

Dobmeier, Mirjam

Article

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Understanding and Managing Service Productivity – A Literature Review

Mirjam Dobmeier

Abstract: Managers in service industries aim to achieve high efficiency and high quality at the same time to be profitable. This dual emphasis might lead to a trade-off as a focus on efficiency often results in decreasing service quality and vice versa. Even as this trade-off is generally acknowledged, research on service performance measurement often focuses only on either operational efficiency or service quality. A research stream that deals with the problem of achieving both efficiency and effectiveness is service productivity. This article gives a review on how service productivity is conceptually defined and empirically analyzed. The objective is to get a finer-grained understanding on service productivity, especially on how efficiency and effectiveness are interrelated and which and how antecedents affect service productivity. In doing so, several insights on how to manage service productivity are given and several implications for further research are examined.

Keywords: Service Productivity · Service Performance · Service Efficiency · Service Effectiveness

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M. Dobmeier

Catholic University of Eichstaett-Ingolstadt, Ingolstadt, Germany
e-mail: Mirjam.Dobmeier@ku.de

Introduction

Peter Drucker declares raising the productivity of knowledge and service workers to be “the greatest challenge facing managers in the developed countries of the world” (Drucker 1991, p. 69). 25 years later, managerial practice and academic research still are at an early stage in terms of understanding and managing productivity in a service context (Grönroos & Ojasalo 2004; Rust & Huang 2012). Services inherently (Parasuraman et al. 1985) demand a more holistic definition of productivity than goods (Grönroos & Ojasalo 2004; Johnston & Jones 2004; Rust & Huang 2012; Vuorinen et al. 1998). More precisely, service productivity has to be thought of as a totally different concept than productivity. Research has proven that productivity in a service context is characterized by an interrelatedness of efficiency and effectiveness. This linkage between efficiency and effectiveness might lead to a trade-off in such a way that a focus on downsizing backfires, for example in form of decreased customer satisfaction (Anderson et al. 1997; Homburg et al. 2012).

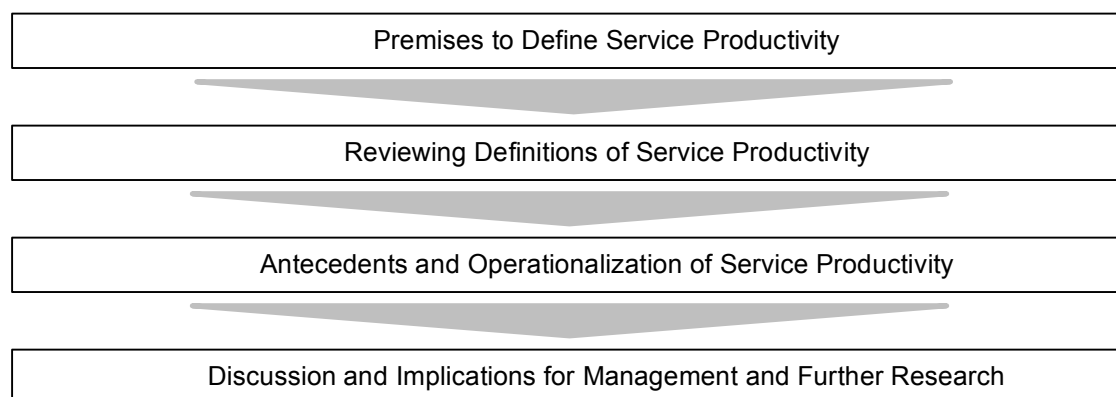
This trade-off is more likely to appear in a service context than in manufacturing because services often are very personnel intensive and customized to suit heterogeneous needs (Anderson et al. 1997). As a consequence, service managers have to deal with two conflicting strategic goals: On the one hand they need to meet the customer’s expectations of service quality, while on the other hand they simultaneously need to meet the firm’s internal efficiency objectives (Marinova et al. 2008). Hereby, the inherent characteristics of services (i.e., inseparability, heterogeneity, and intangibility) make an evaluation of service outcomes and service inputs more difficult (Grönroos & Ojasalo 2004; Parasuraman et al. 1985). Research proves that solely focusing on quality does not guarantee economic success (Rust et al. 1995), and a single-minded pursuit of satisfaction and quality might even lead to overspending (Rust et al. 1995; Rust et al. 2002). Yet focusing on efficiency only will not lead to success either, as a management focus on service efficiency (e.g., through standardization of services) will result in decreasing service quality and thus in lower customer satisfaction (Anderson et al. 1997; Grönroos & Ojasalo 2004; Rust & Huang 2012). This enforces the need for research on cost-benefit relations in service delivery. Given the importance of quality and customer satisfaction as well as the increasing competitiveness in markets, there is a need for research to help managers finding the right balance between a firm’s efforts to be efficient and effective in delivering services (Anderson et al. 1997; Filiatrault et al. 1996; Rust et al. 1995; Rust et al. 2002).

An emerging field of research concerning cost-benefit relations in service delivery concerns service productivity. Many researchers have devoted considerable attention to developing and testing models for managing service productivity (e.g., Brown & Dev 2000; Grönroos & Ojasalo 2004; Marinova et al. 2008; Rust & Huang 2012; Singh 2000; Xue & Harker 2002). Although interest in research on service productivity grows, the literature to date lacks a generally accepted definition of service productivity as the basis for empirical research. Increasingly, research and managerial practice demand a finer-grained understanding of service productivity in order to derive tools to manage service productivity. Therefore, a literature overview of how service productivity can be

defined and operationalized, and which antecedents drive service productivity proves worthwhile from a managerial and academic perspective (Sahay 2005).

To address these research gaps, this paper reviews the current academic literature on how to define and manage service productivity. After giving a short introduction in the methodology of the review process, this literature review reveals the current state of research on service productivity and contributes to this particular field as well as to managerial practice in service firms in several ways: First, this article examines the differences between productivity and service productivity based on the inherent characteristics of services (Parasuraman et al. 1985). This is worthwhile in order to clarify the service-specific requirements that a definition of service productivity must meet; identify antecedents of service productivity; and gain further insights into how service productivity can be managed. Based on the requirements thus identified, in a second step definitions of service productivity are discussed in order to evaluate their utility. Third, this paper provides an overview of the antecedents and operationalization of service productivity. This enhances the existing literature on service productivity, which mainly focuses on a single aspect, such as human resource management or process management, but does not cover a wide variety of antecedents. Beyond, the review on how service productivity is operationalized shows that there is merely research that really analyzes a service-specific productivity concept. Knowing the antecedents of service productivity and how to operationalize it can help service managers to develop management systems that can be both efficient and effective. By illustrating all these aspects of service productivity, this literature review ultimately yields suggestions for future research and practice. The organization of the paper is modeled in Figure 1.

Fig. 1: Structure of this Paper



Methodology

To identify relevant academic articles that conceptually and empirically analyze and discuss service productivity a systematic review was conducted. The EBSCO/Business Source Premier electronic database was screened for relevant academic articles published between 1980 and 2015 containing terms like “service

productivity”, “service efficiency”, “service effectiveness”, and “service performance”. In this step manifold articles could be identified. The EBSCO/Business Source Premier electronic database further provides function to show the references cited in the identified articles (“Cited References”) as well as a list with articles that cited the particular article (“Times Cited in this Database”). These functions were used to identify further articles. Following this approach is widely accepted and recommended in literature (e.g., Denyer & Tranfield 2009; Hogreve & Gremler 2009). Overall, 137 articles were identified based on this approach.

To analyze the current state of research on service productivity a two-step approach was followed. First, among all articles those were identified that explicitly aim to define service productivity. These articles were basically conceptual (i.e., Grönroos & Ojasalo 2004; Johnston & Jones 2004; Vuorinen et al. 1998). In reviewing these articles an evaluation of the concepts of service productivity most empirical articles refer to is given. In a second step, in order to examine the current state of research on antecedents and outcomes of service productivity all articles identified during the screening process were carefully reviewed to decide if they added to the research stream of service productivity, and if the research conducted was empirical. Thus, articles that deal with service productivity in a conceptual way were excluded in order to review empirically proved antecedents of service productivity only. Furthermore, articles that explicitly focused on service process management only (e.g., in terms of applying lean management principles to services) were excluded as those articles do not directly add to the research stream of service productivity. To manage this process the articles have been reviewed by two independent reviewers. Finally, after this detailed purification process there remained 43 articles addressing the objective of this paper, and 13 articles that empirically analyze how to manage antecedents of service productivity.

Premises to Define Service Productivity

In the literature there is an ongoing discussion about how investments and outcomes of service productivity can be measured appropriately; results of the empirical research are mixed at best. A reason why research on service productivity is still at such an early stage might be a lack of clarity about what service productivity actually means. Research often uses the terms efficiency, effectiveness, and productivity synonymously to describe the relation of quality and costs (Armistead et al. 1993; Filiatrault et al. 1996; Johnston & Jones 2004). Yet, productivity in the service domain is characterized by the interrelatedness, and often the trade-off, of efficiency and effectiveness. This precludes the synonymous use of efficiency and effectiveness and further clarifies the need to define service productivity as a different concept than productivity (Anderson et al. 1997; Filiatrault et al. 1996; Grönroos & Ojasalo 2004; Rust & Huang 2012; Vuorinen et al. 1998). Given that a service-specific understanding and conceptualization of productivity needs to cover efficiency as well as effectiveness, it is important to distinguish the terms.

- Efficiency describes how well resources are being used or converted internally. Optimal efficiency is reached if the resources used generate maximum output (Armistead et al. 1993; Buntz 1981; Grönroos & Ojasalo 2004; Johnston & Jones 2004; Nachum 1999a).
- Effectiveness is generally defined as the degree to which results meet the required standards, objectives, or corporate goals. It is a combination of output indicators with indices of quality (Armistead et al. 1993; Buntz 1981; Johnston & Jones 2004). Therefore, effectiveness cannot measure productivity, but is to be understood as the evaluation of how well objectives are met (Buntz 1981). In this paper effectiveness is used to describe the perceived service quality and customer value (Anitsal & Schumann 2007; Filiatrault et al. 1996; Grönroos & Ojasalo 2004).

Literature explains the interrelatedness of efficiency and effectiveness and how to manage the interrelatedness in two different ways (Mittal et al. 2005; Rust et al. 2002). On the one side, efficiency and effectiveness are considered to be complementary. According to this revenue-driven perspective, costs of improving service quality do pay off as high quality reduces service failures and therefore efforts of reworking or costs of making future transactions. Consequently, firms with a revenue emphasis should focus on effectiveness via improvements in service quality in order to increase customer satisfaction. This might even lead to a price premium (Anderson et al. 1997; Mittal et al. 2005; Reichheld & Sasser 1990; Rust et al. 1995; Rust et al. 2002). Yet, literature proves that a single-minded focus on quality might lead to suboptimal economic results when firms overinvest in service quality (Rust et al. 1995). Accordingly, another perspective focuses on efficiency instead of service quality (i.e., effectiveness). This cost-driven perspective considers efficiency and effectiveness to trade-off: Investments in service quality will increase costs and consequently decrease efficiency. Vice versa, investments in efficiency do decrease service quality leading to decreasing customer satisfaction and lower (re-) purchase intentions (Anderson et al. 1997; Mittal et al. 2005; Reichheld & Sasser 1990; Rust et al. 1995; Rust et al. 2002).

Although this trade-off is not service-specific, it is more likely to appear in a service context due to several reasons: The trade-off appears especially if customer satisfaction depends on customization; if it is difficult to raise service quality; if customer co-production is high; if the product or service is highly intangible; and if the product or service is personnel intensive and customized to suit heterogeneous needs. As many services are to be determined by the characteristics named above, the trade-off between efficiency and effectiveness is more likely to appear for services than for goods. To be more concrete, the heterogeneity of services results in a greater role of the single service employee in determining the service outcome. Consequently, efforts to standardize inputs as well as outputs are more costly and may reduce customers' perceived quality. Moreover, due to the situational nature of services flexibility is crucial to maintain high levels of service quality and reduces opportunities to substitute capital for labor. Finally, inseparability of services and consequently customer co-production need to be considered and make it more difficult to standardize and lean

service delivery processes without sacrificing value for their customers (Anderson et al. 1997; Grönroos & Ojasalo 2004; Parasuraman 2010; Rust & Huang 2012).

In addition to the interrelatedness of efficiency and effectiveness the inseparability of production and consumption, and likewise the integration of external factors (e.g., the customer) must be considered when defining service productivity. The customer plays a vital role in services. As a co-producer the customer is an important input factor and influences actively the output of the service (Anitsal & Schumann 2007; Filiatrault et al. 1996; Grönroos & Ojasalo 2004; Johnston & Jones 2004; McLaughlin & Coffey 1990; Parasuraman 2002). Besides being a co-producer, the customer also is a consumer of the service and evaluates the service outcome (Gummesson 1998; Parasuraman 2010). Due to the critical role of the customer, the service provider is only partly capable of managing service productivity on its own. Most important, in contrast to manufacturing the service outcome is hard to measure and not assessed by various quality criteria developed by the provider, but by the individual evaluation of the customer. To define service productivity holistically, a customer perspective must be added (Anitsal & Schumann 2007; Grönroos & Ojasalo 2004; Johnston & Jones 2004).

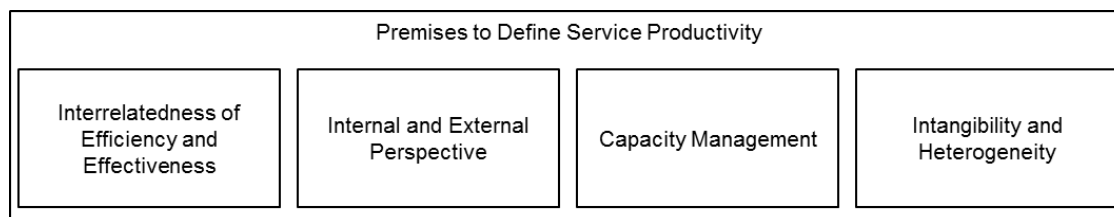
The inseparability of production and consumption plus the perishability of services yield another element in service-specific definition of productivity. Because producing and consuming a service happen at the same time, services are not storable; resources to deliver the service (e.g., employees, customers, information) must also be dealt with in real time. Therefore, in contrast to goods, productivity in a service context is more dependent on customer demand. As a consequence, service providers need to align their capacity management based on demand forecasts (McLaughlin & Coffey 1990). This outlines the major role of service capacity management in understanding and defining service productivity (Armistead et al. 1993; Grönroos & Ojasalo 2004; McLaughlin & Coffey 1990; Vuorinen et al. 1998). More precisely, the capacity of the service provider needs to match customer demand. If the capacity of the service provider exceeds or falls below the actual demand, service productivity will decrease instantly as fluctuations cannot be buffered by stocks (Grönroos & Ojasalo 2004).

Finally, service productivity cannot be defined by a ratio of hard input and output factors. This owes in part to the interrelatedness of efficiency and effectiveness (Anderson et al. 1997; Grönroos & Ojasalo 2004; Rust & Huang 2012). In addition, the intangibility and heterogeneity of services lead to challenges in defining input and especially output factors of service productivity (Armistead et al. 1993). Services are bundles of tangible and intangible components (Grönroos & Ojasalo 2004). While tangible inputs and outputs can be captured, assessing intangible inputs and outputs is more difficult. This complicates measuring input factors against output factors (Armistead et al. 1993). Take service quality as example to evaluate the outcome of a service: Service quality is generally understood as the difference between expected and experienced service quality (Parasuraman 2002). Therefore, service quality reflects personal values, is highly variable, and hard to measure in objective items

(McLaughlin & Coffey 1990). As a consequence, service outcomes are highly dependent on the individual service employee or customer rendering, resp. co-producing and consuming the service (Grönroos & Ojasalo 2004; Parasuraman 2002).

All these issues in defining service productivity demonstrate that a goods-based understanding of productivity is not appropriate to a service context. Several premises necessary to define service productivity can be derived from these points. These premises are illustrated in Figure 2. Further, these premises identified allow an evaluation of existing definitions of service productivity as examined in the following chapter.

Fig. 2: Premises to Define Service Productivity



Reviewing Definitions of Service Productivity

Some researchers have devoted considerable attention to provide a definition of service productivity (e.g., Grönroos & Ojasalo 2004; Johnston & Jones 2004; Vuorinen et al. 1998). Yet, the definitions provided differ fundamentally. Table 1 gives an overview of these definitions and further illustrates if the definitions do meet the premises outlined above. Vuorinen et al. (1998) define service productivity as a service provider's ability to combine its inputs to meet customers' expectations of quality. Thus service productivity can be defined as ratio of quantity and quality of output to quantity and quality of input (Vuorinen et al. 1998). This definition of service productivity integrates a customer perspective and a firm perspective while considering both efficiency and effectiveness. Yet, the definition does not consider capacity management. Consequently, the *uno actu* principle of services and the resulting dependence on customer demand are omitted. Furthermore, the definition does not consider the intangibility that leads to complications in the definition of input factors, and the heterogeneity that makes it hard to define and evaluate output factors.

Tab. 1: Definitions of Service Productivity

Authors	Definition of Service Productivity	Efficiency and Effectiveness	Internal and External Perspective	Capacity Management	Intangibility and Heterogeneity
Vuorinen et al. 1998, p. 380	Service productivity= $\frac{\text{quantity of output and quality of output}}{\text{quantity of input and quality of input}}$	✓	✓	x	x
Johnston & Jones 2004, p. 206	Operational productivity= $f^n \frac{\text{used resources, customers, revenues, ...}}{\text{materials, customers, staff, costs, ...}}$ Customer productivity= $f^n \frac{\text{experience, outcome, value, ...}}{\text{time, effort, costs, ...}}$	✓	✓	x	x
Grönroos & Ojasalo 2004, p. 417	Service productivity= f(internal efficiency, external efficiency, capacity efficiency)	✓	✓	✓	✓

Johnston and Jones (2004) focus on integrating the customer into the definition of service productivity. In doing so, they differentiate operative productivity and customer productivity in order to define service productivity holistically. Operative productivity is defined as ratio of outputs (e.g., used resources, customers, revenue) to inputs (e.g., materials, staff, costs), whereas customer productivity is defined as ratio of customer inputs (e.g., effort, time) to customer outputs (e.g., value, outcome) (Johnston & Jones 2004). Like Vuorinen et al. (1998), Johnston and Jones (2004) also cover the firm's and the customer's perspectives in defining service productivity. Because efficiency (operative productivity) and effectiveness (customer productivity) are in reality strongly interrelated, however, this definition does not cover the complexity of service productivity. Furthermore, capacity management and the consequences of intangibility and heterogeneity are omitted. Nevertheless, the definition provided by Johnston and Jones (2004) provides valuable insights into how customers and co-production can be evaluated in terms of productivity.

Grönroos & Ojasalo (2004) provide a further definition of service productivity that covers efficiency, effectiveness, and capacity management. Service productivity is defined as a function of internal efficiency, external efficiency (used synonymously with effectiveness), and capacity efficiency. Thus they determine service productivity in order to evaluate how a company manages its resources to meet the expectations of a customer and the operational objectives of the firm. The authors also enhance these

concepts by adding a dynamic perspective: As they learn the processes, both the service provider and the customer improve their efficiency as well as effectiveness. Additionally, capacity efficiency increases thanks to experience-based estimates of resource requirements. Grönroos and Ojasalo (2004) are the first to describe service productivity to be managed by how - not solely how much - resources are invested in the service delivery process (see Table 1). Beyond, the authors add a dynamic perspective by examining the importance of mutual learning processes.

To sum up, several authors approach the definition of service productivity outlining the importance of a service-specific definition of productivity. However, based on the premises identified in the previous chapter, there is only one definition that fully meets the requirements to define service productivity accordingly. Both definitions provided by Vuorinen et al. (1998) and Johnston and Jones (2004) do not consider the influence of volatile demand and the appropriate capacity management. As service productivity is a triplet of efficiency, effectiveness, and capacity management, this review defines service productivity in line with Grönroos & Ojasalo (2004, p. 421) “as the combined effect of how well a service provider manages the cost efficiency of its service production resources and processes [...] and the perceived quality of its services [...]”

Antecedents and Operationalization of Service Productivity

The lack of a generally accepted and applied definition and operationalization of service productivity is further shown by the various ways service productivity is measured (e.g., Brown & Dev 2000; Marinova et al. 2008; Rust & Huang 2012). Beyond, a deeper understanding of antecedents and contexts that affect service productivity is still lacking (Nachum 1999b; Sahay 2005). Understanding which and how resources impact service outcomes and how to operationalize them is crucial to manage service productivity. Previous empirical research has focused primarily on a single antecedent and its effect on service productivity (e.g., Marinova et al. 2008; Singh 2000; Xue and Harker 2002). In doing so, several antecedents of service productivity are identified: organizational structure and process management, information technology (IT), employees, customers, third parties, and market environment. Table 2 offers an overview on empirical research on service productivity.

In empirical research definition and operationalization of service productivity are mixed at best as Table 2 illustrates. Research often focuses on efficiency solely, omitting the dimension of service quality (Brown & Dev 2000; Dobni et al. 2000; Frei & Harker 1999; Xue & Harker 2002). Other articles discuss the relation between productivity and quality in a service context from a theoretical perspective, yet do not integrate the quality dimension in their empirical research (Armistead & Machin 1998; Glisson & Martin 1980). Finally, there further are articles analyzing service productivity considering both dimensions, namely efficiency and effectiveness. These articles empirically prove the existence of the trade-off and the challenge of measuring resource inputs and service outcomes (De Jong et al. 2003; Filiatrault et al. 1996; Marinova et al. 2008; Meyer Goldstein 2003; Nachum 1999a; Rust & Huang 2012; Singh 2000). However, Table 2 clearly outlines that there is merely empirical research

that considers a capacity management perspective in analyzing service productivity. Reviewing literature on antecedents of service productivity solidifies the need to not only analyze what resources are invested, but how they should be invested in order to deliver services efficiently and at a high quality level.

Tab. 2: Overview on Empirical Research on Service Productivity

Author	Antecedents						Service Productivity		Premises			
	Internal			External			Definition	Operationalization	Efficiency and Effectiveness	Internal and External Perspective	Capacity Management	Intangibility and Heterogeneity
	Organizational Structure and Process Management	Information Technology	Employees	Customers	Third Parties	Market Environment						
Armistead & Machin 1998	✓	x	x	x	x	x	Productivity is defined as ratio of outputs to inputs, yet in a service context there is an implicit connection between quality and productivity	Utilization, Workrate, Working Methods or Equipment Used	✓	x	✓	x
Brown & Dev 2000	✓	x	✓	x	x	✓	Productivity is defined as ratio of a firm's outputs to its inputs Service performance is a phenomenon consisting of two related but distinct aspects: subjective measures of customer satisfaction and customer perceptions of quality; and verifiable and quantifiable service outcomes	Value Added (sales revenues less any fees that it remits to the chain)	x	x	(✓)	(✓)
De Jong et al. 2003	✓	✓	x	x	x	x	Productivity of service workers is a function of how individuals think, feel, and behave on the job	Customer Satisfaction and Volume of Services Delivered	✓	✓	x	✓
Dobni et al. 2000	✓	x	✓	x	x	x	Service productivity is described by two dimensions that are complementary: service quality and service productivity	Perceived Role Behaviors, Organizational Commitment, Employee Affect	x	x	x	x
Filiatrault et al. 1996	✓	x	✓	✓	✓	x	Productivity is the relative efficiency of a given process	Financial Results and Perceived Customer Satisfaction	✓	✓	x	✓
Frei & Harker 1999	x	✓	✓	✓	x	x		Check Cycle Time, ATM Cycle Time, and Customer Time	x	✓	x	x

Glisson & Martin 1980	✓	x	x	x	x	x	Productivity: quantity of service provided Efficiency: per unit cost of providing service	Productivity: number of clients served per week per line worker Efficiency: number of clients serviced per week per \$10.000 annual budget	x	x	x	x
Marinova et al. 2008	✓	x	✓	x	x	x	Productivity is defined as ratio of outputs to inputs, yet in a service context there is an implicit connection between quality and productivity	Unit Revenue, Customer Satisfaction, and Unit Efficiency	✓	✓	x	✓
Meyer Goldstein 2003	✓	x	✓	x	x	x	Employee outcomes are defined by productivity, satisfaction and customer satisfaction	Productivity: Employee Satisfaction, Employee Turnover, Labor/Management Relationships, Workforce Productivity, and Efficiency; Quality: Satisfaction and Comparisons against Competitors	✓	✓	x	✓
Nachum 1999a	x	x	✓	✓	x	x	Productivity of intangible goods is a ratio of inputs to outputs	Productivity: Ratio of Inputs (Knowledge, Spillover, Client Labor) to Revenues; Quality: Clients' Improved Competitive Position	✓	✓	x	✓
Rust & Huang 2012	✓	✓	x	x	x	✓	There is a trade-off between quality and productivity and firms have to decide how to trade-off these operational goals	Labor Productivity	x	✓	✓	✓
Singh 2000	✓	x	✓	x	x	x	Productivity (comparing quantifiable output with behavioral standards, e.g. number of calls handed) and quality (evaluation how the service is delivered in terms of enhancing customer satisfaction and loyalty) are posited to be distinct aspects of frontline-employee performance that are positively correlated	Performance Productivity and Performance Quality are measured by self-developed scales	✓	x	x	✓
Xue & Harker 2002	x	x	x	✓	x	x	"Customer A is evaluated as more efficient than Customer B if Customer A consumes fewer inputs to produce at least the same amount of certain outputs as Customer B, or if Customer A produces more outputs using at most the same amount of certain inputs as Customer B." (p. 256)	Number of informational transactions, number of service transactions, and number of purchase transactions	x	✓	(✓)	x

Research on organizational structure and process management as antecedents of service productivity (e.g., Armistead & Machin 1998; Brown & Dev 2000; Glisson & Martin 1980) shows that resources have to be carefully balanced to overcome the trade-off between productivity and quality of the service delivered. Hereby, research differs between formal control mechanisms (e.g., strategic planning, operating procedures, and structure) and informal control mechanisms (e.g., goal setting, culture, and group norms). Formal control mechanisms clarify rules and guidelines and, in turn, diminish decision uncertainties of employees. Thus, highly formalized and centralized organizational structures as well as standardized processes result in higher efficiency (Calabrese 2000; Challagalla & Shervani 1996; Dobni 2004; Glisson & Martin 1980; Jaworski 1988; Jaworski & McInnis 1989; Joshi 2009; Schwepker Jr. & Hartline 2005). At the same time, high degrees of formalization, centralization, and standardization reduce employees' perceived autonomy and self-control. This decreases employee satisfaction and in turn service quality (Anderson et al. 1997; Dobni 2004; Glisson & Martin 1980; Ramaswami 1996). Obviously, organizational structure and processes do influence efficiency and effectiveness simultaneously resulting in the trade-off.

This trade-off is further illustrated by research on IT as antecedent of service productivity (De Jong et al. 2003; Dobni et al. 2000; Filiatrault et al. 1996; Rust & Huang 2012). IT enables substituting labor for automation (e.g., via self-service technologies) (Dobni 2004; Filiatrault et al. 1996; Fitzsimmons 1985; Rust & Huang 2012) and enhances the efficiency and effectiveness of service employees alike by enabling flexibility and customization (De Jong et al. 2003). Nonetheless, investing in IT to improve service productivity might backfire in decreasing service quality, e.g., if customers or employees are not able or willing to accept these changes (Anitsal & Schumann 2007; Fitzsimmons 1985; Parasuraman 2000; Parasuraman & Colby 2015). The insights gained on organizational structure, process management, and IT as antecedents of service productivity show that antecedents of service productivity are not fully distinctive. Indeed they are closely interrelated with each other, building a service productivity management system. This becomes obvious in reviewing employees as antecedent of service productivity.

Literature on employees as antecedents of service productivity illustrates how systems for work, job design, training and development, attention to employee well-being, and autonomy—commonly known as internal service quality—influence how efficiently and effectively services are delivered by employees (Dobni et al. 2000; Marinova et al. 2008; Meyer Goldstein 2003). Hereby, once again the trade-off is shown as investments in more efficient systems for work are closely interrelated with the qualitative performance of service workers (Marinova et al. 2008; Meyer Goldstein 2003; Singh 2000): Higher autonomy in carrying out tasks motivates employees to better respond to customer needs and set higher performance goals in terms of quality (Chan & Lam 2011). Yet, several studies found evidence of negative effects of autonomy on employee performance, owing, e.g., to role stress (e.g., Hartline & Ferrell 1996). In addition, employees might take on extra responsibilities in order to serve the customer best, which might slow down the service delivery process and reduce efficiency (Conger & Kanungo 1988). As outlined before, there are control

mechanisms (i.e., organizational structure, process management) and support systems (e.g., IT) influencing or even substituting employee behavior and in turn service outcomes. Thus, in analyzing service productivity no one single antecedent can be isolated as most important; an interrelatedness of several antecedents must be assessed.

Beyond this firm-internal system of antecedents of service productivity, firm-external antecedents have to be considered. As outlined before, services are co-produced with the customer and service outcomes have to be evaluated adopting a customer perspective. Therefore, customers are another antecedent of service productivity (Bitner et al. 1997; Nachum 1999a, 1999b; Xue & Harker 2002). The customer often is seen as partial employee that may supplement provider labor (Fitzsimmons 1985; Xue & Harker 2002). In doing so, the customer contributes to the service process; for example, by providing necessary information (Nachum 1999a). Yet, the customer might hinder the process through delayed contributions or a lack of willingness to co-produce. This causes bottlenecks and capacity problems (Fließ & Kleinaltenkamp 2004). Besides being a co-producer, the customer is an assessor of the output. Service quality has to be evaluated by how customer's expectations are met. It is up to the customer to decide whether service quality is high or low (Grönroos & Ojasalo 2004; Vuorinen et al. 1998). Hereby, the customer influences service productivity in two ways: First, the customer is an important productive resource in delivering the service itself. Thus the customer influences the efficiency of the service delivery process. Second, the customer evaluates the service outcome, and therefore determines the effectiveness of the service.

Besides the customer there are further firm-external factors to be considered: for example, the market environment (Brown & Dev 2000; Rust & Huang 2012), and third parties as suppliers or value-adding partners (Armistead & Machin 1998; Filiatrault et al. 1996). Rust and Huang (2012) provide an excellent starting point to analyze market-induced antecedents of service productivity. The authors show the effects of wages, price, and industry concentration on service productivity. Beyond external context factors a research framework for service productivity further has to consider third parties involved (Armistead & Machin 1998; Evanschitzky 2007; Filiatrault et al. 1996; Scott & Laws 2010). To work efficiently and effectively in such value-constellations, besides processes and structures to avoid bottlenecks, soft aspects like a trusting atmosphere are also important (Gulati 1998). Yet, research on how to efficiently and effectively deliver services in provider-supplier-constellations is still in its infancy; same can be stated concerning the influence of external factors like, e.g., market environment (Ostrom et al. 2010; Raddats & Burton 2014).

In order to manage the complexity of the service productivity system and the special requirements a service productivity management system has to meet (s. Figure 2), an interdisciplinary approach might be the most sufficient. Rust and Huang (2012) are the first to follow such a combinative approach and show that service productivity is a strategic decision variable that is to be optimized by the firm via capacity management. The optimum level is a result of the trade-off between labor

(results in better quality and greater value to the customer) and automation (results in better efficiency), depending on costs of automation and the level of IT (Rust & Huang 2012).

To sum up, this chapter illustrates how service productivity is operationalized in empirical research. Beyond, the review outlined several antecedents of service productivity and their effects on service productivity. In doing so, this article shows that there exists no generally accepted definition as well as operationalization of service productivity. This makes it hard to compare existing empirical research and the effects of antecedents of service productivity. Furthermore, the fact that there are merely empirical articles considering the heterogeneity of services further outline the problem of how to measure antecedents and outcomes of service productivity. Beyond, the review shows the lack of empirical research on how capacities can be managed in order to deliver services in a productive way. Nevertheless, the definition of service productivity provided by Grönroos and Ojasalo (2004) clearly illustrates the importance of understanding service productivity as a function of efficiency, effectiveness, and capacity management. This review further outlined the importance of capacity management as integral component of service productivity management, as all antecedents face the problem of a trade-off between efficiency and effectiveness. Due to the partially conflicting effects antecedents might have on efficiency and effectiveness, it is not enough to focus on which resources are to be managed in delivering services. The discussion of the antecedents reveals that the antecedents of service productivity must not be analyzed in isolation. Internal and external antecedents, along with context factors that affect service productivity, are closely interrelated. Firms have also to consider how these resources have to be invested in order to balance efficiency and effectiveness.

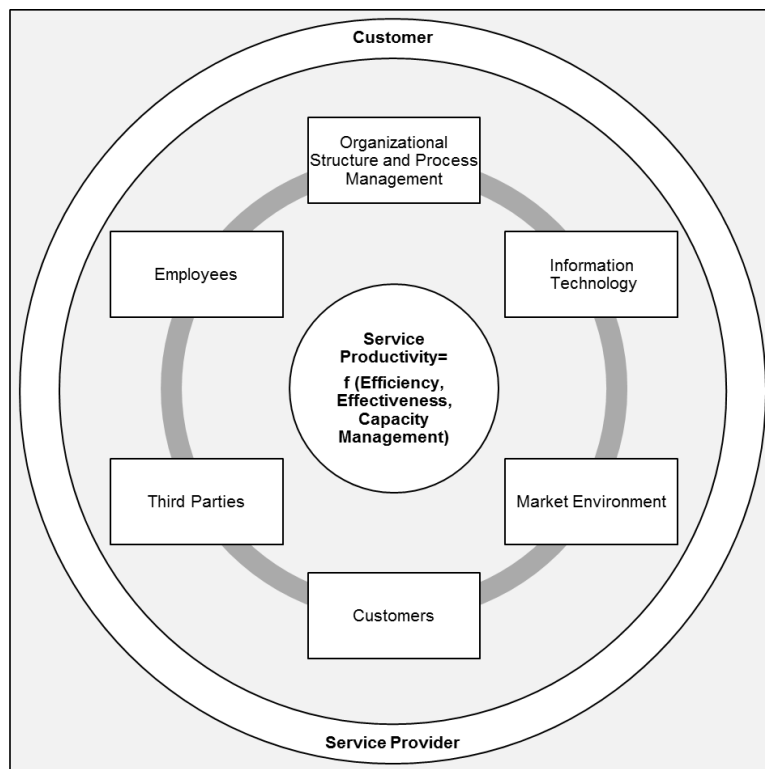
Discussion and Implications for Management and Further Research

The review on how service productivity is conceptually defined and empirically analyzed discloses some major findings concerning the current state of research on service productivity. First, there exists no generally applied and accepted definition and operationalization of service productivity. Concepts of service productivity mostly are based on a goods-dominant logic rather than a service-dominant logic. Using a service-dominant logic perspective might further help to understand the complexity of service productivity. Beyond, empirical research to date often focuses on the impact of antecedents on either efficiency or service quality. Consequently, we find in literature empirical evidence for antecedents' impact on efficiency as well as service quality. However, there also exists research that considered both dimensions (i.e., efficiency and effectiveness) proving the managerial challenge of the trade-off between efficiency and effectiveness (e.g., Marinova et al. 2008; Singh 2000). This makes the identification and examination of antecedents and their impact on service productivity more difficult due to the incomparability.

Beyond, there is an interrelatedness of antecedents that has to be assessed in analyzing and managing service productivity (De Jong et al. 2003; Marinova et al.

2008; Rust & Huang 2012; Singh 2000). The complexity of this service productivity system can only be addressed by considering capacity management as component of service productivity (Rust & Huang 2012). Thus, this article reveals the importance of capacity management in managing service productivity as it enables service providers to appropriately balance their efforts in order to overcome the trade-off (Anderson et al. 1997; Filiatrault et al. 1996; Rust et al. 1995; Rust et al. 2002, Rust & Huang 2012). Yet, research on capacity management as central component of service productivity is still in its infancy.

Finally, the review showed that there might be several context factors as well as third parties influencing the service delivery process and the service outcome (e.g., Armistead & Machin 1998; Evanschitzky 2007; Filiatrault et al. 1996; Kwortnik Jr. & Thompson 2009; Ostrom et al. 2015; Raddats & Burton 2014; Scott & Laws 2010). As the review revealed the customer co-produces and assesses the service outcome. Therefore, the customer decides whether the service outcome meets his expectations. Hereby, the perceived performance is dependent on the customer's individual experience (Helkulla 2015; Holbrook & Hirschmann 1982). The upcoming research stream on customer experience solidifies the importance of research on the influence of (physical) service design and social surroundings on customer's perceived service performance (Bitner 1992; Chandler & Lusch 2015; Kwortnik Jr. & Thompson 2009; Ostrom et al. 2015). Therefore, besides the customers and the service provider actively and passively involved third parties might influence service productivity and its management. Kwortnik Jr. and Thompson (2009) provide a good starting point to unify customer experience management and service operations in their proposed framework. Enhancing perspectives by conducting cross-disciplinary research offers manifold opportunities to develop an appropriate approach to research on service productivity holistically. Figure 3 provides such a framework. Hereby, the antecedents identified have to be managed as a system. Furthermore, capacity management has to meet both performance dimensions, namely efficiency and effectiveness. Finally, a framework to analyze service productivity needs to take into account a customer and a service provider's perspective.

Fig. 3: Framework to Analyze and Manage Service Productivity

The review of empirical research shows that to date, the requirements defined are often only partially met. Mostly, research focuses on effects of efficiency or effectiveness and seldom considers both objectives and their interrelatedness. Further, the importance of capacity management to understand service productivity and its management has been researched very little. Research has mainly focused on single antecedents and often fails to consider the several internal and external factors that affect service productivity.

Second, there is need for more research on the interrelatedness of efficiency and effectiveness. At present, evidence that the interrelatedness of efficiency and effectiveness might be as well complementary proves conflicting. In order to further research on the antecedents of service productivity and in turn to develop management tools for service productivity, managerial practice and academia need a finer-grained understanding of the relation between efficiency and effectiveness. As declared by Anderson et al. (1997) there are certain circumstances (e.g., a service context) that make a trade-off more likely to occur. As there surely are more contextual factors that moderate or even mediate the interrelatedness of efficiency and effectiveness, there is a need for more research in this area in order to identify which context factors make a trade-off more likely to appear and how the interrelation of context factors, inputs, and outcomes of the service process does look like.

Third, Table 2 illustrates that existing empirical research focuses on single or few antecedents and their effects on service productivity. Empirical studies considering multiple internal and external antecedents and research on how antecedents interact

with each other are scarce. Doing such research would be worthwhile from a managerial and academic perspective as it helps to gain a better understanding of how to allocate resources in order to be efficient and effective. There might be special combinations of antecedents that positively or negatively affect service productivity. The development of measurement and management tools for service productivity needs to take these interrelations into account. This is enforced by Grönroos & Ojasalo (2004), which mention a mutual learning process between the customer and the service provider.

This brings up a fourth research gap. Due to the mutual learning process (Grönroos & Ojasalo 2004), it has to be assumed that the short-term and long-term effects of antecedents on service productivity might be different. Longitudinal data could provide further insights about how exactly service productivity influences firm performance—for example, in terms of profitability (Kamakura et al. 2002; Vuorinen et al. 1998). According to Gummesson (1998), quality, productivity, and profitability must not be viewed as separate constructs, but as a triad. Mittal et al. (2005) provide first insights why a long-term perspective might be worthwhile. Using a longitudinal set the authors prove that achieving a dual emphasis (e.g., efficiency and effectiveness) will lead to better financial performance. In doing so, the authors show that the process of achieving the dual emphasis may not be financially rewarding in short-term, yet being an efficient and effective firm in the long run is financially promising.

Fifth, to examine service productivity appropriately, interdisciplinary research is needed. Service productivity includes internal operational performance and external marketing alike (Blumberg 1994). It is not as important to know how much, but instead how to invest resources. Consequently, capacity management is a crucial component of defining, understanding, and managing service productivity (Armistead et al. 1993; Grönroos & Ojasalo 2004; Johnston & Jones 2004; Jones 1998; Kamakura et al. 2002; McLaughlin & Coffey 1990; Vuorinen et al. 1998). As illustrated in Table 2, research to date merely considers the aspect of capacity management. Research on service productivity would benefit from an interdisciplinary approach. A combination of operations research and service marketing might provide an excellent starting point to take a new perspective on service productivity and add value to current service productivity research.

Finally, there is little research on how customers and third parties influence service productivity. As illustrated in this literature review, customers and third parties are important actors in delivering services efficiently and effectively. In order to manage service productivity the best way possible, firms need to know about management tools that help to handle service delivery processes in value-constellations in an effective and efficient way. Therefore, more knowledge about customers and third-parties as antecedents of service productivity is needed.

Beyond these avenues for further research, this literature review also contains implications for managerial practice. First, understanding and developing an appropriate definition of service productivity is crucial. Firms should invest effort in

order to define what their optimal level of service productivity might look like (Rust & Huang 2012). Depending on the strategic orientation and context of an individual firm investments have to be balanced. Furthermore, managers should develop firm-specific measurements in order to monitor their performance. These measurement systems have to consider both objective and quantifiable measures as well as subjective and qualitative measures. This enables firms to determine if their capacity management meets their performance objectives. Moreover, monitoring service performance and constantly evaluating capacity management practices helps service providers to identify the most important levers of service productivity.

Finally, whenever investments to improve service productivity or quality are made, managers have to carefully balance investments considering the trade-off that might occur due to the interrelatedness of resources (e.g., organizational structure, employees, etc.). Initiatives to foster service productivity and therefore operational efficiency (e.g., by implementing more efficient processes) should always be accompanied by change management initiatives to motivate employees, customers, and third-parties alike to act accordingly to the new processes.

In summary, this literature review reinforces Peter Drucker's comment that service productivity is a major challenge. The review also outlines clear approaches to defining and understanding service productivity. Moreover, antecedents of service productivity are identified. Based on the definition proposed by Grönroos and Ojasalo (2004) and the antecedents identified, an evaluation of the current state of research in the field of service productivity reveals important research gaps. This article shows that to date, research on service productivity still is at an early state. What has been done thus far sets out various starting points for further study with the goal of closing existing gaps. This will help managerial practice and academia to gain a better understanding of the phenomenon of service productivity and in turn to develop management tools that support efficient and effective service delivery processes.

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