



Complex or Complicated II - Separation of Concerns and Levels of Abstraction

Version 1.5

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1 Introduction: Complex or Complicated - Basic Principles of Architectural Modeling

In my last blog post, I argued that complexity is a necessary feature of a (Business- or System-) Architecture to ensure stability, and "agility". Complex models require complex models and solutions. At the same time, no user wants to have complicated, unmanageable models.

Important fundamental principles to achieve the necessary complexity while at the same time avoiding complexity and ensuring maintainability is realized by the principle "separation of concerns" and the introduction of defined levels of detail. I look at that later.

2 Separation of Concerns and Architecture Frameworks

Several architecture frameworks exist in the market, helping us to organize our models and to implement the principle of "Separation of Concerns".

The most important frameworks for me are the Zachman framework (<https://www.zachman.com/about-the-zachman-framework>) and the Archimate framework (see e.g., <https://en.wikipedia.org/wiki/ArchiMate>). Both help us to decide which model elements are necessary and how they belong together. Both can be mapped to each other. I am a fan of the Zachman framework, because it is more diverse and at the same time (in contrast to Archimate) is method-neutral and can be used with all methods, of course with Archimate or TOGAF too.

It separates "the world" in various abstractions: the "what", the "how", the "where", the "who," the "when" and the "why." A good model in one of the categories addresses precisely one abstraction, different abstractions are connected forming "complex models". This comprehensively describes the subject of interest without mixing the various views and rendering them difficult to maintain. E.g., processes will be described in one abstraction (the "How"), used concepts are described in another abstraction (the "what").

3 Which abstractions should we choose?

A resulting question is which abstractions do we need. How do we present this content (Which notation or descriptive tool are we using?) and how are contents linked? If we want to represent business processes, we for sure talk about the abstraction "how?". We talk about the concepts used in the abstraction "what?" But what about business rules and business decisions? One argument is that these artifacts are composite, the objects used in particular connect different abstractions. On the other hand, the question addressed is the goal of the description. The main purpose of a decision model is usually to give guidance. So we associate such a model with the abstraction "how?".

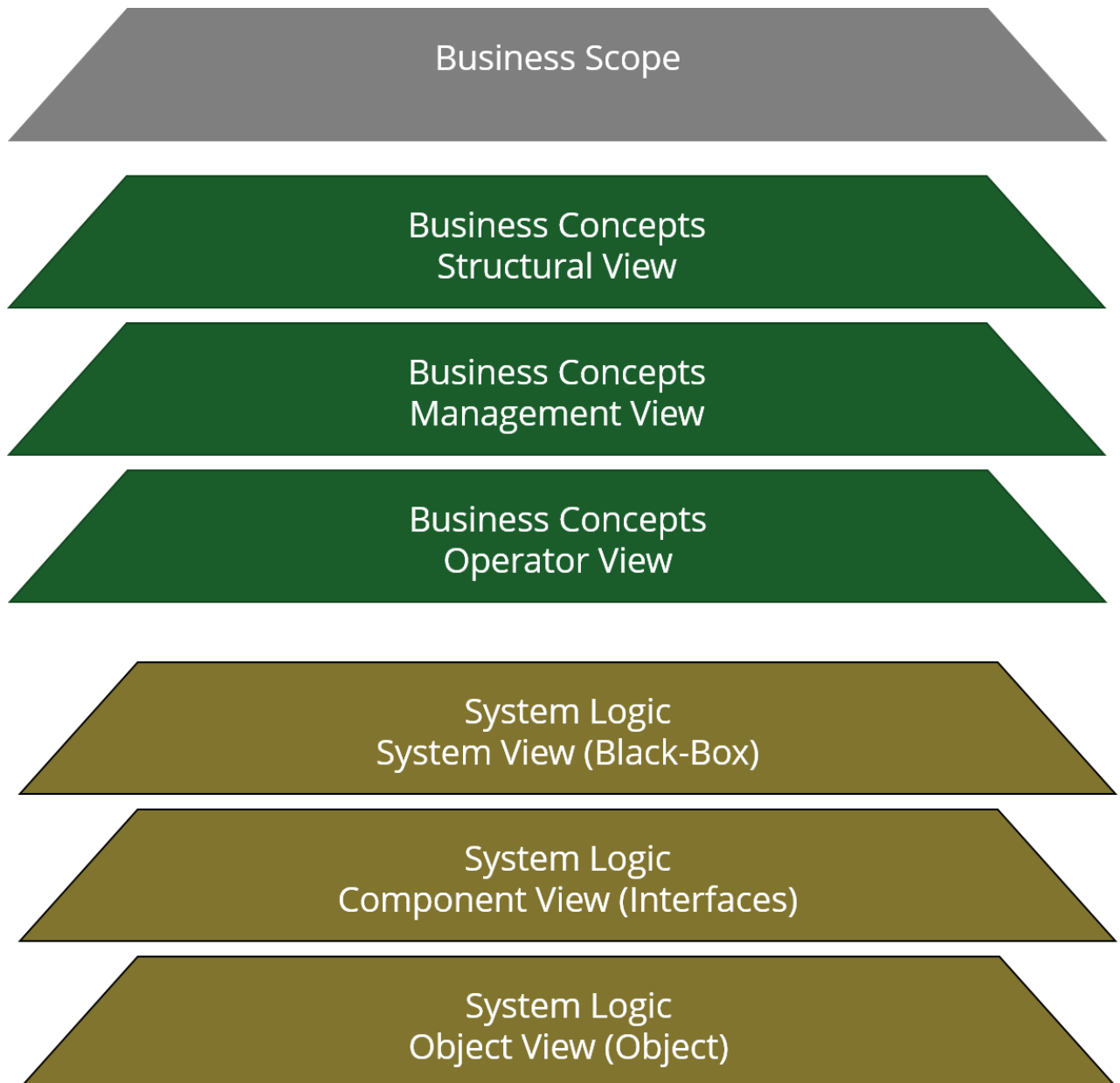
4 Several models in one abstraction

That is, in an abstraction we find several models that are interconnected. An example are process models and decision models. It is well known and admitted that we separate both aspects and not mix the description of the processes with the specification of the decisions. Processes require the description of decisions too; both are connected.

5 Abstraction levels

A problem of the assignment of models to abstractions is the question of defining the needed levels of detail. Often too many levels of detail are defined. Contents become unclear and not maintainable. John Zachman emphasized in defining the original framework the need to specify the levels of detail. But this is not part of the specification of the framework. Users often ask for help in determining the levels of detail. I think the magic number is THREE. This can be derived just from the number of elements (just think how many elements are created

depending on the complexity of the levels of detail). Different practices refer to the abstraction levels purely numerical: Level 1, Level 2, Level 3, etc. I do not think much of that. It is better to name the levels by purpose and target audience. This makes it easier to decide if we need the abstraction and which level of detail is needed. For the basic levels in "Business Concepts" and "System Logic" (see www.zachman.com) I use the following levels of detail:



Reminder: This is a Framework to be adopted not a dogma. If we consider business process optimization in general, we may need all abstractions and levels of detail in "business concepts". Currently, many projects underway are to introduce the GDPR Directive. The focus is on the operator view (with the "Procedures of Operation") and the connection to "System View" in "System View" and maybe other views.

6 Tool Support

We also need support from the tools used. We need functions for different abstractions, and to refine models and model elements (we stay in the same type of model, e.g. we refine a subprocess into a process description) or link models and model elements (we change the

model type to represent different views, e.g. we link Business process models with decision models).

Good tools support these types of linking. Qualiware or Visual Paradigm are samples

Literature

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