), for conceptualizing and floating the highly need-based and demand-driven workshops for upgrading the capacity of the FDP and sensitization program in association with Mr. Sunil Reddy(IFS), CEO of Andhra Pradesh Information Technology Academy (APITA) and Mr. Vishwanath, Director of Andhra Pradesh Information Technology Academy (APITA) for higher education faculties (engineering colleges) in **Kurnool District, Nandyal, Andhra Pradesh.**

The excellent endeavor of CEMCA is expected to have a profound impact on the qualitative enhancement of the Professors, Lecturers, and HODs & Trainers of all the Engineering Colleges of AP with the different methodology of **“Microsoft Azure and Advanced Teaching Techniques”** with the Latest & Traditional, Easy for good, not good & mediocre participant’s perspective of both content & methodology.

It was a privilege for us to get the opportunity to contribute significantly to this value-driven and impact-oriented mission of CEMCA.

BACKGROUND

IT is possibly the fastest developing sector in the last few decades. Computers (in all shapes and sizes) and the Internet have acquired a vital role in most domains of our everyday life. In the same way, education is not imaginable anymore without a strong presence of teaching methodologies. Faculties have had to adapt teaching methodologies throughout curriculum delivery to perform the dual task of providing formal, subject-based education and of encouraging pupils' personal development in a wider social and cultural context.

On the one hand, formal education involves understanding concepts and processes. It aims at acquiring knowledge and skills to be able to apply what has been learned within each subject area and across subjects. On the other hand, pupils need to learn to describe, analyze, interpret, have a critical view, and apply their acquired knowledge and skills creatively and originally in a wide range of social, scientific, and cultural contexts.

Since the world of the **cloud** is changing so rapidly, an important goal is to provide hands-on experience to faculty to equip pupils with the basic knowledge and fundamental skills on one hand, and, on the other hand, to empower them to become independent and autonomous learners too. In this sense, faculty should acquire a range of skills that will allow them to continue learning and teaching with an improved Teaching-Learning Process.

MOTIVATION

Advanced Teaching Methods (ATM)

Innovative teaching methods have improved the learning process and strengthened governance and methods are designed to improve the quality of education along with professors and students involved in the educational process. Method to enhance or expand upon the trainee's experience. One of the basic motives behind advanced teaching is to motivate students/trainees to actively take part in the learning process. When the level of interaction with trainees and peers increases, students gain knowledge that is practical and also, retains more information effectively from the classes.

This motivates the trainers/professors/lecturers/students will make to understand and redeliver not only a subject or a technology but gives more accurate and more knowledge, data, statistics, and case study with the current memory in the existing co-related knowledge

Azure

Cloud computing has become an integral part of businesses across all industries. Serving 190 countries with scalable, reliable, low-cost infrastructure, Azure powers thousands of businesses across the world.

Azure enables us to select the operating system, programming language, web application platform, database, and other services we need. With AWS, we receive a virtual environment that lets us load the software and services the application requires.

INTRODUCTION

Advanced Teaching Methods (ATM)

Advanced Teaching Methods for any trainer in the session provide a comprehensive, critical approach to meeting the new challenges in the session. This program gathers together research on Advanced Teaching methods, principles, and content, and acts as a reference source for proven and innovative methods.

Advanced Teaching Methods for the trainers presents the style of teaching educational technology, design, and engineering. It also contains strategies for innovation by examining the what, why, and how of technology education.

The whole program is a nice balance between foundational and practical issues. It is quite an accomplishment to put together a comprehensive program such as this.

INTRODUCTION

Microsoft Azure

Today's age of the 21st Century is the age of information and technology (IT). Every aspect of life is related to science and technology. A huge flow of information is emerging in all fields throughout the world. Recently, the technology industry has seen a major shift —mostly towards cloud computing. Defined as a web-based computing model, cloud computing allows users to share information with other devices and computers instantly. Some of the top cloud computing platforms that are widely used include Microsoft Azure and AWS.

Cloud computing is the delivery of online services (such as servers, databases, and software) to users. With the help of cloud computing, storing data on local machines is not required. It helps you access data from a remote server. Moreover, it is also used to store and access data from anywhere across the world.

Azure needs no formal introduction, given its immense popularity. The leading cloud provider in the marketplace is Azure. It provides over 200+ services to the developers so they can access them from anywhere at the time of need.

Azure has customers in over 250+ countries worldwide, including 5000 ed-tech institutions and 2000 government organizations. 95% of Fortune 500 companies use Azure services.

For example, Microsoft creates and updates software without depending upon the IT teams. It uses its services by offering multi-terabyte operating environments for its clients. By deploying its services with Azure services, Microsoft integrated and operated its software in a simple manner.

LEARNING OBJECTIVE

The course itself is structured around four modules covering the topics ranging from basic concepts around Advanced Teaching Methodologies and AWS, all the way to understanding AWS Solution capabilities and general scope for the introduction.

Upon completion of the training program, the faculty will be able to:

Advanced Teaching Methodology - ATM

- Explain the principles of ANDRAGOGY viz. Adult Learning
- Enlighten learners regarding the features of the facilitation process
- Explain to learners the features of Facilitation that demarcate it from the Mixed traditional lecture method
- The Etymology of teaching techniques.
- Highlight the importance of Examples, Data, Statistics and History with JAM (Just a Minute) Facilitation Storytelling (Panchatantra), in online & Offline learning/ Teaching
- Explain different psychosocial interventions with 'Panchatantra' that are deployed in facilitation.
- Make the learners illuminated with the beneficial aspects of different learning models, Remembering techniques, Corollaries important Vocabulary, etc.
- Sensitization of learners with the different learning methods that are highly effective in online & Offline / Physical learning
- Administer practical exercises for fostering practice- teaching, with a goal-oriented approach.

Microsoft Azure

- Create, configure, scale, and deploy applications on App Service platform
- Develop and deploy Azure functions and Logic App
- Develop and deploy Azure compute solutions
- Develop Integration Services like Service Bus, Redis Cache, etc.,
- Analyze and troubleshoot the applications
- Implement Azure security, and n-tier architecture
- Create, configure, scale and backup databases on Azure
- Create, configure, and develop Azure storage services
- VPN connectivity and Load balancing
- Azure Identity Access Management and RBAC
- Connect to and consume Azure services and third-party services
- Monitor, troubleshoot, and optimize Azure solutions
- Azure Governance and Cost management

DATE & TIME

S. No.	Course	Date	Time	Participants	Count
1	Advanced Teaching Methodologies	23-May-2022 & 24-May-2022	09:30 AM to 05:00 PM	Higher Education Faculties from Andhra Pradesh	43
2	Microsoft Azure	25-May-2022 to 27-May-2022			

PARTICIPANTS

32 male and 11 female faculty of which 2 Professors, 3 Associate Professors, and 38 Assistant Professors from 2 engineering colleges attended the workshop conducted between 23rd to 27th May 2022 at Rajeev Gandhi Memorial College of Engineering & Technology in Nandyal, Andhra Pradesh.

A Detailed List of Participants for workshops is attached in ***Annexure – A***

TRAINING Azure and ATM

The Training was conducted on the college lab premises. The methodology used was a live demonstration of Teaching Methodologies and Azure followed by hands-on practice by participants using the assignment questions provided by the resource person. The organizing team shared a WhatsApp group to interact, share information, answer queries, and submit feedback.

S. No.	Event	Time	Participants
1	Demonstration Sessions (Every day)	09:30 AM to 05:00 PM	Live
2	Interaction with Queries and Feedback	05:00 PM to 08:00 PM	WhatsApp

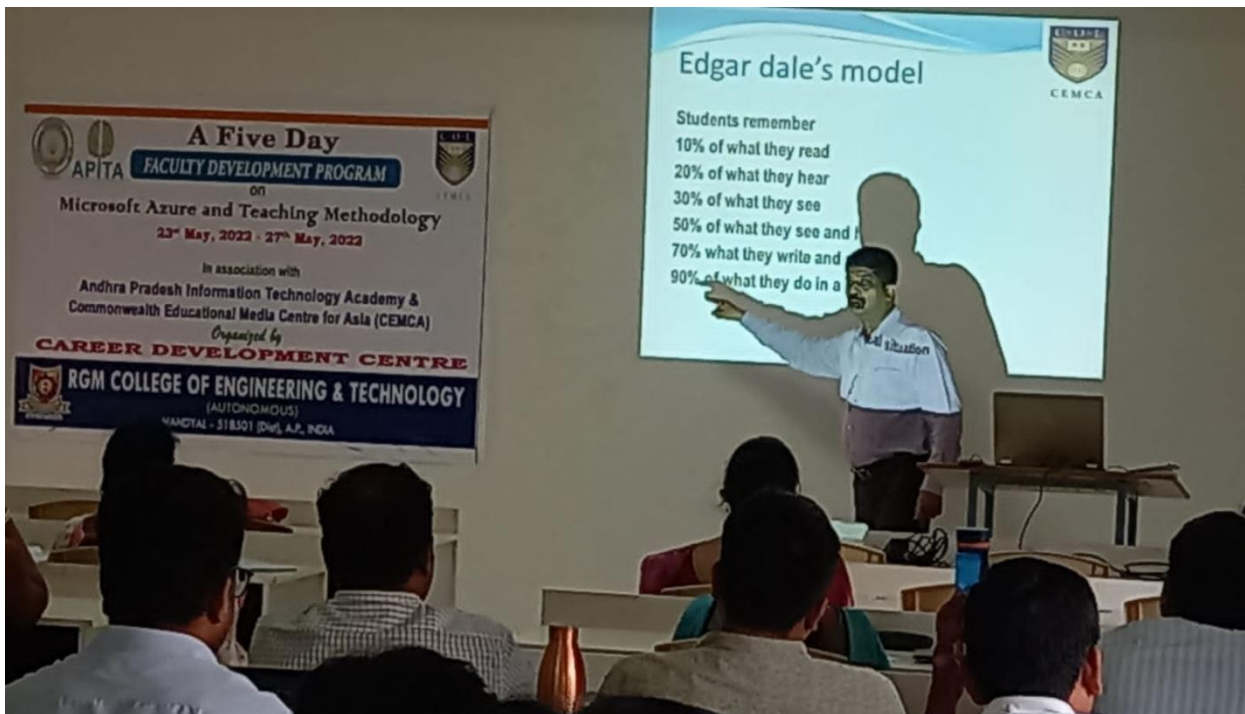


Fig: Demonstration on Advanced Teaching Methodologies by Mr. S. Dinakar Reddy

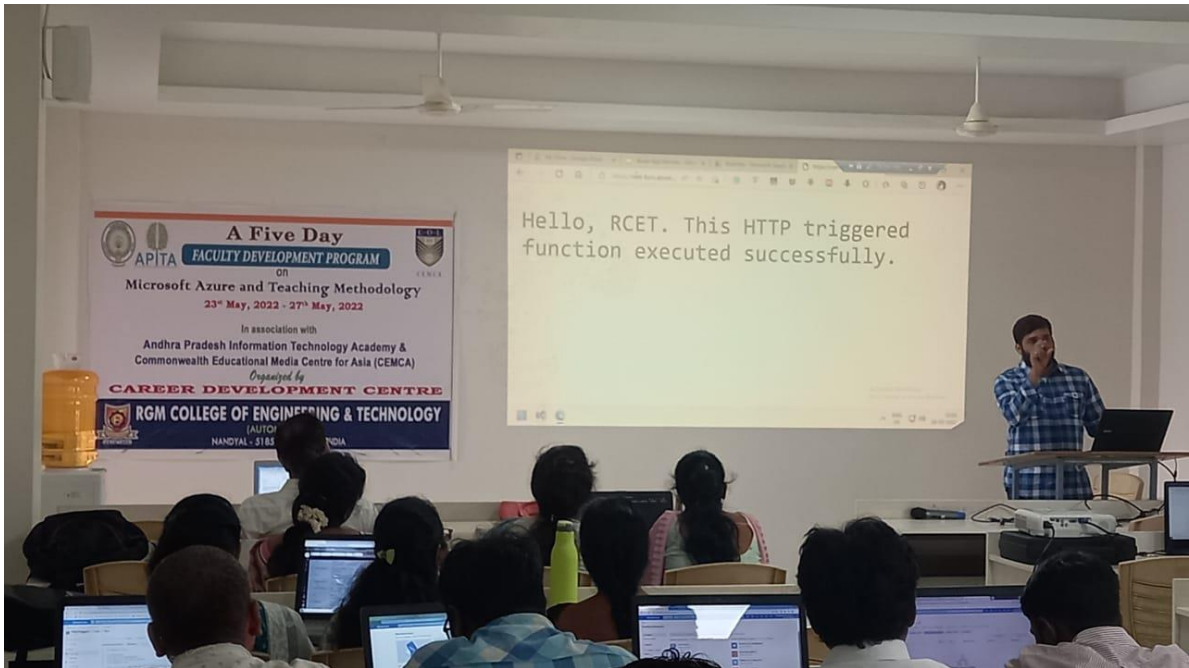


Fig: Live Demonstration on Azure by Mr. P. Sairam Sekhar

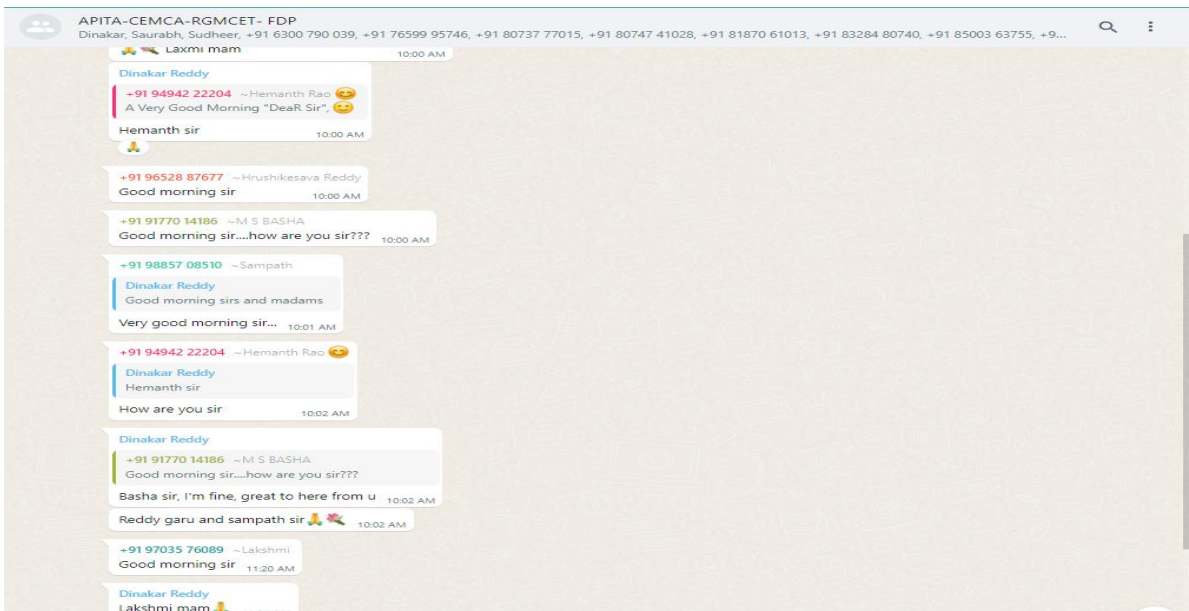


Fig: WhatsApp Discussion

COURSE CONTENT & STRUCTURE

Day	Title	Session Objective	Teaching Andragogy
1	Teaching Methodology Principles	<ul style="list-style-type: none"> ● Principles of ANDRAGOGY ● Beneficial Features of Observation & Facilitation ● Learning Models that are relevant to classroom learning ● JAM – just a minute ● Importance of Communication ● From the baselines of Bloom’s Taxonomy to ARCS 	<ul style="list-style-type: none"> ● Dialogue-driven interaction ● Role Play & JAM ● Case Study, Compare & Contrast ● Reading between the lines ● Group Discussion ● Motivational Stories ● Motivational Interview ● Constructive Feedback ● Successful person’s Unsuccessful stories ● Statistics, Data & History ● Appreciative Inquiry & Assessment ● Problem-solving through Design thinking
2	Innovation Methodology and Tool	<ul style="list-style-type: none"> ● The world’s oldest Innovation Methodology of teaching “Panchatantra” to EdgarDale’s Model. ● Tools & Methods for fostering participative & inductive learning ● Importance of Mediocre. ● Relevance of psychosocial interventions in the class, to ensure the psychological engagement of learners ● Not to let down the last benchers ● The Need for LST as a part of the regular curriculum. 	
3	Cloud and Azure Fundamentals, Azure App Services	<ul style="list-style-type: none"> ● Cloud Fundamentals ● Azure Introduction ● Why Azure? ● Azure Services Overview ● Azure Resource Manager ● Azure Web App 	<ol style="list-style-type: none"> 1. Traditional Computing Vs Cloud Computing 2. Principles of Cloud Computing 3. Hands-on demonstration – creating Azure Account and checking the limitations on free Azure account 4. Demonstrated Azure services 5. Hands-on demonstration 6. Assignment for self-practice
4	Azure Integration Services, Azure Data Services	<ul style="list-style-type: none"> ● Azure Logic App, Functions ● Azure MySQL ● Azure Service BUS ● Azure Redis Cache 	
5	Azure Networking, Compute, and IAM	<ul style="list-style-type: none"> ● Azure Vnet, Subnet classification ● Network Security Group ● Azure Virtual Machine ● Availability Set ● Site-to-Site ● Implemented n-tier architecture ● Azure Active directory 	

WORKSHOP PROCEEDINGS

Day – 1: 23-May-2022:Inaugural Session and Advanced Teaching Methodologies

Inaugural Session:

Day - 1: Teaching Methodologies: Inaugural Session

The Training Programme began with the inaugural session. The inaugural session was graced by Sri Palle Venkata Krishna Kishore, Chairman, Sri K. Sreekanth Reddy, Management Representative, Dr. Bandi Ramesh Babu, Principal, Dr. Y. Santosh Kumar Reddy, Dean, Dr. K. Bhargavi, Convener & HOD (I/C), Department of CSE, PVKK Institute of Technology, Anantapuramu and Dr. Dinakar Reddy. S, Corporate Master Trainer & Facilitator. Sri P.V. Krishna Kishore in his inaugural address highlighted the importance of FDP for Teaching Methodologies and made a note about the importance of Azure.

PARTICIPANTS

34 male and 25 female faculty of which 10 Professors, 10 Associate Professors and 39 Assistant Professors from 10 colleges attended the workshop conducted between 09th to 13th May 2022 in Anantapuramu, Andhra Pradesh..



Fig: Inaugural Session on day 1

Day: 1 – Objectives

- Inauguration & Ice Breaking
- Introduction to Value Education – Andragogy
- Introduction to 21st Century skills
- Advanced Teaching Techniques/ Methods
- Robert Gagne’s Nine Steps Of Instruction
- Benjamin Bloom’s Cognitive Taxonomy
- Edgar Dale’s Model Of Retention Of Learning Inputs
- What I am expecting to get & what I do
- Harmony In The Family And Society
- PANCHATANHIRAM –Teaching Techniques
- May & Doob’s Collaborative Learning Model
- Pre Training Assessment- Discussion

After the ICE BREAKING sessions, the first topic was about Individualized Instruction Model By **Keller Plan**, Success Approximation Model By **Dr. Michael Allen**. The break was up with **Edgar Dale's Model- Giving Following Opportunity To Participants For 90% Retention**.

LEARNING MODELS EXPLAINED	MAIN THEME	OUTPUT OF EXPLANATION
BENJAMIN BLOOM'S COGNITIVE TAXONOMY	<p>This theory deals with the six levels of a learner's cognition and understanding of a specific subject.</p> <p>The Facilitator affirmed that the level is very much subjected specific.</p> <p>A Learner/student who is in the higher level in one subject may be in the lowermost level of another subject</p>	<p>The learners achieved conceptual clarity regarding the different Cognitive Levels of individuals in different subjects</p>
ROBERT GAGNE'S Nine Steps of Instruction	<p>This model indicates that there are <i>nine types</i> of educational instructions arranged in a logical sequence.</p> <p>If an Educator follows the nine instructions in the structured logical sequence, then the learners will achieve the desired learning goal and transfer their learned inputs to others.</p>	<p>The learners got apprised regarding the logical sequence of activities that are to be executed by a Trainer /Facilitator in a Learning Session for facilitating the learners in ensuring retention of the learned content and developing within them the ability to transfer the learned content to others</p>

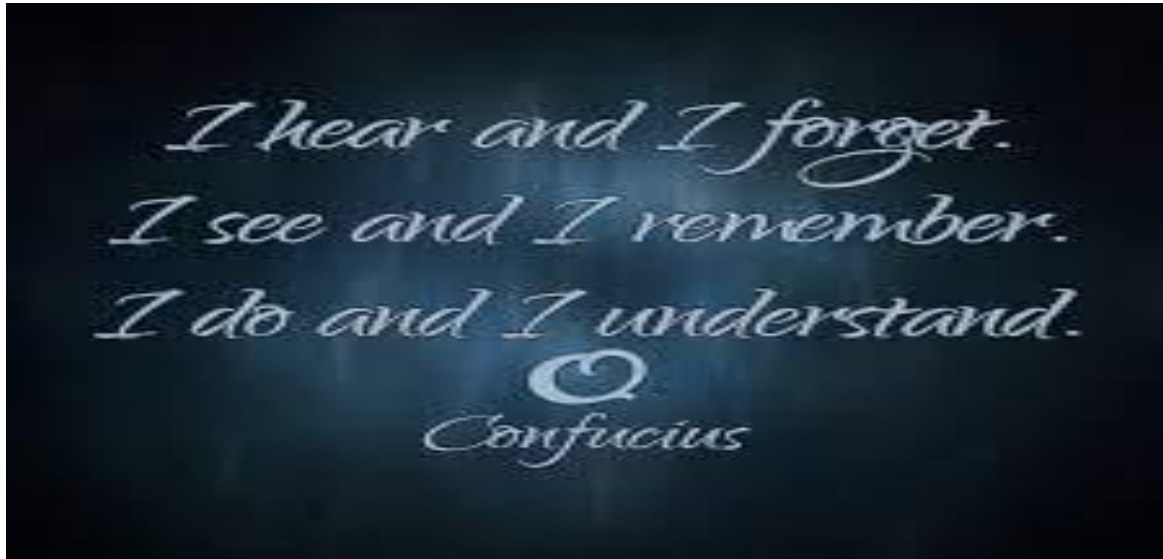
<p>EDGAR DALE's Model of retention of learning inputs</p>	<p>The model suggests that different types of academic activities lead to different levels of retention of learned inputs</p>	<p>The learners got apprised regarding the percentage of retention of learned inputs by the learners under the influence of various sorts of Teaching Activities</p>
<p>MAY & DOOB's Collaborative Learning Model</p>	<p>This learning model indicates that cooperation and collaboration among a group of learners can lead to the achievement of learning outcomes</p>	<p>The learners comprehended how the exchange of views, group discussion, task distribution, and the convergence of thoughts can play extremely significant roles in the learning process.</p>
<p>CHARLES REIGELUTH'S Elaboration Model</p>	<p>The model suggests that an Educator must present the learning materials in a sequential pattern viz. from the simplest level to the most complex level</p>	<p>The learners understood the significance of arranging and presenting the learning content through logical sequences</p>

<p>The Oldest Innovation of Teaching Methodology</p> <p>“Panchatantra”</p> <p>By</p> <p>- Vishnu Sharma.</p>	<p>This model is mainly concerned with the week & mediocre / Average participants.</p> <p>For the First time in the history of “Gurukulas”, this is introduced on the special request by the then King for his three sons.</p>	<p>Faculties were overwhelmed to know, listen and experience the relation and co-relation of connectivity to this present technologies and trends.</p>
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5 E’s of effective teaching



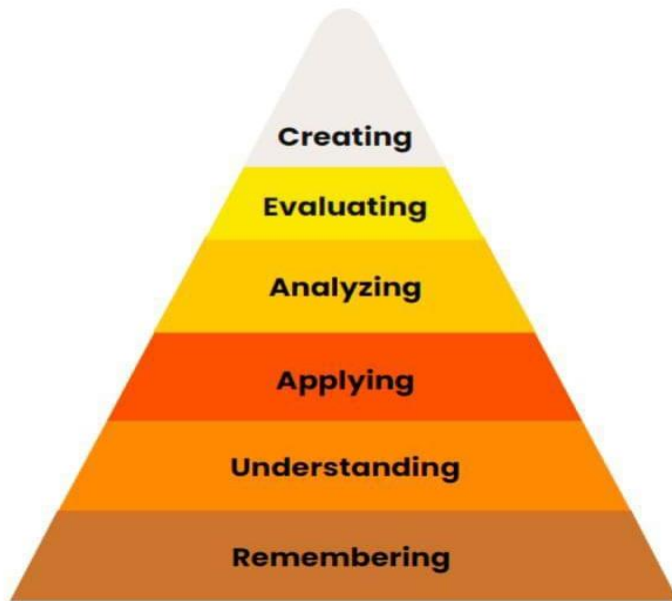
Passive v/s active learning



BLOOM'S TAXONOMY



Day - 2: 24-May-2022: Advanced Teaching Methodologies



Day 2 – Objectives

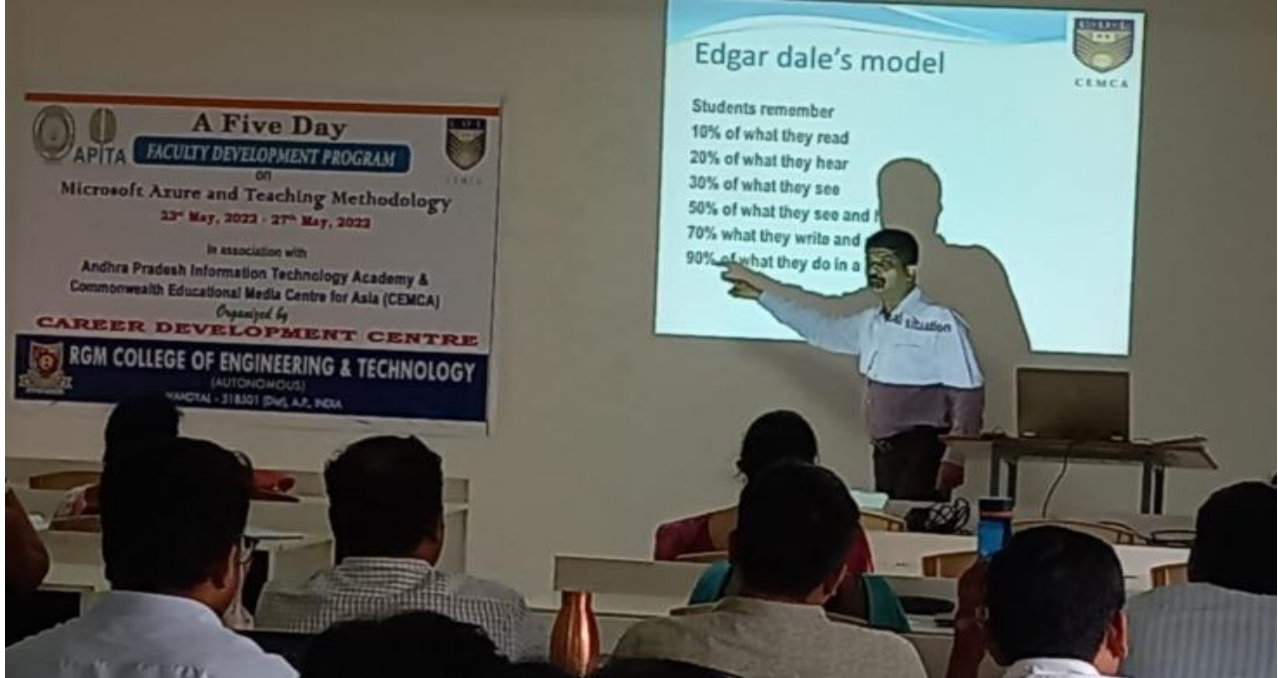
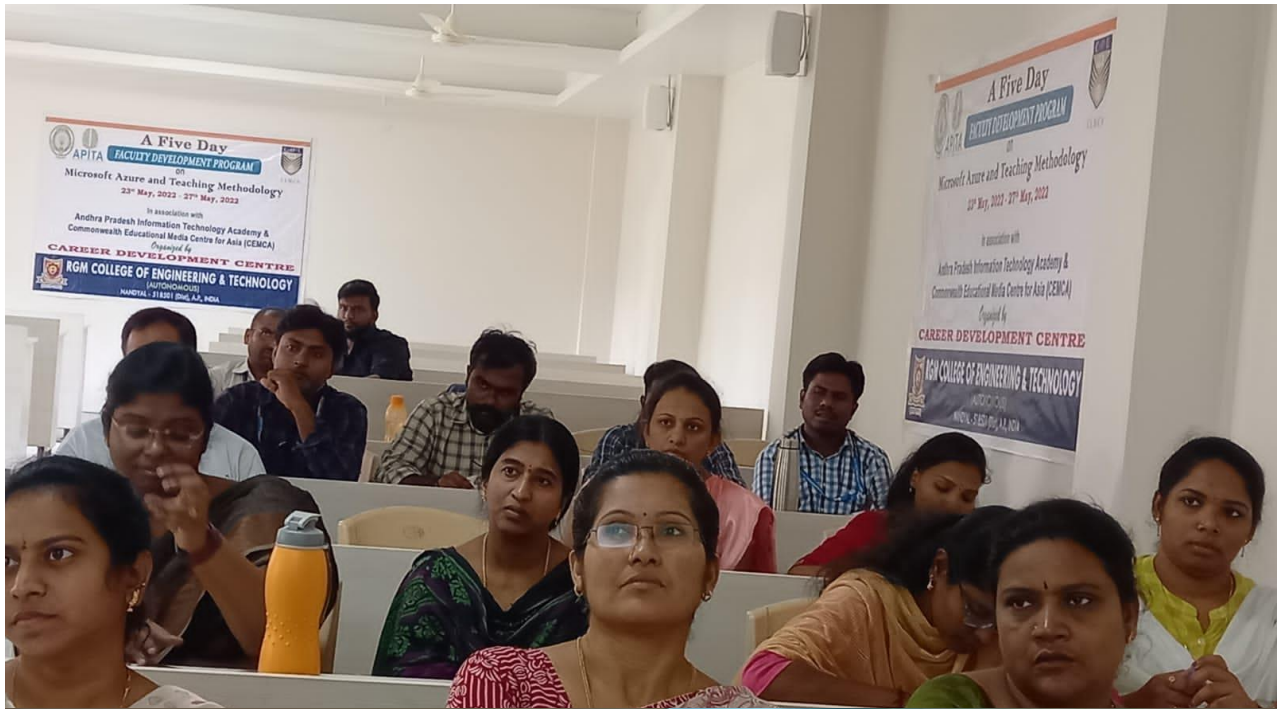
- John Sweller’s Cognitive Load Model
- Values In Human-To-Human Relationship
- John Keller’s Arcs Model
- Innovation – Andragogy – Management
- 'Respect' – As The Right Evaluation
- 'Trust' – The Foundational Value In Relationship
- Jerome Bruner’s Discovery Model
- Howard Burrows’ Problem Based Learning Model
- Assessment result
- PANCHATANTHIRAM – Teaching Techniques
- What we got & how to do

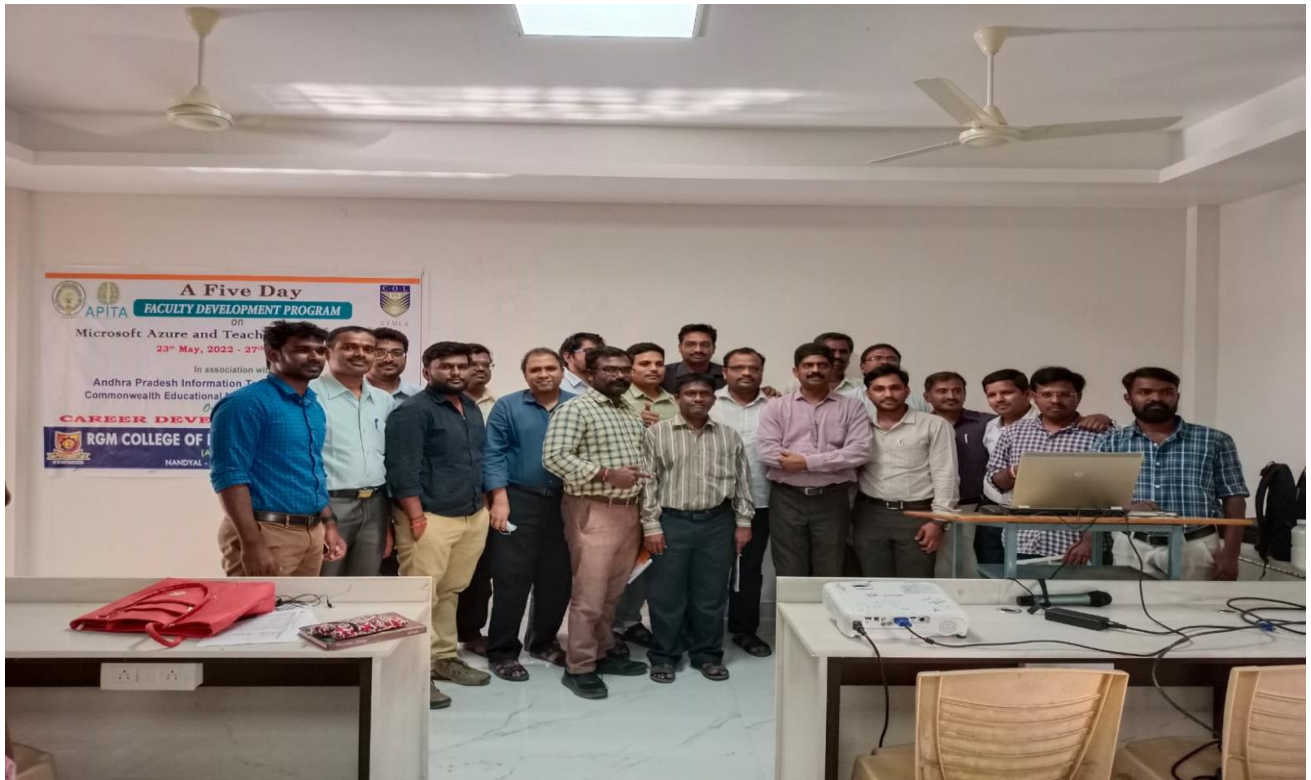
LEARNING MODELS EXPLAINED	MAIN THEME	OUTPUT OF EXPLANATION
<p>JOHN SWELLER'S Cognitive Load Model</p>	<p>This model suggests that to ensure the retention of learning inputs in participants' long-term memory, the learning content should be delivered in a fragmented pattern, part by part.</p> <p>If a large volume of content is foisted upon the learners then the cognitive load will get enhanced to a large extent.</p> <p>Therefore, the learned inputs will not be retained in long-term memory.</p>	<p>The learners understood the significance of presenting a large volume of content in a fragmented pattern instead of continually imposing a huge volume of content upon the learners.</p>

<p>JOHN KELLER'S ARCS MODEL</p>	<p>This model reflects the linear sequence of four activities that are to be followed by educators to</p> <ul style="list-style-type: none"> ● Draw the attention of the participants ● Establish relevance of the learning materials to the prior knowledge or the occupational life of the participants ● Build up the confidence of the learners ● Satisfying the learners by the achieved learning outcome 	<p>The learners understood how to draw the attention of the participants, present relevant inputs to them, build up their confidence, the participants and satisfy the participants in learning sessions.</p>
<p>JEROME BRUNER'S Discovery Model</p>	<p>This model suggests that the Probing Inquiry from the Educator facilitates the participants to introspect and unleash their latent creativity and analytical competencies.</p>	<p>The learners to understand the significance of Inquiry-Based Instructions for the discovery of the hidden creative flair, insight, intuition as well as the analytical power of the participants, embedded within themselves</p>
<p>HOWARD BURROWS' Problem Based Learning Model</p>	<p>This model suggests that if the participants are provided with problems to solve rather than contents to memorize, then the creative and analytical competencies of the learners will get enhanced and unleashed.</p>	<p>The learners understood how problem-solving exercises can enhance critical thinking as well as creative thinking competency of the participant's</p>

<p>MICHAEL ALLEN's Success Approximation Model (SAM)</p>	<p>This model encourages participants centric learning. Here, primarily the prototype of the learning material and finally the prepared instructional material are evaluated by the participants.</p> <p>If the participants suggest any changes, then to ensure the ease of learning for the participants, the changes are engineered accordingly both at the prototype as well as at the final material.</p>	<p>The learners perceived the significance of the customization /re-engineering of the prototype of learning materials as well as the final learning material based on the feedback of the participants</p> <p>The learners understood the significance of Student-Centric Instructional Design.</p>
<p>KELLER PLAN's Individualized Instructional Model</p>	<p>This model is mainly concerned with the heterogeneity of the learners.</p> <p>Since each learner differs from other learners in the learning capacity, style pace, and approach, hence the instructional material should be designed based on the unique capacity, need style standard, and pace of each learner.</p> <p>Within an allotted time frame each learner learns individually in his/her way</p>	<p>The learners deciphered the importance of designing learning materials and determining the methodology of facilitating the participants based on the intellectual standard, learning style, and the learning pace of each student.</p>

<p>The Oldest Innovation of Teaching Methodology</p> <p>“Panchatantra”</p> <p>By - Vishnu Sharma.</p>	<p>This model is mainly concerned with the week & mediocre / Average participants.</p> <p>First time in the history of “Gurukulas”, this is introduced on the special request by the then King for his three sons.</p> <p>Panchatantra means Five Treatises/ chapters. Given learning capacity, style, pace, and approach, hence the instructional materials are all the stories about Animals, Birds & Plants/ Nature.</p> <p>This method of teaching gives not only the knowledge to the students but also a new experience with each & every week student the guru faces every time.</p>	<p>The participants/ Shishyas for the imaginative thinking and stored in the permanent memories. Within an allotted time frame each learner learns individually in his perception like the Guru’s Version.</p> <p>This will be the best example of the “ Experience makes Man Perfect “</p>
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Closing ceremony of day 2- ATM



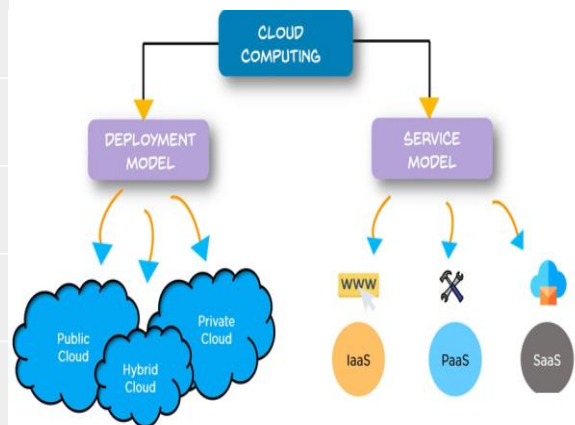
Day – 3: 25-May-2022: Microsoft Azure

Day - 3: Session 1 – Cloud computing Overview

The first session started with Cloud fundamentals which include limitations of traditional computing, an introduction to the cloud, service models in the cloud, and deployment models in the cloud. The following were delivered as part of the session:

- The participants learned about traditional computing and its limitations.
- The participants learned about Cloud computing and its benefits.
- Fundamental knowledge of cloud service models and significant differentiators
- Cloud deployment methods and suppliers were discussed.
- Highlighted current cloud trends and cloud providers' market share
- The participants cleared up any confusion they had about cloud ideas.

01	Traditional Computing	<ul style="list-style-type: none">• Overview• Limitations
02	Cloud Computing	<ul style="list-style-type: none">• Introduction• Features
03	Cloud Service Models	<ul style="list-style-type: none">• Infrastructure as a Service (IaaS)• Platform as a Service (PaaS)• Software as a Service (SaaS)
04	Cloud Deployment Models	<ul style="list-style-type: none">• Private• Public• Hybrid
05	Cloud Providers	<ul style="list-style-type: none">• List of providers• Market trends



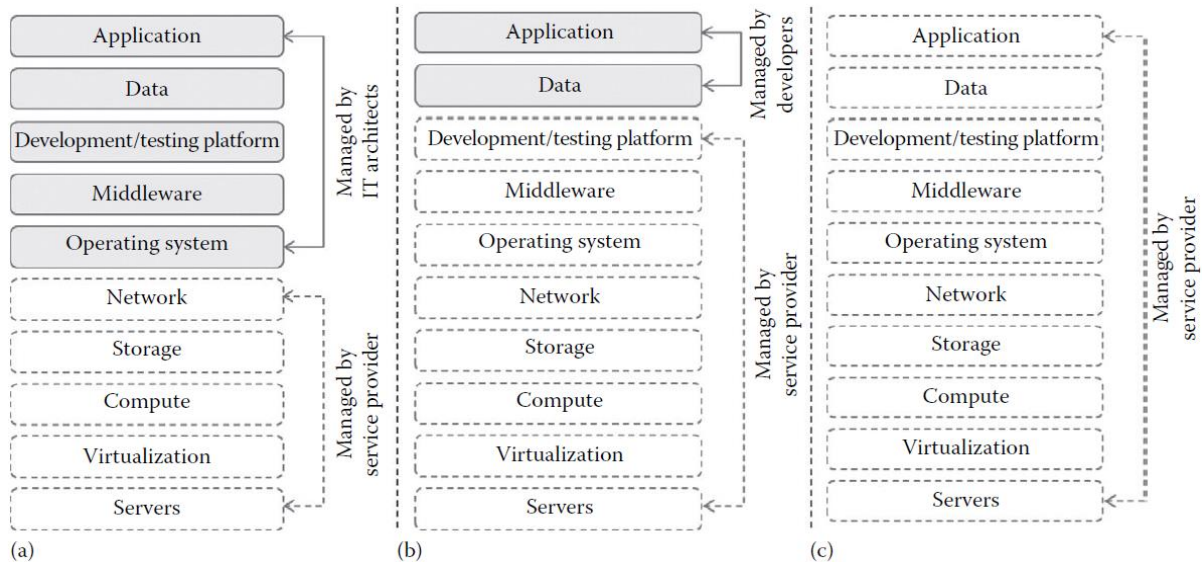
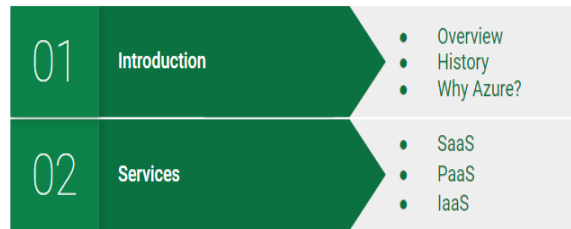


Fig: Cloud service models (a) IaaS (b) PaaS (c) SaaS

Day - 3: Session 2 – Cloud computing Overview

The second session started with Azure fundamentals which include an Azure overview, ARM, Services overview, and ended with Azure App Services. The following were delivered as part of the session:

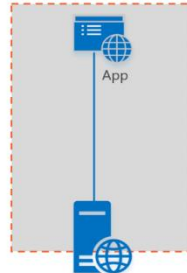
- Azure overview, history, and market relevance were discussed.
- I demonstrated how to set up an Azure free trial.
- The list of Azure services was discussed.
- Hands-on practice with Azure WebApp on the following:
 - Creation of Azure web app
 - Code deployments (FTP, GitHub, IDE)
 - Deployment slots
 - Configuration
 - Custom Domain
 - Auto Scaling (Scale-up and Scale-out)
 - Monitoring using Application Insights
- The participants have clarified their doubts related to Azure fundamentals



Azure Web App

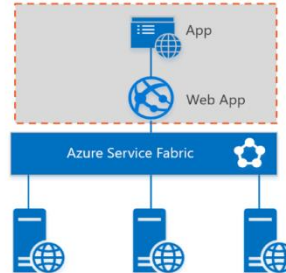


Traditional Webhosting



Server + OS + Webservice (IIS)

Hosting with Web Apps



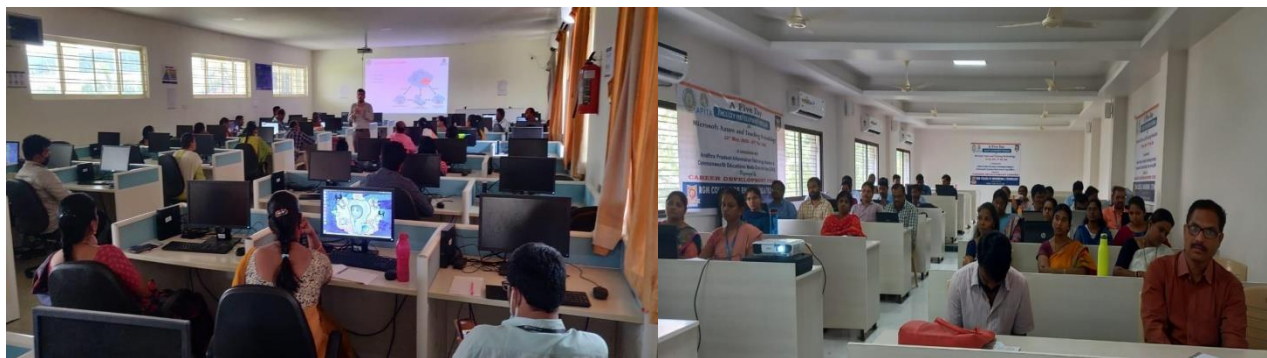
Server + Azure OS + Webservice (IIS)

Fig: Traditional vs Azure Web App Hosting

Day 3 – Objectives

Participants gained knowledge on

- Traditional Computing Vs Cloud Computing
- Principles of Cloud Computing
- Demonstrated Azure and its services
- Hands-on demonstration
 - creating Azure Account and check the limitations on free account
 - creating Azure webapp and deploying a test application
- Creating IAM user account and giving authentication



Day – 4: 26-May-2022: Microsoft Azure

Day - 4: Session 1 – Azure Integration Services

The first session started with the Azure App Services which include Azure Functions, and Logic App. The following were delivered as part of the session:

- Participants got knowledge of serverless architecture
- Participants gained knowledge about Azure functions and its features
- Performed hands-on practice of Azure Functions on the following:
 - Creation, Deployment, Triggers using JavaScript
- Participants gained knowledge about Azure Logic App and its features
- Performed hands-on practice of Azure Logic App on the following:
 - Creation, Deployment, and Triggers
 - Connectors, and testing a workflow
- The participants have clarified their doubts related to Azure serverless concepts

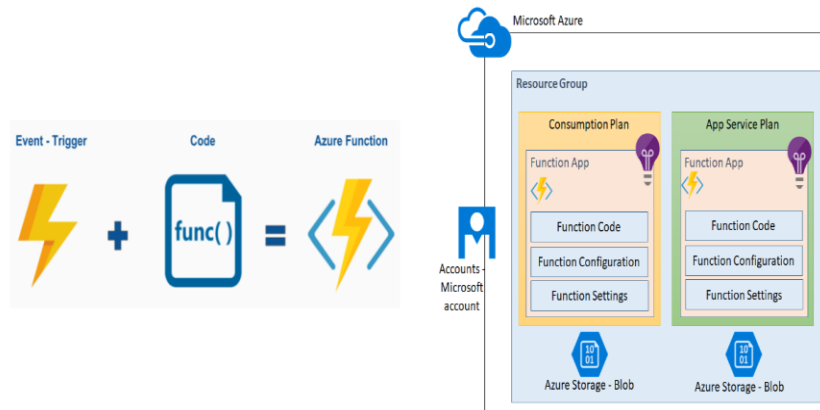


Fig: Azure Functions

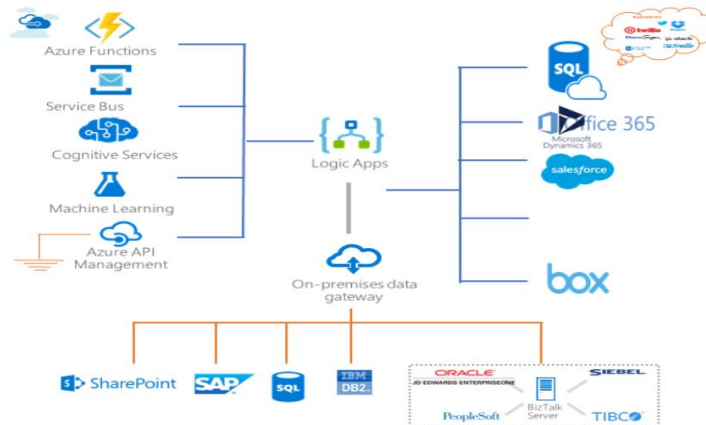


Fig: Azure Logic App

Day - 4: Session 2 – Azure Data Services

The second session started with the Azure Data Services which include Azure MySQL, Storage Account, Service Bus, and Redis Cache. The following were delivered as part of

the session:

- Participants got knowledge of various databases and types
- Discussed structured, unstructured, and key differentiators
- Discussed and performed hands-on practice of Azure SQL on the following:
 - Creation of Azure SQL Server and database
 - Created tables and developed CRUD operations using C#
 - Discussed TDE encryption of Azure SQL
 - Implemented Azure SQL firewall security
 - Discussed Azure SQL auditing and backup
- Discussed and performed hands-on practice of Azure Storage on the following:
 - Creation of Azure Storage Account and discussed replication options
 - Created Blobs, Tables, File, Queue, and performed CRUD operations
 - Discussed TDE encryption of Azure Storage
 - Implemented Azure Storage key rotations
- Discussed and performed hands-on practice of Azure Redis Cache on the following:
 - Creation of Azure Redis Cache
 - Discussed TDE encryption of Azure Redis Cache
 - Performed CRUD operations on cache database using C#
 - Discussed business scenarios of implementing cache databases
 - Implemented key rotations
- The participants have clarified their doubts related to Azure database and storage services

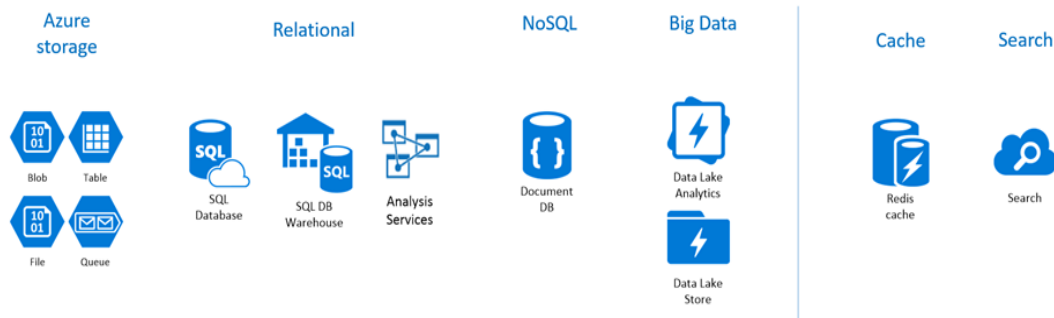


Fig: Azure Data Services

Day 4 – Objectives

Participants gained knowledge on

- Azure Integration services like Functions, Logic App, and Service Bus
- Azure Data services like MS SQL, Redis Cache, and Storage Account
- Hands-on demonstration
 - creating and developing Azure Functions and Logic App

- creating Azure data services and performed CRUD operations using C#



Day – 5: 27-May-2022: Microsoft Azure

Day - 5: Session 1 – Azure Networking Services

The first session started with the Azure Networking Services which include Azure VNet, Subnet, NSG, Virtual Machines, Availability Set, Load balancer, and VPN types (Point to Site, Site to Site, VNet peering). The following were delivered as part of the session:

- Participants got knowledge of Networking, IP addresses, and their types
- Discussed Azure networking and security services
- Discussed and performed hands-on practice of Azure networking on the following:
 - Creation of Azure VNet, and subnet classification
 - Created Network security group and assigned to subnets
 - Added Inbound and Outbound rules to NSG
 - Discussed Virtual Machines, Availability Set and deployed them
 - Tested port communication between the virtual machines in different subnets
 - Added Azure VM to Availability Set
 - Demonstrated Load balancer and its routing strategies
 - Discussed various VPN types and implemented VNet Peering
 - Implemented n-tier architecture of business applications
- The participants have clarified their doubts related to Azure Networking, Availability, and Security services

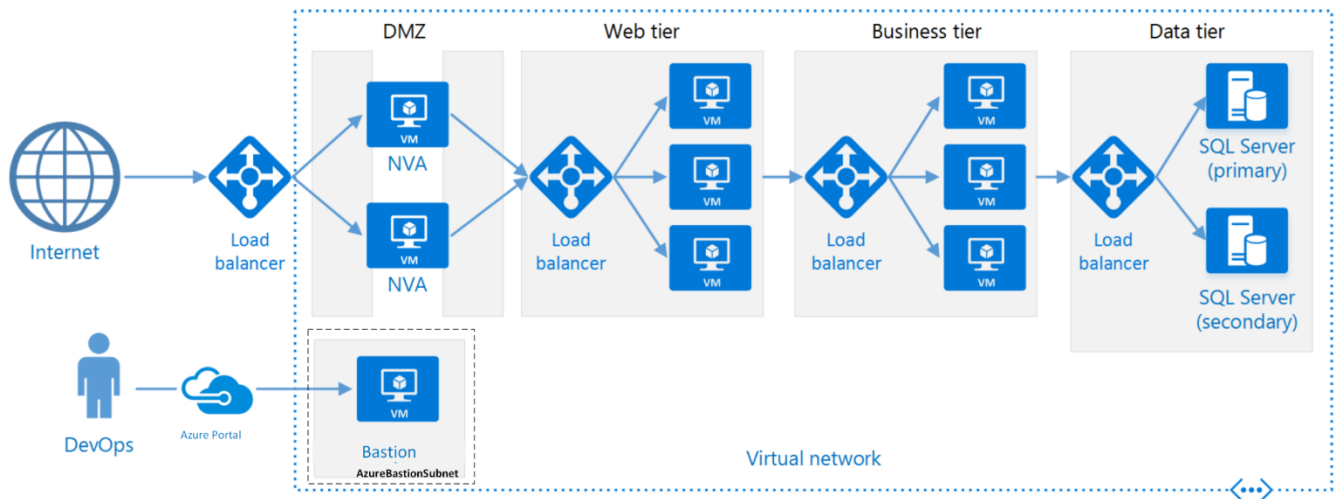


Fig: Azure n-tier architecture

Day - 5: Session 2 – Azure Identity and Governance

The second session started with Azure Governance which includes Azure Active Directory, Resource Locks, IAM, Azure Policy, and Azure Monitor. The following were delivered as part of the session:

- Participants got knowledge of Azure Governance services
- Discussed Azure Resource locks and performed hands-on practice
- Discussed Azure Policy, Blueprints, and performed hands-on practice
- Discussed and performed hands-on practice of Azure Active Directory on the following:
 - Creation of Users and Groups
 - Discussed the directory structure
 - Discussed Service Principal and implemented SSO
 - Enabled Multi-Factor Authentication (MFA)
 - Implemented company branding and Custom Domain
 - Enabled Self Password Reset for user accounts
- Discussed and performed hands-on practice of Azure IAM on the following:
 - Discussed Role-Based Access Control (RBAC) and custom roles in Azure
 - Assigned roles to users and service principals in Azure AD
 - Tested role operations and restrictions of IAM
- The participants have clarified their doubts related to Azure Governance Services

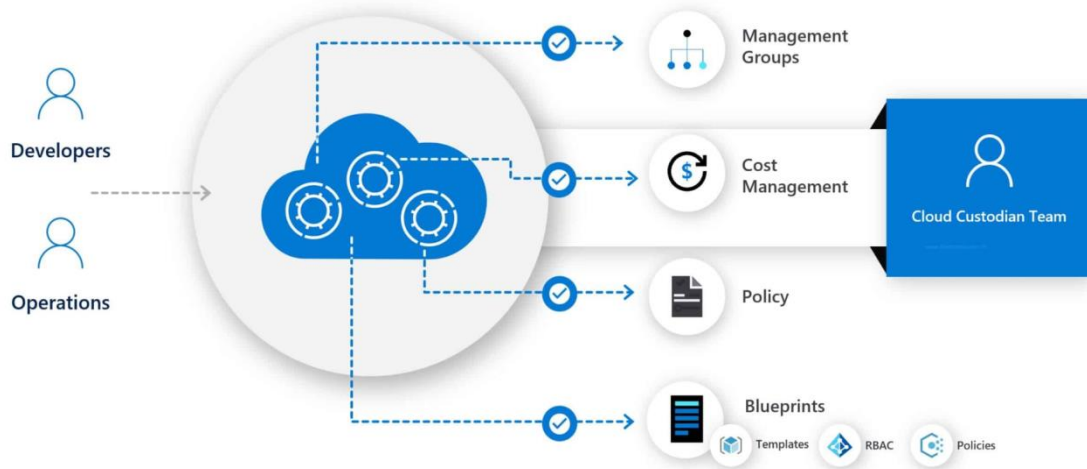


Fig: Azure Governance Overview

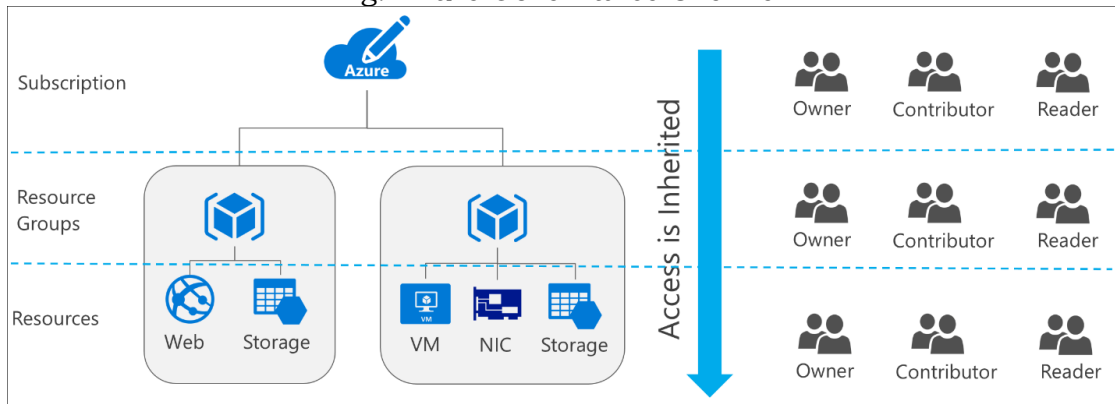
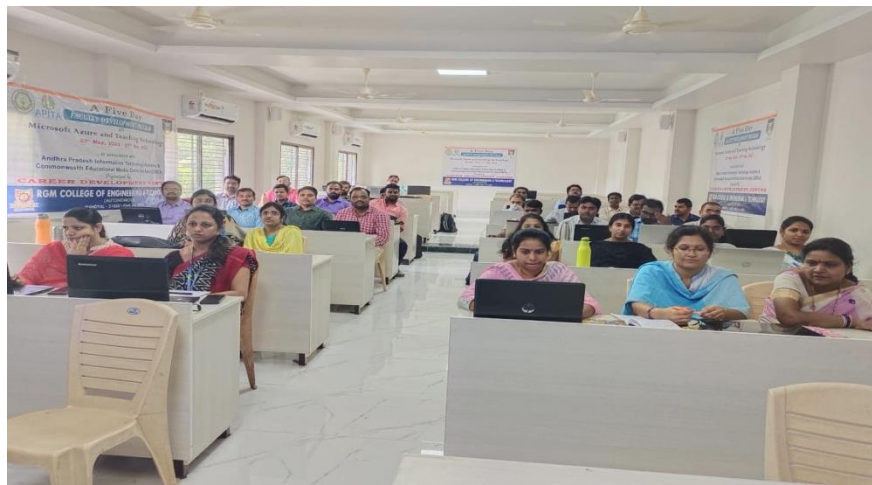


Fig: Azure Identity Access Management

Day 5 – Objectives

Participants gained hands-on knowledge on

- Azure Networking services like VNet, Subnet, NSG, and Load balancer
- Azure High Availability and Virtual Machines
- Azure Governance services like IAM, Policy, Blueprints, and Cost management



Closing Ceremony



Fig: Feedback from Participant

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(Annexure – A)

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Thank you CEMCA