

Design Principles for Engagement Platforms – Design Knowledge on Fostering Value Co-Creation

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Abstract

As the importance of services increases, so does the need for suitable information technology (IT) to support the exchange of resources in interactive value creation processes (co-creation). Engagement platforms (EPs) have been identified as a suitable IT solution, as they enable and foster value co-creation of heterogeneous actors. However, few guidelines exist on how to design for value co-creation on EPs. To address this problem, we employed the Design Science Research approach. We first conducted a literature review and then interviewed 24 experts from successful EP companies. As a result, we derived four design principles and evaluated them for further iterations. This study elaborates our findings and implications for practitioners and scholars seeking knowledge on how to design EPs resulting from three completed design cycles.

1. Introduction

Digital platforms are “an omnipresent phenomenon” that changes how products and services are offered [1]. The relentless advance of digital platforms has already disrupted industries such as retail, entertainment, hospitality, transport and many others. Companies, e.g. Amazon, Netflix, Facebook, Airbnb and Uber, built and popularized platforms to the degree that they are easily dominating their respective market [2, 3, 4]. Adopting platform business models and implementing digital platforms is challenging for incumbent and novel businesses [5, 6]. Both practitioners and scholars are still analyzing aspects that differentiate thriving and failing platforms [7, 8, 9]. Essentially, however, all digital platforms enable and facilitate value co-creation, i.e. the co-

creation of value or experiences of actors by offerers and beneficiaries through resource integration [10, 11, 12]. Due to their decentralized and accessible nature, digital platforms provide a powerful tool for actors to successfully co-create value by improving information and resource exchange, as well as enabling or facilitating the digitization of offerings [1, 13, 14].

Several different conceptualizations of digital platforms exist in literature [5, 15]. To provide a common basis for discussion, we adopt the term engagement platform (EP) for this study and use the definition of Breidbach et al. [16] who consider EP as a “physical or virtual touchpoint designed to structurally support the exchange and integration of resources, and thus co-creation of value, between actors in a service (eco)system” [16, p. 594]. As an example, Google has established multiple EPs to manage the customer experience across a vast EP landscape by providing both physical (Chromebook) and virtual touchpoints (e.g., Google Play Store) [16]. Utilizing EPs to foster actor integration and collaboration provides platform operators (POs) with competitive advantages, as its usage drives efficient sourcing, resource integration, and increased external knowledge assimilation by companies, which in turn leads to the improvement of the user experience (i.e. service innovation) [17, 18].

As EPs increase in popularity, due to the previously stated advantages, their design and implementation differ. In recent years, some authors have demonstrated how EPs may be developed by applying appropriate principles, e.g. [19, 20]. However, no standards could yet be derived that predict whether an EP will be successful in the long-term, or whether it will quickly disappear from the market. Incumbent and emerging POs face a high degree of complexity and lack knowledge related to design features and functions of EPs [8]. Design principles (DPs) simplify the design of later artifacts

and create a standard, which future EP operators might use to guide their EP design [21]. Despite the growing practical and scientific interest, only a very limited number of studies have addressed which DPs to consider when creating and improving EPs [22]. Therefore, our research question is:

How can the support of value co-creation and service innovation be enabled and fostered on engagement platforms?

The next section outlines theoretical concepts related to EPs drawing from service logic and related work on DPs for digital platforms. To answer the proposed research question, we employ the Design Science Research (DSR) approach [21]. The DSR approach and the associated design cycles are described in the methodology section, followed by our results and artifacts. Finally, we conclude this paper with a discussion of the results and an outlook on future research.

2. Foundations and related work

EPs are “physical or virtual touchpoints designed to enable and facilitate value co-creation in a service ecosystem” [16]. Referring to value co-creation and service ecosystems, the conceptualization of EPs heavily draws from Service Logic [11, 16]. To simplify the terminology, and in line with the suggestion from Ojasalo and Ojasalo [23], we refer to “Service Logic” as an umbrella term that draws from basic principles of the service-dominant logic [24], service logic [18] and customer-dominant logic [25] which are tightly interwoven. A central principle of the Service Logic is that a service’s value is not unilaterally provided but offered by one actor as a value proposition that may be accepted by another actor to then co-create value [24]. Therefore, value is always co-created by one or multiple beneficiaries in a service ecosystem, even those unaware of each other [26]. The overarching service ecosystems are “relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange” [26 p. 11]. Due to the increasing level of digitalization, service ecosystems heavily rely on EPs as core enablers and facilitators of value co-creation [7, 17]. As these ecosystems attract additional, heterogeneous actors with distinctive needs, designing an EP remains a challenge due to constant external and internal changes that call for continuous service innovation, i.e. improving the actors’ overall experience [27]. Even more so as the digital infrastructure of EPs needs to provide actor-

specific solutions via a singular technological platform [28]. Consequently, successful EPs rely on a diverse set of mechanisms, i.e. activities, processes, features, and functions, to enable and foster value co-creation [7, 29, 30].

To this day, only a limited number of studies is concerned with deducting DPs for digital platforms. There, the following four design categories have been proposed to guide the development of DPs for EPs: easing the actors’ entry, identifying mutual problems and needs of actors, supporting co-creation, and facilitation of service innovation [22].

Easing the actors’ entry encompasses activities that support a continued influx of new actors, e.g. by lowering the barriers to adapt to existing processes and cultures [19] and collaboratively developed pricing and cost mechanisms that remain fair for established and new actors [4]. By easing the entry and adaptation for new actors on an EP, new opportunities and novel resources are created for all actors within the service ecosystem to integrate resource and benefits [11]. Thereby, continued use of the EP is encouraged as the potential for value co-creation is ever-growing.

As resources on the EP change dynamically, identifying mutual problems and needs of actors enables effective and efficient resource allocation and mobilization [19, 27, 31]. The identification of recent developments and changes in and outside the ecosystem is pivotal to improving the exchange of services, i.e. value co-creation, among actors. Therefore, EPs should implement deliberate activities and processes to ensure the identification of risks and opportunities for actors on the EP.

The support of value co-creation by EPs is an essential and defining trait [19] that requires attracting and maintaining a critical mass of actors, innovating offerings, and improving the overall experience [16, 32, 33, 34]. Drawing from the suggestion of Lusch and Nambisan [11, p. 161] we adopt a broadened view of service innovation that is defined as “rebundling of diverse resources that create novel resources that are beneficial (i.e., value experiencing to some actors in a given context)”. Consequently, this definition of service innovation is less focused on product- and technology-centric innovation per se, but adopts an experience-centric perspective on how to improve the ability to co-create value in the service ecosystem associated with the EP. Facilitating service innovation with and among actors is essential for the long-term success of EPs [20, 22, 31, 35, 36] and companies in general [14], as otherwise internal and external changes, as well as, the increasingly dense competition will motivate actors to join EPs that provide the best competitive advantage to them.

Considering the complexity to design and implement these activities on EPs, exploring design knowledge, to provide practitioners with actionable DPs and adding to literature concerned with EPs and the Service Logic, provides a promising research avenue [26, 30, 31].

3. Overview of the Design Science Research project

This research aims to explore design knowledge for EPs. As a broad theoretical lens, we employ the concept of value co-creation and, more specifically, the Service Logic as kernel theory to inform our research approach [18, 23, 24, 25]. We follow the DSR paradigm as it is specifically well suited to a) provide practitioners with actionable knowledge on how to utilize Service Logic and b) provide sound insights on how to design and improve value co-creation on incumbent and emerging EPs [31]. Following Kuechler and Vaishnavi [37], we structured our research iteratively in three design cycles with five process steps, each: problem awareness, suggestion, development, evaluation, and conclusion (see figure 1).

In the initial design cycle, we conducted a structured literature review following the approach of Webster & Watson [38] as described in figure 1. The detailed process is depicted in an earlier study [22]. A total of 1.169 studies were reviewed. 20 design requirements and seven DPs were identified and eventually grouped, based on four design categories that draw from the solution objectives proposed by Göbel and Cronholm [19]: easing the entry of actors, identifying mutual problems and needs, supporting co-creation and facilitating service innovation (see figure 2). Based on these findings a method to design the customer journey to enter, utilize and co-innovate EPs

was developed and conducted with 16 practitioners to design a first draft or improve their EPs and check the applicability of the DPs and requirements.

In the second design cycle, we further assessed the validity and applicability of our results by conducting 14 semi-structured expert interviews, depicted in figure 1. We derived a database of 136 relevant EPs from publicly available data. We only chose EPs from the DACH (Germany, Austria, and Swiss) region to prevent cultural differences that may affect the EP design, which might influence value co-creation. Also, due to the length and depth of the interviews, we found it more manageable to conduct them in our native language. The interviews for all cycles were conducted between May 2020 and September 2020 and lasted, on average, 52 minutes. Interviewees were CEOs, or managers of B2C and B2B platforms in the personal service sector. We chose the personal service sector to ensure that there are activities of resource exchange and user engagement involved. The interview guideline included the requirements and design categories we identified in the first design cycle. The interviews were transcribed, and afterward the authors collaboratively conducted deductive and inductive coding (see figure 2). The second coding cycle was performed to a) validate or reject the design categories derived from the literature review and b) to search for complementary, contradicting and supporting themes. As deductive coding we used the four derived design categories: easing the entry, mutual problems and needs, value co-creation and fostering service innovation and e.g. derived "provide clear and simple rules" and "fair and collaboratively developed price and cost mechanisms" as inductive codes. A total of 29 inductive codes were identified.

Process steps	Output		
	Design cycle 1	Design cycle 2	Design cycle 3
Awareness	Literature review	14 Semi-structured expert interviews (personal services)	10 Semi-structured expert interviews (non-personal services)
Suggestion	Synthesis of design requirements and principles concerned with EP design	Validation and refinement of Categories	Refinement of the of categories to aims with supporting mechanisms and enactors
Development	Design categories for EP design and a customer journey mapping method especially tailored to EP design	Deduction of categories and additional mechanisms for EP design	Design principles for value co-creation
Evaluation	Application in the field/ argumentative/ peer review	Argumentative/peer review	Survey with B2B and B2C platform providers
Conclusion	Four appropriate categories were derived. Relevance indicated by the lack of related literature and design knowledge.	Further analysis needed to derive generalized design principles	High ratings for applicability and novelty, yet relevance received mixed ratings

Figure 1. Consecutive design cycles and research activities

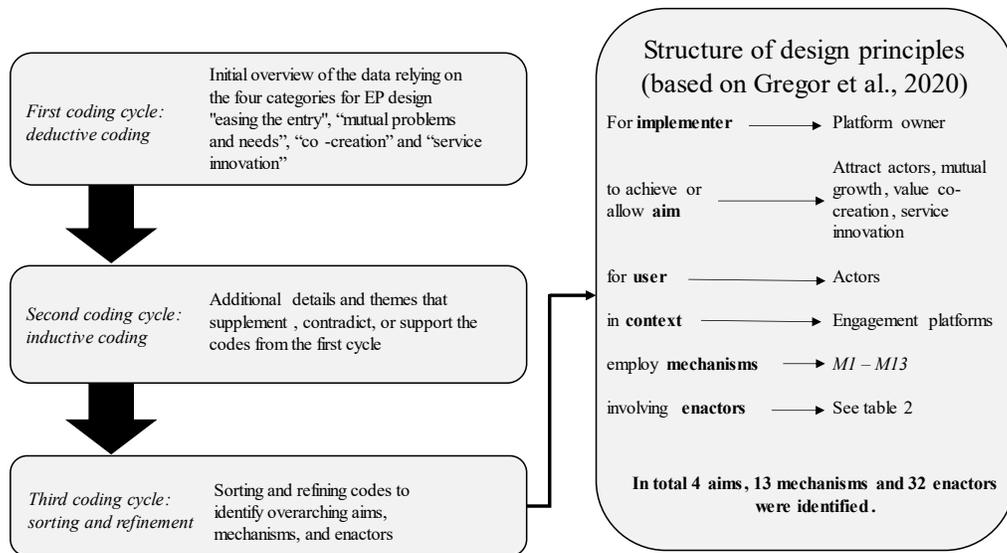


Figure 2. Coding and deduction of design principles

In the third design cycle, we conducted additional interviews with ten experts, i.e. founders, CEOs, or managers of B2B EPs offering industrial services in the DACH region (see figure 1). We selected this sector to contrast our prior findings and identify the respective challenges and mechanisms to industrial and personal service sectors. We then combined the codes from the initial interview series and the second one and analyzed the data in the third coding cycle, figure 2. As a result, we identified 682 codings describing individual activities and features that POs have implemented on EPs, to enhance their user experience. We then added codes for more general *mechanisms* that are used to achieve specific *aims* and include actions, activities, forms, and processes [39] following the structure of a design principle, depicted in figure 2. To identify the overarching mechanisms, individual activities and features were clustered and categorized. E.g. the codings "(manual) matching with existing partners", "tutorials and instructions", "similarity with familiar apps" resulted in the mechanism "supporting actor onboarding". Iteratively, codings and codes have been consolidated during several workshops of two authors into a set of 13 overarching *mechanisms* with a total of 32 enactors, i.e. subsidiary components. Then the *aims* related to the implementation of these *mechanisms* were derived, e.g. *supporting actor onboarding* to **attract and bind actors**. The *aims* are similar to the design categories from the first cycle, but we found that they better describe the DPs.

Since our implementer, user and context remain unchanged throughout, we will present the DPs only with their respective *aims* and the underlying *mechanisms*. In addition, the 32 enactors are presented

in table 1 together with exemplary quotes from the interviewees.

4. Design principles for engagement platforms

Four DPs have been deduced from the three design cycles. We will elaborate on the four *aims* (**A1 - 4**) and 13 *mechanisms* (M1 - 13) in this subsection and provide an overview of the 32 enactors (i.e. subsidiary components) in table 2. The *mechanisms* have been employed on average on 18.07 EPs (standard deviation (SD) = 3.17). In addition, we verified the employment of *mechanisms* by analyzing publicly available data of the EP, e.g. websites and marketing material. We indicate how many EPs in our sample utilized a specific *mechanism* as follows: < 15 = •; 16 - 21 = ••, and > 21 = •••. This categorization is based on the average use of *mechanisms* ± SD.

A1 - attract and bind actors. To foster a steady influx of new actors, who provide and demand offerings, the EPs employ varying mechanisms to attract and bind actors and promote resource exchange as service ecosystems rely on the ability to connect heterogeneous actors efficiently and effectively to afford the dynamic bundling of resources to co-create value. An EP needs a critical mass of actors to ensure these properties. There are several mechanisms that the EPs have implemented. These mechanisms include:

M1. Instrumentalizing existing social media platforms, physical events, marketing campaigns, and B2B partners to *raise actor awareness*. •••

- M2. *Supporting actor onboarding* by familiarizing actors with the respective features of the platform. •••
- M3. *Employment of trust-building symbols and activities* to give actors a sense of trust and security. ••
- M4. Develop *risk-based pricing and cost mechanisms* to allow fair distribution of risk, costs, and revenues among actors. ••
- M5. *Attending interpersonal events* to get into conversation with possible new actors or to identify the problems of existing actors early on. •
- M6. Establishing a *connection between existing and new partners* to support new actors in finding value co-creation opportunities, while also providing existing actors with a continuous influx of potential partners. ••

Following the structure of DP formulation proposed by Gregor et al. [39], the first DP aim addresses the aim of attracting and binding actors constantly to maintain or improve their market position. Consequently, the first DP states:

DP 1: *For POs to attract and bind actors on EPs, they should raise the awareness (M1), support actor onboarding (M2), employ trust-building symbols and activities (M3), establish risk-based costs and pricing (M4), attend interpersonal events (M5) and connect to existing and new partners (M6) in order to foster resource integration.*

A2 - achieve mutual growth. To solidify the overall competitive position in ever-changing markets, an EP should address mutual problems and needs of actors. The collaborative identification of these factors decreases misguided resource allocation and innovation activities within the ecosystem, on the one hand, while increasing the transparency and awareness of latent capabilities among actors as well as a shared understanding and direction for future developments on the other. Therefore, POs should employ the following mechanisms:

- M4. While new or supplementing business models support certain actor groups maintaining *fair risk-based costs and pricing* enables mutual endeavors and growth in the long run. ••
- M5. To sense changes in the sector/market or the actors' sentiments, *participating in interpersonal events* allows a more direct and free exchange about pressing issues that would not have been discovered otherwise. •

- M6. As future challenges, e.g., legal changes, might affect the EP, the *connection of existing and new partners* should counteract these scenarios, e.g. by onboarding more diversified partners or establishing new or supplementary business models for the EP itself, as well as its actors. ••
- M7. This ties into *treating actors as equal partners*, which implies that the needs of all partners and actors of an EP are considered, and problems are addressed, making them more open towards active collaboration. ••
- M8. While the respective POs have a large impact on the innovation and new solutions implemented or offered on the EP, mutual activities and *being open towards new solutions* offered by (new) complementors are needed to serve the emerging needs of different actor groups. ••

Based on these mechanisms that support mutual activities among actors and POs, we propose the second derived DP as follows:

DP 2: *For POs to achieve mutual growth in EPs, they should establish fair risk-based costs and pricing (M4), participate in interpersonal events (M5), connect to existing and new partners (M6), treat actors as equal partners (M7), and be open towards new solutions (M8) to address mutual problems and needs.*

A3 - foster interaction and value co-creation.

The primary purpose of EPs is to enhance interaction and value co-creation among dispersed actors. Thus, all actors' inclusion and engagement is naturally a major driver of the success of an EP. To facilitate the interaction of actors, five mechanisms have been identified:

- M2. Providing clear rules, guides, processes and features *support actor onboarding* and increases the chance that actors successfully co-create value. ••
- M6. The deliberate *connection of existing and new partners* as a key activity of EP design affords an ever-growing feedback loop of new value co-creation opportunities and simplifies the recognition of new resources, thus deepening the commitment with and via the EP. ••
- M9. To ensure that features to support the individual value co-creation are discovered and used by the actors, EPs should be designed to *ensure intuitive usability*. This could be guided by design features of well-known platforms or applications to increase the learning curve of new actors. ••

M10. Mutual problems and needs affect requirements for value co-creation, e.g. restrictions imposed by the Covid-19 pandemic, thus pressuring POs to *create new and useful features*. ••

M11. The *resource exchange* among actors, both virtually and in the real world, needs to be supported by rules of interaction, quality standards and features that conveniently connect physical and virtual aspects of interaction. ••

Combining the mechanisms to support value co-creation on EP, DP 3 states:

DP 3: For POs to *foster interaction and value co-creation* on EPs, they should support actor onboarding (*M2*), connect to existing and new partners (*M6*), design for usability (*M9*), create new and useful features (*M10*), and define mechanisms for resource exchange (*M11*) in order to enhance value co-creation.

A4 - improve competitiveness by coordinated service innovation. As markets are continually changing and actor demands increase, EPs must ensure feasible and sustainable service innovation. This overarching goal is central to the idea of EPs that enable ways for service innovation through increasing resource liquefaction and resource density of service ecosystems. We identified five mechanisms that EPs employ:

M8. *Being open towards new solutions* enables and drives shared innovation endeavors with various actor groups outside of established complementors. ••

M10. While *creating new, useful features* seems quite arbitrary to mention in this context, the experts outlined several challenges in this regard. Regulations, technical path-dependencies, user expectations and costs are more obvious ones, the sheer number of requests and feedback POs receive from actors of different groups is a major challenge by itself. Therefore, almost all POs in our interview sample employ agile methods to inform user-centered, fast-paced and effective innovation of their platforms. ••

M12. To harness the actors' input and insights, POs implement several kinds of *feedback channels for innovation*, e.g., customer hotlines, click-stream data, and UX-testing. ••

M6. Actively including and *connecting existing and new partners* in innovation processes allows the POs to incorporate competencies that would otherwise have to be developed in their own company, and thus, provide them with strategic

flexibility and a stronger relationship to key stakeholders. ••

M13. As actors mainly join and remain in EPs to obtain competitive advantages, POs need to *signal to the actors that their EPs are future proof*, i.e., can react swiftly to changing needs, market activities or legal requirements. ••

The challenges of remaining competitive were strongly emphasized in the interviews, which is why our fourth derived DP states:

DP 4: For POs to *improve competitiveness by coordinated service innovation* in EPs they should connect to existing and new partners (*M6*), be open towards new solutions (*M8*), create new, useful features (*M10*), utilize feedback channels for innovation (*M12*) and signal to actors that they are future proof (*M13*) in order to ensure service innovation.

The mechanisms may be supported by enactors that can have their respective design features [39]. Based on the 24 interviews, we identified 32 enactors that support one or several of the 13 mechanisms. If an enactor is part of more than one mechanism, the additional mechanisms are depicted in brackets after the respective enactor in table 1. For this publication we will not discuss the DPs of individual enactors but give examples of what activities, processes or artifacts were identified. Please note that table 1 is a concise and shortened version to illustrate the enactors to adhere to the page limitations.

The DPs were evaluated based on the initial set of requirements identified in a literature review in design cycle 1. In addition, we conducted a survey that assessed accessibility, importance, novelty and insightfulness, actability and guidance, as well as effectiveness [40] employing a 5-point Likert scale. The descriptive statistics of this survey are depicted in table 2.

The survey was distributed by mail to experts of EPs from our database. The survey was accessed by 62 persons and completed 14 times. We excluded four responses as the respondents indicated to be neither a PO nor an EP developer. Construct reliability is calculated with Cronbach's alpha for items with more than two items and Spearman-Brown for less than three items. In the survey, we provided a total of four tables, one for each DP together with the respective mechanisms to improve the overview. To employ these mechanisms more effectively, the overarching aims and underlying enactors need to be considered to create suitable change agents (i.e. processes, activities and roles).

Table 1. Enactors of mechanisms

Enactor (Mechanism)	Example	Exemplary Statements (translated)
Marketing campaigns (M1)	run advertising to draw attention to the platform	When we started and wanted to test (the new service) we have advertised in newsletters and many different social media channels. - EP3
Social media presence (M1)	be active in relevant social media channels	We have different channels there, of course. Social media is just one that targets student users. - EP7
Tutorials and instructions (M2)	provide instructions on how to use the platform	And then we're also finding automated ways of doing training, such as video training, series webinars, online FAQs, all of those sorts of systems. - EP21
Similarity to familiar apps (M2)	orientate the design on well-known apps	So the app is, with respect, self-explanatory. - EP10
(Manual) matching (M2, 6, 11)	bring together suitable offers with the right users	In the next step, we can significantly reduce the selection, so we only show a very reduced part of what is actually possible in order to create a good matching. - Ep22
Human moderation of content (M3)	offer human support for user questions	We set up a service hotline, which is then not for queries ... but for problems with installation, scanning the QR code... a personal contact point for the first hurdles. -16
Refund systems (M3)	enforce standardized refund policies	In the past we had 1-2 disputes that had to be resolved by us. We paid back the money and sorted it out. - EP2
Quality certificates (M3)	display certificates on the platform	A lot of parents also ask for a criminal record now in the childcare space, or a babysitting course, a first aid course, and if a provider wants to prove that they have that, they can upload that without it being visible on the whole platform. - EP6
Welcome packages (M3)	send the new user physical material about the platform	If I want to start or hold a regulars' table, I get a small join-in kit in the mail, where there is a regulars' table display for the table so that people can find each other right away and name tags and a few game ideas and icebreaker instructions. - EP4
Personal touches (M3)	share user stories and success stories	Of course, we bring examples and inspiring incentives from stories of what you can do together. Be it which groups you can find or which events you can do together. - EP4
Real-world artifacts and symbols (M3, 5)	provide physical information material	Generally, it's for one thing you have the manual flyers and a manual for the daycare management, they just like to look up anything in books. - EP13
Attracting corporate partners (M3, 4, 5)	find companies that promote and use the platform	It's something that we're also familiar with from child emergency care, so it's more likely to be booked when a contractor says, "we've vetted them, we have a contract with them," than when parents come to us directly through the website. - EP3
Involve actors in changes (M4, 7, 13)	have key actors approve and co-design new features	The customer can say, I want to be involved here now and then there are the project managers who say, here is a cool person, we want to include him in this project. - EP24
Establish a personal bond (M5)	try to get to know key actors and their needs better	First of all, every customer has a Customer Success Manager, which is basically a contact person who you can call or e-mail. - EP24
Conduct workshops with actors (M5,7,8)	host actor workshop to identify actor needs and problems	There are various evening events where (actors) are around. Then you can talk about things relatively informally or ask specific questions, so we want to learn now just like that, by the way. - EP1
Communication tools (M6, 11)	provide the user with communication channels	We know that our customers in particular like to have a great deal of independence, and that's why we're totally open (towards use of communication channels). - EP11
Recommender systems (M6)	provide recommendations to relevant offerings	...we call it best basket. We "look" at the items the customer wants to buy and give an optimized suggestion regarding delivery date, number of packages, and price - EP18
Search functionalities (M6)	enhance the search on EPs, e.g., by collaborative filtering	That would be the first process and I can then standardize and search for them. What is very important is that if a larger scout or customer has been with us for several years, then there are so many elements inside that I have to find again. - EP24
Integration of innovation partners (M7)	involve partners to co-develop features	We do customer feedback sessions, what's what their feelings are about the platform right now, how they're using it, how they use it, which might be different from our expectations. - EP21
White label solutions (M8)	individualize the platform for specific focus groups	Otherwise, we shoot small learning videos, which we then put on Youtube. But more in the direction of white label. - EP10
Third-party innovations (M8)	integrate features from other partners into the platform	The service provider gets its own access to the backend, can enter its services there, such as table reservations, and the users can book this and can then tick the box "Arrangement desired". And then the service provider can get in contact. - EP8
Prevent exploitation (M8, 13)	ensure that the business model is not undermined	What we actually do, we stop, a bit understandable if the business model is contact initiation, we stop bypassing the platform at that point. - EP11
Feedback channels (M9, 12)	implement feedback channels and user data	We have a feedback function directly via the platform, so that you can write feedback tickets directly and that flows directly into our feedback board... - EP16
Idea realization (M10)	follow up on feedback and implement the actor ideas	We don't have a feature set or a concept that we're approaching, it's a single flow. And everything that is reported back to us ends up in the roadmap. - EP5
Ease the exchange of resources (M11)	create and support channels for resource exchange	We have a (virtual) workspace. After a task is accepted actors can communicate and exchange data here... For the future we may include (calls) on the platform itself - EP2
Quality standards (M11)	provide clear instructions and rules on proper quality	On the one hand, we have the content rules that no vulgar language may be used, so that is the respectful language towards others. This is also already moderated in the job ad and otherwise controlled only on demand. - EP6
Rules of interaction (M11)	ensure respectful interaction among users	For this purpose, we have published a netiquette: It consists of four golden rules: Be nice, be polite, be honest and be helpful. - EP4
Trend scouting (M12)	participate in trade fairs and identify current trends	So we're always out and about at trade fairs, of course, reading the latest stuff about what's happening in digitization. - EP8
KPI tracking and reporting (M12)	use technology to identify and improve user behavior	How many users return to the platform on a daily or weekly basis? How long do they stay on which pages...? We measure these things anonymously. - EP4
Implement rating systems (M12)	allow users to rate the EP and related offerings	You can't write ratings on the website like that, but no reviews have actually been faked or deleted. So these are honest ratings that we also measure ourselves against. - EP12
Innovation workshops (M12, 13)	conduct meetings to discuss offerings and improvements	I try, on the part of the employees, to ensure that we have an open culture of discussion and that I promote and encourage this. - EP9
Agile processes (M12, 13)	use agile approaches to react to external changes	I think the whole company is a changing innovation process. All the processes we have are always designed for change. - EP11

As the number of respondents is quite low, and there is no universal scale for measuring the quality of DPs, the statistical validity of the results remains very limited. Still, we identified several implications from this explorative evaluation of our artefact. From the evaluation of the individual items, we conclude that the illustration of the DPs, especially of the enactors, remained vague to the user group of POs and developers. The respondents rate several aspects on average only slightly above 3, i.e. “undecided”. These items referred to the specific context of the respondents’ business (e.g. “I find the DPs useful for designing digital platforms in practice”, $\bar{x} = 4.2$). They are rated lower than items with more general wording of the same measure/construct (e.g. “compared to my current situation, I believe that the DPs would improve the effectiveness of my work”, $\bar{x} = 3.44$). Since our DPs are highly generalized at this point, this is valid criticism as the level of generalization, while chosen deliberately, reduces guidance and relevance to specific domains or responsibilities. While the aims and mechanisms will remain on a general level to guide the design efforts of EPs of several domains, future efforts will include the definition of specific sets of enactors to increase relevance, guidance, and effectiveness in specific contexts. We will detail the according steps further in the discussion.

Table 2. Measures and results

Measure	Items	\bar{x}	SD	Reliability
Accessibility	3	4,28	0,76	0,914
Importance	2	3,55	1,02	0,875
Novelty & insightfulness	2	4,08	1,02	0,797
Actability & guidance	4	3,75	1,07	0,769
Effectiveness	8	3,76	0,82	0,9

5. Discussion

This research employs DSR to generate prescriptive knowledge in the form of DPs for EPs to support value co-creation. The expert interviews have been coded and evaluated through the lens of Service Logic and existing DSR on EP design. By summarizing and advancing the existing body of design knowledge with 24 expert interviews from incumbent POs, our contribution encompasses several aspects for practitioners and scholars.

We present managerial implications of Service Logic and provide a set of four DPs that consists of

four aims, 13 mechanisms, and 32 enactors to enable and enhance co-creation and service innovation on EPs. The prescriptive knowledge at hand informs POs of incumbent and newly founded EPs on enabling and fostering interaction among actors and actor groups.

As EPs are structures that allow and facilitate value co-creation, prescriptive research provides advice to inform the design of mechanisms related to growth, governance and innovation of EPs. By that, we also contribute to existing research gaps concerning applicable research that draws from Service Logic [26], the call for actionable information for designing EPs [31], and the empirical assessment of digital platform mechanisms [5].

As an EP needs to support various, sometimes contradicting needs via a singular technological platform [28], we assessed a wide array of critical mechanisms and enactors, thus contributing to a better understanding and design of activities and features. In this regard, we also acknowledge non-virtual components that contribute to these mechanisms, e.g. personal meetings, workshops, marketing material, handbooks and training. Thus, we contribute to the EP literature that deliberately considers both physical and virtual touchpoints [7]. Consequently, our research provides a broader and more pragmatic overview of activities, processes, rules and roles to improve to value co-creation on EPs than studies that focused only on virtual aspects.

Drawing from Service Logic, we refer to a varied group of EP users as actors [11] with the only exception being the PO. As a result, our analysis remains rather vague on how specific groups play into certain mechanisms and what needs the respective complementors, customers, or other agents might have. This is also reflected in the evaluation of the DPs, as items related to the specific work context of practitioners received lower approval on average with higher deviations compared to questions referring to the general context.

While the overarching aims and mechanisms have been evaluated and refined based on extensive qualitative research, i.e. a structured literature review and 24 expert interviews from a diverse set of business contexts, the 32 enactors remain to be explored further. E.g. Mehrwald et al. [41] assessed 150 EPs in the personal service sector to derive a set of 53 trust-building features and functions based on quantitative analysis. A similar approach combined with an analysis of features and functions and respective mechanisms and underlying enactors could yield more applicable and relevant results to address the existing shortcomings we identified in the surveys’ results. Another limitation of this research is the absence of a discussion of co-creative vs individual contributions

considering the different mechanisms we present. Future research could consider individuals more thoroughly, e.g. by employing the Self-Determination Theory [42, 43], to complement our focus on collaborative relationships through the lens of value co-creation [24, 29].

Even though we are confident that the results of this study support practitioners' in designing EPs and provide new theoretical insights, our results are subject to confirmation and acquiescence bias. Our efforts to minimize these biases included extensive literature reviews, individual coding of the authors, increasing our sample, and an exploratory survey. However, as we limited the interview sample to experts from the DACH-region, there may be culturally specific factors missing from our findings. Also, resulting from the deliberate choice to exclusively interview experts working at EPs, we refrained from interviewing a heterogeneous set of actors, e.g. consumers or other experts, complementors, as the selection of experts for our interviews was more robustly ensured by relying on established and measurable criteria such as job position and experience in the field.

6. Conclusion

EPs are increasingly popular and powerful means to enable co-creation and service innovation. Therefore, identifying suitable DPs should be pursued to provide future platform operators with guidelines on how to design successful EPs. Concerning our proposed research question: *How can the support of value co-creation and service innovation be enabled and fostered on engagement platforms?*, this study describes the three completed design cycles and the respective findings derived from an extensive research project, including a structured-literature review, a workshop with 16 practitioners, 24 interviews, the assessment of publicly available data and an explorative survey. Based on these empirical insights, scholars and practitioners may derive and redefine their activities to enable and foster value co-creation on engagement platforms. The set of four design principles, 13 mechanisms and 32 enactors we provided, serves as a structured and tested fundament for the strategic and operational improvement of EPs. The design knowledge we explore in this research contributes to calls from the fields of service logic, EP design, and digital platforms built on empirical insights.

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