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## Further Semiotic Perspectives on the Outcome-Based vs Performance-Based Semantic Dispute

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**Title:** Further Semiotic Perspectives on the Outcome-Based vs Performance-Based Semantic Dispute

**Year:** 2021

**Version:** Accepted manuscript

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### Please cite the original version:

Korkeamäki, L. (2021). Further Semiotic Perspectives on the Outcome-Based vs Performance-Based Semantic Dispute. In: Kohtamäki, M., Baines, T., Rabetino, R., Ziaee Bigdeli, A., Kowalkowski, C., Oliva, R. & Parida, V. (eds.) *The Palgrave Handbook of Servitization*, 133-147. Cham: Palgrave Macmillan. [https://doi.org/10.1007/978-3-030-75771-7\\_9](https://doi.org/10.1007/978-3-030-75771-7_9)

# FURTHER SEMIOTIC PERSPECTIVES ON THE OUTCOME-BASED VS PERFORMANCE-BASED SEMANTIC DISPUTE

## ABSTRACT

The current book chapter addresses the result-oriented servitization business models coined in the academic literature as outcome-based contracts or performance-based contracts. Indeed, the given polarization in terms of academic terminology certainly does not serve to decrease the conceptual complexity of these business models. As extant arguments with the pro “outcome” prefix have built on its unambiguousness compared to “performance”, I intend to provide further insights into the debate by offering pragmatics- and syntax-based perspectives on the topic. In this effort, I draw upon a systematic literature review of over 80 top-tier academic journal papers (AJG3, AJG4 and AJG4\*). Thus, the current chapter contributes to the definition stream of the outcome-based service literature. For managers, the chapter synthesizes research trends, offers an outlook of the eminent research facets that publish on the topic and provides some contextualized explanations and antecedents of the differences in academic terminology.

**Keywords** – Servitization, Outcome-based contracts, Performance-based contracts

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# 1 INTRODUCTION

To ensure the added value of their services, providers use performance- and outcome-based contracts (PBCs & OBCs) instead of billing based on the time and materials dedicated to the service activity. The interchangeable use of the terms “outcome” and “performance”, however, has often caused confusion (Datta & Roy, 2011; Grubic & Jennions, 2018; Hou & Neely, 2018; Hypko, Tilebein, & Gleich, 2010b, 2010a) Recently, however, arguments have been made in favor of “outcome” as the preferred prefix (Schaefers, Ruffer, & Böhm, 2020) to be used when discussing what the associated contracts are based on. The reasoning behind the given arguments has leaned much on semantics, that is, the meaning(s) attached to these terms. For example, “performance” can refer to an artist’s presentation of artwork, the manner in which a mechanism operates, or the action of performing a task. Given this semantic ambiguity (Rodd, Gaskell, & Marslen-Wilson, 2004), the term “performance-based contract” has been accompanied by an alternative term, “outcome-based contract”, in academic discourse. However, because semantics constitutes only a part of the entire semiotics of the topic, this chapter contributes by systematically reviewing over 80 top-tier journal articles considering the topic from the perspectives of pragmatics and syntax as well.

With regard to the chicken-or-the-egg dilemma, it seems clear that “performance” was the first to emerge in the late 1980s and early 1990s (Selviaridis & Wynstra, 2015). From the syntax perspective, however, simultaneously with the surfacing of the terms “business model” and “innovation”, the term “outcome” has started to capture shares in the academic discourse. Furthermore, in terms of pragmatics, the more innovation- and marketing-oriented research outlets

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tend to emphasize the term “outcome”. To summarize the contributions of the current paper, it provides further understanding of the antecedents of the “outcome-based vs. performance-based” debate in the related leading level literature, resulting in a fuller description of the semiotics at play in the recent pro-outcome arguments. Thus, the current chapter contributes to the definition stream of the literature concerning outcome-based contracts (Schaefers et al., 2020).

## 2 THEORY DEVELOPMENT

The literature to be reviewed was collected following the guidelines for systematic literature reviews (Kohtamäki, Rabetino, & Möller, 2018; Tranfield, Denyer, & Smart, 2003). I began by *defining the keywords* to collect the studies of interest. The choice of keywords was guided by prior literature reviews (Grubic & Jennions, 2018; Hypko et al., 2010b; Selviaridis & Wynstra, 2015) concerning outcome-based business arrangements. Studies were collected from the *Scopus* database using the advanced search function. The search string used was as follows: TITLE-ABS-KEY ("outcome-based contract\*" OR "performance-based contract\*" OR "outcome business model\*" OR "performance-based logistic\*" OR "performance contract\*") AND (LIMIT-TO (DOCTYPE, "ar")). The query produced 853 hits (in January 2020). To address the requirement of *deciding target journals*, the search results were further refined by limiting them to journals with *Academic Journal Guide 2018 ranking 3, 4 or 4\** to guarantee the high quality of the publications. The given ranks indicate highly regarded, top tier and distinguished research quality, respectively (Academic Journal Guide, 2018).

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After application of the second-stage criteria, 81 articles were left. Next, to assess the suitability of the studies, I scrutinized the abstracts of the papers. I excluded studies that focused on employee/manager performance-rewarding contracts (7 in total, e.g., Fehrenbacher, Kaplan, & Pedell, 2017). As a result, 74 studies remained to be reviewed, to which I added 9 articles published/indexed after the initial search (e.g., Huang, Chen, Sun, Zhang, & Yao, 2020; Korkeamäki & Kohtamäki, 2020; Sjödin, Parida, Jovanovic, & Visnjic, 2020) or deemed relevant based the references of the reviewed papers (e.g., Datta & Roy, 2011; Jain, Hasija, & Popescu, 2013; Selviaridis & Van der Valk, 2019; Visnjic, Neely, & Jovanovic, 2018). The outlets and the number of publications are compiled in Table 1. In addition to reviewing the collected literature, I scanned the lists of references of the collected articles for further insights and supplemented these secondary data with conference proceedings, academic book articles and anecdotal evidence (such as industry and working group reports). These insights and data were not included in the following analyses but rather worked as a data triangulation practice grounding the analytical work.

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**Table 1.** OBS publications by journal

<b>Journal</b>	<b>AJG2018</b>	<b>No. Papers</b>
Management Science	4*	6
Operations Research	4*	2
Strategic Management Journal	4*	2
European Journal of Operational Research	4	8
International Journal of Operations and Production Management	4	7
Journal of Product Innovation Management	4	1
Production and Operations Management	4	5
American Journal of Agricultural Economics	3	2
American Review of Public Administration	3	2
Energy Economics	3	2
European Economic Review	3	1
Health Services Research	3	2
Industrial Marketing Management	3	10
International Journal of Production Economics	3	8
International Journal of Production Research	3	7
International Review of Administrative Sciences	3	3
Journal of the Operational Research Society	3	4
Management Accounting Research	3	2
Milbank Quarterly	3	2
Public Management Review	3	4
Technovation	3	1
Journal of Business Research	3	1
Production Planning and Control	3	1
Grand Total		83

## 2.1 Pragmatics

Pragmatics is concerned with how context and practices influence meanings (Levinson, 1983). Thus, as in the literature review by Selviaridis and Wynstra (2015), the articles reviewed were categorized by the AJG 2018 fields. The fields included in the sample were Innovation (INNOV), Marketing (MKT), General Management, Ethics, Gender and Social Responsibility (ETHICS-CSR-MAN), Public Sector and Health Care (PUB-SEC), Operations and Technology Management

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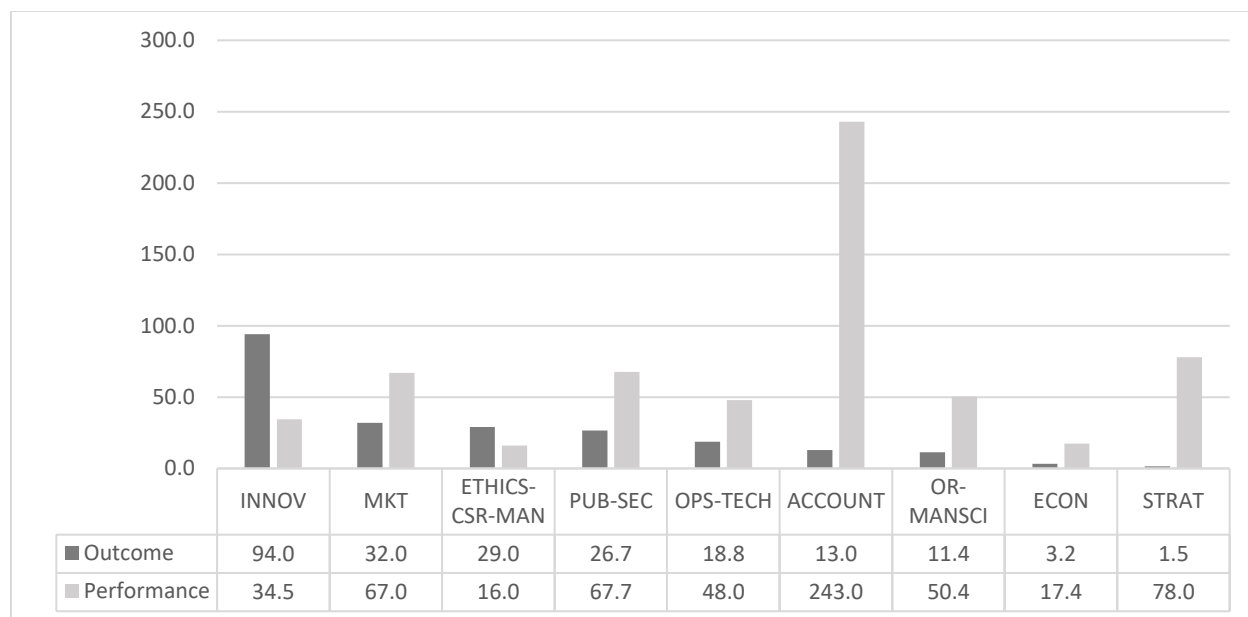
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(OPS-TECH), Accounting (ACCOUNT), Operations Research and Management Science (OR-MANSCI), Economics, Econometrics and Statistics (ECON) and Strategy (STRAT). The number of papers by field was INN = 2, MKT = 10, ETHICS-CSR-MAN = 1, PUB-SEC = 13, OPS-TECH = 29, ACCOUNT = 1, OR-MANSCI = 20, ECON = 5 and STRAT = 2. In particular, related research in the OPS-TECH and MKT fields has been published at a growing pace, especially in the latter decade of the century.

To investigate how the academic field influences the frequency of use of the terms “outcome” and “performance”, the publications were searched using the find function provided by either the publisher or the browser. The papers were scrutinized one by one, and the search hits in the affiliations, repeated titles, lists of references, acknowledgments and direct quotations were excluded from the count. In other words, “outcome” and “performance” hits were counted only if they belonged to the original body text. The average frequencies of the terms “outcome” and “performance” per paper were used to compare the fields. The resulting chart (Figure 1) shows that “outcome” as a term is endorsed more in the innovation and marketing-oriented fields, while the term “performance” is emphasized in the more technical fields. In alignment with prior literature reviews (see, e.g., Selviaridis and Wynstra, 2015; Grubic and Jennions, 2018), the terms often seem to go hand in hand. Earlier research has also pinpointed that the terms are often used interchangeably (Grubic & Jennions, 2018). What is worth noting is that I conducted the search using the words “outcome” and “performance” per se, not variants including them (e.g., performance-based logistics, outcome business models). This is to create a general overview.

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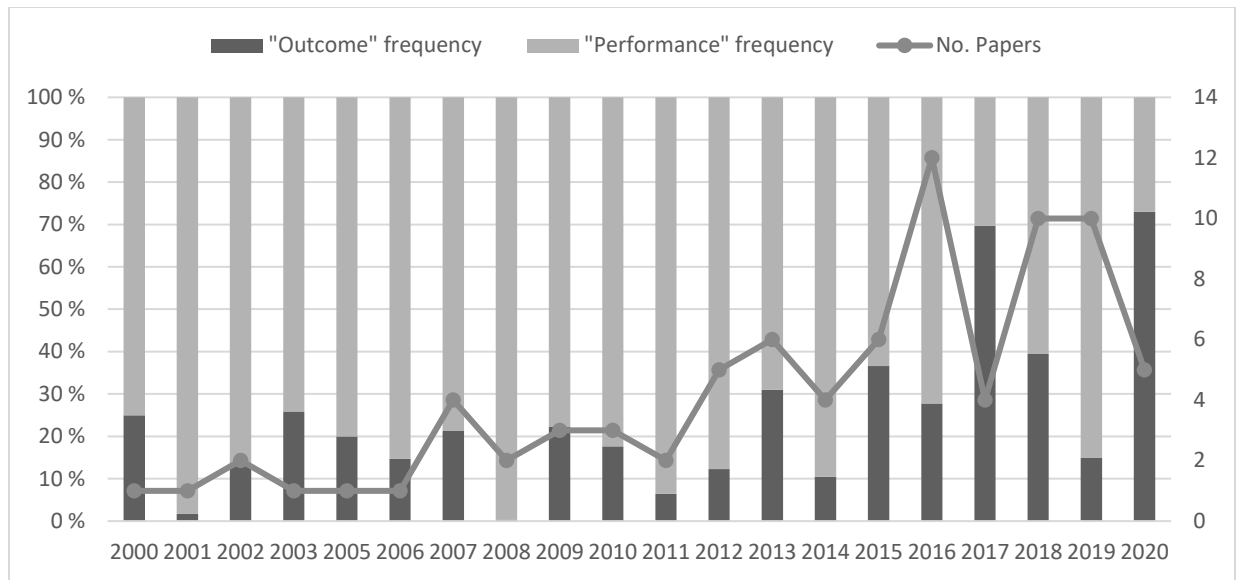
**Figure 1.** Average frequency (per paper) of “outcome” and “performance” terms by field.

## 2.2 Syntax

Syntax is a study of relations between expressions in language (Carnie, 2006). To illustrate the balance between the terms “outcome” and “performance”, the annual sums of the frequencies were rendered into stacked yearly percentage columns and overlaid with the respective number of publications per year. Figure 2 illustrates two trends in the given literature during the first decades of the twenty-first century (excluding 2004 with no publication data). First, the number of publications per year concerning the topic has rapidly increased in top-tier journals, especially in the latter decade. Second, although the term “performance” has historically been the dominant of the two, there seems to be a trend towards “outcome” capturing shares as an alternative term, especially in the latter decade of the current century.

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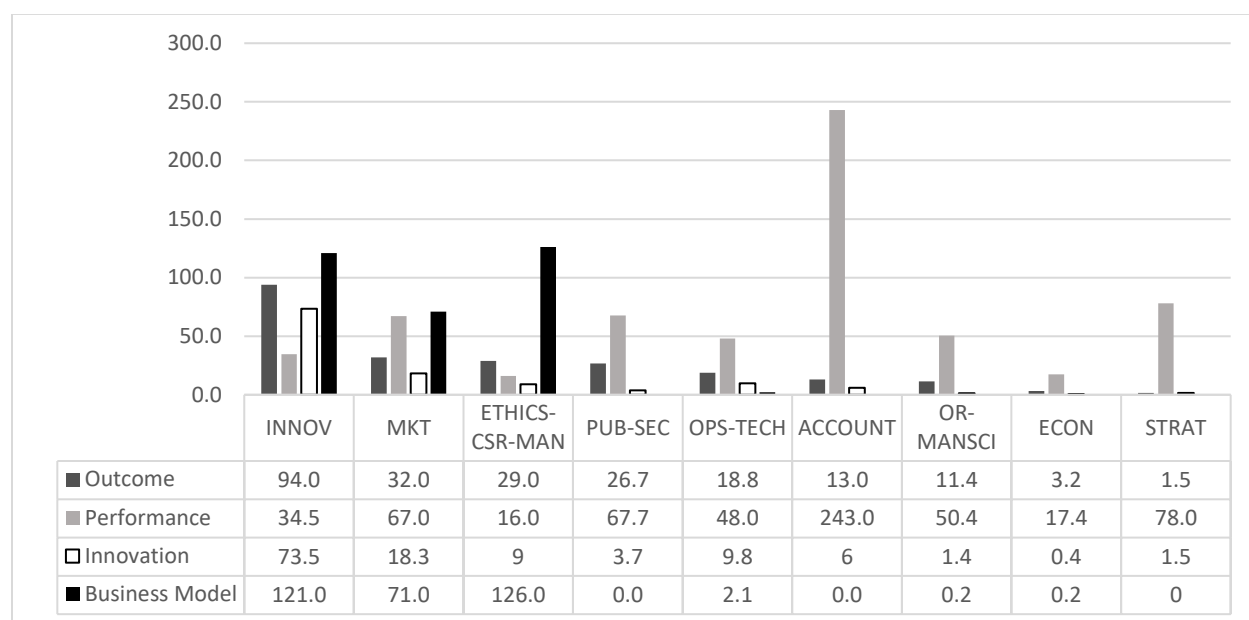
**Figure 2.** The annual balance between the use of the terms “Outcome” and “Performance”.

To retrace antecedents of this shift, I first turned to Google Trends. For instance, Google Trends’ index (0-100) on topic popularity shows that from February 2004 to October 2020 (the longest available timeframe), the popularity of the topic “performance-based logistics” peaked at the beginning of the century. On the other hand, the popularity index for the keyword “outcome business model” began generating continuing monthly interest only around the year 2010. Furthermore, referring to the discussions I have shared with fellow scholars, it appears that the term “performance” is preferred in more operational and purchasing-related journals, while innovation- and marketing-related facets endorse “outcomes”. Indeed, innovation and marketing scholars use the expression “outcome business model” (Ng, Ding, & Yip, 2013; Sjödin et al., 2020; Visnjic, Jovanovic, Neely, & Engwall, 2017), but rarely is the business model referred to as a “performance business model”. To explore these premises, complementary data on the frequency of the terms related to innovation (“innovat” was used to capture alternative endings, such as

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“innovative”), and “business model” was collected using the search functions once again. The frequency of each term was again divided by the number of papers in each of the fields to derive the average frequencies. The results are presented in Figure 3, which is essentially a further refined version of Figure 1. Veritably, not only did the use of innovation- and business model-related terms increase over time, but there was also a reason to suspect that syntax-wise, the use of the given terms increased the “outcome” term frequency.



**Figure 3.** Average frequency (per paper) of the terms used by field.

To test this hypothesis, a multiple regression analysis was conducted. The analysis started by fitting a simple linear regression with the sum of innovation-related terms (per year) as a predictor of the annual use of the outcome term. The model was significant ( $\text{prob} > F = 0.0013$ ) and produced a positive coefficient for the predictor ( $p\text{-value} = 0.001$ ) and an  $R^2$  of 0.4455 (adjusted  $R^2 = 0.4146$ ). Next, the annual sum of the term “business model” was added as a predictor. Again, the model was significant ( $\text{prob} > F = 0.0003$ ) and produced positive and significant coefficients for

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both regressors. Furthermore, the adjusted  $R^2$  increased to 0.5773. Last, the annual sum of the term “performance” was modeled, and the adjusted  $R^2$  increased to 0.6486 in effect. The normality of the residuals was tested using the skewness/kurtosis test for normality ( $\text{prob} > \chi^2 = 0.3304$ ) and the Shapiro-Wilk test (Shapiro & Wilk, 1965) for normality ( $\text{prob} > z = 0.07997$ ). To test whether the model met the assumption of constant variance, a Breusch-Pagan/Cook-Weisberg test (Breusch & Pagan, 1979) for heteroscedasticity ( $\text{prob} > \chi^2 = 0.1057$ ) was performed. To inspect influential data points, both DFFITS (Belsley, Kuh, & Welsh, 1980) and Cook’s distance (Cook, 1977, 1979) diagnostics were used and plotted. The results showed that 2019 was an outlier in terms of influence. To test the effect of this observation, the model was fitted again without it, and another Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was performed.

The results yielded improvements in the goodness of fit ( $R^2 = 0.8388$  c.f. 0.7041, adj.  $R^2 = 0.8066$  c.f. 0.6486) and indicated that the 2019 observation was a major factor for heteroscedasticity (Breusch-Pagan:  $\text{prob} > \chi^2 = 0.8575$  c.f. 0.1057). However, as demonstrated in Figure 2, 2019 was among the top three years in terms of published papers. Hence, I chose not to omit it from the analysis and used the model including it with robust standard errors. Thus, the final significant ( $\text{prob} > F = 0.0000$ ) model produced an adjusted  $R^2$  of 0.6486 and positive coefficients for all the predictors ( $p$ -values =  $< 0.05$ ). The results of the analysis are reported in Table 2. For the sake of comparison, using the term “performance” as the dependent variable, the regression results for none of the other terms as predictors were significant ( $p$ -value =  $> 0.05$ ). Although rudimentary, the results of the analysis support the hypothesis that there is a direct positive relationship between the use of business model- and innovation-related terminology and the frequency of the term

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outcome. However, a more detailed analysis should be conducted using dynamic topic modeling (Blei & Lafferty, 2006), for instance.

**Table 2.** Regression results

“outcome”	Coef.	Robust Std. Error	t	P >  t	[95% Conf. Interval]	
“business model”	.8273419	.351236	2.36	0.032	.0827548	1.571929
“innovation”	.39374	.1660052	2.37	0.031	.0418248	.7456552
“performance”	.1799559	.0825943	2.18	0.045	.0048639	.3550479
constant	5.957126	15.38481	0.39	0.704	-26.6572	38.57146

### 2.3 Semantics

Finally, semantics is interested in the meaningful relations between expressions in language (Jackendoff, 1990). Thus, as semantics centers on the meanings attached to terms, it is a vital part of understanding language, which is defined as a tool of expression that reflects and constructs its surroundings (Samra-Fredericks, 2005). The semantic analysis started by looking for the dictionary definitions of the words “performance” and “outcome”. The Merriam-Webster definition for “performance” can be understood as “*the fulfillment of a claim, promise, or request*” or as “*the manner in which a mechanism performs*”, the latter of which is often an appropriate meaning in manufacturing contexts. An outcome, on the other hand, is defined more univocally as “*something that follows as a result or consequence*” (Merriam-Webster.com). Thus, the word “performance” as a term<sup>1</sup> is considerably more polysemic (Cruse, 2000, pp. 103–124). Moreover,

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<sup>1</sup> The distinction between “word” and “term” is that while a word is only component of language, a term is a word that has meaning(s) attached to it.

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and importantly, the term “performance” can refer to multiple other things, such as the performance of an actor in a play. This makes “performance” also homonymic (Rice, Beekhuizen, Dubrovsky, Stevenson, & Armstrong, 2019), meaning that despite the identical spelling (or pronunciation), the word carries multiple unrelated meanings. For example, the word “mean” can *mean* unkind or average.

Due to the polysemic nature of the term “performance”, I argue that it is necessary to define the scope of its usage in academic discourse. Both arguments presented next are also strongly related to pragmatism. First, the given result-oriented service offerings have been found to be particularly important for capital-intensive (Grubic & Jennions, 2018; Hypko et al., 2010b, 2010a) and complex systems (Essig, Glas, Selviaridis, & Roehrich, 2016; Ng & Nudurupati, 2010) that are driven by life cycle logic (Grubic & Jennions, 2018; Kleemann & Essig, 2013). Thus, the term “performance” as a central signal attached to industrial objects (thus also reflecting pragmatics), such as machines or systems (i.e., extralinguistic objects), should be used to describe *the manner in which a mechanism operates*. For example, Li, Qiu and Wang (2014) investigated 140 energy performance contracts in China, where the providers intended to improve *energy performance* together with their clients. Adapted from Nowicki, Kumar, Steudel and Verma (2008), a step function (Equation 1) representing such revenue functions was formulated accordingly:

$$R(P_i) = \begin{cases} R^f & \text{if } P_i \leq P_{min} \\ R^f + R^v \times (P_i - P_{min}) & \text{if } P_i > P_{min} \end{cases} \quad (1)$$

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where  $R^f$  is the fixed part of the revenue function and  $R^v$  is the variable part of the revenue that is conditionally tied to the improved performance ( $P_i$ ) over the agreed minimum performance ( $P_{min}$ ). In addition to the design in the Equation (1), the variable revenue logic can be designed as an exponential, a polynomial or a step function (Brown & Burke, 2000; Nowicki et al., 2008). The second important argument in favor of separate definitions is legal-technical. In advanced technical systems, such as power plants, manufacturing systems and e-commerce computer systems, the liquidated damages due to downtime are often measured in millions per hour, which is why investments in extensive maintenance efforts usually account for a major share of the total cost of ownership of the system (Öner, Kiesmüller, & Van Houtum, 2015). Following Patra, Kumar, Nowicki and Randall's work (2019), the operational availability ( $A_o$ ) of a machine can be defined as presented in Equation (2):

$$A_o = \frac{H^{Max} - H^{Sched} - H^{DT}}{H^{Max} - H^{Sched}} \quad (2)$$

where  $H^{Max}$  is the maximum operating hours of the machine during a specified timeframe,  $H^{Sched}$  is the scheduled maintenance time and  $H^{DT}$  is the downtime of the machine during the timeframe (Patra et al., 2019). Alternatively, availability can be based on the sample average of downtimes (Grubic & Jennions, 2018; Kim, Cohen, Netessine, & Veeraraghavan, 2010). These types of contracts have been typified as availability outcome-based contracts (Böhm, Backhaus, Eggert, & Cummins, 2016). However, customers are not only concerned with availability: *“The movement towards a service-based economy has led many manufacturing firms to recognize the strategic importance of after-sales product support services that enable the availability of properly*

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*functioning products*” (Guajardo, Cohen, Kim, & Netessine, 2012, p. 961). Especially concerning machinery-focused OEMs, calculations based on mere equipment availability (measured in, e.g., operating hours) may disregard important performance specifications, according to anecdotal evidence (Klise & Balfour, 2015, p. 25). In a legal sense, the machine/system could be operational and thus considered available, although it would operate in a degraded state (e.g., produce less energy). The conclusion follows that it is in the interest of both the provider and the customer to have separate definitions for performance and availability. Thus, in these types of contracts, the aforementioned mechanical performance is an integrated part of the offering. The underlying subordination argument is as follows: availability is more important than performance because the level of performance has no significance if it is not available. The two, however, have a reciprocal influence. Correspondingly, the level of availability has lower importance if performance decreases.

### **3 DISCUSSION**

#### **3.1 Theoretical contributions**

In the current chapter, I briefly synthesized the semiotics of top-tier literature concerning outcome- and performance-based contracts. Thus, this chapter contributes to the debate (Grubic & Jennions, 2018; Hypko et al., 2010b; Schaefers et al., 2020) regarding which term is the more appropriate prefix for describing the given advanced services. By doing so, the current chapter contributes to the definition stream of literature concerning the topic (Schaefers et al., 2020). The pragmatics analysis showed that although the terms “performance” and “outcome” seem to go hand in hand

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and are even used interchangeably (as noted by Grubic & Jennions, 2018, see, e.g., Selviaridis & Wynstra, 2015), the term “outcome” is used more frequently in journals in the fields of innovation, marketing, general management, ethics, gender and social responsibility, and the public sector and health care. Diving deeper into the syntax between the words, it was found that over time, the use of the term “outcome” has increased. Furthermore, given the premises of a higher frequency of “outcome” in the field of innovation and the fact that the related business models seem to be referred to as “outcome business models” rather than “performance business models”, further analysis confirmed that both “business model” and “innovation” are directly related to the frequency of “outcome”. Last, in support of recent research on the topic (Schaefers et al., 2020), semantic analysis argued that the term/prefix “outcome” should be preferred over “performance” in academic literature discussing the associated contracts because the latter term is more polysemic and homonymic. Linking the argument back to pragmatics, it was found that due to the ambiguity of the term “performance”, its use may cause legal technical issues if it is not sufficiently distinguished from outcome-related metrics, such as availability. In conclusion, I argue that “outcome-based” is the more appropriate phrase due to its univocal nature and provide further insights into pragmatics- and syntax-wise antecedents of terminological practices in related high-quality research.

### **3.2 Managerial contributions**

The current chapter offers managers multiple contributions. First, it offers managers some contextualized explanations and causes of the terminological differences present in the top-tier journal papers concerning the topic. This is important, because the variance of the terms used may

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not only confuse the readers, but also cause the readers to give preference to the studies endorsing one term and disregard the theoretical insights in studies using the other. Second, it summarizes current research trends and provides a catalog of the research outlets publishing papers on the topic. Furthermore, managers can rest assured of the high quality of the given facets because they represent the top level of business research regardless of the discipline. Third, although the current chapter is focused on academic discourse, it highlights some important managerial considerations, such as aspects of contract language and basic formulas for revenue functions or outcome metrics.

### 3.3 Limitations and suggestions for future research

Like all research, the current study also has limitations. First, as the goal of the study was to look into and contribute to the debate on “outcome/performance” terminology specifically, the choice was made to focus on research endorsing the given terms. Alternative and closely related concepts include but are not limited to result-oriented product service systems (Van Ostaeyen, Van Horenbeek, Pintelon, & Duflou, 2013), advanced services (Baines & Lightfoot, Howard, 2014), smart operations and maintenance (Huang et al., 2020) and value-based selling (Töytäri & Rajala, 2015). Thus, future research could examine the semiotics of the wider body of related research as well. Second, despite the evolution in academic discourse, the *in situ* practical names used for the given type of services vary by firm. For instance, Wärtsilä speaks about “lifecycle solutions” (Wärtsilä.com), and Rolls-Royce coins its business models based on flight hours TotalCare<sup>®</sup> or CorporateCare<sup>®</sup> (Rolls-Royce.com), while Hilti calls its power tools as-a-service as Fleet Management (Hilti.com). Understandably, the practical terminology used to describe the given type of services is even more scattered and nuanced than the theoretical terminology. Therefore,

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future research could map the various outcome-based offerings aggregately to spot differences, similarities and patterns and yield more granular typologies to accompany the extant availability/economic outcome-based contract typology (Böhm et al., 2016).

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