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A Quick Chat about SOMF Capabilities

Constructing a Service-Oriented Attribution Model

Training material for architects, business analysts, system analysts, software developers, modelers, team leaders, and managers

Use the SOMF modeling capabilities for enterprise architecture, application architecture, service-oriented architecture (SOA), and Cloud Computing projects.

SOMF is empowered by Sparx Systems Enterprise Architect modeling platform
All Diagrams in this training document have been created with Enterprise Architect

What are Attributes?

Attributes are simply descriptions of software capabilities derived from a variety of documents or artifacts that are typically provided during a project. These properties define certain characteristics of a future software product. Remember, in the context of the SOMF paradigm every software construct is actually a service.

Service attributes can be derived from various sources:

- Business requirements documents
- Technical requirements and specification documents and diagrams
- Problem domain documents
- Business process modeling documents and diagrams which depict and characterize business activities
- Business and technology strategy documents
- Software product description documents
- And more…

Why do we need to Collect Service Attributes?

We collect service attributes to facilitate the discovery of conceptual services early during the software development life cycle. These concepts are formalized ideas that propose solutions to organizational concerns. The collected attributes then identify the capabilities of a future software product, namely a service.

Recall, not all conceptual services will materialize into tangible software executables. This activity, however, encourages practitioners to study requirement documents and think about proposing remedies to organizational problems.

Listing Software Product Attributes

While reading the requirement and specification documents, start compiling a simple list of software product attributes. The attributes typically represent capabilities that a service may possess. For example, if a software product requires the construction of trading investment accounts*, then risk*, *liquidity*, investment *time*, and *return* on investment would be a list of attributes to consider.

Remember, not all listed attributes will be selected to drive the discovery of a service. Some will fall under the "wish list" category and others will serve as the *core attributes* that will eventually drive software building initiatives.

Introducing an Attribution Model

To enable the selection of the *core attributes* discussed earlier in the Listing Software Product Attributes Section, start constructing an attribution model, as illustrated in Figure 1. This model simply arranges the service attributes in a *tree-like* formation: parent service attributes are linked by connectors to corresponding child attributes forming a top-down tree structure.

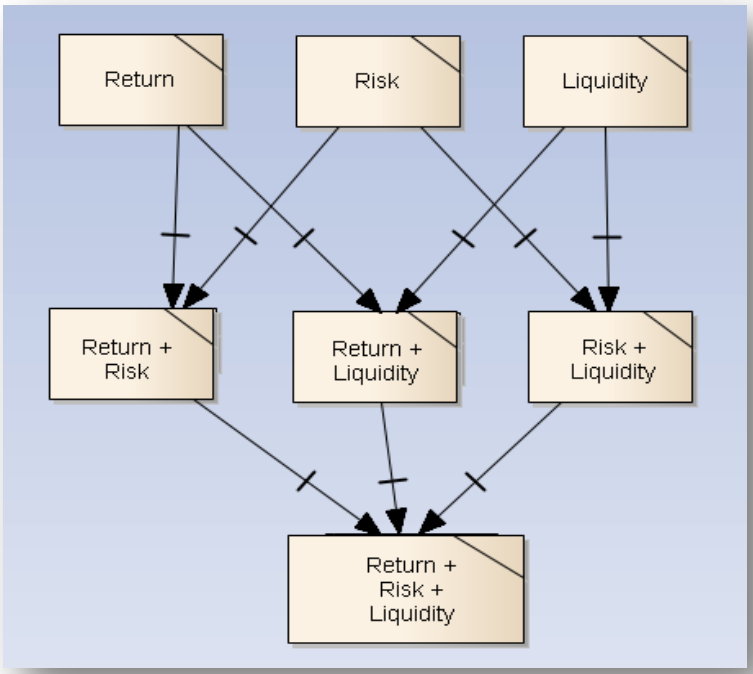

Figure 1: An Attribution Model Example

Setting Enterprise Architect

The process of setting up Enterprise Architect for building an attribution model is straightforward:

- Start by launching the Enterprise Architect modeling platform
- Click on the Settings menu item
- Click on the MDG Technologies item in the drop down box
- In the MDG Technologies dialog box (as shown in Figure 2), select SOMF 2.1 by enabling the corresponding checkbox on the far right

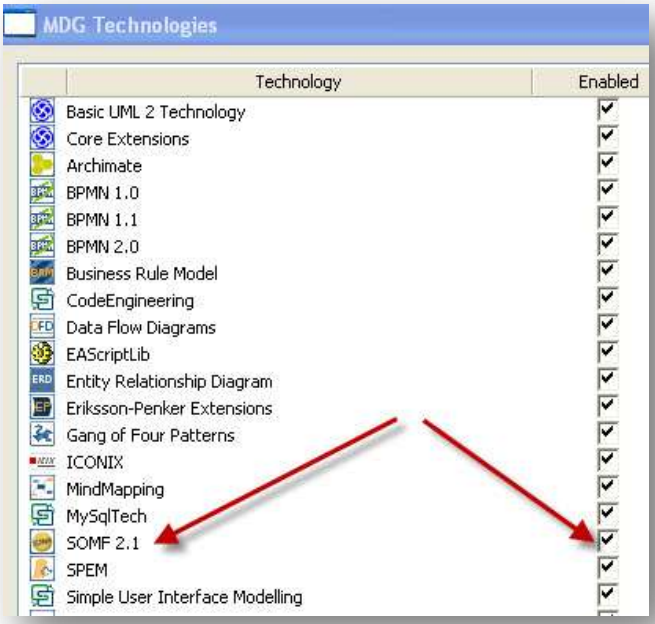

Figure 2: MDG Technologies Dialog Box

- Now, select the top EA menu item New and click on the New Project dropdown selection
- Next, the Select Models dialog box will appear (as illustrated in Figure 3). Check the box next to SOMF (2.1) Template Model and click OK

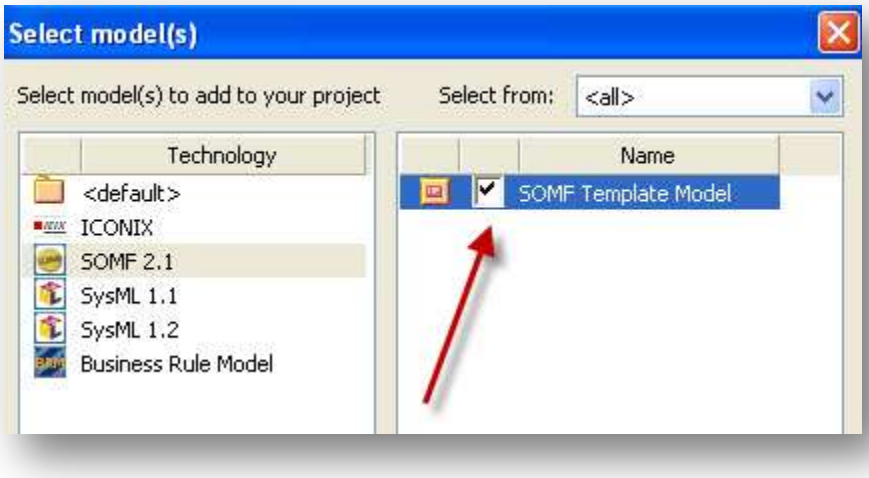

Figure 3: Select Model(s) Dialog Box

- The previous step will create in the EA Project Browser (typically appears on the far left of the EA screen) displaying all available SOMF 2.1 models, as illustrated in Figure 4. Now expand the Conceptual Model and double click on the Attribution Model Diagram item

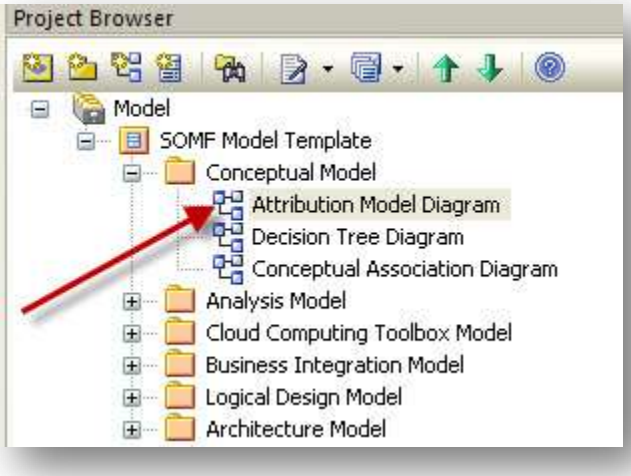

Figure 4: EA Project Browser

The last settings step also displayed the Toolbox dialog box, which typically appears on the far left side of the EA platform (see Figure 5).

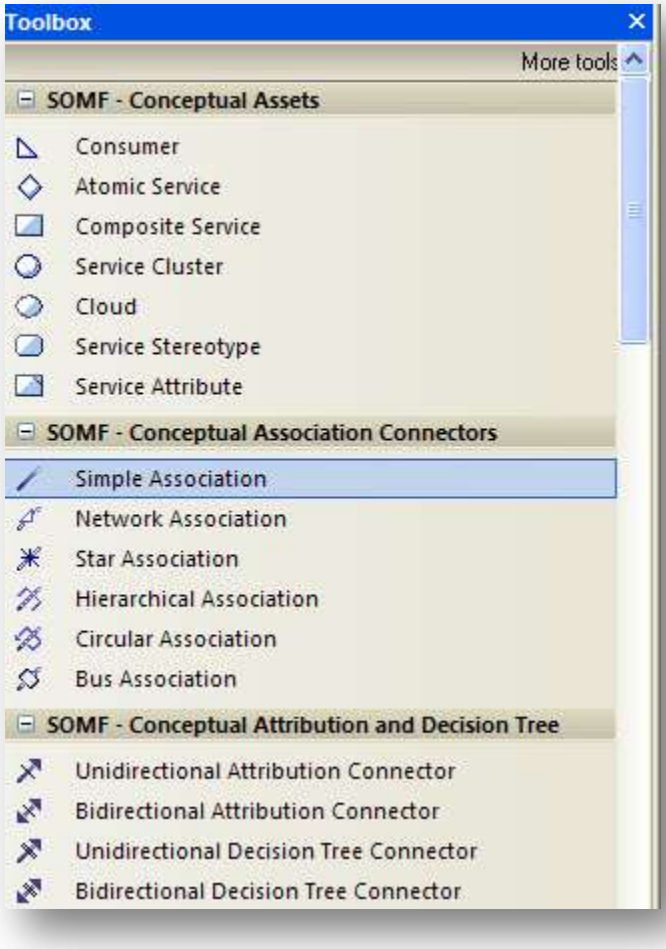

Figure 5: SOMF 2.1 Toolbox Items

Creating an Attribution Model

Now you are ready to create an attribution model. To build a formal Attribution Model diagram, use the depicted symbols in Figure 6:

- *Service Attribute*: an allocated space to hold one or more service attributes
- *Unidirectional Connector*: a symbol that links a parent service attribute to its related child service attribute

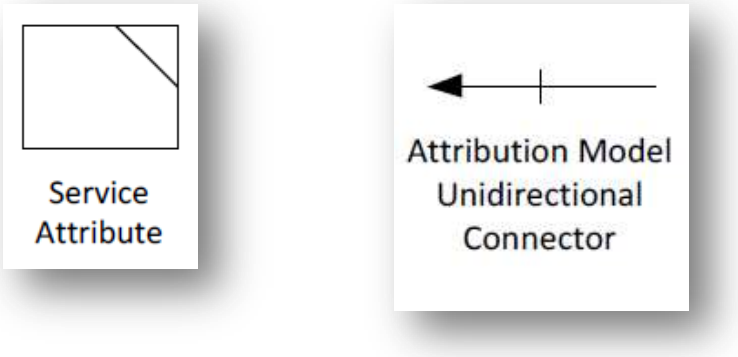

Figure 6: Service Attribute and Connector Symbols

This activity should follow a consistent construction pattern:

- The entry point into the attribution model should always be at level 1 (as depicted in Figure 7), which is made up of the core attributes collection
- Maintain a persistent top-down level construction pattern. Each added level should be positioned in a downward direction
- For each descending level, it is recommended to increase the number of attributes in each node by one. For example, a node that is positioned on level 2 should be composed of two attributes. In the same fashion, a child node on level 3 should contain three attributes, and so forth
- The last attribution model level should be made up of a converging node that represents all possible model attributes as illustrated in Figure 7

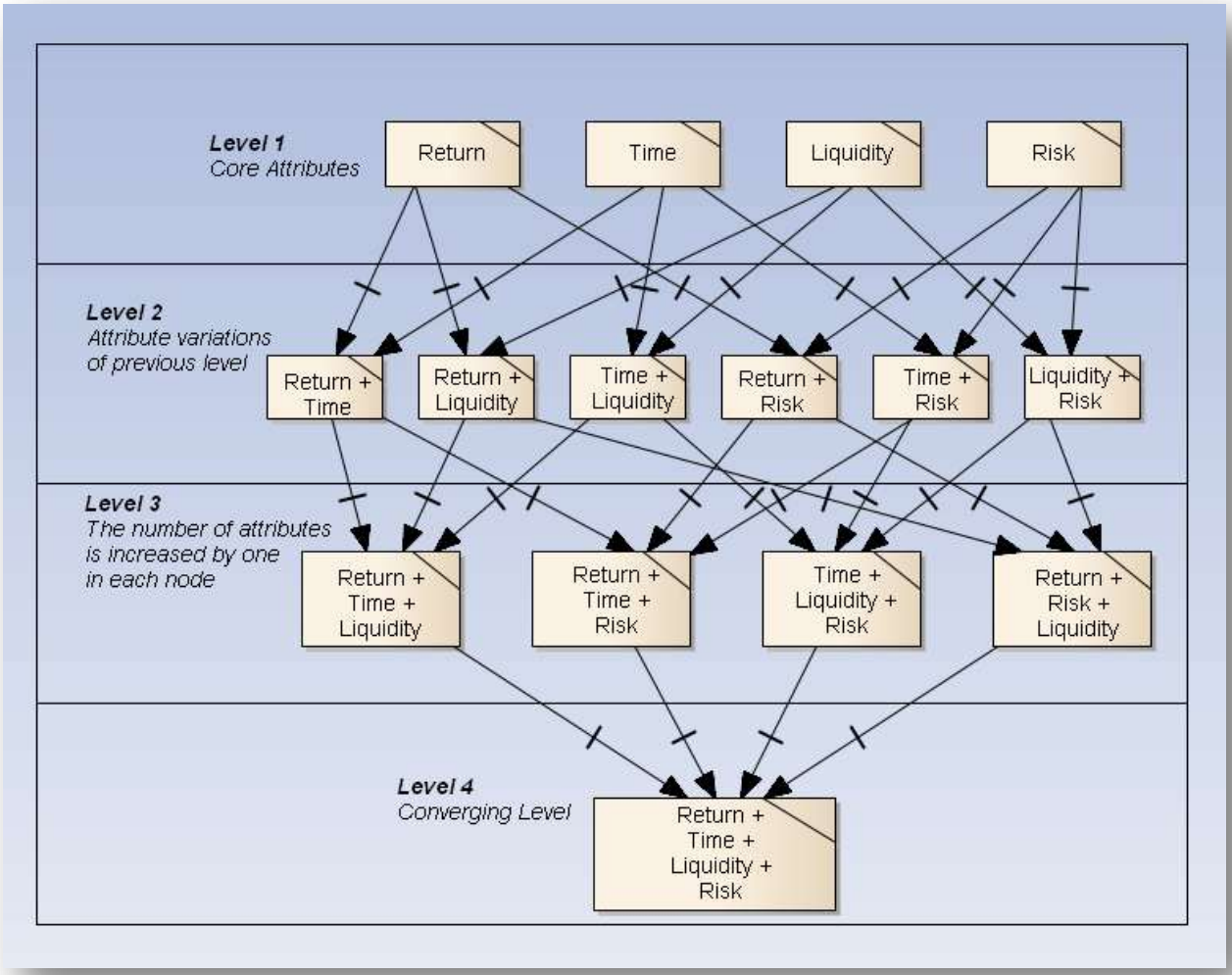

Figure 7: Four-Level Attribution Model Example

The Attribute Selection Process

Now we are ready to select service attributes that will later facilitate the discovery of conceptual services. There are three major approaches for selecting the right attributes:

1. *Forward Attribute Selection*: starting the search at the top of the attribution tree and moving in a downward direction until the node that represents the right attribute collection is found
2. *Backward Attribute Selection*: starting the search at the bottom of the attribution model and moving upward until the node that represents the right attribute collection is found
3. *Combined Attribute Selection*: combining the forward and the backward attribute selection methods

Forward Attribute Selection

As mentioned earlier, to employ the forward attribute selection as depicted in Figure 8, start at the top of the attribution model tree. Move downwards from one of the nodes that is included in the *core attributes,* always located on Level 1. Continue the search for the node containing the desired set of attributes..

For example, in Figure 8 the search for the right attribute collection starts at the 'Return' attribute (marked as 1), passing through node 2 that represents 'Return + Time' attributes, and finally arriving to node 3 that contains 'Return + Time + Risk' attributes. A second attribute collection effort is illustrated in Figure 8 as well. The 3.a node is selected as a result of searching through nodes 1.a and 2.a.

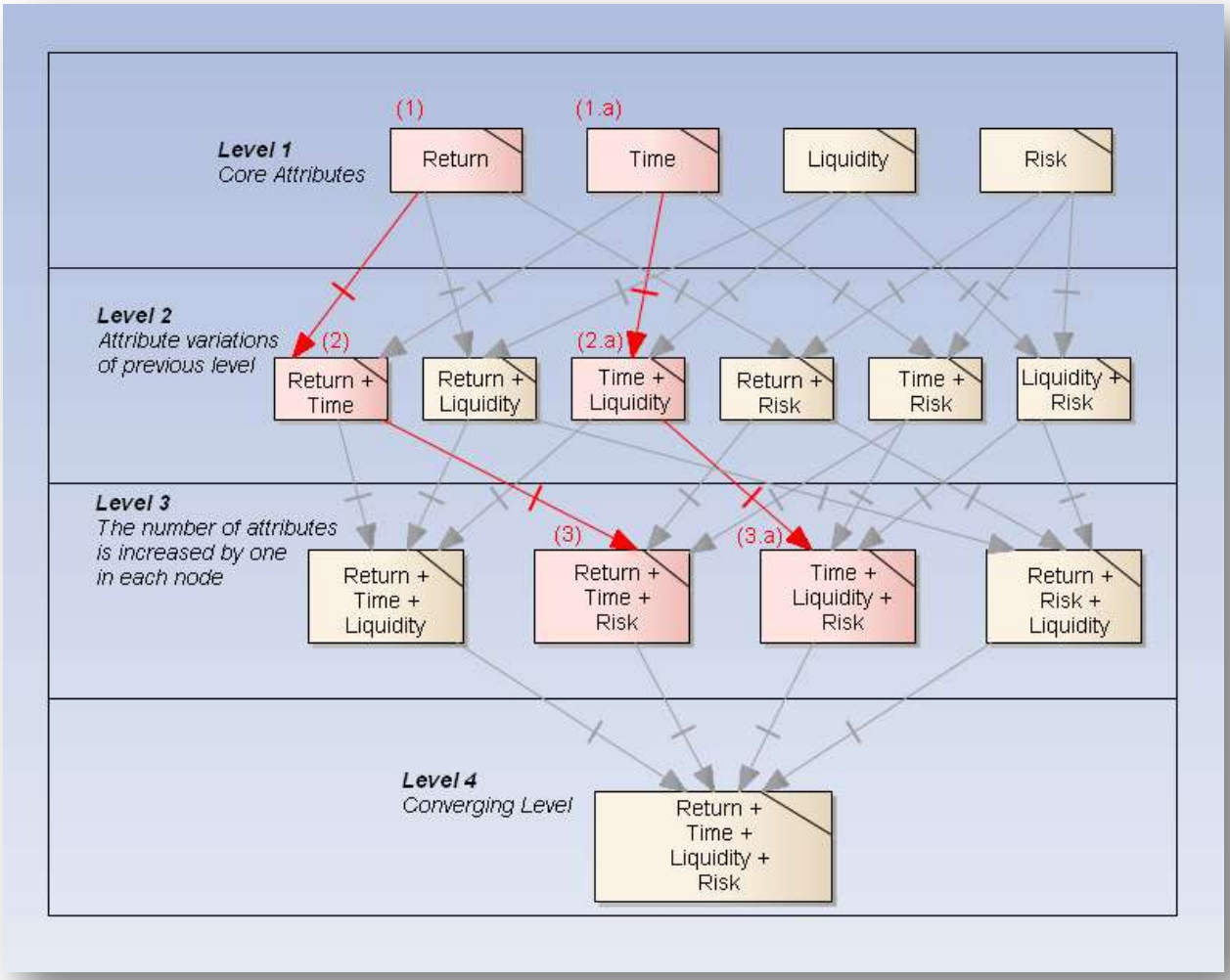

Figure 8: Forward Attribute Selection Method Example

Backward Attribute Selection

The backward attribute selection method (also known as the attribute elimination process) advocates starting from the lower levels of the attribution model and moving up toward level 1 to enable proper filtering of attributes,
as seen in Figure 9. At which node should one start searching the network? It is recommended to start from the very bottom, from the converging node, and move up to higher levels. Note the two selection efforts: nodes 1,2, and 3; and 1.a and 2.a.

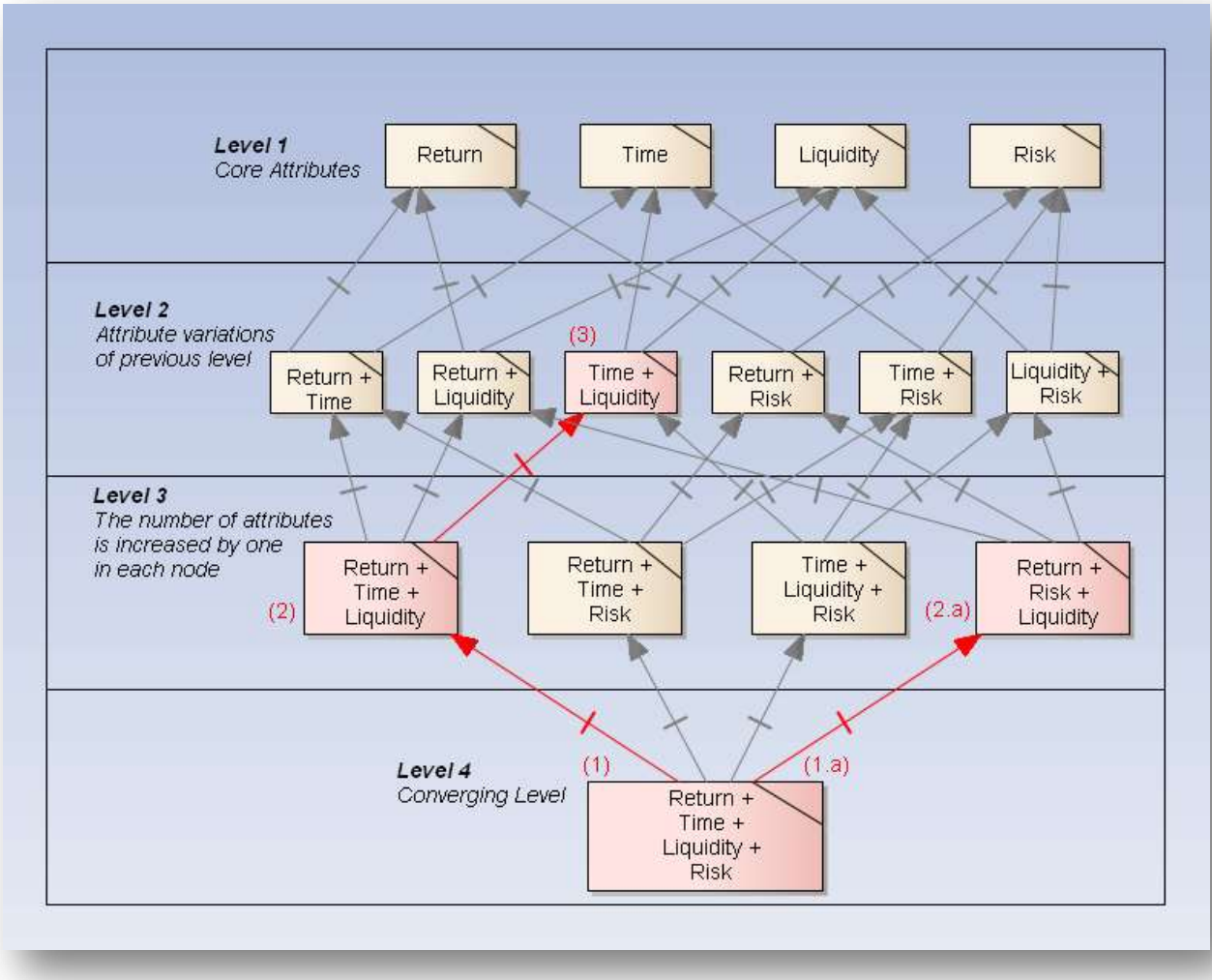

Figure 9: Backward Attribute Selection Method Example

Combined Attribution Selection Method

The combined attribute selection method employs the discussed other two attribute selection methods: Forward and Backward. Figure 10 depicts this combined approach, in which the attribution model nodes are traversed to reflect attribution analysis preferences. The search path employs the top-down pattern, moving from node 1 to node 3, whereas the bottom-up search method navigates upward to node 4.

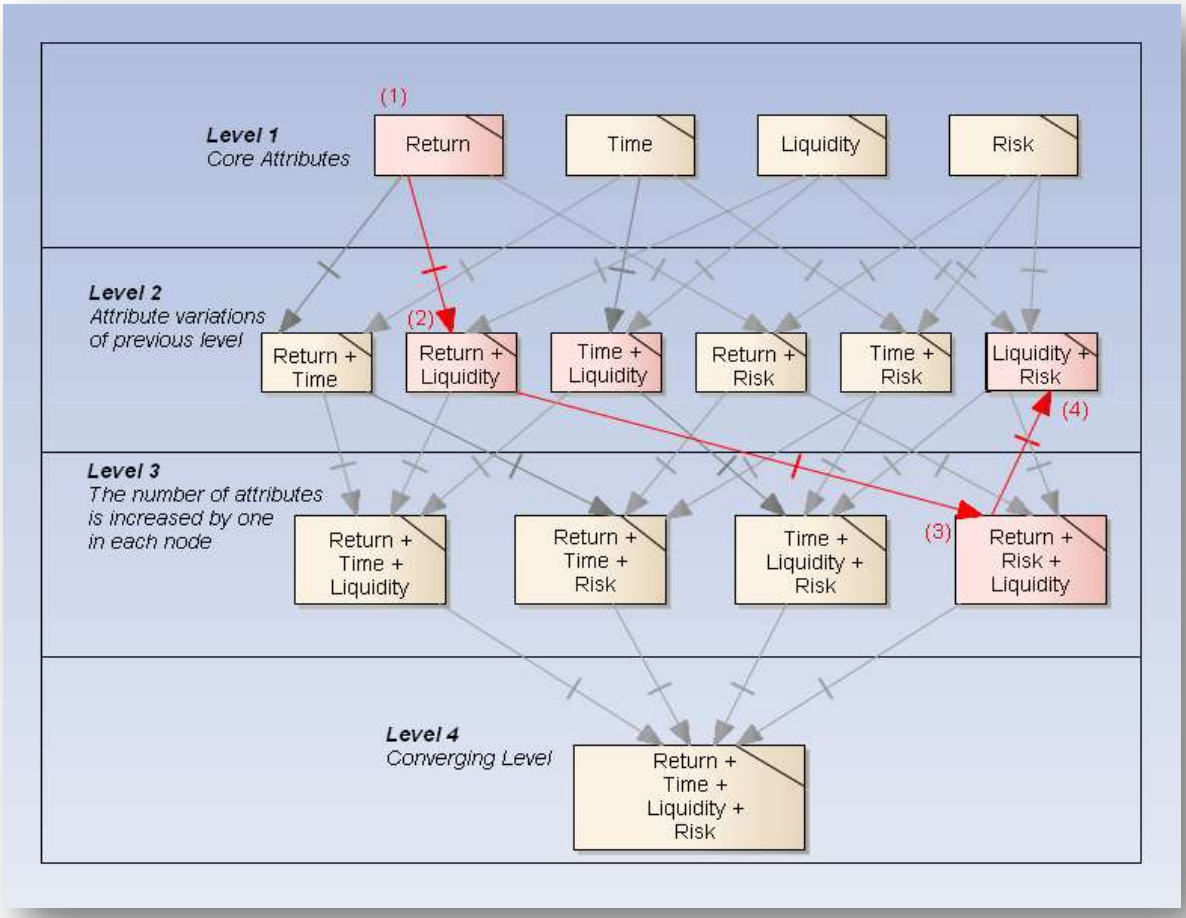

Figure 10: Combined Search in an Attribution Model Example

Attribute Prioritization

To prioritize the selected attributes so far, classify the found nodes in the attribution tree based on a feasibility scale. The "most practical" node should be marked as a "sweet spot". The less practical attribute group should be categorized as a "hot spot". Figure 11 illustrates this idea. Nodes 3 and 3.a are sweet spots, while nodes 2.b and 2.c are considered hot spots.

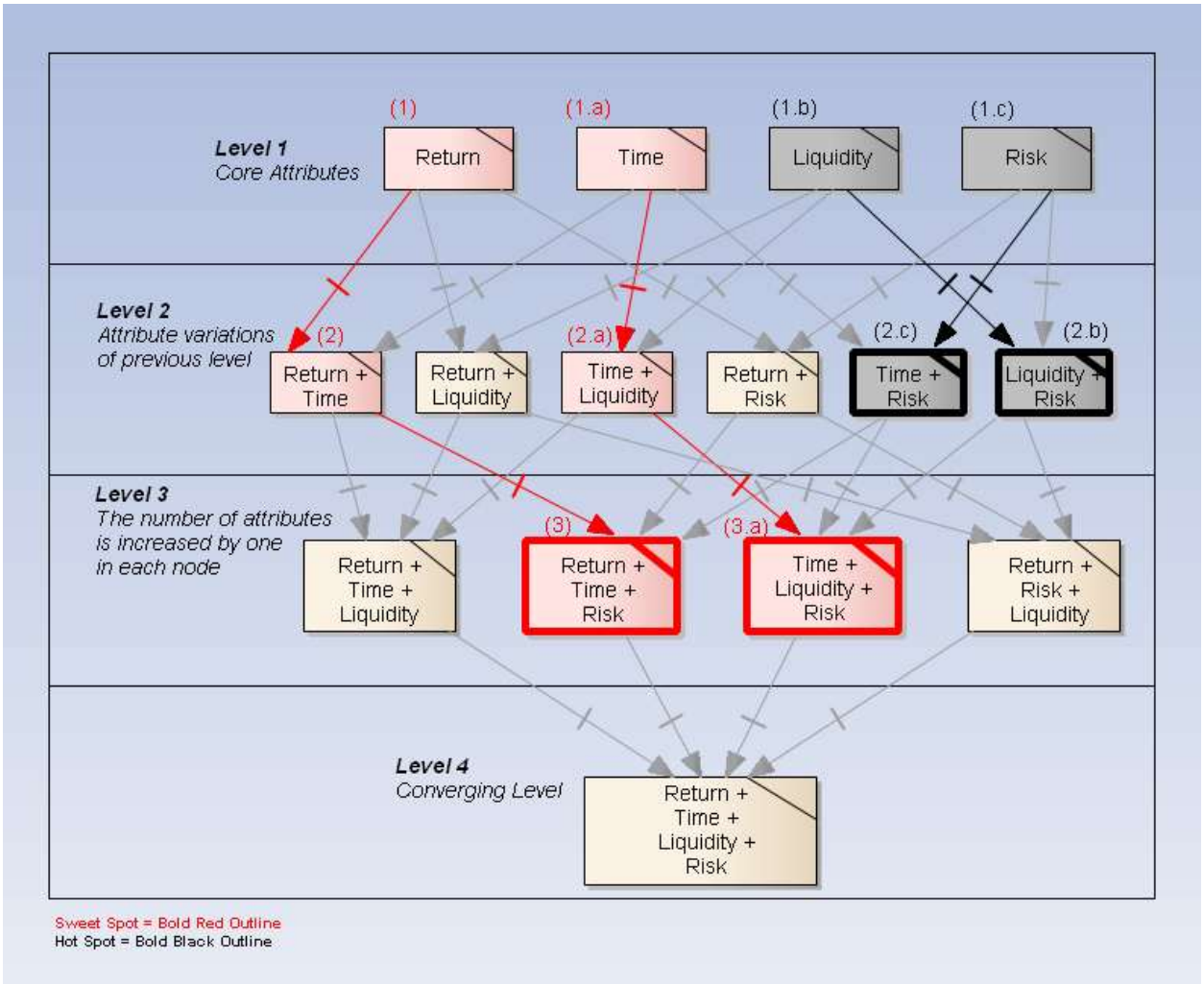

Figure 11: Hot and Sweet Spots in an Attribution Model Example

Next Steps

Once the sweet spot and hot spot attributes have been marked, the quest for discovering conceptual services can start. To further read about building a decision tree that can facilitate the discovery of conceptual services refer to the Discovering Conceptual Services training document on this site.

Further Reading

To learn more about many SOMF capabilities, modeling methods and formal notation, and patterns for enterprise architecture, application architecture, service-oriented architecture (SOA), and Cloud Computing refer to these books: