Software Architecture
Module 5
Ensuring conformance to architecture

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SEZG651/SSZG653 Software Architectures

Code may drift away from Architecture

Examples of drift:

- Not sticking to the discipline of layers – an object in one layer calling an object located in a layer beyond the adjacent layer
- Accessing data base directly without going through data access layer
- Notifying different modules one by one instead of using ‘publish – subscribe’ model,
- Not making use of a common logging mechanism, etc.

What other architecture violations have you come across?

Techniques to keep the code and architecture consistent

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- Embed design concepts in the code (Architecturally evident coding style)
- Use frameworks
- Use code templates
- Update architecture documentation

Embed design in code

Follow ‘Architecturally Evident Coding Style’

Indicate in the code, aspects of architecture being implemented. Example:

- If we are using a layered architecture, indicate to which layer the code belongs
- If we are using ‘Publish – Subscribe’ pattern, indicate in the code whether it belongs to Publisher or Subscriber
- If we are using Message queues (MQ) for communication between components, indicate what the component is doing - inserting message or retrieving message from the MQ.

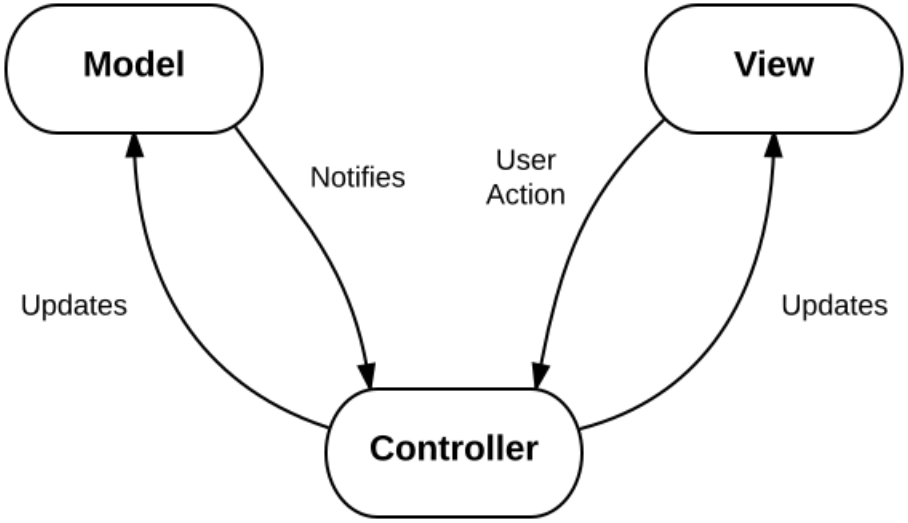
Use Frameworks

Examples of frameworks:

- Spring
- Hibernate
- Autosar - AUTomotive Open System Architecture

Spring MVC Framework

- Supports Model-View-Controller framework
- Here code belongs to one of the 3 component types - Model, View or Controller
  - **Model** encapsulates the application data
  - **View** renders screens on browser
  - **Controller** processes user requests, interacts with Model components and passes information to View components for rendering



Experience sharing

Can you give examples of other frameworks that you have used?

Other examples of frameworks

- Publish – Subscribe framework (JMS)
- Workflow framework of SalesForce.com
- Rules engine (DROOLS)
- Logging framework - Log4J (for logging events)

Use Code templates

- A template provides a structure for developers to code
- For example a template for developing a code that needs to be fault tolerant will have the following sections in the template

```
Get event

Case (Event type)
    Normal: // received by primary process
        Process X; Send state to backup process;
        Process Y; Send state to backup process;

    Update State data: // received by Backup process
        Update state data;

    Switch over: // received by Backup process
        Notify clients about change in Primary process;

End case;
```

Code needs to be accommodated in this template

Update architecture documentation

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- Changes to code should be accompanied with changes to architecture document when applicable
- At least mark parts of the arch document that is no longer applicable as ‘No longer applicable’. This increases trust on remainder of the document
- Technique: At release time, synchronize the arch doc with code.

Exercise

- What other techniques can we think of to ensure that code does not drift away from architecture?

Exercise

What other techniques can we think of to ensure that code does not drift away from architecture?

- Educate new team members about the architecture
- Do Code reviews
- Create folders for each architectural aspect such as layer, service, UI, external interfaces, etc. and follow a discipline of storing the code in respective folders