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ABSTRACT

With businesses becoming more and more dependent on IT services, business operations are highly depending on the stability of IT services, and the predictability of IT service performance. The Service Level Agreement (SLA) is a core document that prescribes service performance over time. The Service Level Management (SLM) function designs the SLA and uses the SLA for defining the terms of inter- and intra-firm service provision. SLAs are a procedural IT governance mechanism that moderates business-IT alignment. Consequently, SLAs are an essential tool for managing IT customers' expectations of IT performance and value. Firms often use one standardized SLA design for all IT services included in their portfolio. Research has further contributed to the development of standardized SLAs. Assuming that IT service performance varies across services, we must, however, ask how those performance patterns vary across IT services. This discussion adds to our understanding of critical design requirements for service performance definitions and metrics. Both performance definitions and metrics are the core element of every SLA. The objectives of this research are to test if IT services have varying performance patterns, and if so, how IT service design characteristics impact those performance patterns. We hypothesize that IT services perform contingent on IT service design. Contingency factors include technical, process, and human resources characteristics. Through a case study approach, we analyzed quantitative and qualitative IT service data for one year. The results of this study are a classification of performance patterns.

We discuss the managerial implications of performance patterns and present metrics for each pattern that can be used in SLA design.

INTRODUCTION

With businesses becoming more and more dependent on ICT services, service level agreements (SLAs) are a valuable document that prescribes service performance. An SLA is a contract between the IT service provider and the business customer receiving the service. The SLA is negotiated by IT and business representatives and the negotiated agreement acts as a baseline for business-IT alignment. The SLA helps demonstrate the IT value by identifying the service responsibilities of the IT organization and performance expectations of the business. Most organizations rely on ICT services for efficient and effective information processing, or for achieving competitive advantage. Undesired ICT service performance changes disrupt business operations negatively or result in systemic IT business non-alignment. Examples of consequences from undesired ICT service levels are that the IT service does not work, the IT service does work, but works incorrectly or not as intended, IT service works at the wrong time and the IT service works too slow.

Scholars have researched the role of SLAs in firms from different perspectives, and no clear consensus exists whether SLAs are a governance or management concept. Many scholars see SLAs as an IT governance mechanism. Peterson, 2004, first introduced the SLA as a procedural governance mechanism that formalizes the degree to which IT decision-making follows specific rules and standard procedures [1]. In this article, we will use the IT Governance Institute's definition stating that "*IT governance is the responsibility of the Board of Directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategy*

and objectives [2]." According to this definition, IT governance focusses mainly on achieving business-IT alignment. De Haes and Van Grimbergen, 2004, argue that IT management focuses on the effective provision of IT services, while IT governance focuses on the bigger picture of prescribing the desired IT-business performance [3]. Other scholars associate the SLA with the IT service management function. The IT service management best-practice framework ITIL even allocates the SLA under the control of the operational service management process [4].

The SLA is a widely known contact, but it is not always clear how the individual design elements used in SLAs act as an effective governance mechanism for IT services. The design elements of the SLA are manifold, and the contract partners decide on the elements. Standard SLAs include a service description, responsibilities, operational IT service parameters, service level goals, service improvement goals, pricing, performance incentives, penalties, performance reporting, signoffs or SLA revision cycle [5]–[7]. A study by Weill and Ross, 2004, found that SLAs are a widely-used IT governance mechanism in firms [8]. However, CIOs ranked the effectiveness of certain very important SLA design elements, such as the pricing and IT value tracking mechanisms as very low [8]. The high relevance of SLAs paired with the concurrent low effectiveness of the SLA design elements calls for in-depth research on how to improve the SLAs design elements. By understanding the mechanisms behind the individual design elements and their impact on SLA performance, practitioners and firms will be enabled to use the SLA as a more effective governance mechanism.

The research on SLA design is extensive. The literature comprises the design of SLAs for specific service types (Web services, Cloud-based ICT services, SaaS services,…), service relationships (inter-firm and intra firm SLA contracts), SLA parties (corporate-level, customer-level, service level) [7]. The governance frameworks such as ITIL and COBIT cover IT incident management and SLA design [4]. The core managerial challenge of SLA design is the definition of service performance (defined as the changes in the service level over time), and the calculation and

measurements of the service level. The service level management (SLM) process is a core IT process concerned with the performance management of ICT services. The SLM process constitutes the design of service level agreements (SLAs), and the monitoring, reporting, and improvement of service level performance.

The object of the SLA is the ICT service, and consequently, the design of SLA highly depends on the ICT service definition used by firms. Scholars have used the ICT service definition differently and for different purposes. For the context of SLA management, we would like to introduce three service definitions:

- **Service as exchange or value co-creation:** Service is an exchange of value, and hence is co-created. This is the basic idea of service-dominant logic [9]. This service definition focuses on defining the value of a service/product that IT delivers to the business.

- **Service as a work system:** Every service system is a work system, i.e., a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific product/services for specific internal/external customers [10]. This service definition focuses on the (architectural) elements that implement the IT service.

- **Work system life cycle model:** The IT service evolves over time and defines the architectural boundaries of an information system, and IT processes and resources needed to design, run, change, or retire said information system [10]. The service definition includes a dynamic component that varies over time. The service level is a dynamic characteristic that equals dynamic service performance over time.

Those three service definitions and viewpoints have a different consequence on the required governance of services. Furthermore, depending on the chosen definition of a service, the SLA has to include different design elements describing the service characteristics. We hypothesize that service performance is contingent on the ICT service design including technical, process, and human resources characteristics.

The following table summarizes the impact of the different service characteristics on SLA design elements, and the resulting measurable ICT service performance patterns:

Service characteristics	SLA Design Elements	Performance Patterns
Service value	• Service description • Service level goals • Pricing • Performance incentives • Penalties	• Initial service level • Business/IT alignment • Strategic performance of the IT service

Service system	• Technical service components
	  ○ Data & Information
	  ○ Systems & Applications
	  ○ Network & Infrastructure
	• IT processes
	• Resources
		• Specifications of technical components
		• Configuration of technical components
		• Operational level agreements
		• Procedures

Service life cycle	• Service improvement goals • Dynamic service level over time	• IT service resilience • Dynamic service level • Lifecycle parameters

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