

Guest Editorial

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Gone navigating without a map?

How to survive in today's competitive environment? Two main actions are the continual renewal of service offerings and the firm lowering of price. To keep up the evolution speed, a default option seems to be introduction of new systems. By introducing new systems, the overlap in functionality will commonly increase. There seems to be a correlation between the length of history for an organization and the complexity of its system portfolio.

This addresses the aspect of growing over several generations of services and systems. It is necessary to maintain *an overall map of the systems to avoid the complexity increase*. This map must also be used to strictly manage system upgrades and when supplementing the system portfolio.

Another argument for having such a map is also observed by any newcomer in the market. The map could actually be used to devise needed functionality or identify any other 'holes' in a current operation and offering. In the same manner, it can also be used for defining business opportunities. Note that such a map is needed even though major parts of the portfolio are outsourced.

Considering a *multi-market operation*, such a map works to *carry over knowledge and experience across different markets*. Market-specific aspects, however, must then also be identified and resolved correspondingly. On the other hand, commonalities can be identified and mutual benefits addressed.

So, without any doubt; *an architecture does provide such a map*. In fact, it provides even more useful information. The architecture does describe the relevant components and how these components are related. Both mandatory and optional components can be included. Moreover, the architecture will reveal any inefficiencies where some components actually do not contribute with any value and could be removed from the flow. Although these aspects seem trivial, they are far from simple to detect in a complex system and larger organization.

The map is commonly referred to as a *reference architecture*. This includes structuring all the components. Different perspectives could still be applied, though, such as a functional architecture, a physical

architecture, a data architecture, and so forth. Characteristics of the architecture are also used in certain cases, such as a layered architecture, a vertically integrated architecture, loosely coupled components, and so forth.

Having devised the reference architecture allows us to more efficiently communicate and evaluate system solutions and evolution. In particular, quite 'interesting' discussions can be observed when the reference is not the same for the partners in the conversation. Misunderstandings would then rather become the rule than the exception.

Taking the reference architecture one step further, we may elaborate a *target architecture*. This would describe what the overall configuration should look like. That is, which are the preferred systems and how should they relate. Comparing the target with the existing system portfolio can be the basis for making an action plan. This could be considered as making a shopping list before going to the shops. Such a list would assist when evaluating the systems to acquire and which roles these should play. Naturally, an alternative approach might be to simply go shopping without the requests in mind and simply sort out the actual goods after returning home. This could, however, become rather expensive or may end up with missing major components and systems unable to speak to each other.

Why do we need architecture(s)? Try to ask anyone involved in planning a system evolution or migration of system portfolio. In view of the numerous options revealed, there is fundamental support in having a common reference. Then, deciding upon the way(s) forward, there is also assistance in defining a common target. Architectures will provide the framework for both of these. So, anyone who has to weave through different offerings and specifications need an architecture understanding, either implicit or explicit. Having no architecture perspective is like stating that one does not know how different components are related. And that is quite a serious confession for anyone.

Experience shows that different *opportunities are revealed during the architecture elaboration*. These opportunities refer to ways of simplifying the system configurations, ways of migrating existing systems, as well as business roles. However, to really reveal the opportunities requires a great deal of smartness

and insight. This also implies applying the proper level of detail. If the level is too high there will be little support for the further work. If the architecture is too detailed the overview could be obfuscated. Hence, an architecture is commonly elaborated in refining steps, each providing further clarifications or giving a different perspective.

A perspective must be chosen according to the purpose of the architecture. For example, in case the purpose is to identify data, reference data architecture should be defined. On the other hand, if functional components are sought, the architecture must address which functions must be present and how these are related. This *Teletronikk* issue includes examples of several of these perspectives.

This magazine issue is divided into three main parts: The *first part* provides a general overview of technical architecture, how the technical aspects are related to other aspects and overall trends. The technology development has implied a need for updating the architecture as well. For example, in case tailored solutions are requested due to complexity, capacity, etc, a so-called vertical integrated solution could be thought of. In recent years, however, there is a heavier weight placed on re-usability and multi-purpose systems. This gives inspiration to horizontal or layered-oriented solutions. Different technical capabilities should be reflected in the architecture in a timely manner in order to take advantage of the corresponding opportunities.

In the *second part*, methodology is presented. In order to define architectures a range of approaches have been applied by various organizations. Some of them are tailored to their purpose, while others more easily can be transferred to different areas. A particular area is the importance of defining an expressive data model.

The *third part* includes several examples of systems and applications that have been designed following specific architecture principles. These principles may vary for the different areas.

At certain irregular intervals any provider faces duties of *transforming the production systems*. How can this be done in a systematic manner without defining appropriate reference and target(s)? The willingness to change in an efficient manner is simply manifesting a way of surviving in today's environment. Everyone has to continually evolve their service offerings and production means. This leads to steadily launching new solutions and offerings that challenge any provider in the market place. The likely challenges

include on-going margin squeeze and agility regarding launching adequate capabilities and requested services. Contributions to innovative services come from various sources corresponding to lowering the threshold for deploying services. As a common reference architecture defines how to re-use modules, it becomes even more crucial in such dynamic market environments.

Commonly, we find that traditional telecom operations have been separated in rather independent units, in particular in terms of organisation units and areas of responsibility. The classical interfaces between such units have been under increasing pressure during the last years. This has in fact led to several of the traditional telecom providers going through a number of re-organization steps. More steps are expected corresponding to further technological development. Defining new areas of responsibility would be much more efficient and precise when a common reference has been defined. Considering the fairly long history that several operators have been through, the list of systems grows correspondingly, placing an even stronger request for reference architecture.

It is fair to say that phasing out systems has been a steady challenge from the early days. One reason for this phenomenon is the inherent risk that comes with phasing out a running system. Commonly every running system implements functions utilized by service portfolios and range of users. Another point is that there are commonly fewer people knowing the finer details of the older systems. A third argument could be that short-term cost gains are not that obvious as effort must be spent on removing and reconfiguring systems. So, the risks undertaken, and costs, might be considered too high. This is, however, resulting in a classical act reaching for long term savings while lowering short term costs.

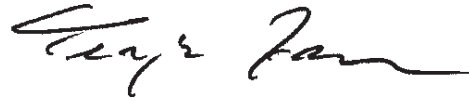
The evolving '2.0 – and even 3.0' trends with increasing *collaboration and contributions distributed on different partners* place even higher pressure on the motivation for a common architecture. In fact, the architecture clarifies interfaces between players allowing for defined interactions and descriptions of capabilities available across the interfaces.

Several markets in the world are going through massive transformations. In the old days, value was delivered to customers physically and services delivered locally. Steadily more value seems to be delivered electronically with services delivered by software applications and generated from any location. These services are often either included in a fixed rate or as a 'pay-as-you-use' model.

One may also see signs that several services are offered similarly to *fast-moving consumer goods*. As a result, the needed agility to act in a dynamic manner grows in intensity. While earlier delivery could be counted in days, we now see expectations of services provided in the range of seconds. This is on the condition that the basic infrastructure is in place, though. The areas of complexity and main challenges may also shift. It falls upon the provider to resolve several of the challenges to maintain agility and level of user expectation.

In all it is hoped that this *Teletronikk* issues will provide you with some samples of the non-trivial discipline of architecture work.

Enjoy your reading!

A handwritten signature in black ink, appearing to read 'Terje Jensen', with a long horizontal flourish extending to the right.

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