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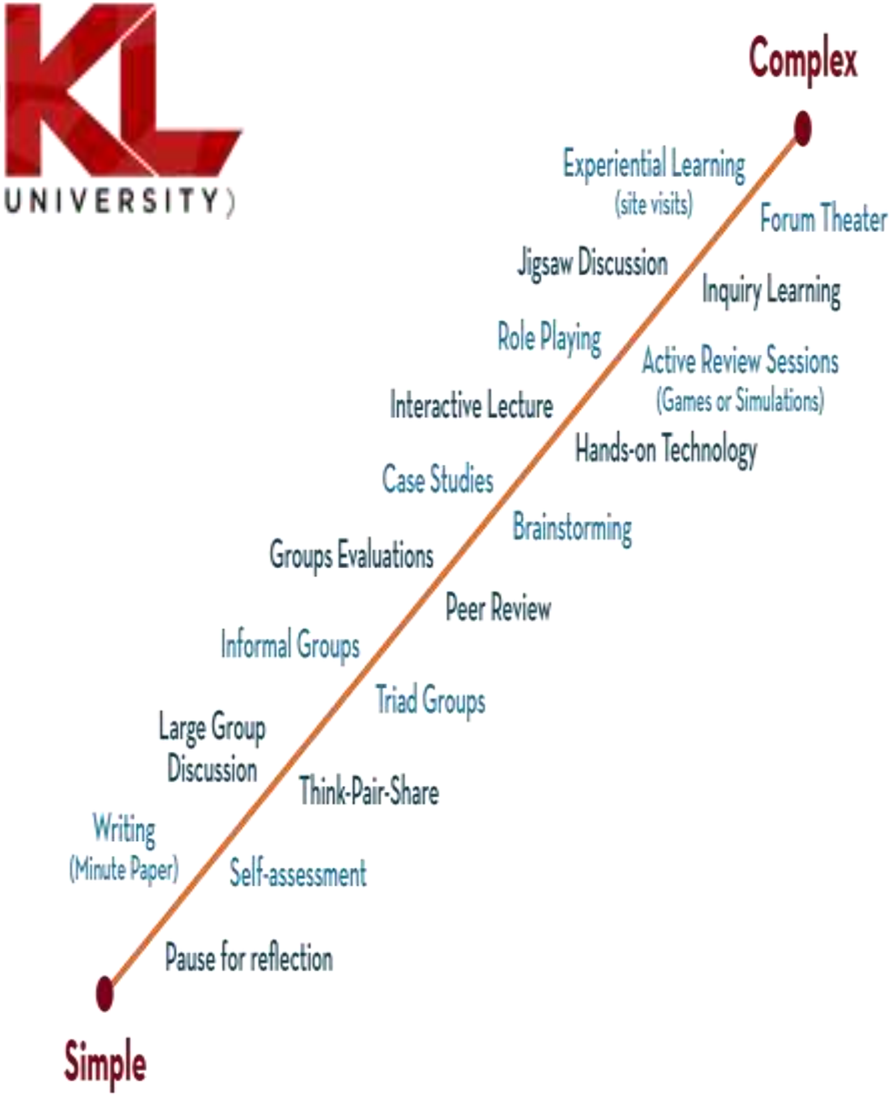


DEPARTMENT OF CSE , CSIT & AI&DS

ADAPTIVE SOFTWARE ENGINEERING
COURSE CODE – 23CI2001

TOPIC:
Model Driven Architecture

Session -19

AIM OF THE SESSION

INSTRUCTIONAL OBJECTIVES

This Session is designed to:

1. Define SAFe
2. Describe foundations of SAFe
3. List out the uses of SAFe
4. Describe SAFe core values

LEARNING OUTCOMES

At the end of this session, you should be able to:

1. Define SAFe
2. Describe the foundations of SAFe
3. Summarize SAFe principles

HERE ARE SOME OF THE KEY TOPICS THAT ARE TYPICALLY COVERED IN A DISCUSSION OF MODEL-DRIVEN ARCHITECTURE (MDA)

- Introduction to MDA
- Modeling Languages
- Model Transformation
- Model-Driven Engineering (MDE)
- Model-Based Systems Engineering (MBSE)
- Tools and Technologies
- Case Studies
- Future Directions

1.INTRODUCTION TO MDA

- This includes a brief history of MDA, its key principles and benefits, and an overview of its role in software development
- Model-Driven Architecture (MDA) is a software development approach that emphasizes the use of models to design and build software systems. MDA is based on the idea of separation of concerns, where the design and implementation phases of software development are decoupled
- The key benefit of MDA is that it promotes reuse of software components by creating models of these components that can be used in multiple systems. This reduces the time and effort required to develop software systems and improves their overall quality and maintainability

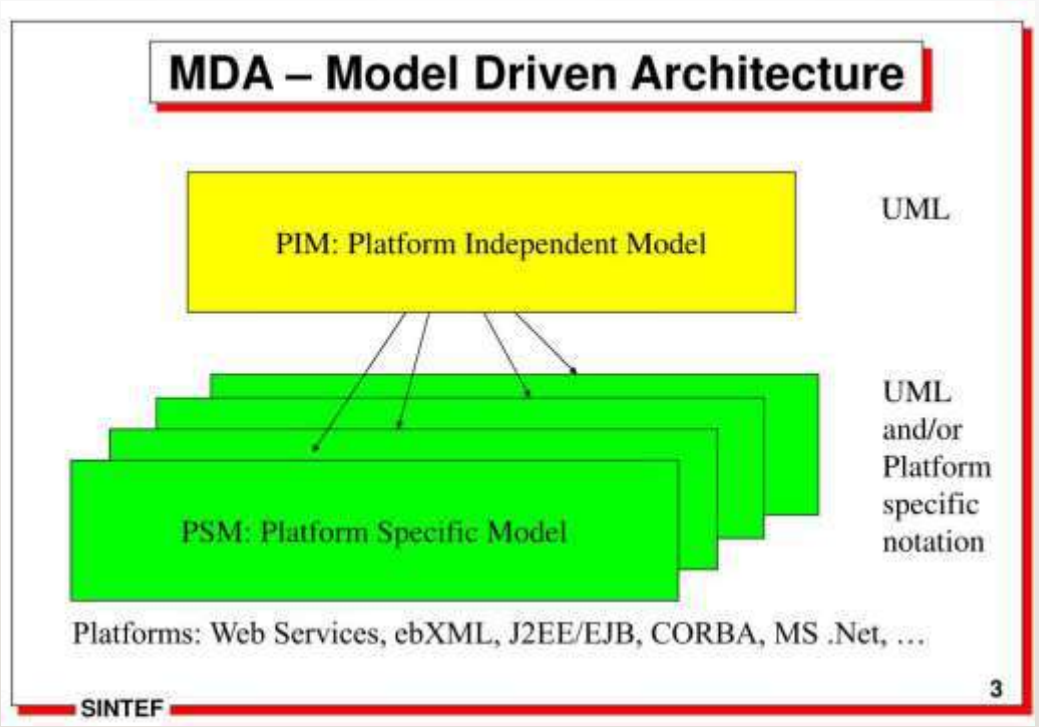
2.MODELING LANGUAGES

- MDA relies on the use of modeling languages to create software models. Common modeling languages include UML, SysML, BPMN, and others. This topic covers the basics of modeling languages, their syntax and semantics, and their use in software modeling
- In Model-Driven Architecture (MDA), modeling languages are used to create models that describe the structure, behavior, and functionality of software systems. Modeling languages provide a formal syntax and semantics for creating software models that can be understood by both humans and machines

SOME OF THE COMMONLY USED MODELING LANGUAGES IN MDA INCLUDE

- **Unified Modeling Language (UML)**: UML is a general-purpose modeling language that is widely used in software engineering. It provides a rich set of graphical notations for modeling various aspects of software systems, including structure, behavior, and interactions
- **Systems Modeling Language (SysML)**: SysML is a modeling language that is based on UML and is designed specifically for systems engineering. It provides a set of graphical notations for modeling complex systems, including their structure, behavior, and interactions

MDA-ARCHITECTURE



MDA – Model Driven Architecture

PIM: Platform Independent Model

UML

PSM: Platform Specific Model

UML and/or Platform specific notation

Platforms: Web Services, ebXML, J2EE/EJB, CORBA, MS .Net, …

SINTEF

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CONTINUATION

- **Business Process Model and Notation (BPMN)**: BPMN is a modeling language that is used to model business processes. It provides a set of graphical notations for modeling the flow of activities, events, and data in a business process
- **Domain-Specific Modeling Languages (DSMLs)**: DSMLs are modeling languages that are designed specifically for a particular domain or application. They provide a set of graphical notations and modeling constructs that are tailored to the specific needs of the domain or application

3.MODEL TRANSFORMATION

- Model transformation is a key process in MDA, which involves converting one model into another model. This topic covers the types of model transformations, such as model-to-model and model-to-code transformations, and the tools and techniques used to perform them

4.MODEL-DRIVEN ENGINEERING (MDE)

- MDE is an approach to software development that is closely related to MDA. This topic covers the basics of MDE, its principles, and its role in software development

5.MODEL-BASED SYSTEMS ENGINEERING (MBSE)

- MBSE is another approach to systems engineering that is based on the use of models. This topic covers the basics of MBSE, its principles, and its relationship to MDA

6. TOOLS AND TECHNOLOGIES

- Tools and Technologies: MDA relies on a variety of tools and technologies, including modeling tools, transformation engines, and code generators. This topic covers the key tools and technologies used in MDA, their features and capabilities, and their strengths and weaknesses

7.CASE STUDIES

- Case studies provide practical examples of MDA in action, including its benefits, challenges, and best practices.This topic covers real-world examples of MDA implementations, their outcomes, and lessons learned

8.FUTURE DIRECTIONS

- Future Directions:This topic covers the emerging trends and future directions in MDA, including the role of MDA in emerging technologies such as AI, machine learning, and cloud computing

SELF-ASSESSMENT QUESTIONS

1. What is Model Driven Architecture
2. Why to use Model Driven Architecture
3. When to Use Model Driven Architecture
4. Explain Foundations of Model Driven Architecture

REFERENCES FOR FURTHER LEARNING OF THE SESSION

- **TEXT BOOKS:**

1 . Roger S.Pressman, “Software Engineering – A Practitioner’s Approach” 7th Edition, Mc Graw Hill,(2014).
2. Ian Sommerville, “Software Engineering”, Tenth Edition, Pearson Education, (2015).

- **Reference Book**
- Agile and Iterative Development: A Manager's Guide, Craig Larman, Addison-Wesley

WEB REFERENCES/MOOCS:

:

- https://www.digite.com/kanban/what-is-kanban/
- http://www.scaledagileframework.com
- https://www.guru99.com/test-driven-development.html
- https://junit.org/junit5/

THANK YOU

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Team - svv