

4. TAILORING CONCEPT

Poetry teaches us music,
metaphor, condensation and
specificity.

(Walter Mosley)

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This chapter defines the term *tailoring* and presents an overview on how tailoring activities relate to the context of metrics. It then describes a metaphor regarding tailoring of metrics.

4.1. Tailoring

At the beginning of this work, it was stated that metrics are a way to quantify projects and processes. Metrics are constituted of attributes that represent a characteristic of the measured entity, e.g. "data storage information" is an attribute of the metric *Cost Performance Index (CPI)* (See Appendix A). This attribute, at the project level, may differ in its value with respect to other projects. That means, metrics are characterized by commonalities and variabilities in their attributes and tailoring takes advantage from this fact. While the common attributes from the metrics remain the same for all the projects, the attributes that are variable represent the set of possible adaptation or adjustment, namely tailoring. Tailoring preserves the structure of the metrics by making the minimal possible changes. The tailoring is seen more like a process, rather than a technical detail. Throughout the work, the following definition will be used:

"Metric tailoring is the process of creating a project specific metric by adapting and/or completing the details of characteristic attributes of a metric defined at the organizational level."

For example, tailoring the metric *Requirements by number and status* by giving the value of *weekly* to the attribute "measure interval" for use on a small project. The tailoring of metrics is a process, which is performed until the desired adjustment, within the project context, has been achieved. It starts when the project stakeholders require certain information. The identification of the information needs is a task performed by project team members. The next step is to select a collection of metrics. The place where the metrics are selected from is made available from the organization. The

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process of tailoring is then finished when the attributes from the selected metrics are adjusted to meet the information needs. The result of the process is a collection of metrics fulfilling initial requirements. For example, three metrics called "requirements", "change requests" and "testcases" are identified by two different software engineering projects (small and large) as the group, which meets their needs. The collection of metrics is made available on demand by the organizations and the possible attributes to tailor are the frequency, visualization and data storage information. The small project requires short intervals of measurement, e.g. daily or weekly. The large project stores the metric data a central repository, whereas the small project uses datasheets. Finally both projects use the same visualizations for the metric data. Although every project tailored characteristic attributes regarding their specific information needs, the core from the metrics remained unmodified.

Tailoring of metrics assumes that the collection of metrics from the organization is complete enough to cover all the project environments. The pre-requisites to create this collection of metrics are:

1. Analysis of goals and needs of the projects should either be known in advance or be aligned to the organizational goals.
2. Analysis of metrics and identification of the points where the tailoring can occur. These points are attributes from the metrics. These points can include for example degree of formality, frequency, granularity, or scope among others.
3. Previous knowledge of possible values for the attributes where the tailoring happens. For instance, the attribute of *measure interval* contains values like *weekly*, *monthly* and *yearly*.

Tailoring task has certain aspects that must be taken into account. These are described in the following paragraphs:

Sound, complete, lean and consistent definition of tailoring: Tailoring is sound when it is valid in the project environment. Complete when it covers all the metrics required from the projects to meet their information needs. Lean when it covers only the required set of metrics and no more. Consistent when the same process is preserved.

Reusability: Tailoring of metrics is not a one-time event, but a repeated, ongoing task that is embedded within process improvements followed by an organization. Thus, tailoring of metrics can be regarded as a reuse task. From a technical perspective, tailoring of metrics should be represented as a function that takes the different metrics along with other values as an input. Then, metrics can be seen as highly cohesive and lowly coupled units, which encapsulate commonalities and variabilities from their characteristic attributes in the form of internal structures, with explicit interfaces.

Preserving properties in the metric: There are properties that can be seen as the core from the metric and these values have to be preserved after tailoring.

Standard compliance: Tailoring must ensure that the resulting set of metrics still conform to the collection of metrics from the organization. That is, the tailoring does not modify the meaning of the metric.

Flexibility: Tailoring of metrics must grant to the project teams the flexibility to operate efficiently by selecting their metrics, while also preserving the maximum amount of possible commonalities. The idea is to try to limit the tailoring to changes in degree and not introduce changes in kind. One of the benefits from tailoring of metrics is the amount of time and effort that can be saved by this task, rather than defining the metrics each time from scratch for each project, a collection of metrics is made available. Another benefit is that different sets of metrics, aligned to project information needs, conform the collection of metrics from the organization.

A formal approach for tailoring of metrics is essential to ensure that the results are consistent with the intent of the organization. The set of techniques, derived from the approach, must also aid the organization in understanding this process of tailoring and how it is applied in the context of the projects. At the same time, the approach must maintain commonalities of the metrics across projects. The idea of tailoring of metrics is to make them fit for each specific project without losing their characteristics. This approach is introduced in the next chapter. First, a metaphor regarding tailoring of metrics is reviewed.

4.2. Metric Framework Metaphor

A *metaphor*¹ to derive project specific metrics from the available collection within the organization is introduced and it is called **Metric Framework Metaphor**. As a reminder and further understanding of the idea here described, *software framework* (see Section 2.3.2) is an abstraction in which common code providing generic functionality can be selectively overridden or specialized by user code, thus providing specific functionality.

The general idea of the Metric Framework Metaphor is that each metric defined at the organizational level represents an adaptable frame intended to be tailored. The collection of organizational wide defined metrics constitutes the Metric Framework. Project teams will select a set of frames according to their specific goals and will specialize the default functionality by filling the *hot-spots* (or variation points). Variation points represent those parts where the specialists using the Metric Framework tailor each frame to meet specific information needs according to their own projects. Figure 4.1 provides an illustration of the Metric Framework Metaphor. The Metric Framework provides ready-to-use metrics and the user adapts these metrics, which later on are instantiated. The organization is responsible for the framework, whereas the projects make the adaptation. The purpose of the Metric Framework is to:

¹See Section 2.6.

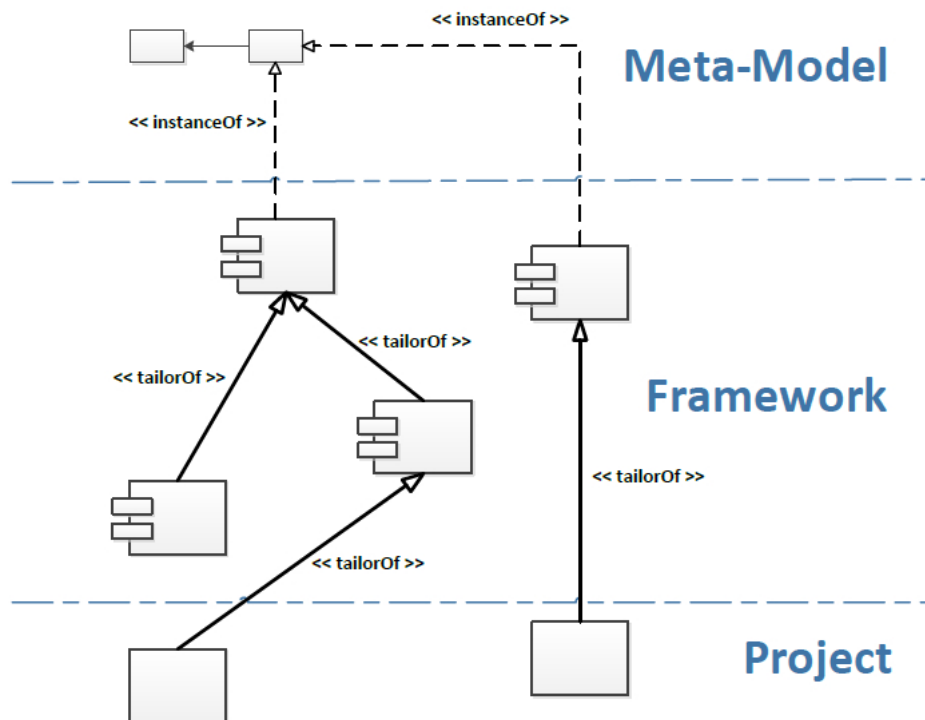


Figure 4.1.: Metric framework metaphor

- Develop generic metric frames that can be tailored by supplying values into the variation points.
- Represent and centralize a structure of the available metrics to be used from the different project teams within the organization.
- Provide the specific points where the tailoring occurs, which are valid for all the project teams.
- Define which collection of metrics from the organization (best practices library) can be selected.
- Implement internal communication and control between the organization and projects regarding metric usage.
- Allow each project to tailor the metrics according to their objectives.

An advantage of the Metric Framework is to promote the reuse of metrics with focus on variation management, which is explained in the next chapter. On the other side, a disadvantage is the time and effort required to get the metric collection into the Metric Framework, specify the points that can be specialized and provide with the options for the specialization. The process of collecting the metrics is an iterative process, where the first iteration requires most of the effort and the iterations that will follow can be

seen as improvements from the Metric Framework.

The Metric Framework represents the collection of metrics in the organization, which belongs to the metric meta-model (see Section 2.2.2) and the metrics at the project level are result of the adjustment from this framework.

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