Chapter 1

A Business Perspective on Non-Functional Properties for Services

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ABSTRACT

This chapter provides an overview from a business perspective of some of the important non-functional properties of services, such as availability, performance, and security. It discusses the typical metrics for these non-functional properties which are used in service level agreements to measure and report how well a service is meeting customer expectations. It briefly discusses cost considerations for service providers and consumers, as some levels of service are expensive to attain. The goal is to provide the reader with an understanding of these non-functional properties, their measures and cost implications, and related interesting research opportunities.

INTRODUCTION

In the context of this chapter, a *service* is defined as a collection of people, processes, and technology which provides some business value. The organization or individual providing the service is the *service provider*. The organizations, individuals, and/or services using the service are the *service consumers*. As shown in Figure 1, the service consumer may also be a service provider, and the service provider (and a service instance) may also be a service consumer. A service must have some *service front-end interface* by which the service consumers use the service. This interface can include interfaces for people such as web sites, telephones, email, postal mail, and face-to-face conversations, as well as interfaces for IT systems such as SOAP, REST, EDI, and proprietary APIs or communication channels. All such communication channels are represented in Figure 1 as solid black lines. A service may have a *service back-end interface* by which elements of the service consume other services and/or interact with people. The consumed services may be *internal services* (delivered by the service provider) or *external services* (delivered by other service

Figure 1. Service ecosystem
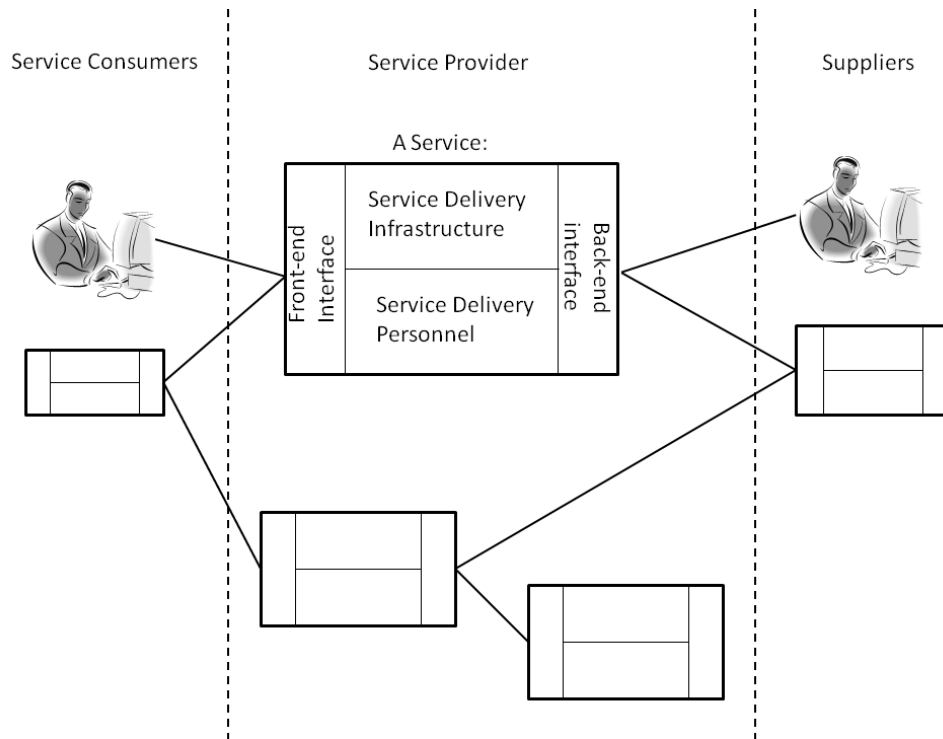
providers). A service must have some *service delivery personnel.* Depending on the nature of the service, these personnel can directly provide the service themselves, and/or they may operate the *service delivery infrastructure.* The service delivery infrastructure helps to provide the service and/or support the service delivery personnel. This chapter focuses mainly on *IT-based services*; that is, services which include some amount of service delivery infrastructure in addition to the service delivery personnel. The service delivery infrastructure for IT-based services typically includes the datacenters, software, servers, storage systems, network equipment, and other IT systems which provide the service in concert with the service delivery personnel. Many of the non-functional properties can be applied to any type of service. These terms will be used throughout the chapter.

The IT industry is undergoing significant changes in the way critical parts of the service delivery infrastructure, such as datacenters, are

evolving. This is similar to changes which happened over 100 years ago during the industrial revolution. When electricity was first used to power manufacturing and other industrial processes, many companies ran their own electricity generation facilities onsite. As the technology matured, some companies specialized in the operation of electricity generation facilities and sent the electricity to a broad base of customers using power transmission lines. Soon very few companies bothered to construct and operate their own electricity generation facilities. Very large datacenters gain significant economies of scale but are very expensive to construct, so a small number of companies are building very large datacenters and selling various services from those datacenters to a broad base of customers. The services range from low-level "Infrastructure as a Service" offerings to various business capabilities provided as a service. As the industry matures, even mission critical business capabili-

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