Technology Standardisation
Creating consistency in solution architecture

With a diverse portfolio of offerings and technologies – designed to meet a broad range of customer requirements – Fujitsu has established an approach to technology standardisation that drives down costs but, more importantly, allows for consistency in the definition, design and delivery of solutions.

Introduction

Without careful control, the inherent complexity of integrating products and services from a variety of sources can be challenging and costly. In our rapidly evolving world, solution architects and designers are trained to create innovative solutions to problems but, all too often, those solutions involve bespoke elements or unproven technologies that increase risk and drive up the cost of delivery. At the same time, there are pressures to reduce costs and maintain the business benefits – pressures that run completely contrary to the idea of bespoke systems designed to meet each and every customer's needs.

The answer to this conundrum lies in standardisation. By building solutions that integrate well-defined offerings using standard technologies, it is possible to reduce the risk of project and service failure, reduce the cost of project delivery and consequently, to maintain margins whilst providing value for money. Standardisation has other benefits too – by building solutions based on known components, time to market for a new offering or solution may be reduced, customer satisfaction increases (through improved consistency in service delivery) and this, in turn, has positive impacts on brand perception, customer acquisition, and increasing revenue from existing customers.

This paper discusses technology standardisation. There are a number of other elements to solutions that can also benefit from standardisation – for example, processes can be standardised as part of on-going business systems optimisation and delivery, whilst frameworks like the Skills Framework for the Information Age (SFIA) can be adopted for standardisation of the roles performed by people – but this paper is entirely focused on standardising the technology elements of solutions.

Where do we standardise?

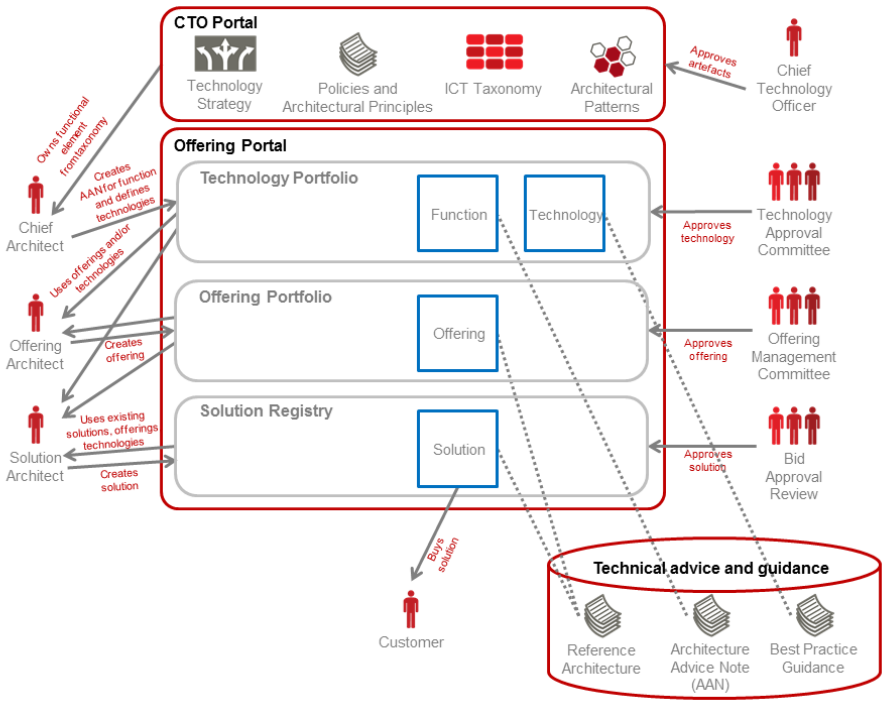
In a complex world of system integration, if Fujitsu only sold standard offerings, there would be gaps where customer requirements could not be met. A little pragmatism is required to understand that standard offerings will need to be integrated – not just with other offerings but with existing systems, and with other technologies used to provide additional business value.

Fujitsu's standardisation approach involves a blend of defined offerings and approved standard technologies, together with a technical advice and guidance model intended to help architects and designers create consistency in their approach to building solutions.

From a technology perspective, Fujitsu's standardisation approach starts with the Chief Technology Officer (CTO), who defines the **technology strategy** and the associated **policies and architectural principles**. Closely aligned with these strategic elements are other artefacts that play crucial roles in creating the technology standardisation:

- The first of these is the **ICT Taxonomy**. As the name suggests, this is a classification system for organising ICT elements. At the top level is the architectural domain (business, application, infrastructure – although other views may be provided on the taxonomy to show, for example, the security, information, or service management architectures). Below that, each architecture is divided into technology domains of related functions, before defining each of these "functional domains" – the high level components used to create a solution (for example, application management tools, web services/REST interface, Unix platform).
- The second artefact consists of **architectural patterns** for re-use (for example in the creation of reference architectures). A pattern can be described as "an idea that has been useful in one practical context and can be useful in others", so it's easy to see how this fits with the concept of re-use. In effect, patterns are considered to be a way of putting building blocks into context; for example, to describe a re-usable solution to a problem. Our building blocks are the functional domains from the ICT Taxonomy, or there may be patterns that are useful from other sources, such as TRIOLE patterns from our colleagues in Japan.

Once approved by the CTO, the technology strategy, policies, ICT taxonomy and architectural principles and patterns are made available for use and communicated via the **CTO Portal** – the first of two portals to consider in our standardisation process. The second is the **Offering Portal**, which contains portfolios of offerings (in effect, Fujitsu's go-to-market propositions), technologies (classified using the ICT taxonomy functions) and solutions (approved and used elsewhere). The contents of each portfolio are approved by the relevant committee with representation at a senior level from across the Fujitsu UK and Ireland business.



Before describing the use of the portfolios, there are some other artefacts to introduce which provide technical advice and guidance for use by architects and designers:

- **Reference architectures** are examples of architectural patterns but are used to either: provide a specific configuration of an offering in order to meet a specific business problem (in order to facilitate similar implementations); or to show how themes that cut across many functional domains (e.g. security, enterprise management) are integrated.
- **Architecture advice notes** (AANs) are created for every functional domain in the application and infrastructure architectures from the ICT taxonomy. Each AAN clearly defines the scope of the function and guides the decisions relating to selection of technology (e.g. the AAN for the Data Persistence platform might describe the circumstances under which an architect should elect to use an Oracle database, a Microsoft SQL Server database, a MySQL database, or a specialist database product to meet a particular need, such as linked data). AANs also identify boundaries (where other functions may need to be used), define standards for use of technology to perform a particular function and deal with variance.
- **Best practice guidance** might take a number of forms but is typically at a more detailed design level for implementation or operation of a particular technology. This guidance might result from Fujitsu's own experience, or from external parties (e.g. software vendors).

It's important to stress that these artefacts are about providing clarity and guidance, rather than re-use, but they are vital to the standardisation journey as they effectively restrict the options to define non-standard solutions.

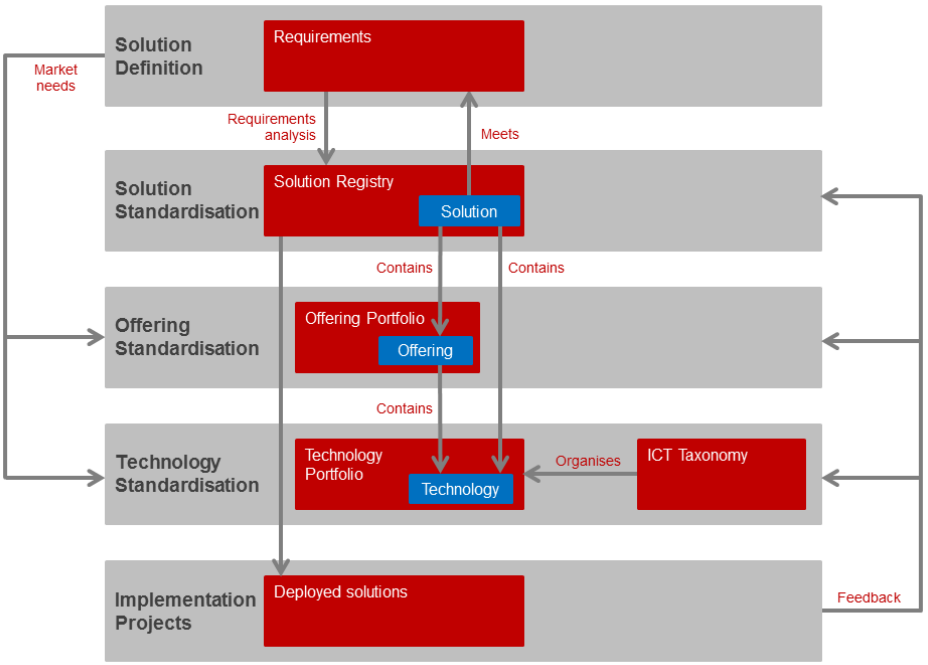
Having defined the various elements of technology standardisation, it's worth considering how these are created in practice:

- Chief Architects (in each service line within Fujitsu's UK and Ireland organisation) each take ownership of the functional domains from the ICT taxonomy, according to their area of responsibility. For each functional domain, the relevant Chief Architect creates an AAN and defines the technologies that are available for use. This information is stored in the technology portfolio.
- Offering Architects create offerings that meet the needs of Fujitsu's chosen markets, using a combination of existing offerings and standard technologies (together with the appropriate service elements). Information about the offerings (including dependencies and roadmaps) is stored in the offering portfolio.
- Solution Architects re-use existing solutions, offerings and, where necessary, fill any gaps using standard technologies to create new solutions that meet specific customer requirements. Each solution is registered in the solution registry as part of the solution governance process, which also allows reuse of standard offerings and technologies to be tracked.

How does this fit together?

Up to this point, this paper has discussed the various layers of abstraction that allow technology standardisation to become reality. It is just as important to consider how these layers interact from an enterprise architecture perspective. In its TOGAF methodology, The Open Group describes the concept of an "enterprise continuum" that is used to take generic solutions and configure them in order to support the requirements of an individual organisation. The diagram on the next page shows a similar concept from the perspective of Fujitsu's standardisation initiatives, with solution standardisation making use of offering standardisation, which also makes use of technology standardisation.

Starting out with **solution definition**, requirements are analysed, both from the perspective of meeting a specific customer requirement (e.g. responding to a bid) and in identifying market needs to feed into offering development (e.g. the requirement for a business application store) and technology selection (e.g. an open source alternative solution is needed).



Solution standardisation is the act of creating solutions that meet customer requirements. Each solution registered in the solution registry contains one or more standard offerings and/or one or more standard technologies, with additional service management elements as required (the panel at the side of this page describes the avoidance of unnecessary, complex and costly duplication of service elements).

As previously described, the details of offerings are contained in the offering portfolio with assets that outline the offering's characteristics and advise on its use at all stages in the offering lifecycle. The provision of a portal that is the "single source of the truth" for all offerings is a key element of **offering standardisation**.

Technology standardisation makes use of the technology portfolio, which classifies technologies using various attributes but, most significantly, they are organised by the functions described in the ICT taxonomy. Like the offering portfolio, the technology portfolio is a "single source of the truth" but is focused on technology elements rather than offerings that may be sold directly to the market.

Eventually, solutions are deployed into service through **implementation projects** and the feedback from experience of deploying and delivering a solution (through to its demise) is passed back into the Solution, Offering and Technology standardisation. This feedback is an input as new solutions are created (to learn from past experiences), new offerings are created (and redundant offerings discontinued) and new technologies are selected (for example avoiding the use of technologies that have proven problematic in the past, or for which there are inadequate support arrangements).

Summary

In this paper, we have seen how Fujitsu's UK and Ireland region approaches technology standardisation to reduce costs and drive profitability whilst improving service delivery and customer perception of our brand. We've seen: how standardisation is governed at various layers with each layer making use of the layers below; how information is used to advise and guide architects and designers in the formation of customer solutions; how architects use the ICT taxonomy functions to create modular offerings and solutions, applying service management only at an appropriate level; and finally how standardisation works as part of a continuous loop of generalisation and customisation.

Service management and technology standardisation

Avoiding unnecessary duplication

One of the challenges when creating a solution from multiple levels of reusable components is that of service management.

- One option is to wrap the service around the complete solution but this is effectively a bespoke service built around standard components – which creates an undesirable paradox, as well as increasing the risks associated with the solution.
- An alternative is to create a service wrap for each component and then to provide an additional layer on top – but this creates additional costs and inefficiencies through the application of multiple layers of service management.
- A more desirable approach is to map accounts, solutions, offerings and technologies against a service integration and management (SIAM) taxonomy and to define at which point the service management elements should be applied.

The third approach provides the best of both worlds (avoiding overly risky or expensive alternatives) and is an example of an architectural pattern to define where the service management elements are applied. This is also the current preferred industry approach taken across both public and private sector organisations.

About the author

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Mark Wilson is an architect working in Fujitsu's UK and Ireland Office of the CTO, providing thought leadership, both internally and to help customers shape business and technology strategy, whilst leading a programme to implement a number of technology standardisation initiatives across Fujitsu's UK and Ireland business. He has 19 years' experience of working in the IT industry, 14 of which have been with Fujitsu. Mark has a background in leading large IT infrastructure projects with customers in the UK, mainland Europe and Australia and also has a degree in Computer Studies from the University of Glamorgan. Mark may be found commenting on a variety of technology topics on Twitter @markwilsonit.

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