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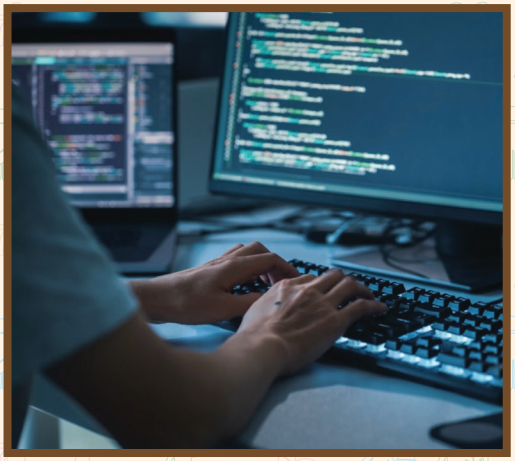
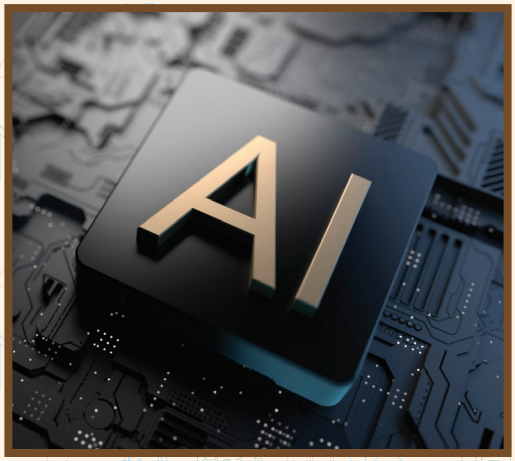
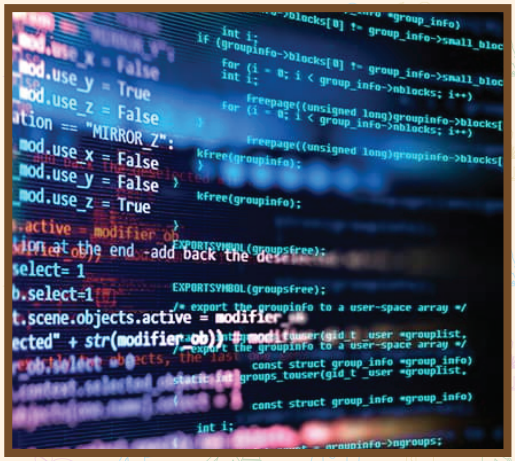
Facilitator Guide







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Future Skills

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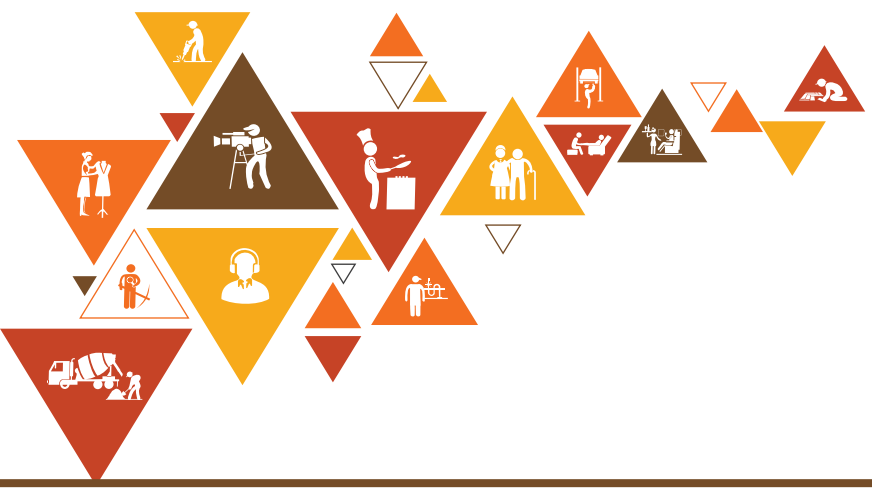

> Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

Acknowledgements

NASSCOM would like to express its gratitude towards company representatives, who belieive in our vision of improving employability for the available pool of engineering students. SSC NASSCOM makes the process easier by developing and implementing courses that are relevant to the projected industry requirements.

The aim is to close the industry-academia skill gap and create a talent pool that can withstand upcoming externalities within the IT-BPM industry.

This initiative is the belief of NASSCOM and concerns every stakeholder – students, academia, and industries. The ceaseless support and tremendous amount of work offered by IT-ITes members to strategize meaningful program training materials, both from the context of content and design are truly admirable.

About this Guide

The facilitator guide (FG) for AI- Solution Architect is primarily designed to facilitate skill development and training of people, who want to become professional AI- Solution Architect in various stores. The facilitator guide is aligned to the Qualification Pack (QP) and the National Occupational Standards (NOS) as drafted by the Sector Skill Council (IT-ITeS) and ratified by National Skill Development Corporation (NSDC).

It includes the following National Occupational Standards (NOSs)-

1. SSC/N8113 – Design new solution architectures as per specifications
2. SSC/N8114 – Maintain existing architectures for solutions
3. SSC/N9009 – Empower the team
4. SSC/N9014 Maintain an inclusive, environmentally sustainable workplace
5. DGT/VSQ/N0102 –Employability Skill

Post this training, the participants will be able to perform tasks as AI- Solution Architect. We hope that this Facilitator Guide provides a sound learning support to our young friends to build a lucrative career in the IT- ITeS Sector Skills Council NASSCOM of our country.

Symbols Used

Ask


Explain


Elaborate


Notes


Objectives


Do


Demonstrate


Activity


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Practical


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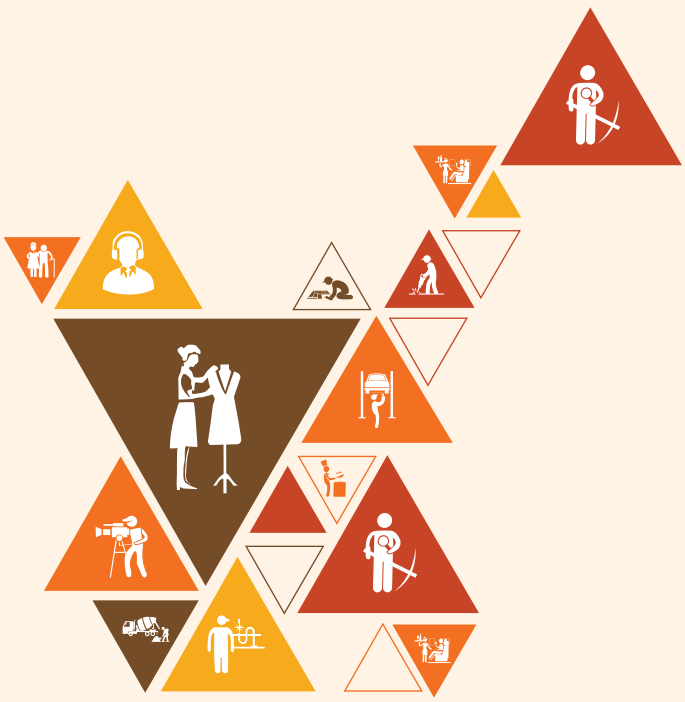
1. Artificial Intelligence & Big Data Analytics - an Introduction

Unit 1.1 - AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape



Bridge Module

Key Learning Outcomes 

By the end of this module, the participants will be able to:

1. Explain the relevance of AI & Big Data Analytics for the society
2. Explain the various use-cases of AI & Big Data in the industry
3. Define “general” and “narrow” AI
4. Describe the fields of AI such as image processing, computer vision, robotics, NLP, etc.
5. Outline a career map for roles in AI & Big Data Analytics
6. Analyse the differences between key terms such as Supervised Learning, Unsupervised Learning and Deep Learning

Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify Key AI/Big Data Use Cases
2. Differentiate AI System Types
3. Define Crucial Roles in Entrepreneurial AI Implementation
4. Analyse the Impact of AI on Entrepreneurial Strategy

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we're diving into the fascinating world of Artificial Intelligence and Big Data Analytics.
- Throughout this session, feel free to ask questions and engage actively in discussions. Your participation will enrich the learning experience for everyone.

Activity

1. **Activity Name:** Name Game (Ice Breaker)
2. **Objective:** This activity is focused on breaking the ice between the participants so that they can come up confidently in putting forward their opinion
3. **Type of activity:** Group activity
4. **Resources:** Participant Handbook, Pen, Notebook, Writing Pad, etc.
5. **Duration of the activity:** 60 minutes
6. **Instructions:**
    - Arrange the class in a semi-circle/circle
    - Say your name aloud and start playing the game with your name.
    - Say, "Now, each of you shall continue with the game with your names till the last person in the circle/ semi-circle participates".
    - Listen to and watch the trainees while they play the game.
    - Ask questions and clarify if you cannot understand or hear a trainee.

- Discourage any queries related to one's financial status, gender orientation or religious bias during the game
- Try recognising each trainee by their name because it is not recommended for a trainer to ask the name of a trainee during every interaction

7. **Outcome:** This activity has focused on breaking the ice between the participants so that they can come up confidently, putting forward their opinion.

Ask

- Can anyone share a real-life example where you think Artificial Intelligence is being used?
- Have you ever encountered the term "Big Data" before? If so, what does it mean to you?

Do

- Begin the session by providing a brief overview of the agenda and learning outcomes.
- Encourage participants to take notes during the session to aid their understanding and retention of the material.
- Break down complex concepts into simpler, digestible parts to ensure understanding.
- Foster a collaborative learning environment where participants can share insights and perspectives freely.

Elaborate

- Key AI/Big Data Use Cases
- AI System Types
- Crucial Roles in Entrepreneurial AI Implementation
- AI on Entrepreneurial Strategy

Explain

- General and Narrow AI
- Subfields of AI: image processing, computer vision, robotics, NLP, etc.
- Career opportunities in AI & Big Data Analytics

Activity

1. **Activity Name:** AI & Big Data Use-Case Scenarios
2. **Objective:** To explore various use-cases of Artificial Intelligence and Big Data Analytics in different industries.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, whiteboard, markers, internet access.
5. **Time Duration:** 30 minutes
6. **Instructions:**
   - Divide participants into small groups of 3-5 people.
   - Provide each group with a list of industries such as healthcare, finance, transportation, retail, etc.
   - Instruct each group to choose one industry from the list.
   - Within their chosen industry, ask each group to brainstorm and come up with at least three potential use-cases where AI and Big Data Analytics can be applied to solve specific problems or enhance operations.
   - Each group should write down their chosen industry and use-case scenarios on the whiteboard, along with brief explanations of how AI and Big Data can be utilized in each scenario.
   - After 20 minutes of brainstorming, allow each group to present their chosen industry and use-case scenarios to the rest of the class.
   - Encourage other groups to ask questions and provide feedback on the presented use-cases.
   - Facilitate a brief discussion at the end of all presentations to summarize the key insights and common themes across different industries.
7. **Outcome:** Participants will gain a deeper understanding of the diverse applications of Artificial Intelligence and Big Data Analytics across various industries, enhancing their awareness of the real-world impact of these technologies.

Notes for Facilitation

- Encourage creativity and critical thinking among participants during the brainstorming process.
- Monitor group dynamics to ensure all members are actively engaged and contributing to the activity.
- Provide guidance and assistance as needed, especially for participants who may struggle to generate ideas or understand the application of AI and Big Data in specific industries.
- Emphasize the importance of considering ethical implications and potential challenges associated with implementing AI and Big Data solutions in different contexts.
- Use the activity as an opportunity to highlight the relevance of AI and Big Data Analytics for addressing real-world problems and driving innovation across various sectors.

Answers to Exercises for PHB

Multiple Choice Questions:

1. b. Improved decision-making
2. b. Social media marketing
3. b. Narrow AI is specialized in specific tasks, while general AI can perform any intellectual task
4. c. Natural Language Processing (NLP.
5. a. Linear progression from entry-level to management roles

Descriptive Questions:

1. Refer to Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape Topic 1.1.1 Key AI/Big Data Use Cases
2. Refer to Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape Topic 1.1.4. AI on Entrepreneurial Strategy
3. Refer to Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape Topic 1.1.2 AI System Types
4. Refer to Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape Topic 1.1.2 AI System Types
5. Refer to Unit 1.1: AI/Big Data Use Cases, AI System Types, and Roles in the Entrepreneurial Landscape Topic 1.1.3 Crucial Roles in Entrepreneurial AI Implementation

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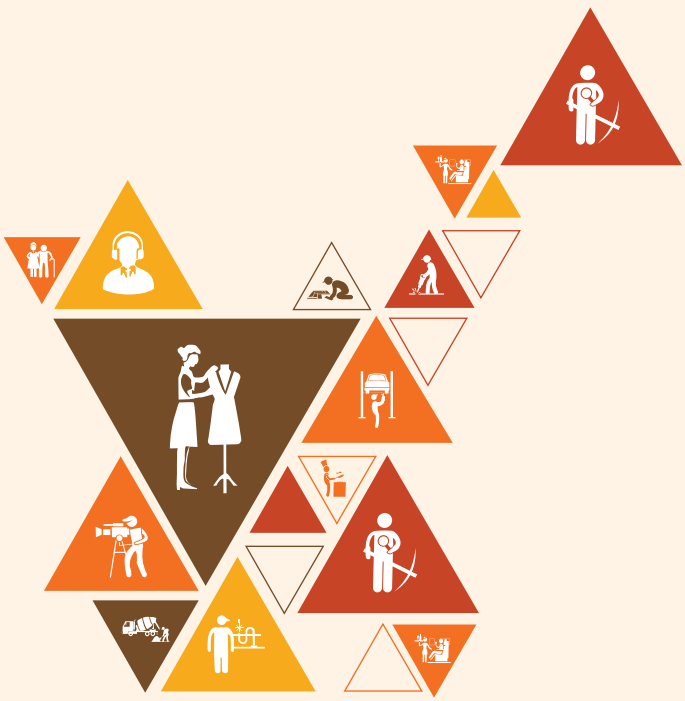
2. Basics of Architecture

Unit 2.1 - Understanding the role of AI - Solution Architect



Bridge Module

Key Learning Outcomes 

By the end of this module, the participants will be able to:

1. Explain enterprise architecture principles, components and their practical application
2. Identify critical success factors for common enterprise architect approaches

Unit 2.1: Understanding the role of AI - Solution Architect

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explain the principles, components, and practical application of enterprise architecture
2. Identify critical success factors for common enterprise architect approaches

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we're diving into the fundamentals of architecture.
- Throughout this session, feel free to ask questions and engage actively in discussions. Your participation will enhance the learning experience for everyone.

Ask

- Can anyone share an example of a building or structure that you admire for its architecture?
- How do you think architecture impacts our daily lives?

Do

- Begin the session by providing a brief overview of the agenda and learning outcomes.
- Encourage participants to take notes during the session to aid their understanding and retention of the material.
- Use visual aids such as diagrams, images, or videos to illustrate key concepts and principles.
- Foster discussions and group activities to promote collaborative learning and critical thinking.

Elaborate

- Enterprise architecture principles, components, and their practical application
- Critical success factors for common enterprise architect approaches

Explain

- Definition and significance of enterprise architecture
- Key components of enterprise architecture such as business, data, application, and technology architectures
- Practical application of enterprise architecture principles in organizational contexts
- Critical success factors for effective enterprise architecture implementation

Activity

1. **Activity name:** Architecture Blueprint Creation
2. **Objective:** To reinforce understanding of enterprise architecture principles, components, and practical application.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, whiteboard, markers, paper, pens.
5. **Time Duration:** 30 minutes
6. **Instructions:**
   - Divide participants into small groups of 3-5 people.
   - Provide each group with a scenario of a fictional organization facing specific challenges or goals related to its architecture (e.g., expanding into new markets, improving operational efficiency, integrating new technologies).
   - Instruct each group to create an architectural blueprint that addresses the challenges or goals outlined in the scenario.
   - Encourage groups to identify and incorporate key components of enterprise architecture (business, data, application, and technology) into their blueprint.
   - Allocate 20 minutes for groups to brainstorm, discuss, and sketch out their architectural blueprint on paper or the whiteboard.
   - After 20 minutes, ask each group to present their blueprint to the rest of the class, explaining how their design addresses the challenges or goals in the scenario and highlighting the practical application of enterprise architecture principles.
   - Facilitate a brief discussion after each presentation, allowing other groups to ask questions, provide feedback, and offer alternative perspectives.
   - Encourage groups to reflect on the critical success factors for common enterprise architect approaches as they discuss their blueprints.
7. **Outcome:** Participants will apply their understanding of enterprise architecture principles to create practical solutions for organizational challenges, enhancing their ability to identify critical success factors for effective architectural approaches.

Notes for Facilitation

- Provide clear instructions and guidance at the beginning of the activity to ensure participants understand the task and objectives.
- Monitor group discussions to ensure that all members are actively engaged and contributing to the blueprint creation process.
- Encourage creativity and innovation in designing architectural solutions, while also emphasizing the importance of aligning solutions with organizational goals and objectives.
- Use the activity as an opportunity to reinforce key concepts and principles of enterprise architecture through hands-on application.
- Facilitate a debriefing session at the end of the activity to recap key insights, lessons learned, and best practices for effective architectural design.

Answers to Exercises for PHB

Multiple Choice Questions:

1. b. Modularity and standardization
2. c. Application architecture
3. a. Strategic planning
4. c. Continuous improvement
5. c. Alignment with business goals

Descriptive Questions:

1. Refer to Unit 2.1: Understanding the role of AI - Solution Architect
   Topic 2.1.2 Critical Success Factors for Common Enterprise Architect Approaches
2. Refer to Unit 2.1: Understanding the role of AI - Solution Architect
   Topic 2.1.2 Critical Success Factors for Common Enterprise Architect Approaches
3. Refer to Unit 2.1: Understanding the role of AI - Solution Architect
   Topic 2.1.1 Understanding the Enterprise Architecture
4. Refer to Unit 2.1: Understanding the role of AI - Solution Architect
   Topic 2.1.1 Understanding the Enterprise Architecture
5. Refer to Unit 2.1: Understanding the role of AI - Solution Architect
   Topic 2.1.2 Critical Success Factors for Common Enterprise Architect Approaches

   Refer to Unit 2.1: Understanding the role of AI - Solution Architect

   Topic 2.1.2 Critical Success Factors for Common Enterprise Architect Approaches

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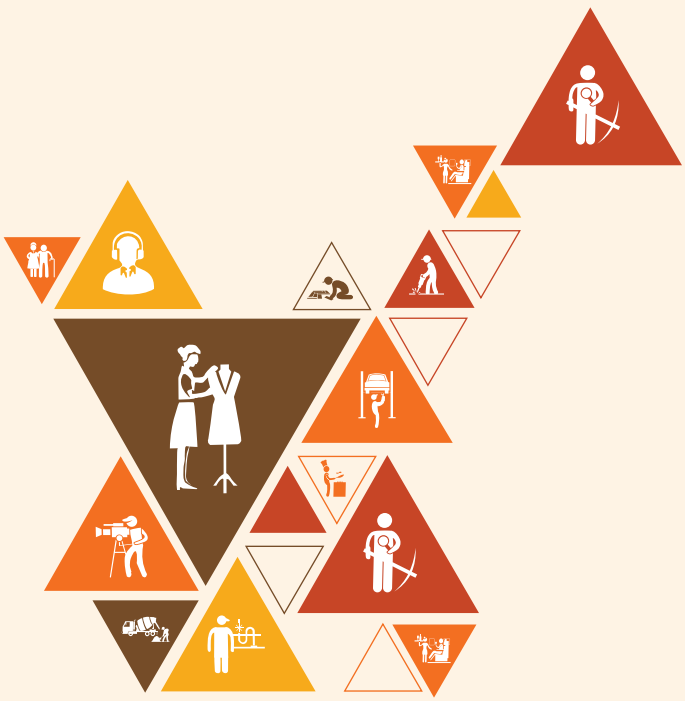
3. Global Data Regulations and Standards

Unit 3.1 - Global Data Management Standards



Bridge Module

Key Learning Outcomes 

By the end of this module, the participants will be able to:

4. Discuss the need for data regulations and standards
4. Analyse commonly used global data regulation policies (such as GDPR)
4. Discuss the roles and responsibilities of key actors involved in enforcing data regulations and standards
4. Identify best practices used by various organizations in the enforcement of data regulations and standards

Unit 3.1: Global Data Management Standards

Unit Objectives

By the end of this unit, the participants will be able to:

1. Evaluate the overarching ideas and fundamentals of global data management standards

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we're delving into the complex world of global data regulations and standards.
- Throughout this session, feel free to ask questions and participate actively. Your engagement will enrich our discussion and learning experience.

Ask

- Have you ever encountered any data privacy regulations or standards in your personal or professional life?
- Why do you think data regulations and standards are important in today's digital age?

Do

- Begin the session by outlining the agenda and learning objectives to provide clarity on what to expect.
- Encourage participants to take notes and jot down any questions they may have during the session for further discussion.
- Foster a collaborative learning environment by facilitating group discussions and activities to explore real-world applications of data regulations and standards.
- Use case studies or examples to illustrate the practical implications of different regulatory frameworks and enforcement mechanisms.

Elaborate

- Fundamental Ideas and Principles of Global Data Management Standards

Demonstrate

Show videos how organizations can implement data protection measures such as encryption, access controls, and data anonymization to comply with regulations like GDPR

Activity

1. **Activity name:** Best Practices Brainstorm
2. **Objective:** To identify and discuss best practices used by organizations in the enforcement of data regulations and standards.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, notepad, pen, whiteboard, markers.
5. **Time Duration:** 30 minutes
6. **Instructions:**
   - Divide participants into small groups of 3-5 people.
   - Provide each group with a list of commonly used global data regulation policies (e.g., GDPR, CCPA, HIPAA).
   - Instruct each group to choose one data regulation policy from the list and analyze it to identify best practices used by organizations in compliance and enforcement.
   - Allocate 15 minutes for groups to brainstorm and discuss best practices associated with their chosen data regulation policy.
   - Encourage groups to consider various aspects such as data collection, processing, storage, security measures, consent mechanisms, and accountability.
   - After 15 minutes, ask each group to present their findings to the rest of the class, highlighting the best practices identified and explaining how they contribute to effective enforcement of data regulations.
   - Facilitate a discussion after each presentation, allowing other groups to ask questions, provide feedback, and share additional insights.
   - Encourage participants to take note of key best practices discussed during the activity for future reference.
7. **Outcome:** Participants will gain a deeper understanding of the practical application of data regulations and standards through the identification and discussion of best practices used by organizations for compliance and enforcement.

Notes for Facilitation

- Provide clear instructions and guidance at the beginning of the activity to ensure participants understand the task and objectives.
- Monitor group discussions to ensure that all members are actively engaged and contributing to the brainstorming process.
- Encourage creativity and critical thinking in identifying best practices, while also emphasizing the importance of aligning practices with regulatory requirements and organizational needs.
- Use the activity as an opportunity to facilitate knowledge sharing and peer learning among participants, allowing them to benefit from each other's insights and experiences.
- Encourage participants to reflect on how they can apply the identified best practices within their own organizations or professional roles to enhance compliance with data regulations and standards.

Answers to Exercises for PHB

Multiple Choice Questions:

1. b. To ensure data security and privacy
2. b. HIPAA
3. c. Data Protection Officer (DPO.
4. c. Monitoring data protection practices
5. b. Conducting regular data training for employees

Descriptive Questions:

1. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
   Topic 3.1.1 Fundamental Ideas and Principles of Global Data Management Standards
2. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
   Topic 3.1.1 Fundamental Ideas and Principles of Global Data Management Standards
3. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
   Topic 3.1.1 Fundamental Ideas and Principles of Global Data Management Standards
4. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
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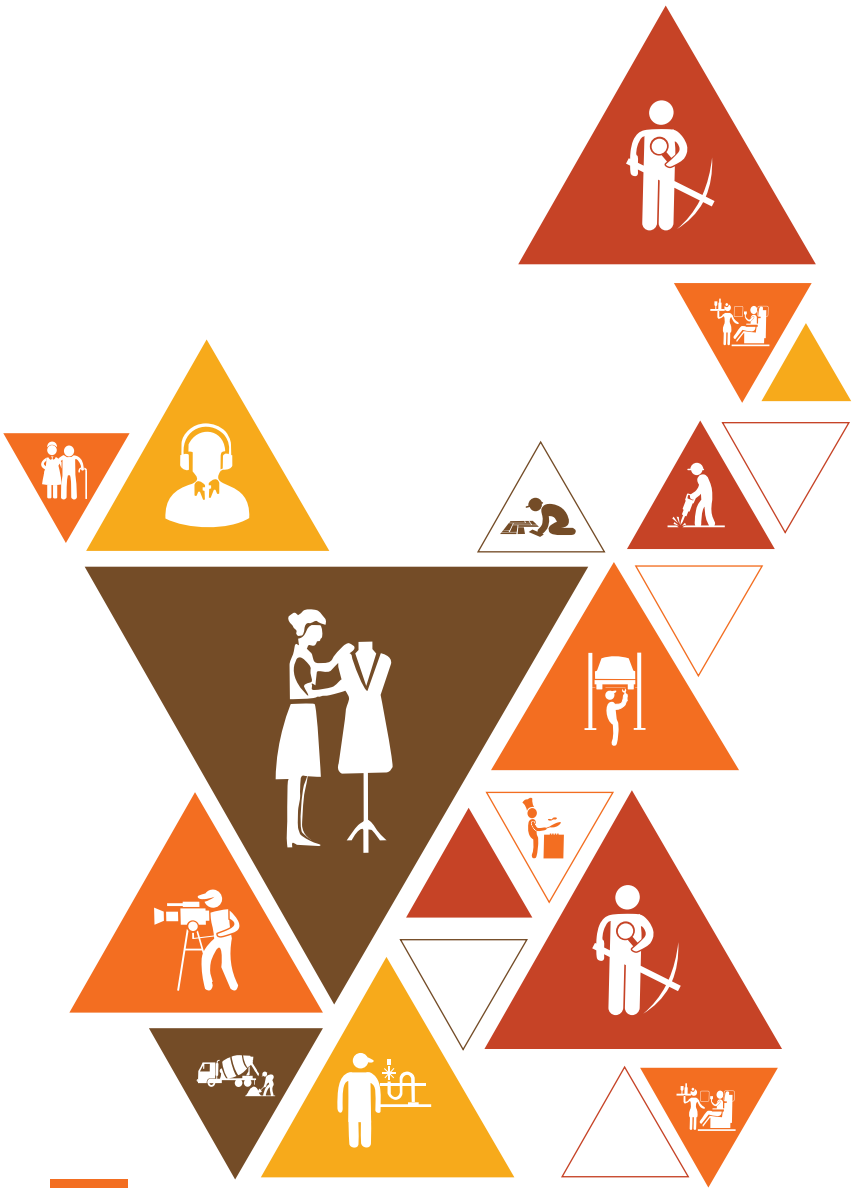
5. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
   Topic 3.1.1 Fundamental Ideas and Principles of Global Data Management Standards
6. Refer to Unit 3.1: Understanding the role of AI - Solution Architect
   Topic 3.1.1 Fundamental Ideas and Principles of Global Data Management Standards



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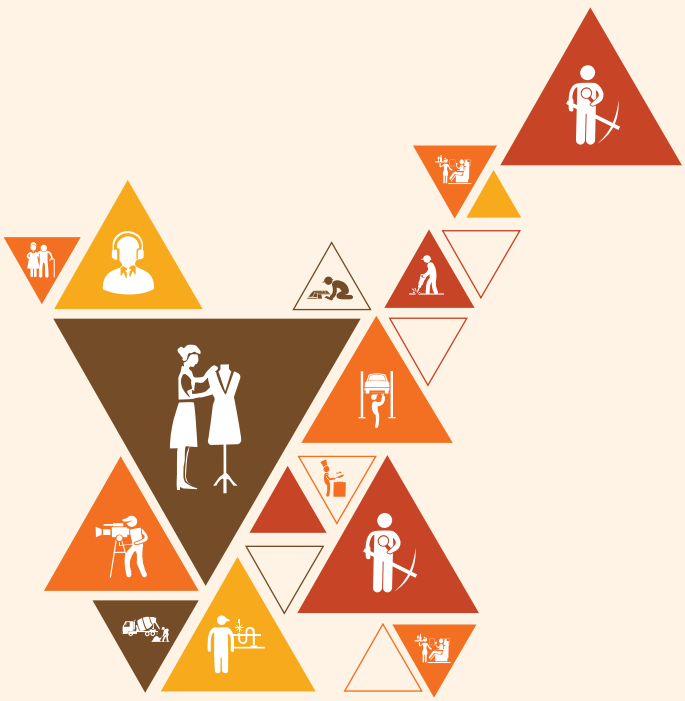
4. Data Tools and Usage

Unit 4.1 - Tools and Platforms for Data Integration and Processing



Bridge Module

Key Learning Outcomes 

By the end of this module, the participants will be able to:

1. Identify the various data integration and management tools and platforms
2. Discuss the fundamentals of using the data integration and management tools and platforms
3. Discuss fundamentals of various infrastructure components such as storage devices, networking hardware, server-storage connectivity
4. Explain fundamental tools used for distributed computing services such as data storage, integration and processing
5. Assess the role of scripts to extract and understand data
6. Demonstrate the ways to use data integration and management tools
7. Demonstrate the ways to use different infrastructure components such as storage devices, networking hardware, server-storage connectivity, virtualization technologies
8. Configure various microservices, frameworks, libraries, packages
9. Create scripts for data extraction

Unit 4.1: Tools and Platforms for Data Integration and Processing

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify data integration and management tools and platforms.
2. Discuss fundamentals of using data integration and management tools and platforms.
3. Discuss fundamentals of various infrastructure components, including storage devices, networking hardware, and server-storage connectivity.
4. Explain fundamental tools for distributed computing services, covering data storage, integration, and processing.
5. Demonstrate ways to use data integration and management tools, infrastructure components

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we're diving into the world of data tools and their usage.
- Throughout this session, feel free to ask questions and actively participate. Your engagement will enhance our learning experience.

Ask

- Can you name any data integration or management tools or platforms you've heard of or used before?
- How do you think understanding infrastructure components like storage devices and networking hardware can benefit data management processes?

Do

- Begin the session by providing an overview of the agenda and learning outcomes to set expectations.
- Encourage participants to take notes and jot down any questions they may have during the session for clarification or further discussion.
- Use a combination of lecture-style teaching, demonstrations, and interactive discussions to cover the various topics and engage participants effectively.
- Provide opportunities for hands-on practice or guided exercises to reinforce learning and ensure understanding of key concepts and tools.

Elaborate

- Various data integration and management tools and platforms
- Fundamentals of using data integration and management tools
- Fundamentals of infrastructure components such as storage devices, networking hardware, server-storage connectivity
- Fundamental tools for distributed computing services
- Role of scripts in data extraction

Explain

- Basic principles and functionalities of data integration and management tools
- Overview of infrastructure components and their relevance to data management
- Key features and use cases of distributed computing services
- Importance of scripts in automating data extraction processes

Activity

1. **Activity name:** Tool Exploration and Presentation
2. **Objective:** To familiarize participants with various data integration and management tools and platforms, and enhance their understanding of the fundamentals of using these tools.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, notepad, pen, whiteboard, markers, laptop/computer with internet access.
5. **Time Duration:** 30 minutes
6. **Instructions:**
    - Divide participants into small groups of 3-5 people.
    - Provide each group with a list of data integration and management tools and platforms (e.g., Apache Kafka, Informatica, Talend, Microsoft Azure Data Factory, etc.).
    - Instruct each group to choose one tool or platform from the list to explore.
    - Allocate 15 minutes for groups to research and explore their chosen tool or platform online. They should focus on understanding its features, functionalities, use cases, and any tutorials or resources available.
    - After 15 minutes, ask each group to prepare a brief presentation to share their findings with the rest of the class. The presentation should include an overview of the tool/platform, its key features, and how it can be used for data integration and management tasks.
    - Allocate 10 minutes for each group to present their findings to the class.
    - Encourage other groups to ask questions and engage in discussions after each presentation.
    - Facilitate a debriefing session at the end of all presentations to summarize key insights and discuss commonalities and differences among the tools/platforms explored.
7. **Outcome:** Participants will gain exposure to a variety of data integration and management tools and platforms, deepen their understanding of their features and functionalities, and learn how to effectively utilize them for data-related tasks.

Notes for Facilitation

- Encourage active participation and collaboration within each group to ensure thorough exploration of the chosen tool/platform.
- Remind participants to focus on key features and practical applications of the tool/platform during their research.
- Provide guidance and support as needed, especially for participants who may be less familiar with the tools or technologies being explored.
- Keep track of time to ensure that each group has sufficient opportunity to both research and present their findings.
- Use the activity as an opportunity to promote knowledge sharing and facilitate discussions on the relevance and applicability of different data tools and platforms in various contexts.

Answers to Exercises for PHB

Multiple Choice Question

1. d. Apache Kafka
2. b. Storing and retrieving data
3. b. Hadoop
4. b. Extracting and understanding data
5. c. Improving scalability and maintainability

Descriptive Questions:

1. Refer to Unit 4.1: Understanding the role of AI - Solution Architect
   Topic 4.1.1 Data Integration, Management Tools and Platforms
2. Refer to Unit 4.1: Understanding the role of AI - Solution Architect
   Topic 4.1.2 Fundamentals of Using Data Integration and Management Tools and Platforms
3. Refer to Unit 4.1: Understanding the role of AI - Solution Architect
   Topic 4.1.3. Foundational Elements of IT Infrastructure
4. Refer to Unit 4.1: Understanding the role of AI - Solution Architect
   Topic 4.1.4 Strategies for Leveraging Data Integration and Management Tools
5. Refer to Unit 4.1: Understanding the role of AI - Solution Architect
   Topic 4.1.5 Ways to use Data Integration and Management Tools, Infrastructure Components

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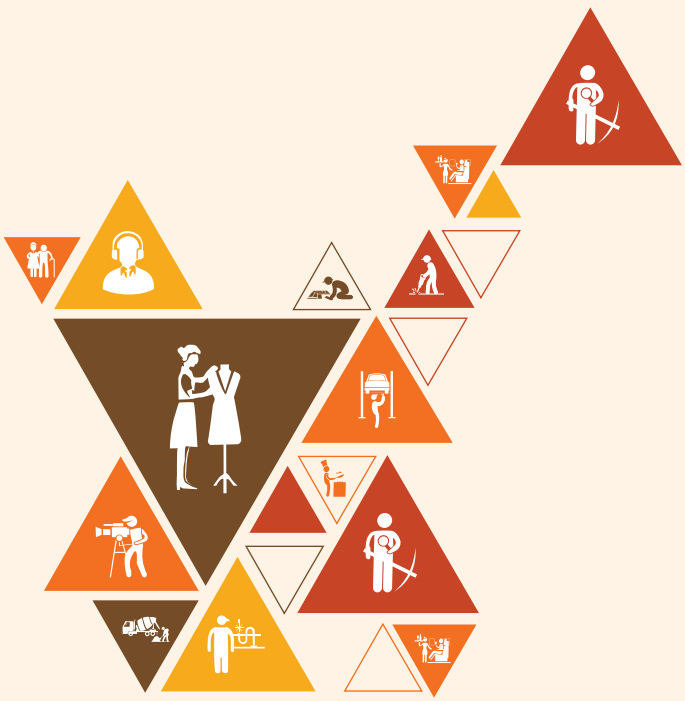
5. Solution Architecture - Platforms

Unit 5.1 - Strategic Platform Selection



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Key Learning Outcomes 

By the end of this module, the trainees will be able to:

1. Understand and analyse the organization's needs and requirements for deploying a solution.
2. Evaluate diverse platform options for deploying the solution, considering factors such as scalability, performance, and compatibility.
3. Assess solution architecture constraints, including the decision between deploying on web or mobile platforms.
4. Describe the solution architecture based on platform types, such as Thin Clients (for online applications), Thick Clients (for offline applications), or Smart Clients (for occasionally connected applications).
5. Establish mechanisms for tracking vendor solution capabilities and product roadmaps to ensure ongoing alignment with organizational goals.
6. Evaluate regulatory standards and protocols governing solution deployment across platforms, addressing issues like cross-border data governance, PII regulations, GDPR, global-scale security, and monitoring.
7. Demonstrate a systematic approach to selecting a suitable platform for solution deployment based on organizational needs, considering factors such as data governance, security, and compliance.
8. Perform impact analysis to review the advantages and limitations of deploying the solution across different platforms, identifying potential challenges and mitigations.
9. Develop competencies to guide developers in resolving complex issues, ensuring the successful implementation and maintenance of the solution across chosen platforms.

Unit 5.1: Strategic Platform Selection

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Conduct a comprehensive analysis of the organization's needs and requirements for solution deployment
2. Evaluate a range of platform options, considering solution architecture constraints and deciding between web and mobile deployment based on the specific requirements.
3. Establish mechanisms for ongoing alignment with organizational goals
4. Demonstrate a systematic approach to platform selection, focusing on organizational needs, data governance, security, and compliance.
5. Perform impact analysis to identify and address potential challenges, developing competencies.

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we're exploring the intricacies of solution architecture on different platforms.
- Let's engage actively and ask questions to deepen our understanding of how to select and deploy solutions effectively.

Ask

- Can you share an example of a solution deployed on different platforms? (e.g., web, mobile)
- Why is it important to consider regulatory standards and protocols when deploying solutions across platforms?

Do

- Start the session by outlining the agenda and objectives to provide clarity on what we'll cover.
- Encourage participants to take notes and jot down any questions they may have during the session for further discussion.
- Foster interactive discussions and group activities to explore real-world examples and challenges related to deploying solutions on different platforms.
- Use case studies or scenarios to illustrate the impact of platform selection on solution architecture and deployment.

Elaborate

- Needs and requirements of the organization for solution deployment
- Evaluation of various platform options for solution deployment
- Solution architecture constraints based on platform types (e.g., Thin Clients, Thick Clients, Smart Clients)
- Tracking vendor solution capabilities and product roadmaps
- Evaluation of regulatory standards and protocols for cross-platform deployment
- Consideration of cross-border data governance issues and PII regulations

Explain

- Different types of platform options for solution deployment and their characteristics
- Importance of tracking vendor solution capabilities and product roadmaps for long-term solution sustainability
- Implications of regulatory standards and protocols on solution architecture and deployment

Activity

1. **Activity name:** Platform Evaluation and Selection
2. **Objective:** To evaluate various platform options for solution deployment and select the most suitable platform based on organizational needs.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, notepad, pen, whiteboard, markers, laptop/computer with internet access.
5. **Time Duration:** 30 minutes
6. **Instructions:**
   - Divide participants into small groups of 3-5 people.
   - Provide each group with a list of potential platform options for solution deployment, such as web, mobile, cloud, on-premise, etc.
   - Instruct each group to evaluate the pros and cons of each platform option based on the needs and requirements of a hypothetical organization provided to them.
   - Allocate 15 minutes for groups to discuss and analyze the platform options, considering factors such as scalability, performance, security, cost, regulatory compliance, etc.
   - After 15 minutes, ask each group to present their findings and recommendations to the rest of the class. Groups should justify their choice of platform and explain how it aligns with the organizational needs and requirements.
   - Encourage other groups to ask questions and engage in discussions after each presentation.
   - Facilitate a debriefing session at the end of all presentations to summarize key insights and discuss commonalities and differences among the platform options evaluated.
7. **Outcome:** Participants will gain experience in evaluating platform options for solution deployment and develop the skills to select the most suitable platform based on organizational needs and requirements.

Notes for Facilitation

- Provide clear instructions and guidance at the beginning of the activity to ensure that participants understand the task and objectives.
- Encourage active participation and collaboration within each group to ensure thorough evaluation of the platform options.
- Remind participants to consider a holistic approach to platform evaluation, taking into account various factors such as technical capabilities, regulatory compliance, and organizational priorities.
- Use the activity as an opportunity to promote critical thinking and decision-making skills, as participants justify their choice of platform and evaluate its suitability for the given scenario.
- Facilitate a constructive and inclusive discussion during the debriefing session, allowing participants to share their perspectives and learn from each other's insights and experiences.

Answers to Exercises for PHB

Multiple Choice Question

1. d. Understand and analyze the organization's needs
2. b. Scalability, performance, and compatibility
3. a. Online applications
4. c. Establishing mechanisms for tracking vendor capabilities
5. b. To identify potential challenges and mitigations

Descriptive Questions:

1. Refer to Unit 5.1: Understanding the role of AI - Solution Architect
   Topic 5.1.1 Analysis of the Organization's Needs and Requirements for Solution Deployment
2. Refer to Unit 5.1: Understanding the role of AI - Solution Architect
   Topic 5.1.2 Evaluating Platform Alternatives under Solution Architecture Restrictions
3. Refer to Unit 5.1: Understanding the role of AI - Solution Architect
   Topic 5.1.3 Continuous Alignment with Organizational Goals
4. Refer to Unit 5.1: Understanding the role of AI - Solution Architect
   Topic 5.1.4 Strategic Platform Selection
5. Refer to Unit 5.1: Understanding the role of AI - Solution Architect
   Topic 5.1.5 Performing Impact Analysis and Addressing Challenges for Competency Development

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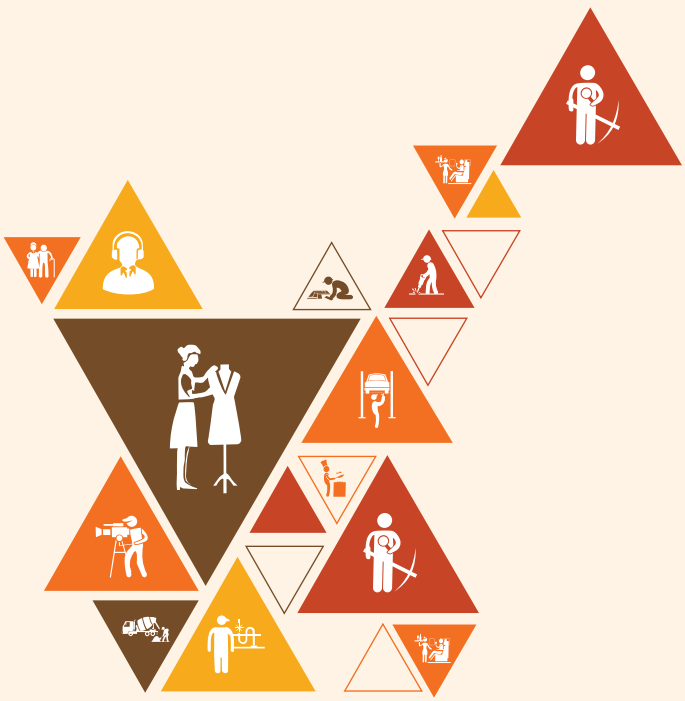
6. Solution Architecture - Design

Unit 6.1 - Detailed Specifications of the Solution

Unit 6.2 - Performance Metrics for Solution Analysis

Unit 6.3 - Strategic Architectural Development and Repository Management



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Key Learning Outcomes 

By the end of this module, the trainees will be able to:

1. Describe the system-level architecture for the solution.
2. Describe ways to configure data feeds, data quality checks, and components for the solution.
3. Discuss and interpret component specifications into detailed designs for implementation.
4. Evaluate the performance of the solution architecture for potential risks and provide mitigation plans to appropriate stakeholders.
5. Discuss methods to verify solution architecture from various stakeholders.
6. Evaluate the implications of the business, technical and data requirements on the design of solution architecture.
7. Develop solution architectures using appropriate design standards, methods, and tools.
8. Develop metrics to measure and improve continuous data quality.
9. Develop architectures that are distributed and highly scalable.
10. Create a repository of designed solution architectures for stakeholders.

Unit 6.1: Detailed Specifications of the Solution

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Outline the system-level architecture of the solution.
2. Establish setup procedures for solution components, data streams, and data quality checks.
3. Discuss ways to translate component specifications into detailed implementation designs.

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, overhead projector or large screen, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we'll delve into the detailed specifications of the solution, focusing on system-level architecture and implementation designs.
- Let's actively engage in discussions and activities to deepen our understanding of how to translate component specifications into detailed implementation designs effectively.

Ask

- Can you define what system-level architecture means to you?
- Why is it important to have detailed implementation designs in place before moving forward with a project?

Do

- Start the session by providing an overview of the agenda and learning outcomes to set expectations.
- Encourage participants to take notes and jot down any questions they may have during the session for clarification or further discussion.
- Utilize interactive activities, discussions, and practical examples to reinforce key concepts and engage participants effectively.
- Use case studies or real-world scenarios to illustrate the importance of detailed specifications in the solution development process.

Elaborate

- Understanding the Concept of System-Level Architecture
- Solution Setup and Data Management
- Strategies for Translating Component Specifications into Detailed Implementation Designs

Explain

- Key principles and components of system-level architecture
- Importance of solution setup and data management in the development process
- Strategies and best practices for translating component specifications into detailed implementation designs

Demonstrate

The process of translating component specifications into detailed implementation designs using relevant tools or software.

Activity

1. **Activity name:** Component Specifications Translation
2. **Objective:** To practice translating component specifications into detailed implementation designs, reinforcing understanding of system-level architecture and solution setup.
3. **Type of Activity:** Group
4. **Resources:** Participant handbook, notepad, pen, whiteboard, markers, presentation slides (if needed), sample component specifications.
5. **Time Duration:** 30 minutes
6. **Instructions:**
    - **Preparation:**
        - Prepare sample component specifications representing different aspects of a solution (e.g., user interface, database structure, data processing logic).
        - Divide participants into groups of 3-5 members.
    - **Introduction:**
        - Briefly explain the importance of translating component specifications into detailed implementation designs.
        - Emphasize the role of system-level architecture and solution setup in this process.
    - **Activity:**
        - Distribute the sample component specifications to each group.
        - Instruct each group to collaborate and translate the given specifications into detailed implementation designs.
        - Encourage participants to discuss and brainstorm various strategies for translating the specifications effectively.

- **Implementation:**
  - Allocate 15-20 minutes for groups to work on their designs.
  - Remind participants to consider factors such as scalability, performance, security, and data management during the translation process.
- **Presentation:**
  - After the allocated time, ask each group to present their translated implementation designs to the class.
  - Encourage groups to explain their rationale behind the design decisions and how they addressed the given specifications.
- **Discussion:**
  - Facilitate a brief discussion after each presentation, allowing other groups to ask questions or provide feedback.
  - Encourage participants to share insights and lessons learned from the activity.

7. **Outcome:** Participants will gain practical experience in translating component specifications into detailed implementation designs, enhancing their understanding of system-level architecture and solution setup.

Notes for Facilitation

- Ensure clear communication of instructions and objectives to participants at the beginning of the activity.
- Monitor group progress and provide guidance or assistance as needed.
- Encourage active participation and collaboration within each group.
- Emphasize the importance of considering various factors and constraints during the translation process.
- Use the activity as an opportunity to reinforce key concepts and promote critical thinking skills among participants.

Unit 6.2: Performance Metrics for Solution Analysis

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Evaluate the performance of the solution architecture for potential risks and provide mitigation plans to appropriate stakeholders.
2. Discuss ways to develop metrics to measure and improve continuous data quality.

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we'll be diving into the topic of performance metrics for solution analysis, focusing on solution architecture performance and continuous data quality management metrics.
- Let's engage actively and collaboratively to understand how performance metrics play a crucial role in evaluating and optimizing solutions.

Ask

- Can you name any performance metrics you're familiar with in the context of solution analysis?
- Why is it important to continuously monitor and manage data quality in a solution?

Do

- Begin by providing an overview of the agenda and learning objectives to set the context for the session.
- Encourage participants to actively participate in discussions and activities throughout the session.
- Utilize a combination of presentations, group discussions, and hands-on activities to explore and reinforce key concepts.
- Allocate sufficient time for practical demonstrations or case studies to illustrate the application of performance metrics in real-world scenarios.

Elaborate

- Understanding the factors influencing solution performance and identifying relevant performance metrics.
- Strategies for establishing data quality metrics and implementing continuous monitoring processes.

Explain

- Key performance indicators (KPIs) for evaluating solution architecture performance, such as response time, throughput, and scalability.
- Techniques for developing and implementing metrics to ensure continuous data quality management, including data profiling, anomaly detection, and data validation processes.

Demonstrate

The process of setting up performance monitoring tools or data quality management systems, showcasing how metrics are collected, analyzed, and utilized to optimize solution performance.

Activity

1. **Activity name:** Solution Performance Analysis Workshop
2. **Objective of the Activity:** Apply solution performance metrics to a case study, identifying potential improvements.
3. **Resources:** Case study, whiteboard, markers, laptops or devices.
4. **Time Duration:** 45 minutes
5. **Instructions:**
   - Divide participants into small groups.
   - Distribute the case study and ask each group to identify performance metrics relevant to the scenario.
   - Each group presents their chosen metrics and proposes solutions to improve performance.
   - Facilitate a group discussion to compare approaches and insights.
6. **Outcome:** Enhanced understanding of applying performance metrics to real-world scenarios.

Notes for Facilitation

- Encourage active participation and collaboration within each group.
- Provide guidance and support as needed during the activity.
- Emphasize the importance of considering various factors and constraints when selecting metrics.
- Use the activity as an opportunity to reinforce key concepts related to solution architecture performance and data quality management.
- Facilitate a summary discussion at the end of the activity to reinforce key takeaways and address any remaining questions or concerns.

Unit 6.3: Strategic Architectural Development and Repository Management

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Discuss developing architectures that are distributed and highly scalable.
2. Create a repository of designed solution architectures for stakeholders.

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, computer/laptop with internet connection.

Say

- Welcome, everyone! Today, we will delve into the topic of strategic architectural development and repository management, focusing on developing highly scalable and distributed architectures, as well as designing solution architectures for stakeholders.
- Let's engage actively and collaboratively to understand how strategic architectural decisions can drive organizational success and meet stakeholder needs effectively.

Ask

- Can you think of any examples of highly scalable and distributed architectures used in popular applications or services?
- How important do you think it is to design solution architectures that align with stakeholder requirements and expectations?

Do

- Begin by providing an overview of the agenda and learning objectives to set the context for the session.
- Encourage participants to actively participate in discussions and activities throughout the session.
- Utilize a combination of presentations, group discussions, and practical exercises to explore and reinforce key concepts.
- Allocate time for hands-on activities or case studies to allow participants to apply strategic architectural principles in real-world scenarios.

Elaborate

- Developing Highly Scalable and Distributing Architectures
- Designed Solution Architectures for Stakeholders

Explain

- Key considerations and best practices for developing highly scalable and distributed architectures, such as load balancing, horizontal scaling, and fault tolerance.
- Techniques for gathering and analyzing stakeholder requirements to inform the design of solution architectures, including stakeholder interviews, user personas, and requirements workshops.

Demonstrate

The process of designing and implementing a highly scalable architecture or presenting a case study illustrating the design of a solution architecture tailored to stakeholder needs.

Activity

1. **Activity name:** Architectural Design Challenge
2. **Objective:** To apply the concepts of developing highly scalable and distributed architectures and designing solution architectures for stakeholders in a practical scenario.
3. **Type of Activity:** Group activity
4. **Resources:** Whiteboard, markers, flip chart paper, sticky notes, pens
5. **Time Duration:** 30 minutes
6. **Instructions:**
    - Divide participants into small groups of 3-5 members each.
    - Explain that each group will be given a hypothetical scenario related to architectural design challenges.
    - Provide each group with a scenario card outlining a specific problem or challenge related to architectural development and solution design.
    - Instruct the groups to analyze the scenario, identify key requirements, and brainstorm solutions based on the concepts discussed in the session.
    - Encourage groups to consider aspects such as scalability, distribution, stakeholder needs, and solution effectiveness in their designs.
    - Allocate 15-20 minutes for group discussion and brainstorming.
    - Each group should prepare a brief presentation outlining their proposed architectural solution, highlighting key design decisions and rationale.
    - After the discussion time, ask each group to present their solutions to the rest of the class.

- Encourage questions and feedback from other participants after each presentation.
- Facilitate a brief summary discussion to compare and contrast different approaches, emphasizing the importance of strategic architectural development and stakeholder alignment.

7. **Outcome:** Participants will gain hands-on experience in applying strategic architectural principles to real-world scenarios, fostering critical thinking and problem-solving skills in architectural design challenges.

Notes for Facilitation

- Provide clear instructions and guidance at the beginning of the activity to ensure all participants understand the objectives and expectations.
- Monitor group discussions to ensure active participation and provide support or clarification as needed.
- Encourage creativity and innovative thinking in designing architectural solutions, while also emphasizing the importance of feasibility and practicality.
- Foster a collaborative atmosphere where participants feel comfortable sharing their ideas and perspectives.
- Use the activity as an opportunity to reinforce key concepts and principles discussed in the session, relating them back to practical applications in architectural development and repository management.

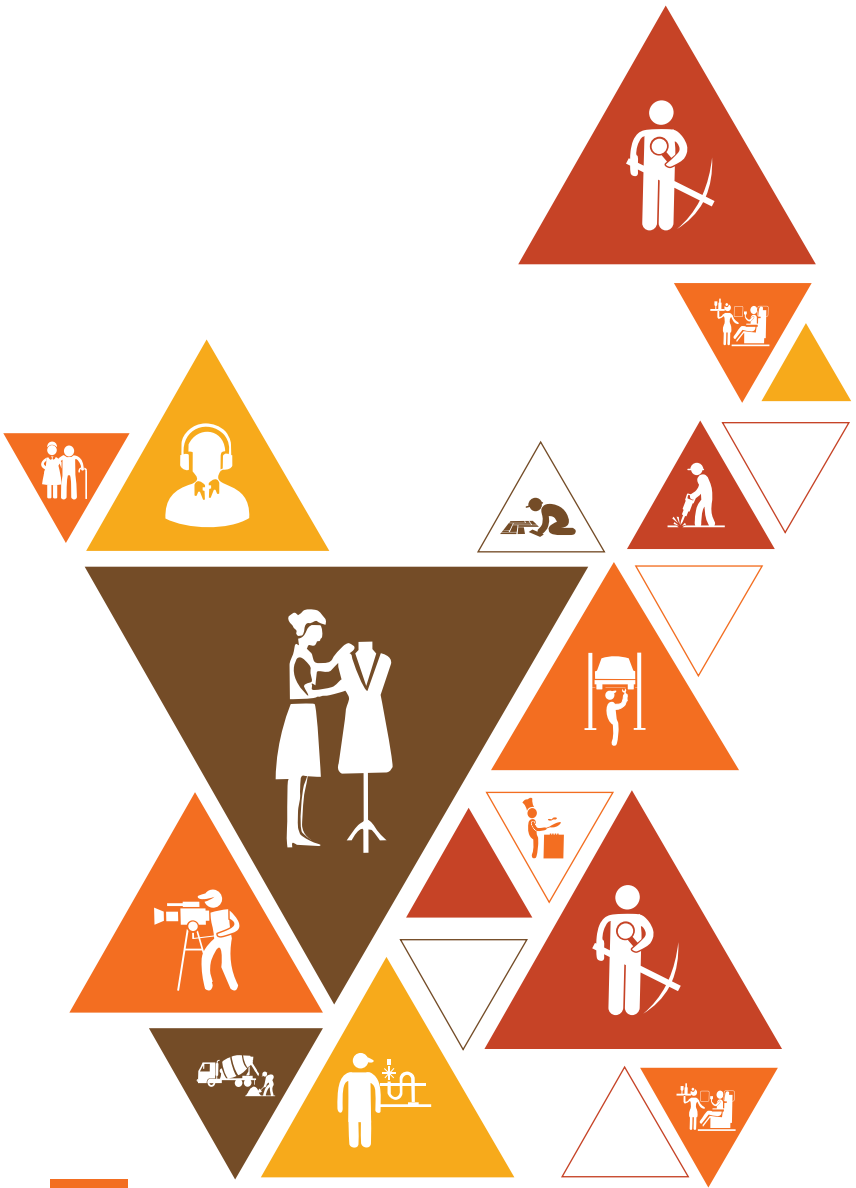
Answers to Exercises for PHB

Multiple Choice Questions

1. a. Reliability and Scalability
2. b. Achieving Technical and Functional Objectives
3. b. Regularly Updating Documentation
4. c. Incrementally Update Documents as Changes Occur
5. c. Guiding Future Development Efforts

Answer the following:

1. Refer to Unit 6.1: Detailed Specifications of the Solution
   Topic 6.1.1 Understanding the Concept of System-Level Architecture
2. Refer to Unit 6.1: Detailed Specifications of the Solution
   Topic 6.1.3 Strategies for Translating Component Specifications into Detailed Implementation Designs
3. Refer to Unit 6.2 Performance Metrics for Solution Analysis
   Topic 6.2.1 Solution Architecture Performance
4. Refer to Unit 6.2 Performance Metrics for Solution Analysis
   Topic 6.2.2 Developing Metrics for Continuous Data Quality Management
5. Refer To Unit 6.3 Strategic Architectural Development and Repository Management
   Topic 6.3.2 Designed Solution Architectures for Stakeholders



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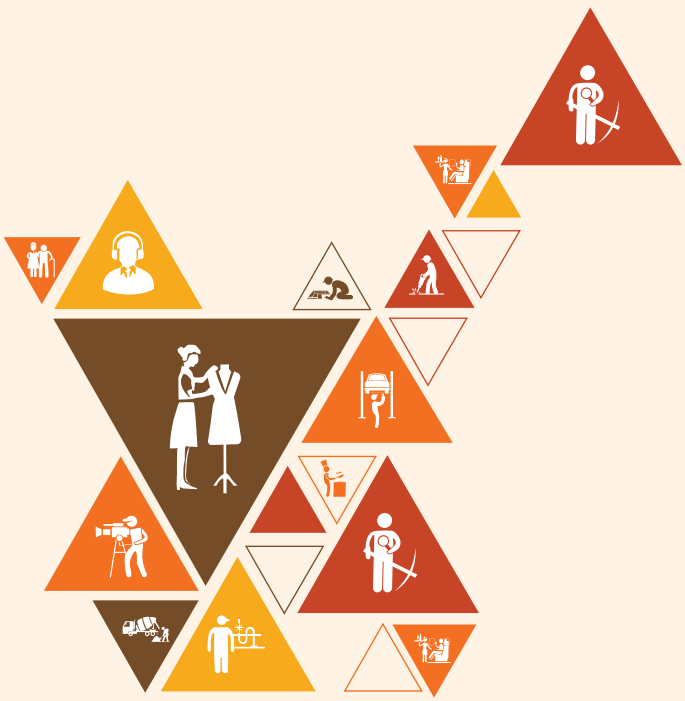
7. Solution Architecture - Maintenance

Unit 7.1 - Monitoring Data Metrics and Solution Performance

Unit 7.2 - Monitoring Data Metrics and Solution Performance



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Key Learning Outcomes 

By the end of this module, the trainees will be able to:

1. Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures
2. Discuss the architecture review process to achieve both technical and functional objectives
3. Assess the process to monitor changes in solution design standards
4. Discuss the ways in which existing document needs to be updated based on changes in design standards
5. Review technical capabilities roadmap for existing solution architectures
6. Demonstrate the ways to update existing solution architectures
7. Demonstrate the process of optimization of existing solution architectures performance

Unit 7.1: Monitoring Data Metrics and Solution Performance

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Assess the several data metrics (accuracy, consistency, completeness, etc.) that are used to gauge how well solution architectures are performing.
2. Discuss the architecture review procedure to meet functional and technical goals.
3. Evaluate the procedure to keep track of modifications to solution design criteria.
4. Explain the current document needs to be changed in light of modifications to the design standards.

Resources to be Used

Presentation slides, whiteboard, markers, participant handbook, notepad, pen, laptop with internet connection.

Say

- Welcome, everyone, to the session on Monitoring Data Metrics and Solution Performance.
- Today, we will explore key concepts related to monitoring data metrics and ensuring optimal solution performance.

Ask

- Can anyone share their understanding of data metrics?
- Why do you think monitoring solution performance is important?

Do

- Begin the session with a brief overview of the topics to be covered.
- Encourage active participation and discussion throughout the session.
- Use real-world examples and case studies to illustrate concepts and engage participants.
- Facilitate group activities and discussions to reinforce learning objectives.

Elaborate

- Understanding Data Metrics
- Architecture Review Procedure to Meet Functional and Technical Goals
- Procedure for Managing Modifications to Solution Design Criteria
- Document Modification in Response to Design Standards Updates

Explain

- The concept of data metrics and their significance in evaluating solution performance.
- The procedure for conducting architecture reviews to ensure alignment with goals.
- The procedure for managing modifications to solution design criteria and the importance of maintaining consistency.
- The process of documenting modifications in response to design standards updates and the importance of version control.

Demonstrate

The use of monitoring tools or software to track data metrics and solution performance in real-time.

Activity

1. **Activity name:** Solution Modification Simulation
2. **Objective of the Activity:** Simulate the process of managing modifications to a solution's design criteria.
3. **Resources:** Sample documentation templates, whiteboard, markers, laptops or devices.
4. **Time Duration:** 60 minutes
5. **Instructions:**
   - Provide a simulated case scenario where a solution requires modification due to changing requirements.
   - Divide participants into small groups and assign each group a specific modification task.
   - Ask each group to create a modification procedure, document the changes, and present their approach.
   - Facilitate a discussion on the presented modifications, emphasizing key considerations and challenges.
6. **Outcome:** Enhanced understanding of the practical aspects of managing solution modifications.

Notes for Facilitation

- Encourage active participation and collaboration among group members.
- Provide guidance and support as needed, particularly for participants who may be less familiar with the topics.
- Foster an open and supportive environment for discussion and idea-sharing.
- Use the activity as an opportunity to reinforce key concepts and address any misconceptions.
- Conclude the activity with a summary of key takeaways and actionable insights for participants to apply in their professional roles.

Unit 7.2: Monitoring Data Metrics and Solution Performance

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Discuss technical capabilities roadmap for existing solution architectures
2. Demonstrate the ways to update existing solution architectures
3. Explain the process of optimization of existing solution architectures performance

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, computer/laptop with internet connection.

Say

- Welcome, everyone, to the session on Monitoring Data Metrics and Solution Performance.
- Today, we will delve into understanding technical capabilities roadmap, solution architectures, and the process of optimizing existing solution architectures' performance.

Ask

- What do you understand by the term "solution architecture"?
- Why is it important to monitor data metrics for solution performance?

Do

- Begin the session by providing a brief overview of the topics to be covered.
- Engage participants in interactive discussions and activities to reinforce learning.
- Encourage active participation and exchange of ideas among participants.
- Facilitate group activities and discussions to apply the concepts learned to real-world scenarios.

Elaborate

- The concept of a technical capabilities roadmap and its significance in aligning technology initiatives with business objectives.
- Different types of solution architectures and their roles in designing and implementing complex systems.
- Strategies and best practices for optimizing the performance of existing solution architectures.
- Evaluate Technology, Resource Efficiency, and Interoperability
- Optimizing Solution Architectures

- Adapting Solution Design Standards
- Optimizing Solution Architecture Documentation for Stakeholders

Explain

- A plan that outlines the development and deployment of technical capabilities to support business objectives.
- Existing system architecture designs
- The structural design of complex systems that defines the relationships between components and how they work together to achieve specific goals.
- The systematic approach to improving the performance and efficiency of existing solution architectures through analysis, modification, and enhancement.

Demonstrate

The process of optimizing the performance of an existing solution architecture using a real-world case study or example.

Activity

1. **Activity name:** Solution Optimization Workshop
2. **Objective of the Activity:** Apply optimization strategies to a case study, identifying potential improvements in solution performance.
3. **Resources:** Case study, whiteboard, markers, laptops or devices.
4. **Time Duration:** 60 minutes
5. **Instructions:**
   - Provide a case study where a solution is facing performance challenges.
   - Divide participants into small groups and assign each group a specific aspect of the optimization process.
   - Ask each group to analyze the case, propose optimization strategies, and present their findings.
   - Facilitate a discussion on the presented optimizations, emphasizing key considerations and challenges.
6. **Outcome:** Enhanced understanding of practical strategies for optimizing solution performance.

Notes for Facilitation

- Ensure each group has access to necessary resources such as presentation slides, whiteboard, and markers.
- Encourage active participation and collaboration within each group.
- Circulate among the groups to provide guidance and answer any questions that may arise.
- Emphasize the importance of considering both technical and business requirements when proposing optimization strategies.
- Use the activity as an opportunity to reinforce key concepts related to solution architecture optimization and technical capabilities roadmap.

Answers to Exercises for PHB

Multiple Choice Question

1. a. Reliability and Scalability
2. b. Achieving Technical and Functional Objectives
3. b. Regularly Updating Documentation
4. c. Incrementally Update Documents as Changes Occur
5. c. Guiding Future Development Efforts

Descriptive Questions:

1. Refer to Unit 7.1 Monitoring Data Metrics and Solution Performance
   Topic 7.1.1 Understanding Data Metrics
2. Refer to Unit 7.1 Monitoring Data Metrics and Solution Performance
   Topic 7.1.2 Architecture Review Procedure to Meet Functional and Technical Goals
3. Refer to Unit 7.1 Monitoring Data Metrics and Solution Performance
   Topic 7.1.3 Procedure for Managing Modifications to Solution Design Criteria
4. Refer to Unit 7.2 Monitoring Data Metrics and Solution Performance
   Topic 7.2.1 Understanding Technical Capabilities Roadmap
5. Refer to Unit 7.2 Monitoring Data Metrics and Solution Performance
   Topic 7.2.1 Understanding Technical Capabilities Roadmap

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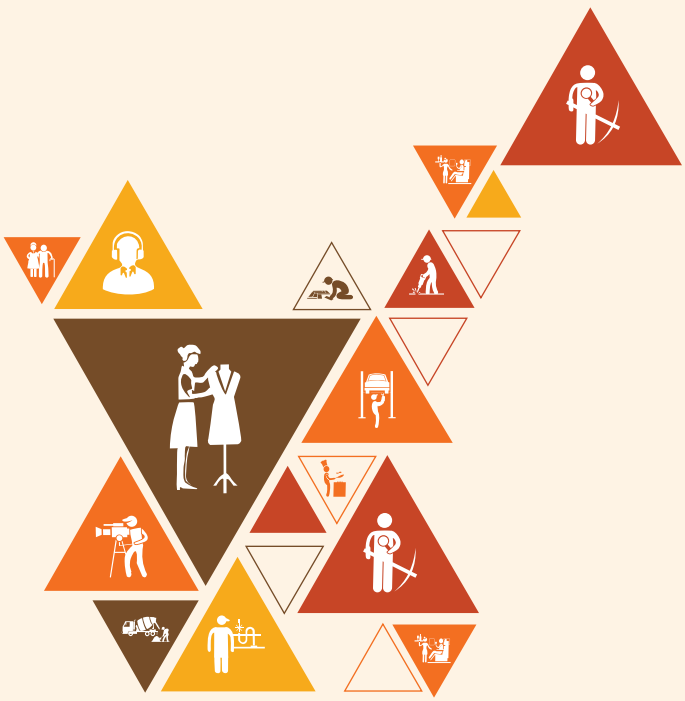
8. Team Empowerment

Unit 8.1 - Understanding the Concept and Importance of Team Empowerment



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Key Learning Outcomes 

By the end of this module, the trainees will be able to:

1. Illustrate the importance of envisioning the larger picture
2. Discuss methods to provide authority and autonomy to employees to help empower them
3. Discuss methods to inculcate an effective system of accountability within the team
4. Discuss methods to be empathetic and respect others' thoughts and opinions
5. Discuss how to encourage team members to take up ownership of work
6. Evaluate best practices to measure employee performance
7. Demonstrate different approaches to recognize and motivate others
8. Demonstrate the process of providing constructive feedback to others

Unit 8.1: Understanding the Concept and Importance of Team Empowerment

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Emphasize the importance of envisioning the larger picture for strategic alignment.
2. Discuss the importance of authority and autonomy to employees for increased empowerment.
3. Discuss the effective system of accountability within the team for transparency.
4. Elaborate the importance of empathy and respect for diverse thoughts and opinions.
5. Discuss the importance of ownership of work for increased responsibility.

Resources to be Used

Participant handbook, notepad, pen, whiteboard, markers, presentation slides, computer/laptop with internet connection.

Say

- Welcome everyone to the Team Empowerment session. Today, we'll explore strategies to empower teams for greater success.
- Let's start by understanding the importance of envisioning the larger picture and how it contributes to team empowerment.

Ask

- What do you think are some benefits of providing authority and autonomy to employees?
- Can you share an example of a time when you felt motivated and recognized by your team or leader?

Do

- Encourage active participation and foster an inclusive learning environment.
- Facilitate group discussions and activities to engage participants in practical learning experiences.
- Provide real-world examples and case studies to illustrate key concepts.
- Offer constructive feedback and guidance throughout the session to support learning outcomes.

Elaborate

- Understanding Strategic Alignment
- Importance of Authority and Autonomy
- Building an Effective System of Accountability for Team Transparency
- Importance of Empathy and Respect for Diverse Thoughts and Opinions
- Ownership and its Importance

Explain

- Importance of envisioning the larger picture in team success.
- Methods for providing authority and autonomy to empower employees.
- Strategies for fostering empathy and respect within teams.
- Techniques to encourage ownership and accountability among team members.
- Best practices for measuring and recognizing employee performance.
- Process of providing constructive feedback for continuous improvement.

Demonstrate

Role-playing scenarios for providing constructive feedback or conducting team recognition ceremonies.

Activity

1. **Activity name:** Empowerment Scenario Analysis
2. **Objective:** To discuss and analyze methods for team empowerment through scenario-based learning.
3. **Learning Objectives Addressed:**
    - Discuss methods to provide authority and autonomy to employees.
    - Discuss methods to inculcate an effective system of accountability within the team.
    - Discuss methods to be empathetic and respect others' thoughts and opinions.
4. **Type of Activity:** Group
5. **Resources, Printed copies of scenario descriptions (one for each group), Flipchart paper, Markers**
6. **Time Duration:** 30 minutes
7. **Instructions:**
    - Divide participants into small groups of 3-5 individuals.
    - Distribute one scenario description to each group. Each scenario should highlight a different aspect of team empowerment, such as providing autonomy, fostering accountability, or demonstrating empathy.
    - Instruct each group to read and discuss the scenario, identifying key challenges and opportunities for empowerment.
    - Encourage groups to brainstorm and write down specific strategies or actions they would take to address the challenges presented in the scenario.

- After 15 minutes of discussion, reconvene the larger group and invite each group to present their scenario and share their proposed strategies.
- Facilitate a discussion following each presentation, allowing for questions, insights, and feedback from other groups.
- Summarize key takeaways and insights from the activity, emphasizing the importance of envisioning the larger picture, providing autonomy, fostering accountability, and demonstrating empathy in empowering teams.

8. Outcome

- Participants gain a deeper understanding of various methods for team empowerment through practical scenario analysis.
- Participants learn from each other's perspectives and experiences, enriching their understanding of effective empowerment strategies.
- Participants develop actionable strategies they can apply to empower their own teams effectively.

Notes for Facilitation

- Ensure each group has enough time to read, discuss, and brainstorm solutions for their scenario.
- Encourage active participation and collaboration within each group.
- Foster an open and respectful environment for sharing ideas and perspectives.
- Guide discussions to ensure relevance to the learning objectives and topics covered in the chapter.
- Use the activity as an opportunity to reinforce key concepts and principles of team empowerment.

Answers to Exercises for PHB

Multiple Choice Question

1. b. To understand the broader context and long-term goals
2. c. Enhances employee confidence and decision-making
3. b. Encouraging a blame-free culture
4. c. To understand and relate to team members' feelings
5. c. Providing clear expectations and responsibilities

Descriptive Questions:

1. Refer to Unit 8.1: Understanding the Concept and Importance of Team Empowerment
   Topic 8.1.1. Understanding Strategic Alignment
2. Refer to Unit 8.1: Understanding the Concept and Importance of Team Empowerment
   Topic 8.1.2 Importance of Authority and Autonomy
3. Refer to Unit 8.1: Understanding the Concept and Importance of Team Empowerment
   Topic 8.1.3 Building an Effective System of Accountability for Team Transparency
4. Refer to Unit 8.1: Understanding the Concept and Importance of Team Empowerment
   Topic 8.1.4 Importance of Empathy and Respect for Diverse Thoughts and Opinions
5. Refer to Unit 8.1: Understanding the Concept and Importance of Team Empowerment
   Topic 8.1.5 Ownership and its Importance

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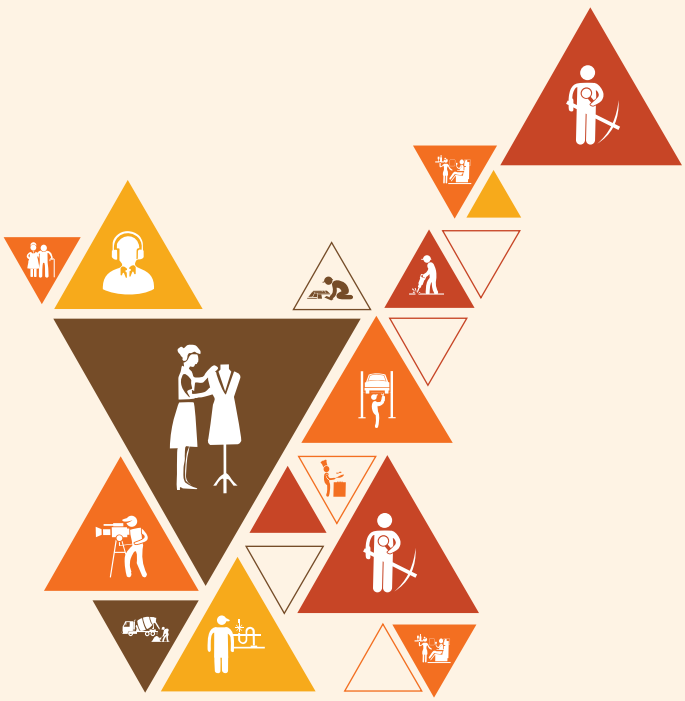
9. Inclusive and Environmentally Sustainable Workplaces

Unit 9.1 - Promoting Sustainable Practices in the Workplace Unit Objective

Unit 9.2 - Promoting Sustainable Practices in the Workplace



SSC/N9014

Key Learning Outcomes 

By the end of this module, the trainees will be able to:

1. Describe different approaches for efficient energy resource utilisation and waste management
2. Describe the importance of following the diversity policies
3. Identify stereotypes and prejudices associated with people with disabilities and the negative consequences of prejudice and stereotypes
4. Discuss the importance of promoting, sharing and implementing gender equality and PwD sensitivity guidelines at organization level
5. Practice the segregation of recyclable, non-recyclable and hazardous waste generated
6. Demonstrate different methods of energy resource use optimization and conservation
7. Demonstrate essential communication methods in line with gender inclusiveness and PwD sensitivity

Unit 9.1: Promoting Sustainable Practices in the Workplace Unit Objective

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Describe various strategies for effective waste management and the use of energy resources.
2. Highlight the significance of adhering to the policies on diversity.
3. Recognize the negative effects of discrimination and stereotypes, as well as those connected to individuals with disabilities.

Resources to be Used

Participant handbook, Notepad, Pen, Whiteboard, Markers, Presentation slides, Overhead projector or large screen, Computer/laptop with internet connection.

Say

- Welcome, everyone, to our session on promoting sustainable practices in the workplace. Today, we'll explore techniques for efficient waste management and energy utilization, as well as the importance of diversity policies.
- I encourage you all to actively engage in discussions and activities throughout the session.

Ask

- What do you think are some simple ways we can reduce waste in our workplace?
- Why is it important for companies to have diversity policies in place?

Do

- Begin the session by briefly introducing the importance of sustainability in the workplace and its relevance to organizational success.
- Use interactive activities to reinforce learning objectives, such as group discussions, case studies, and brainstorming sessions.
- Incorporate real-life examples and success stories to illustrate the benefits of sustainable practices in the workplace.
- Encourage participants to reflect on their own roles in promoting sustainability within their organizations.

Elaborate

- Techniques for Efficiently Managing Trash and Utilizing Energy Resources
- Significance of Adhering To the Policies on Diversity

Explain

- Trash segregation methods and recycling procedures
- Energy-saving practices such as using energy-efficient appliances and turning off lights when not in use
- The business case for diversity and how it contributes to innovation and productivity

Demonstrate

Show participants how to assess and reduce waste in the workplace effectively.

Activity

1. **Activity name:** Sustainability Action Plan
2. **Objective:** To apply techniques for efficiently managing trash and utilizing energy resources while considering the significance of adhering to diversity policies.
3. **Type of Activity:** Group
4. **Resources:** Flipchart paper, markers, sticky notes, pens
5. **Time Duration:** 30 minutes
6. **Instructions:**
   - Divide participants into small groups of 3-5 people.
   - Provide each group with flipchart paper, markers, sticky notes, and pens.
   - Explain to the groups that they are tasked with creating a sustainability action plan for their workplace.
   - Instruct them to brainstorm and list practical strategies for managing trash efficiently, utilizing energy resources effectively, and promoting diversity and inclusion within the organization.
   - Encourage participants to consider both short-term and long-term goals, as well as any potential challenges or barriers they may encounter.
   - After 20 minutes of brainstorming, have each group present their action plan to the rest of the participants.
   - Facilitate a brief discussion after each presentation, allowing participants to ask questions and provide feedback.
   - Encourage groups to incorporate any valuable insights or suggestions from the discussion into their action plans.
   - Conclude the activity by summarizing key takeaways and emphasizing the importance of implementing sustainable practices and diversity policies in the workplace.
7. **Outcome:** Participants will have developed a comprehensive sustainability action plan that includes practical strategies for managing trash, utilizing energy resources, and promoting diversity in the workplace. They will also have enhanced their teamwork and problem-solving skills through collaborative brainstorming and discussion.

Notes for Facilitation

- Ensure that all group members have an opportunity to contribute to the discussion and decision-making process.
- Provide guidance and support to groups as needed, especially if they encounter difficulties in generating ideas or developing their action plans.
- Foster a supportive and inclusive environment where participants feel comfortable sharing their thoughts and opinions.
- Emphasize the importance of creativity and innovation in developing sustainable solutions that are tailored to the specific needs and challenges of their workplace.
- Encourage participants to take ownership of their action plans and commit to implementing them within their organizations.

Unit 9.2: Promoting Sustainable Practices in the Workplace

Unit Objectives

By the end of this unit, the trainees will be able to:

1. Explain the negative Effects of Discrimination and Stereotypes
2. Promote, Share, and Implement Gender Equality and PwD Sensitivity Guidelines
3. Define Waste Segregation Practices
4. Explain ways to optimize and conserve energy resources
5. Understand the importance of Inclusive communication methods

Resources to be Used

Participant handbook, Notepad, Pen, Whiteboard, Markers, Presentation slides, Overhead projector or large screen, Computer/laptop with internet connection.

Say

- Welcome, everyone, to our session on promoting sustainable practices in the workplace. Today, we'll delve into various topics including discrimination, waste segregation, energy conservation, and inclusive communication.
- I encourage you all to actively participate and engage in discussions to make the most out of this learning experience.

Ask

- What are some examples of discrimination or stereotypes that you have encountered in the workplace?
- How do you think inclusive communication methods can contribute to a more effective AI solution architecture?

Do

- Start the session by setting a respectful and inclusive tone, emphasizing the importance of creating a safe space for open dialogue and learning.
- Incorporate interactive activities such as group discussions, case studies, and role-playing exercises to encourage active participation and deeper understanding of the topics.
- Use real-life examples and scenarios to illustrate key concepts and highlight the relevance of sustainable practices in various workplace contexts.
- Facilitate small group discussions to promote peer-to-peer learning and collaboration among participants.

Elaborate

- Negative Effects of Discrimination and Stereotypes
- Gender Equality and PwD Sensitivity Guidelines
- Waste Segregation Practices
- Energy Resources and Its Conservation
- Significance of Inclusive Communication Methods in AI Solution Architecture

Explain

- The impact of discrimination and stereotypes on workplace dynamics and employee well-being
- Guidelines and best practices for promoting gender equality and sensitivity towards persons with disabilities (PwD) in the workplace
- Different waste segregation methods and their importance in reducing environmental impact
- Strategies for conserving energy resources in the workplace, such as implementing energy-efficient technologies and encouraging behavior change among employees
- The role of inclusive communication methods in designing AI solutions that are accessible and equitable for all users

Demonstrate

Show participants how to properly sort and dispose of different types of waste in the workplace.

Activity

1. **Activity name:** Sustainable Workplace Scenarios (9.2.4 Energy Resources and Its Conservation)
2. **Objective:** To explore and address issues related to discrimination, gender equality, waste segregation, energy conservation, and inclusive communication in the workplace.
3. **Type of Activity:** Group
4. **Resources:** Scenario cards (each depicting a workplace scenario related to one of the covered topics), flipchart paper, markers, sticky notes
5. **Time Duration:** 30 minutes
6. **Instructions:**
    - Divide participants into small groups of 4-5 people.
    - Distribute scenario cards to each group, ensuring that each card represents a different topic covered in the unit (discrimination, gender equality, waste segregation, energy conservation, and inclusive communication).
    - Instruct each group to read the scenario on their card and discuss the following:
        - Identify any instances of discrimination, stereotypes, or lack of inclusivity in the scenario.
        - Brainstorm potential solutions or actions that could promote sustainable practices and address the issues raised.

- Provide flipchart paper and markers for each group to record their discussions and solutions.
- After 15-20 minutes of group discussion, reconvene and have each group present their scenario and the solutions they proposed.
- Facilitate a brief discussion after each presentation, allowing other groups to provide feedback and suggestions.
- Encourage participants to reflect on the importance of addressing these issues in the workplace and consider how they can contribute to creating a more sustainable and inclusive environment.
- Conclude the activity by summarizing key insights and takeaways from the discussions.

7. **Outcome:** Participants will gain a deeper understanding of the challenges and opportunities related to promoting sustainable practices in the workplace, including addressing issues of discrimination, gender equality, waste segregation, energy conservation, and inclusive communication. They will also develop critical thinking and problem-solving skills by brainstorming solutions to real-life scenarios.

Notes for Facilitation

- Ensure that all group members have an opportunity to contribute to the discussion and decision-making process.
- Encourage active participation and respectful communication among group members.
- Provide guidance and support as needed, especially if groups encounter difficulties in identifying solutions or addressing complex issues.
- Emphasize the importance of considering multiple perspectives and brainstorming creative solutions that address the root causes of workplace challenges.
- Use the activity as an opportunity to reinforce key concepts and learning objectives from the unit, and encourage participants to apply these principles in their own workplaces.

Answers to Exercises for PHB

Multiple Choice Question

1. d. Segregating recyclable and non-recyclable waste
2. d. To foster a diverse and inclusive work environment
3. d. Social exclusion and discrimination
4. d. To create a positive and inclusive workplace culture
5. d. Segregating recyclable, non-recyclable, and hazardous waste

Descriptive Questions:

1. Refer to Unit 9.1: Promoting Sustainable Practices in the Workplace Unit Objective
   Topic 9.1.1 Techniques for Efficiently Managing Trash and Utilizing Energy Resources
2. Refer to Unit 9.2: Promoting Sustainable Practices in the Workplace
   Topic 9.2.1 Negative Effects of Discrimination and Stereotypes
3. Refer to Unit 9.2: Promoting Sustainable Practices in the Workplace
   9.2.2 Gender Equality and PwD Sensitivity Guidelines
4. Refer to Unit 9.2: Promoting Sustainable Practices in the Workplace
   Topic 9.2.5 Significance of Inclusive Communication Methods in AI Solution Architecture
5. Refer to Unit 9.2: Promoting Sustainable Practices in the Workplace
   Topic 9.2.4 Energy Resources and Its Conservation

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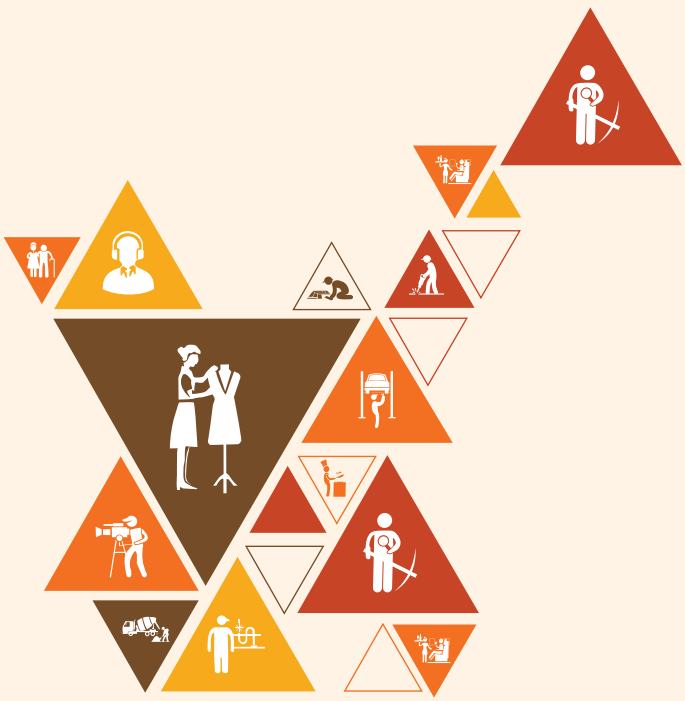
10. Employability Skills



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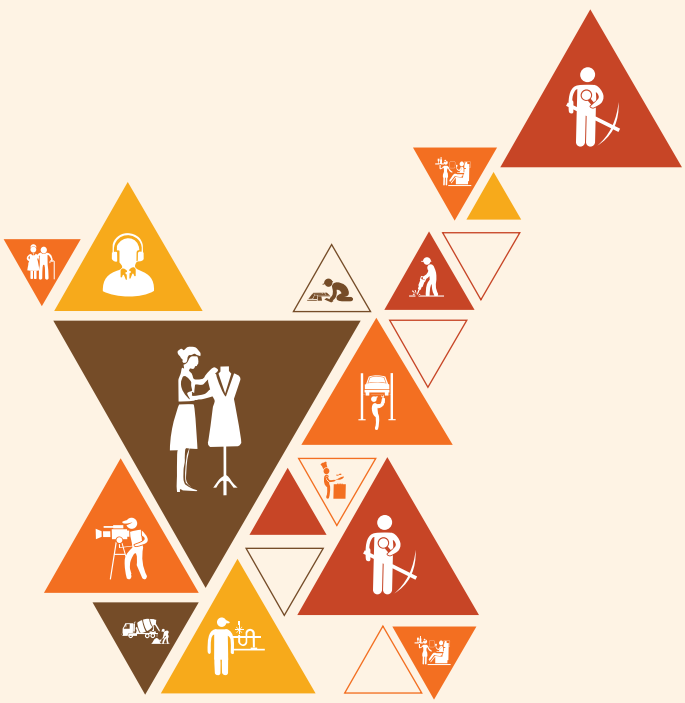
11. Annexures

Annexure I: Training Delivery Plan

Annexure II: Assessment Criteria

Annexure III: List of QR Codes Used in PHB



Annexure I

Training Delivery Plan

Training Delivery Plan			
Program Name:	AI- Solution Architect		
Qualification Pack Name & Ref. ID	AI - Solution Architect &SSC/Q8108		
Version No.	3.0	**Version Update Date**	22/09/2020
Pre-requisites to Training (if any)	Not Applicable		
Training Outcomes	**By the end of this program, the participants will be able to:** 1. Describe the use cases of AI & Big Data Analytics in various industries and define the various roles under this occupation 2. Apply principles and methods of enterprise architecture which conform to industry standards and frameworks. 3. Implement data management standards within the organization 4. Use tools and infrastructure to manage data storage, ingestion and processing. 5. Compare different platforms on which solution is to be deployed, based on solution requirements and architecture constraints. 6. Assess the implications of business and technical requirements on solution architecture design and develop solution architecture using appropriate design standards, methods and tools. 7. Monitor changes in solution design standards and continuously optimize performance of solution architectures. 8. Plan their schedules and timelines based on the nature of work. 9. Demonstrate effective communication with colleagues. 10. Use different approaches to manage and share data. 11. Develop strong relationships at the workplace through effective communication and conflict management. 12. Develop mechanisms to empower and motivate team members. 13. Apply the principles of persuasive communication for negotiations and discussions. 14. Identify best practices to maintain an inclusive, environmentally sustainable workplace		

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
1	**Artificial Intelligence & Big Data Analytics – An Introduction**	**Fundamentals of AI/Bigdata**	• Explain the relevance of AI & Big Data Analytics for the society • Explain the various use-cases of AI & Big Data in the industry • Define “general” and “narrow” AI	Bridge Module	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White-board and Markers , Chart paper and sketch pens ,	6 Theory (02:00) Practical (04:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Career Map for AI & Big Data Analytics Roles	• Describe the fields of AI such as image processing, computer vision, robotics, NLP, etc. • Outline a career map for roles in AI & Big Data Analytics • Analyse the differences between key terms such as Supervised Learning, Unsupervised Learning and Deep Learning	Bridge Module		LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated)	6 Theory (02:00) Practical (04:00)
2	**Basics of Architecture**	**Factors applicable to enterprise architecture**	• Explain enterprise architecture principles, components and their practical application • Identify critical success factors for common enterprise architect approaches	Bridge Module	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	Whiteboard and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated)	4 Theory (04:00) Practical (00:00)
3	**Global Data Regulations and Standards**	**Principles and basic concepts of data management**	• Discuss the need for data regulations and standards • Analyse commonly used global data regulation policies (such as GDPR) • Discuss the roles and responsibilities of key actors involved in enforcing data regulations and standards • Identify best practices used by various organizations in the enforcement of data regulations and standards	Bridge Module	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	Whiteboard and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated)	4 Theory (04:00) Practical (00:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
4	**Data Tools and Usage**	**Data Integration and Management Tools and Platforms**	• Identify the various data integration and management tools and platforms	Bridge Module	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White-board and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated), Database Management Systems such as MongoDB, Teradata, Amazon DynamoDB, Apache Hive, MySQL, IBM DB2, etc. , DBaaS such as AWS, Oracle, Hortonworks, Cloudera, Microsoft Azure, etc.	5 Theory (01:00) Practical (04:00)
		Fundamentals of Data Integration and Management Tools	• Discuss the fundamentals of using the data integration and management tools and platforms	Bridge Module			5 Theory (01:00) Practical (04:00)
		Fundamentals of IT Infrastructure Components	• Discuss fundamentals of various infrastructure components such as storage devices, networking hardware, server-storage connectivity	Bridge Module			5 Theory (01:00) Practical (04:00)
		Fundamental Tools for Distributed Computing Services	• Explain fundamental tools used for distributed computing services such as data storage, integration and processing	Bridge Module			5 Theory (01:00) Practical (04:00)
		Role of Scripts in Data Extraction and Understanding	• Assess the role of scripts to extract and understand data	Bridge Module			5 Theory (01:00) Practical (04:00)
		Data Integration and Management Tools: Practical Demonstrations	• Demonstrate the ways to use data integration and management tools	Bridge Module			5 Theory (01:00) Practical (04:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Utilizing Infrastructure Components in IT Systems	• Demonstrate the ways to use different infrastructure components such as storage devices, networking hardware, server-storage connectivity, virtualization technologies	Bridge Module			5 Theory (01:00) Practical (04:00)
		Setting Up Microservices and Scripting for Data Extraction	• Configure various microservices, frameworks, libraries, packages • Create scripts for data extraction	Bridge Module			5 Theory (01:00) Practical (04:00)
5	**Solution Architecture –Platforms**	**Understanding Organizational Needs and Requirements**	• Discuss and understand the needs and requirements of the organization.	SSC/N8113 PC1	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White-board and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops • IoT Platforms such as Watson IoT, GE Predix, PTC Thingworx, AWS IoT, Azure IoT, Eclipse IoT, Raspberry Pi etc. , Development Environment Software such as Apache Maven, PowerShell, Docker, Visual Basic, COBOL, Ruby, C,	8 Theory (03:00) Practical (05:00)
		Evaluating Deployment Platform Options	• Evaluate various platform options on which the solution is to be deployed.	SSC/N8113 PC2			8 Theory (03:00) Practical (05:00)
		Evaluating Solution Architecture Constraints: Web vs. Mobile Platforms	• Evaluate solution architecture constraints, i.e., deploying a solution on web vs mobile platforms.	SSC/N8113 PC3			8 Theory (03:00) Practical (05:00)
		Solution Architecture Based on Client Types	• Describe the solution architecture based on the type of platforms such as Thin Clients (for online applications), Thick Clients (for offline applications), or Smart Clients (for occasionally connected applications).	SSC/N8113 PC4			8 Theory (03:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Tracking Vendor Solution Capabilities and Product Roadmaps	• Discuss ways to keep a track of the vendor's solution capabilities and product roadmaps.	SSC/N8113 PC5		Mobile Application Development Platform such as Apple Xcode, Android Studio, Kony, Appzillon, Telerik, Xamarin , Web Development Software such as AJAX, LAMP Stack, Nodejs, ReactJS, AngularJS, Elm , Documentation tools such as Adobe and MS-Word	8 Theory (03:00) Practical (05:00)
		Evaluation of Regulatory Standards and Protocols for Cross-Platform Deployment	• Evaluate various regulatory standards and protocols to deploy solution across the platforms.	SSC/N8113 PC6			8 Theory (03:00) Practical (05:00)
		Navigating Cross-Border Data Governance and Privacy Regulations	• Discuss ways to track cross-border data governance issues, PII (Personally Identifiable Information) regulations, GDPR (General Data Protection Regulations), global-scale, security, and monitoring.	SSC/N8113 PC7			8 Theory (03:00) Practical (05:00)
		Selecting the Right Deployment Platform for Organizational Needs	• Demonstrate how to select a suitable platform for the deployment of the solution based on the organizational needs.	SSC/N8113 PC8			8 Theory (03:00) Practical (05:00)
		Impact Analysis for Cross-Platform Deployment	• Perform impact analysis to review the uses and limitations of deploying the solution across different platforms. PART 1	SSC/N8113 PC9, PC13			6 Theory (01:00) Practical (05:00)
			• Perform impact analysis to review the uses and limitations of deploying the solution across different platforms. PART 2	SSC/N8113 PC10, PC13			6 Theory (01:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Competency Development for Developer Problem Solving:	• Develop competencies to guide developers in resolving their most challenging issues. PART 1	SSC/N8113 PC11			6 Theory (01:00) Practical (05:00)
			• Develop competencies to guide developers in resolving their most challenging issues. PART 2	SSC/N8113 PC12, PC14			6 Theory (01:00) Practical (05:00)
6	**Solution Architecture –Design**	**System-Level Architecture Overview**	• Describe the system-level architecture for the solution.	SSC/N8113	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White board and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops , IoT Platforms such as Watson IoT, GE Predix, PTC Thingworx, AWS IoT, Azure IoT, Eclipse IoT, Raspberry Pi etc. , Development Environment Software such as Apache Maven, PowerShell, Docker, Visual Basic, COBOL, Ruby, C,	8 Theory (03:00) Practical (05:00)
		Configuring Data Feeds, Quality Checks, and Solution Components	• Describe ways to configure data feeds, data quality checks, and components for the solution.	SSC/N8113			8 Theory (03:00) Practical (05:00)
		Translating Component Specifications into Detailed Designs	• Discuss and interpret component specifications into detailed designs for implementation.	SSC/N8113			8 Theory (03:00) Practical (05:00)
		Evaluating Solution Architecture Performance and Risk Mitigation	• Evaluate the performance of the solution architecture for potential risks and provide mitigation plans to appropriate stakeholders	SSC/N8113			8 Theory (03:00) Practical (05:00)
		Verifying Solution Architecture with Stakeholders	• Discuss methods to verify solution architecture from various stakeholders.	SSC/N8113			8 Theory (03:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Evaluating Implications of Solution Architecture Design	• Evaluate the implications of the business, technical and data requirements on the design of solution architecture.	SSC/N8113		Mobile Application Development Platform such as Apple Xcode, Android Studio, Kony, Appzillon, Telerik, Xamarin , Web Development Software such as AJAX, LAMP Stack, Nodejs, ReactJS, AngularJS, Elm , Documentation tools such as Adobe and MS-Word	8 Theory (03:00) Practical (05:00)
		Developing Solution Architectures: Design Standards, Methods, and Tools	• Develop solution architectures using appropriate design standards, methods, and tools.	SSC/N8113			8 Theory (03:00) Practical (05:00)
		Continuous Data Quality Metrics and Improvement	• Develop metrics to measure and improve continuous data quality.	SSC/N8113			8 Theory (03:00) Practical (05:00)
		Developing Distributed and Highly Scalable Architectures	• Develop architectures that are distributed and highly scalable. Part 1	SSC/N8113			6 Theory (01:00) Practical (05:00)
		Developing Distributed and Highly Scalable Architectures	• Develop architectures that are distributed and highly scalable. Part 2	SSC/N8113			6 Theory (01:00) Practical (05:00)
		Designing Solution Architectures: Building a Repository for Stakeholders	• Create a repository of designed solution architectures for stakeholders Part 1	SSC/N8113			6 Theory (01:00) Practical (05:00)
		Designing Solution Architectures: Building a Repository for Stakeholders	• Create a repository of designed solution architectures for stakeholders Part 2	SSC/N8113			6 Theory (01:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
7	**Solution Architecture – Maintenance**	**Evaluating Data Metrics in Solution Architectures**	• Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures Part 1	SSC/N8114 PC1	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White board and Markers, LCD Projector and Laptop for presentations, Chart paper and sketch pens, Labs equipped with the following: PCs/Laptops, Internet with Wi-Fi (Min 2 Mbps Dedicated), Tools and Programming Languages: Database Management Systems such as MongoDB, Amazon DynamoDB, Apache Hive, MySQL, Oracle JDBC, IBM DB2, etc., Database Reporting Software such as Microsoft SQL Server Reporting Services, Oracle SQL Plus,	8 Theory (03:00) Practical (05:00)
		Evaluating Data Metrics in Solution Architectures	• Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures Part 2	SSC/N8114 PC2			8 Theory (03:00) Practical (05:00)
		Evaluating Data Metrics in Solution Architectures	• Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures Part 3	SSC/N8114 PC3			8 Theory (03:00) Practical (05:00)
		Evaluating Data Metrics in Solution Architectures	• Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures Part 4	SSC/N8114 PC4			8 Theory (03:00) Practical (05:00)
		Evaluating Data Metrics in Solution Architectures	• Evaluate the various data metrics (completeness, accuracy, consistency etc) used to measure performance of solution architectures Part 5	SSC/N8114 PC5			8 Theory (03:00) Practical (05:00)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 1	SSC/N8114 KU1			8 Theory (03:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 2	SSC/N8114 KU1		SAP Crystal Reports, etc., DBaaS such as AWS, Hortonworks, Cloudera, Microsoft Azure, etc.	8 Theory (03:00) Practical (05:00)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 3	SSC/N8114 KU1			8 Theory (03:00) Practical (05:00)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 4	SSC/N8114 KU1 KU2			8 Theory (03:00) Practical (05:00)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 5	SSC/N8114 KU1 KU2			8 Theory (03:00) Practical (05:00)
		Architecture Review Process for Achieving Technical and Functional Objectives	• Discuss the architecture review process to achieve both technical and functional objectives Part 6	SSC/N8114 KU1 KU2			8 Theory (03:00) Practical (05:00)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 1	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 2	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 3	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 4	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 5	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)
		Monitoring Changes in Solution Design Standards	• Assess the process to monitor changes in solution design standards Part 6	SSC/N8114 KU3, KU4			8 Theory (03:00) Practical (05:00)
		Updating Existing Documents to Reflect Changes in Design Standards	• Discuss the ways in which existing document needs to be updated based on changes in design standards part 1	SSC/N8114 KU5, KU6, KU7, KU8			8 Theory (03:00) Practical (05:00)
		Updating Existing Documents to Reflect Changes in Design Standards	• Discuss the ways in which existing document needs to be updated based on changes in design standards part 2	SSC/N8114 KU5, KU6, KU7, KU8			8 Theory (03:00) Practical (05:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Updating Existing Documents to Reflect Changes in Design Standards	• Discuss the ways in which existing document needs to be updated based on changes in design standards part 3	SSC/N8114 KU5, KU6, KU7, KU8			7 Theory (02:00) Practical (05:00)
		Updating Existing Documents to Reflect Changes in Design Standards	• Discuss the ways in which existing document needs to be updated based on changes in design standards part 4	SSC/N8114 KU5, KU6, KU7, KU8			6 Theory (01:00) Practical (05:00)
		Updating Existing Documents to Reflect Changes in Design Standards	• Discuss the ways in which existing document needs to be updated based on changes in design standards part 5	SSC/N8114 KU5, KU6, KU7, KU8			6 Theory (01:00) Practical (05:00)
		Reviewing Technical Capabilities Roadmap for Solution Architectures	• Review technical capabilities roadmap for existing solution architectures	SSC/N8114 KU9.			6 Theory (01:00) Practical (05:00)
		Updating Existing Solution Architectures	• Demonstrate the ways to update existing solution architectures	SSC/N8114 KU10			6 Theory (01:00) Practical (05:00)
		Optimizing Solution Architecture Performance	• Demonstrate the process of optimization of existing solution architectures performance	SSC/N8114 KU11			6 Theory (01:00) Practical (05:00)
8	**Team Empowerment**	**Envisioning the Larger Picture: Importance and Impact**	• Illustrate the importance of envisioning the larger picture	SSC/N9009 PC1	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White-board and Markers , Chart paper and sketch pens ,	6 Theory (0:00) Practical (04:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Empowering Employees Through Authority and Autonomy	• Discuss methods to provide authority and autonomy to employees to help empower them	SSC/N9009 PC2		LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated)	6 Theory (0:00) Practical (04:00)
		Fostering Accountability within Teams	• Discuss methods to inculcate an effective system of accountability within the team	SSC/N9009 PC3			6 Theory (0:00) Practical (04:00)
		Fostering Empathy and Respect for Diverse Perspectives	• Discuss methods to be empathetic and respect others' thoughts and opinions	SSC/N9009 PC4			6 Theory (0:00) Practical (04:00)
		Encouraging Ownership and Performance Measurement in Teams	• Discuss how to encourage team members to take up ownership of work • Evaluate best practices to measure employee performance	SSC/N9009 PC5			6 Theory (0:00) Practical (04:00)
		Effective Leadership Practices: Recognition, Motivation, and Feedback	• Demonstrate different approaches to recognize and motivate others • Demonstrate the process of providing constructive feedback to others	SSC/N9009 PC,PC7			6 Theory (0:00) Practical (04:00)
9	**Inclusive and environmentally sustainable workplaces**	**Efficient Energy Resource Utilization and Waste Management Approaches**	• Describe different approaches for efficient energy resource utilisation and waste management	SSC/N9014 PC1	Classroom lecture/ PowerPoint Presentation/ Question & Answer and Group Discussion	White-board and Markers , Chart paper and sketch pens , LCD Projector and Laptop for presentations, PCs/Laptops , Internet with Wi-Fi (Min 2 Mbps Dedicated)	6 Theory (0:00) Practical (04:00)
		The Significance of Diversity Policies in the Workplace	• Describe the importance of following the diversity policies	SSC/N9014 PC1			6 Theory (0:00) Practical (04:00)

SL	Module Name	Session name	Session Objectives	NOS	Methodology	Training Tools/Aids	Duration (hours)
		Stereotypes and Prejudices Towards People with Disabilities	• Identify stereotypes and prejudices associated with people with disabilities and the negative consequences of prejudice and stereotypes	SSC/N9014 PC2			6 Theory (0:00) Practical (04:00)
		Promoting Gender Equality and PwD Sensitivity Guidelines in Organizations	• Discuss the importance of promoting, sharing and implementing gender equality and PwD sensitivity guidelines at organization level	SSC/N9014 PC3			6 Theory (0:00) Practical (04:00)
		Practice of Waste Segregation: Recyclable, Non-Recyclable, and Hazardous Waste	• Practice the segregation of recyclable, non-recyclable and hazardous waste generated	SSC/N9014 PC4			6 Theory (0:00) Practical (04:00)
		Demonstrating Energy Resource Optimization and Conservation	• Demonstrate different methods of energy resource use optimization and conservation • Demonstrate essential communication methods in line with gender inclusiveness and PwD sensitivity	SSC/N9014 PC5.PC6			6 Theory (0:00) Practical (04:00)
Total Duration							Theory: 160:00 Practical: 320:00
Employability Skills (DGT/VSQ/N0101) **(https://www.skillindiadigital.gov.in/content/list)**							60:00
OJT							120:00
Total Duration							PR + TH + OJT + ES= 660 : 00

Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for AI- Solution Architect	
Job Role	**AI- Solution Architect**
Qualification Pack	**SSC/Q8108, V3.0**
Sector Skill Council	**IT-ITeS Sector Skill Council**

S. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/ option NOS/set of NOS.
4	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6	To pass a QP, a trainee should score an average of 70% or more
7	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Assessment Outcomes	Assessment Criteria for Outcomes	Marks Allocation		
		Theory	Practical	Viva
SSC/N8113: Design new solution architectures as per specifications	PC1. identify business requirements	2	3	-
	PC2. evaluate the platform on which the solution is to be built	2	5	-
	PC3. evaluate changes in cross-border data governance issues, PII (Personally Identifiable Information) regulations, GDPR (General Data Protection Regulations), global-scale, security, and monitoring	2	3	-
	PC4. select appropriate design standards, methods and tools	2	5	-
	PC5. define system level architecture for the solution	3	5	-
	PC6. design data feeds, data quality checks and components needed to configure the solution	3	7	-
	PC7. define detailed component specifications	2	3	-
	PC8. translate component specifications into detailed designs for implementation	1	4	-
	PC9. undertake impact analysis on major design options	3	5	-
	PC10. develop technical capabilities roadmap for new solution architectures	3	5	-
	PC11. create documentation on designed solution architectures for appropriate people	-	5	-
	PC12. validate solution architectures with appropriate people	-	5	-

	PC13. identify data quality metrics and guide processes that track and measure data quality continually	3	5	-
	PC14. troubleshoot and resolve issues with new solution architectures	2	5	-
	PC15. identify potential risks, and define mitigation plans and processes for appropriate people	2	5	-
	NOS Total	**30**	**70**	**-**
SSC/N8114: Maintain existing architectures for solutions	PC1. review existing system architecture designs to ensure balance of functional, service quality, and systems management requirements	10	20	-
	PC2. review existing system architecture designs to ensure selection of appropriate technology, efficient use of resources, and integration of multiple systems	10	20	-
	PC3. review technical capabilities roadmap for existing solution architectures	5	15	-
	PC4. monitor changes in solution design standards and update architecture	5	10	-
	PC5. update documentation on existing solution architectures for appropriate people	-	5	-
	NOS Total	**30**	**70**	**-**
SSC/N9009: Empower the team	PC1. encourage teams to set goals aligned to the vision and objectives of the organization	5	5	-
	PC2. express confidence on the team's ability to accomplish certain tasks	5	5	-
	PC3. encourage team members with diverse view points to express their concerns	5	5	-
	PC4. recognise individual contributions and acknowledge team accomplishments	5	15	-
	PC5. assist team members in delivery of their work	5	10	-
	PC6. support team members in taking independent action	5	10	-
	PC7. develop mechanisms to incorporate and develop ideas from the team	5	15	-
	NOS Total	**35**	**65**	**-**
SSC/N9014: Maintain an inclusive, environmentally sustainable workplace	PC1. optimize usage of electricity/energy, materials, and water in various asks / activities / processes and plan the implementation of energy efficient systems in a phased manner	5	15	-
	PC2. segregate recyclable, non-recyclable and hazardous waste generated for disposal or efficient waste management	5	15	-
	PC3. understand the diversity policy of the organization and use internal & external communication to colleagues to improve	5	10	-
	PC4. comply with PwD inclusive policies for an adaptable and equitable work environment	-	10	-
	PC5. improve through specifically designed recruitment practices, PwD friendly infrastructure, job roles, etc.	-	20	-
	PC6. use and advocate for appropriate verbal/nonverbal communication, schemes and benefits of PwD.	5	10	-
	NOS Total	**20**	**80**	**-**
DGT/VSQ/N0102: Employability Skills (60 Hours)	Introduction to Employability Skills	1	1	-
	PC1. identify employability skills required for jobs in various industries	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-
	Constitutional values – Citizenship	1	1	-

	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-
	Becoming a Professional in the 21st Century	2	4	-
	PC5. recognize the significance of 21st Century Skills for employment	-	-	-
	PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-
	Basic English Skills	2	3	-
	PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-
	PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-
	PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-
	Career Development & Goal Setting	1	2	-
	PC10. understand the difference between job and career	-	-	-
	PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-
	Communication Skills	2	2	-
	PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-
	PC13. work collaboratively with others in a team	-	-	-
	Diversity & Inclusion	1	2	-
	PC14. communicate and behave appropriately with all genders and PwD	-	-	-
	PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-
	Financial and Legal Literacy	2	3	-
	PC16. select financial institutions, products and services as per requirement	-	-	-
	PC17. carry out offline and online financial transactions, safely and securely	-	-	-
	PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-
	PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-
	Essential Digital Skills	3	4	-
	PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-
	PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-
	PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-
	Entrepreneurship	2	3	-

	PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-
	PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-
	PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-
	Customer Service	1	2	-
	PC26. identify different types of customers	-	-	-
	PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-
	PC28. follow appropriate hygiene and grooming standards	-	-	-
	Getting ready for apprenticeship & Jobs	2	3	-
	PC29. create a professional Curriculum vitae (Résumé)	-	-	-
	PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-
	PC31. apply to identified job openings using offline	-	-	-
	/online methods as per requirement	-	-	-
	PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-
	PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	20	30	-
	NOS Total			

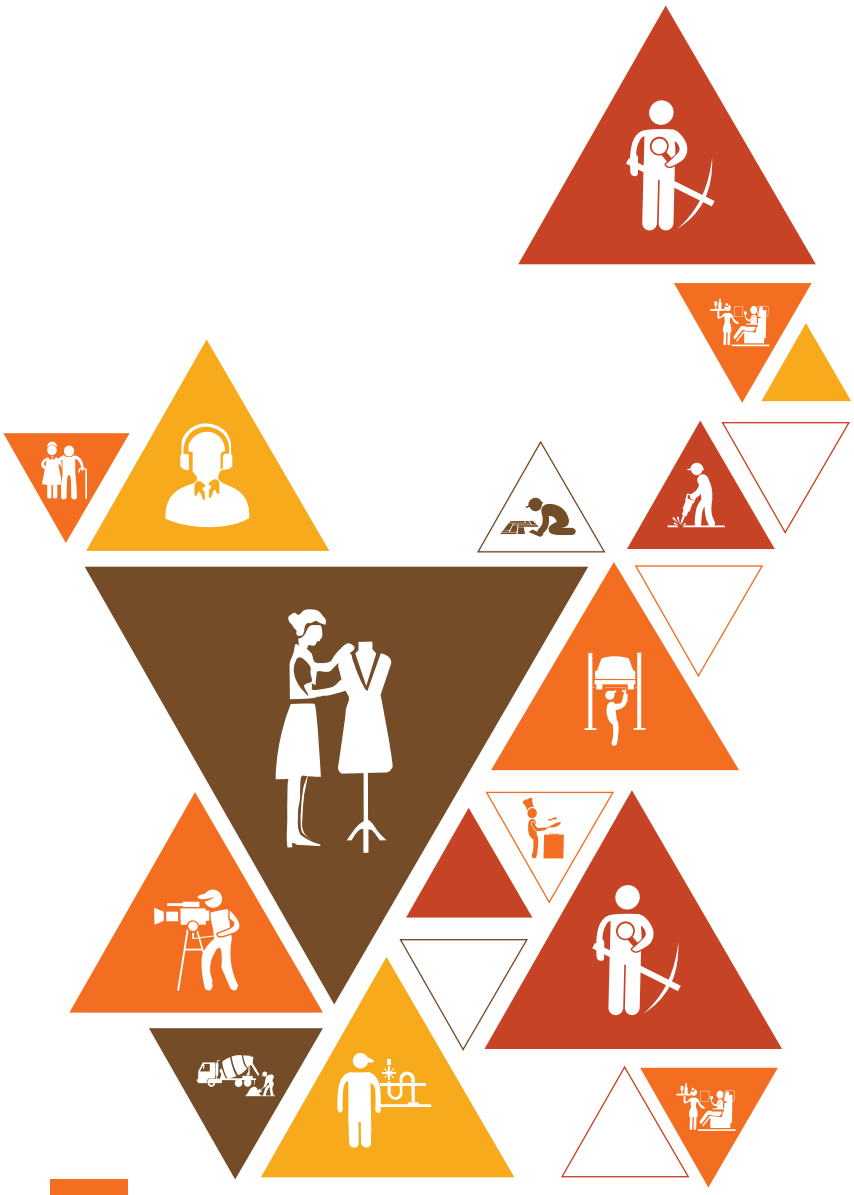
Annexure III

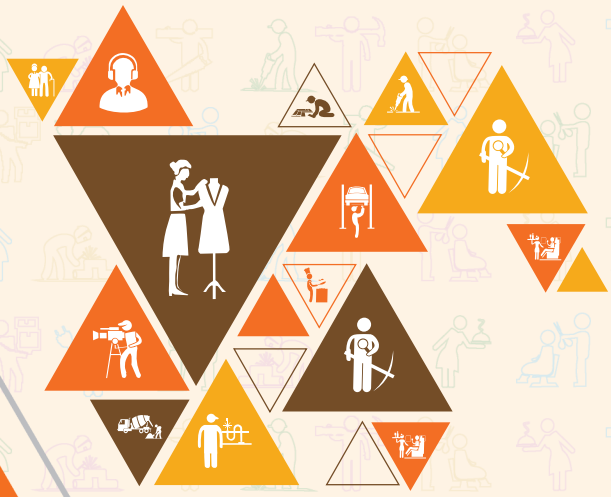
List of QR Codes Used in PHB

Module No.	Unit No.	Topic Name	Page No. in PHB	Link for QR Code (s)	QR code (s)
Module 1: Artificial Intelligence & Big Data Analytics – An Introduction	Unit 1.1 Introduction to Artificial Intelligence & Big Data Analytics	1.1.1 Introduction to Artificial Intelligence & Big Data Analytics	16	https://youtu.be/ad79nYk-2keg?si=U3fOp-AmnaBCe-Gl	What Is AI?
		1.1.4 AI on Entrepreneurial Strategy	16	https://youtu.be/reUZRyXxUs-4?si=MsWHu54mtDVD6Pkk	How AI Could Empower Any Business
Module 2: Basics of Architecture	Unit 2.1: Understanding the role of AI - Solution Architect	2.1.2 Critical Success Factors for Common Enterprise Architect Approaches	26	https://youtu.be/9TVc32M_gI-Y?si=S4JQGhf-vVVZf3Pz	What is Enterprise Architecture
Module 3: Global Data Regulations and Standards	Unit 3.1: Understanding the role of AI - Solution Architect	3.1.1 Fundamental Ideas and Principles of Global Data Management Standards	37	https://youtu.be/nk-27sKrwtHw?si=o0g6Eo--6fc-7t09I	Global Data Management
Module 4: Data Tools and Usage	Unit 4.1: Understanding the role of AI - Solution Architect	4.1.1 Data Integration, Management Tools and Platforms	60	https://youtu.be/Kq4Qgbh-kqyE?si=o6B34iGejG-m4sQH	What is Data Integration?

Module No.	Unit No.	Topic Name	Page No. in PHB	Link for QR Code (s)	QR code (s)
		4.1.3 Foundational Elements of IT Infrastructure	60	https://youtu.be/91pTxcL9E-no?si=ukULKGmIM3Bu8ynu	What is IT Infrastructure
Module 5: Solution Architecture –Platforms	Unit 5.1: Understanding the role of AI - Solution Architect	5.1.1 Analysis of the Organization's Needs and Requirements for Solution Deployment	80	https://youtu.be/JNLRXc-zA9-Y0?si=Wwa6vN5usr5EIOkq	Software Requirements
		5.1.5 Performing Impact Analysis and Addressing Challenges for Competency Development	80	https://youtu.be/OXVIoWz_uNc?si=s2A3nouLThhNe3eE	What is Competency
Module 6: Solution Architecture –Design	Unit 6.1: Detailed Specifications of the Soluti on	6.1.1 Understanding the Concept of System-Level Architecture	108	https://youtu.be/5nvjQvy_Cbg?si=ouGhRMZVW6sXv8OJ	Systems Architect & Systems Engineer
		6.1.2 Solution Setup and Data Management	108	https://youtu.be/lSSb39KlgoI?si=_oWt4UNNidfUsTAf	Data Management

Module No.	Unit No.	Topic Name	Page No. in PHB	Link for QR Code (s)	QR code (s)
Module 7: Solution Architecture – Maintenance	Unit 7.1 Monitoring Data Metrics and Solution Performance	7.1.1 Understanding Data Metrics	133	https://youtu.be/j7HuAWl4VW8?si=3xj86EDNZXQB0iBO	What Are Metrics & Dimensions?
		7.1.3 Procedure for Managing Modifications to Solution Design Criteria	133	https://youtu.be/i9c-43Oq7qE?si=_QBVmb1kjIQbPovp	Change Control in software engineering
Module 8: Team Empowerment	Unit 8.1: Understanding the Concept and Importance of Team Empowerment	8.1.2 Importance of Authority and Autonomy	153	https://youtu.be/jc1PdAkhRo0?si=usg9Pl2HMD5TG3vp	Delegation of Authority
Module 9: Team Empowerment Team Empowerment	Unit 9.1: Promoting Sustainable Practices in the Workplace Unit Objective	9.1.1 Techniques for Efficiently Managing Trash and Utilizing Energy Resources	175	https://youtu.be/O9pwV3JoqwA?si=ksf6we7uP-XIMQjz	How it works - Waste-to-Energy
	Unit 9.2: Promoting Sustainable Practices in the Workplace	9.2.2 Gender Equality and PwD Sensitivity Guidelines	175	https://youtu.be/1gCr4jOsweo?si=MuaWK_-_XhWx3U2-	Gender Sensitivity





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