Service Catalogue and Service Sourcing

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Abstract: Service management organizations and processes increasingly become standardized and even certified according to ISO/IEC 20000-1, creating detailed knowledge of the IT services rendered. The description of the services in a service catalogue needs to be enhanced beyond the components of IT services to include all contributing organizational units and business processes. An integrated model of the service catalogue is developed, visualized in a novel way and exemplarily applied to a large service provider. Finally, its usage for balanced sourcing decisions is discussed.

1 Service Management as Part of the Service

The provisioning of complex and cost efficient services almost always involves one or several integrated IT solutions – which in turn render IT services for internal or external customers. In the example of Toll Collect GmbH, the business services for the German electronic toll for heavy trucks involve more than 50 IT services ranging from standard IT applications (e.g. central billing processes, customer relationship management, and document management) to highly service-specific customer processes. The service levels are established according to the customers' requirements and typically involve availability, performance and failure rate as metrics. As a result the most critical services are operated 24 by 7 in a fault tolerant environment consisting of several hundred servers regularly communicating with more than 650.000 units in the field.

Since late 2005 it is possible to certify the management of IT services, i.e. the organization and its processes according to the international standard ISO/IEC 20000 [ISO05]. The certification of a service management organization ensures the implementation of processes covering all requirements defined in the ISO/IEC 20000 norm – including different perspectives of customers, services, technology, finances and

suppliers. As a result a certified service management organization has a working definition and knowledge of services and corresponding technical configurations – the service catalogue and the configuration management database (CMDB).

However, the separation of services and the organization needed for rendering the services is an artificial simplification. It must be assumed that any large-scale service includes the behaviour of the organizations and people involved in the usage, operations and development of the service systems (therefore corresponding to an E-type system [Leh80]). Non-technical aspects of the service e.g. customer satisfaction, usability, time-to-market for new features and operational quality are added to the service level agreements on an equal footing. The behaviour of the service management processes and organizations becomes itself part of the service, even if it is not specified in the service level agreement [Leh05].

2 Service Architecture

The service provider organization needs a clear description of the service to be rendered for a customer including specific quality criteria regarding the service provisioning processes. This is typically formalized in a contractual document called service level agreement (SLA) [OG07a]. The SLA document represents the interface between customer and service provider and thus captures the customers' expectations as well as the service providers' degree of freedom, which enables both parties to create a cost-effective service supply chain. This in turn leverages the core competencies of the participating service provider and service customer organisations ([Fit08], [Lov10]).

The SLA captures the customers' perspective of the major service features and criteria. Depending on the kind of service, different descriptions and levels of detail are appropriate:

- The most complex – and also highest-value type of service is to offer complete business processes to the customer e.g. financial transactions or software development and testing. In this case the SLA focuses on process-specific parameters, the service provider is free to choose the internal service operations independently, e.g. the technology stack, the service management processes and organizations. The same business process can be offered as a service to other customers, allowing an increase in process efficiency by a factor of ten [Ham01].

- In many cases the responsibility for business processes remains with the customer to a much higher degree, yet some or all supporting IT applications as well as partial business or support processes reside with the service provider. The responsibility for aligning business processes to IT services (giving rise to the discipline "IT business alignment") remains with the customer. In this case the SLA is not able to capture end to end customer business process specific requirements – it has to "fall back" to technical parameters of the IT applications e.g. availability, recovery time or transaction rate. The service

provider still has the choice of appropriate technologies, processes and organizations involved in the service provision. Consequently the technical description should not be part of the SLA but rather make up the internal service description – the service catalogue. Gradually even more simple services appear and can be used as service components within more complex service, e.g. technology driven commodity-like services (storage, data networks, and virtual servers).

Of course both models can co-exist within a service sourcing relationship e.g. providing the software development and testing processes as well as the application operations.

2.1 Configuration Management Database

Regardless of the kind of service provided the service provider needs an accurate description of all contributing parts necessary for the successful service operation. The ISO/IEC 20000 ITIL-based framework establishes a configuration management database (CMDB) as the repository to store configuration items and their respective logical and physical relationships. Even with these established best practices, only 41% of German companies with more than 1000 employees currently have a working CMDB [ITS10] – the complexity of the IT is the major driver for introducing a CMDB.

The CMDB as a data repository stores configuration items vital for most of the service management processes – most notably the change and incident management processes [OG07b]. Therefore it addresses the technology operated for the services provided (Fig. 1) – giving a detailed technical mapping of the physical infrastructure (e.g. data networks, hardware and data centre infrastructure) as well as logical elements (e.g. virtual resources, storage units, databases and applications). A rather abstract part of the CMDB can also store a description of the information architecture i.e. the data items and data models used across applications – e.g. facilitating security analysis based on data protection requirements.

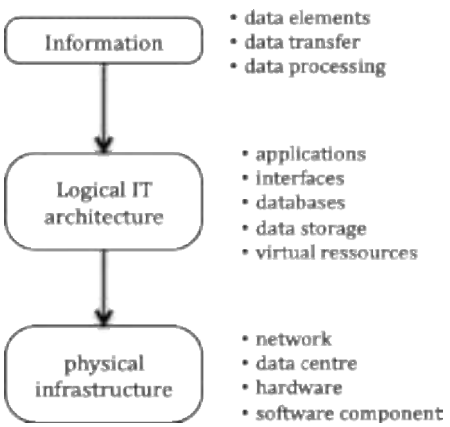

Figure 1: The CMDB model

2.2 Service Catalogue

The SLAs describe the customers' perspective as the starting point for the service provider to enhance the service descriptions for the design, implementation and operation of the appropriate technical systems using the providers' service management processes and organizations – usually including suppliers for parts of the service. The service catalogue is the major enabler within the service providers' organization and therefore needs to enhance the SLAs by service specific solution descriptions e.g. the functional requirements and architecture of the IT services (see fig. 2). Based on the solution descriptions the service provider decomposes the service into its service components. Each service component is in itself a service that is completely rendered by a single responsible organization. The service catalogue is therefore essentially the service configuration management database storing all service components and their respective relationships. The service catalogue transcends the CMDB by including all types of services: business process services (e.g. service levels for traditional service management processes), application services and typically a large number of technical infrastructure services.

In the example of the central billing processing application at Toll Collect GmbH more than 200 service components are needed to provide the service to internal and external customers. Each type of service component is thereby accompanied by a standardized description including

- a functional description
- the service levels (parameters)
- interfaces with other compatible service components
- organizational, contractual and financial details.

The service components as simple "service building blocks" within the service catalogue connect the SLAs to the component specification, i. e. either to the technical elements within the CMDB or further underpinning contracts and operational level agreements.

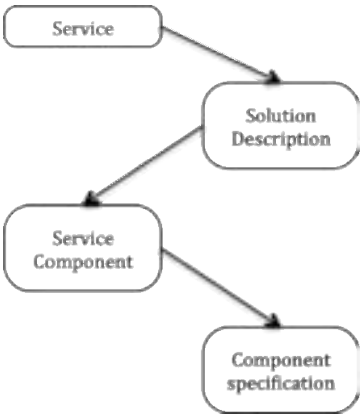

Figure 2: The service catalogue

3 Service Cost Mapping

Based on the service components and their relationships within the service catalogue and their relationships with the contributing configuration items in the CMDB, the service catalogue can give a complete picture of the service landscape.

Enhancing all elements of the service catalogue and the CMDB to also carry financial information allows the accurate calculation of the costs associated with a service (or a service component). However, the data set involved may not allow a simple interpretation since even small services can involve several hundred of cost contributions. An intuitive visualisation of this data can be an aid for the interpretation and as such of the management of the service. Such a visualisation of the cost contributions may help to identify relevant and major types of cost as well as the cost trends. We propose to use sunburst diagrams [Sta00] to give a compact view of services involving hundreds to thousands of cost contributions.

In the Toll Collect example sunburst diagrams are used to navigate service costs (fig. 3). Major cost contributions can immediately be spotted and form the input for further sourcing discussions. Fig. 3 shows the hierarchical representation of all cost contributions to the operations of a large-scale financial service. The innermost circle represents the sum of all costs as indicated by the adjacent slices. In a sense a service component is drawn as a slice with its opening angle proportional to the associated costs (with 360° opening angle corresponding to 100% of the cost). These associated costs can either be caused directly by the service component or collected from other related down-stream service components. The shading indicates different cost types.

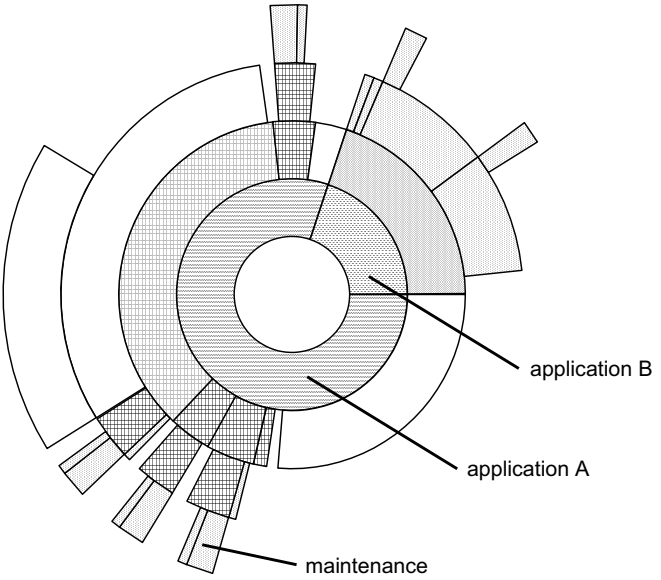

Figure 3: Sunburst visualisation of service costs

In the example the various contributions of maintenance cost are indicated and readily allow putting this cost type into proportion. This kind of visualisation has enabled the analysis and a considerable reduction of costs for service components by aiding to focus on relevant yet changeable and variable cost types.

4 Service Component Sourcing

Based on the service catalogue and the service costs it is possible to systematically derive the right sourcing decisions aligned to the customer services and the service providers' service management processes and organizations.

The first step is to identify the financially relevant service components (or types thereof) – ranging from business processes to technical commodities.

In the Toll Collect example we supplement the service cost maps by treemaps [Shn92] displaying the costs associated with certain types of service components (see fig. 4), e.g. distinguishing between highly standardized service components (networks, servers, databases, applications), non-standardized service components (custom applications and equipment), business processes (e.g. software development and testing processes) and temporary services required by projects.

In treemaps the whole drawing area carries information whereas in the sunburst diagrams the information is primarily displayed along the circumference making limited

use of the available area. As a consequence of the higher information density, treemaps can include more details yet remain comprehensible at a glance.

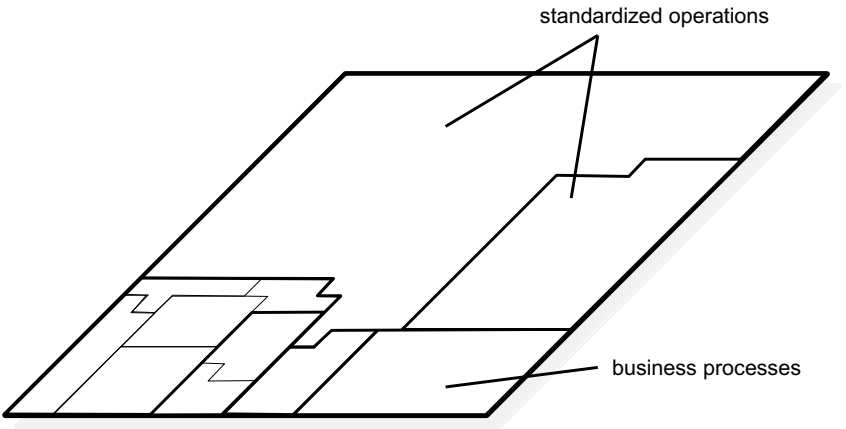

Figure 4: Treemap visualisation of service costs across the service catalogue

Once the relevant service components have been identified, the appropriate sourcing can be discussed using the customisation-specificity map [PJG09] which applies seamlessly to technical, organisational and process-driven service components.

5 Conclusion

The delivery of services – even largely IT-based services – goes beyond the standardized ISO/IEC 20000 service management to include business processes and organizational features. The service provider can and must decide upon many aspects of the service independently from the customer yet fulfil the service level agreement.

An integrated, accurate and complete overview over all services and their internal working details enables the service provider to identify and address the sourcing in a coordinated way using the established customisation-specificity maps. The service catalogue as the principal mapping between SLAs, technical configurations, organizational and process-driven service components has been shown to enable the sourcing decisions based on sound financial reasons. This can be facilitated by appropriate visualization techniques such as sunburst and treemap diagrams.

List of Literature

[Fit08] James A. Fitzsimmons, Mona J. Fitzsimmons: Service Management: Operations, Strategy, Information Technology. Austin 2008.

[Ham01] Hammer, M.; Champy, J.: Reengineering the corporation. New York, 2001.

[ISO05] ISO/IEC 20000-1:2005, Information technology -- Service management – Part 1: Specification.

[ITS10] itSMF, Marktstudie Configuration Management 2010, itSMF Deutschland, 2010.
[Leh80] Lehman, M., M.: Programs, Life Cycles and Laws of Software Evolution. In: Proceedings IEEE, Special Issue on Software Engineering, vol. 68, no. 9, Sept. 1980, pp. 1060-1076.
[Leh05] Lehman, M., M.: The Role and Impact of Assumptions in Software Development, Maintenance and Evolution. Proceedings of the 2005 IEEE Workshop on Software Evolvability. 2005.
[Lov10] Lovelock, C., H.; Wirtz, J.: Services Marketing. People, Technology, Strategy, New Jersey, 2010.
[OG07a] Office of Government Commerce (OGC): ITIL – Service Strategy, Norwich, 2007.
[OG07b] Office of Government Commerce (OGC): ITIL – Service Operation, Norwich, 2007.
[Sta00] Stasko, J.; Catrambone, R.; Guzdial, M.; McDonald, K.: Int. J. Human-Computer Studies 53, p. 663, 2000; M. C. Chuah, Dynamic aggregation with circular visual designs, Proceedings of the IEEE Information Visualization Symposium, p. 35ff, Raleigh Durham, NC, October 1998; K. Andrews & H. Heidegger, Information slices: Visualising and exploring large hierarchies using cascading, semi-circular discs, Proceedings of the IEEE Information Visualization Symposium, Late Breaking Hot Topics, p. 9ff, Raleigh Durham, NC, October 1998.
[PJG09] Pfitzinger, B.; Jestädt, T.; Gründer, T.: Sourcing decisions and IT Service Management. In: Klaus-Peter Fähnrich, Rainer Alt, Bogdan Franczyk (ed.): Practitioner Track – International Symposium on Services Science (ISSS'09). Leipziger Beiträge zur Informatik: Band XVI. Leipzig, 2009.
[Shn92] Shneiderman, B.: Tree visualization with tree-maps: a 2-d space-filling approach. In: ACM Transactions on Computer Graphics, 11, 1992, p. 92.