
Tutorial 4 – Architectural Styles

Introduction

You are to design an architecture for each of the following problems, by applying the most appropriate style out of the six styles we learnt in the last two weeks.

- For reasons of time and effort, do not use more than 5 or 6 components – noting that a component might be given more detail later in design by making it composite.
- Make sure you specify interfaces in detail – but, to save yourself time and effort, do not specify more than 3 interfaces in detail.
- Some of these architectures could be solved by combining styles – you may combine styles if you want, but be sure to justify your combination with respect to the questions. The *correct* answer to the question is the style that you absolutely cannot do without to solve the problem specified. Any other combined styles will impress or distress me, but would not give you extra marks were this an exam.

Exercise 1 – HTML Editor

Design an HTML editing tool. It should include a GUI similar to the kind used by editors like Dreamweaver or Microsoft Frontpage. The editor is to offer four ways to view and edit HTML text:

1. A WYSIWYG view (“Normal”),
2. A WYSIWYG view but with HTML tags made explicit (“HTML Tags”),
3. A view of the raw HTML source (“HTML Source”), and
4. A preview of the HTML as an executable web page in Mozilla (“Preview”).

The user should be able to load up and save their HTML files and select between the four views, editing text in one view, switching to another view, and then seamlessly continuing to edit in that view, and so on.

Exercise 2 – Hospital Monitoring System

Design the overall structure of a hospital monitoring system, given access to the following systems/protocols:

- All the beds, rooms, and equipment are equipped with Jini-compliant sensors – so, for instance, a room’s sensor might provide a temperature reading, while a patient monitoring sensor might provide the patient’s heartbeat.
- An administrator uses a Visio-based GUI to maintain a visual design of the hospital, consisting of rooms, beds, patients and hospital equipment. Visio can export and import data via XML. The purpose is to show data from the sensors in this GUI.
- There exists Jini-based middleware software for reading and sending data from and to wireless mobile devices.

Note: I want the overall coarse-grain structure, modelling how the systems/protocols are going to interact to achieve the required solution. I do not want a finer-grained view with individual components corresponding to actual pieces of equipment (that’s also a kind of architecture, but not the one we want at this stage of design).

Exercise 3 – Online Chocolate Sales

Design an online chocolate selling store. The store should have several web-based frontends: one for customers, one for accountants, and one for packers (the people who deal with customer orders). The overall business logic of this store is rather complicated, due to the wide range of functionalities: e.g., maintenance of customer wish-lists, recommendations, algorithms for packaging orders for fastest delivery, etc. Some of this functionality is shared between the different frontends; some is specific to individual frontends.

Exercise 4 – A History of Chocolate

Design an online chocolate aficionado page. This is an educational website that provides a navigable repository of chocolates from throughout chocolate history.

Exercise 5 – Notepad

Design a notepad-style text editor. Basic functionality should include editing, loading and saving text files, undoing and redoing mistakes, and spellchecking.