Digital innovation platforms as orchestrators of (non-)decided orders and their impact on the role of software product management

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1. Towards a theory of digital innovation platforms (DIPs)

Software product management (SPM) is undeniably one of the most important roles in the technology sector today (Kittlaus & Clough, 2009; Kittlaus & Fricker, 2017, p. 258 ff.; Wagenblatt, 2019, p. 22 ff.). At the same time, interorganizational collaboration in the development of software products – especially mediated via innovation platforms – is becoming increasingly important (Cusumano et al., 2019; Jansen et al., 2013). This makes it necessary for the role of SPM to adapt (Jansen, 2020). But how should this be done? To lay the foundation for answering this question, we focus on innovation platforms and work out that these can be captured aptly with the help of the term “partial organization” (Ahrne & Brunsson, 2011, 2019). Based on this conceptualization, the changing role of SPM as proposed by Wagenblatt (2019) can be examined both on the part of the innovation platform and on the part of the partner organization.

Innovation platforms – more specifically: digital innovation platforms (DIPs) (de Reuver et al., 2018, p.126) like Salesforce force.com, Amazon Web Services, or Apple iOS – have so far received little attention in organizational science. One possible explanation for this is that they are far less visible than their more conspicuous ‘sisters’ in the everyday world: Transaction platforms (Uber, Amazon Marketplace, or Apple AppStore) or social media platforms. In extant literature, platforms tend to be treated as “black box[es]” (de Reuver et al., 2018, p. 126) and are often reduced in their function to the mediation of content (Weinryb et al., 2019), funding (Nielsen, 2018), or transactions (Ahrne et al., 2015; Kirchner & Beyer, 2016; Kirchner & Schüßler, 2019). While analyses examining these prominent functions have yielded important insights about the general operation of platforms, we propose to focus on DIPs as a specific form of platform which lends itself particularly well to a partial organization lens.

When introducing the phenomenon of DIPs and comparing them with other forms of “organizationality” (Dobusch & Schoeneborn, 2015), the function of a platform can no longer be adequately reduced to that of an “intermediary” (McIntyre et al., 2020) limited to specific role constellations (of the market or the media). Treating platforms as “multi-sided markets” (Thomas et al., 2014) obscures the fact that they coordinate „two or more ,sides‘ which could not [...] interact otherwise“ (McIntyre et al., 2020) – irrespective of any specific role constellation. DIPs must be distinguished from transaction and social media platforms – that is, digital marketplaces where people exchange goods and services or content, respectively. In contrast to these forms of platforms, DIPs „usually consist of common technological building blocks that the owner and ecosystem partners can share in order to create new complementary products and services” (Cusumano et al., 2019, p. 18; Schüler & Petrik, 2020). Based on such an understanding of their functions, we can say that DIPs are at least “both intermediary and architecture” (McIntyre et al., 2020 our emphasis). They „provide a stable core but also mediate between different groups of users” (de Reuver et al., 2018, p. 125), thereby creating a constantly evolving product fragment on which other organizations (so-called ‘complementors’) generate complementing innovations (Cusumano, 2019; Cusumano et al., 2019; Gawer, 2020; Hein et al., 2020).
In the following, we build up on Gawer’s (2014, 2020), introduction of DIPs as a novel “organizational form” by relating it to the notions of “meta-organization” (Ahrne & Brunsson, 2005, 2008) and “partial organization” (Ahrne & Brunsson, 2011). We argue that DIPs are complete organizations which ‘orchestrate’ both decided orders (partial organizations and complete organizations) and non-decided orders (networks and institutions). By the very nature of their business models, they constitute second-order decided orders that orchestrate first-order (non-)decided orders.

![Diagram of Digital Innovation Platforms (DIPs) as orchestrators of (non-)decided orders](image)

**Figure 1:** Digital innovation platforms (DIPs) as orchestrators of (non-)decided orders

### 2. DIPs as complete organizations

DIPs fall under the category of ‘orchestrators’ (also called ‘keystone organizations’, ‘lead firms’, ‘hubs’ or ‘architects’), which are more than just intermediaries (Dhanaraj & Parkhe, 2006; Gawer & Cusumano, 2002; Gulati et al., 2012; Iansiti & Levien, 2004; Teece, 2018; Williamson & De Meyer, 2012). They are “firm[s] that own [...] a core element of the technological system that defines its forward evolution” (Gawer & Henderson, 2007). Despite its prevalence, the term ‘intermediary’ is a rather misleading designation for this role. Although DIPs mediate economic relationships, they are far more than “profiteers” (Ahrne et al., 2015). DIPs themselves are first and foremost complete organizations (Ahrne & Brunsson, 2011) – they decide internally about membership, hierarchy, rules, sanctions, and monitoring. As orchestrators, however, they are at the same time “evolving organizations” or “meta-organizations” which federate and coordinate constitutive agents who can innovate and compete (Gawer, 2014, p. 1240). As second-order decided orders orchestrating first-order (non-)decided orders, DIPs “manage a portfolio of complementors” (McIntyre et al., 2020).

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1 For the term ‘complementor’ – as opposed to: ‘supplier’ – cf. (Adner & Kapoor, 2010). Although both types of platforms rarely exist in pure form, most have a clear focus. Only a few companies succeed in pursuing a “hybrid strategy” – which might accordingly become the “next phase in the evolution of platform thinking” (Cusumano et al., 2019, p. 103).
3. DIPs orchestrate complete organizations

Whereas in complete organizations decisions are made about all elements of the organization, in partial organizations this is not the case (Ahrne & Brunsson, 2011, p. 87 f.). Using this distinction to examine DIPs, we can see that DIPs orchestrate the ecosystem with the help of other complete organizations and partial organizations.

Regarding the orchestration of complete organizations, it is worth noticing that DIPs spend a large part of their organizational work on the management of partners. This entails “practices such as the creation of partnership models, partner training, and consultancy and sales partner support” (Jansen, 2020). In their seminal essay on innovation ecosystems, Williamson & De Meyer (2012) repeatedly point out that an orchestrator is dealing with decisions about the composition of other decision-making structures, e.g. by „defining an architecture of differentiated partner roles“, „stimulating complementary partner investments“, and „enabling flexibility and co-learning“. Van Alstyne et al. (2016a) make a similar observation when emphasizing that DIPs need to „optimize openness“, „engage developers“, and „put critical mass ahead of money“. In particular, DIPs strive to achieve a balance in its level of openness so that other partners can work on it without eliminating the very knowledge gap making its operation profitable in the first place (Boudreau, 2012).

DIPs not only orchestrate actors of two different sides (e.g., customers and salespersons), but also actors of the same side – particularly complementors – based on their capacity to exploit direct and indirect network effects (Cusumano, 2019, p. 105; McIntyre & Srinivasan, 2017). In current literature, this orchestration of complete organizations is mainly discussed with reference to questions of governance (Schreieck et al., 2018) or ecosystems (Adner, 2017; Jacobides et al., 2018).

4. DIPs orchestrate partial organizations

DIPs do not only orchestrate complete organizations – they also employ the five forms of partial organization identified by Ahrne & Brunsson (2011) in their orchestration processes. We will briefly touch upon each of these in the following.

Membership: To be able to develop as a complementor on a DIP, individuals must be part of a DIP ecosystem. The platform provides „participation architectures“ (Schüler & Petrik, 2020) for their ‘club’ members (who are not members of the organization), among other things, to at least appear as open as possible to the developers (Benlian et al., 2015).

Hierarchy: The platform itself serves as a convenor, as a „core element“ (Gawer & Henderson, 2007), an „architecture“ (McIntyre et al., 2020) around which the complements are arranged. It thus constitutes a technically mediated hierarchy.

Rules: “[E]cosystem standards” (Jansen, 2020) as “specific rules” (Schüler & Petrik, 2020) are a core element of DIPs. They set rules for managing the trade-off between control and stimulation in processes of innovation. In particular, the orchestrator sets technical standards, e.g. through a „design of the technological interfaces (such as
APIs)” (Cusumano et al., 2019, p. 88; Ghazawneh & Henfridsson, 2013; Tiwana & Konsynski, 2009). However, standards are not only used in the form of such boundary resources, but also in the form of intellectual property agreements (Huang et al., 2013) and „development practices” (software and collaboration frameworks), which are communicated to the complementors by means of the so-called “documentation” (Jansen, 2020).

**Monitoring:** „[R]ating systems” (Schreieck et al., 2018, p. 47) are a common theme in the context of transaction platforms. However, ratings also play an important role on DIPs as a means of so-called „partner health analysis” and „software development governance”, e.g. in evaluation of the quality of applications, developers, or assistance provided by developers to others as so-called „software operation knowledge“ (Jansen, 2020).

**Sanctions:** Wareham et al. (2014, p. 1203) emphasize DIP’s „advanced regime[s] of certification of both employees and partners for technology competencies”. Jansen (2020) also highlights the necessity of “observing, supporting, and enabling software developers” by “testing, road mapping, [and] shared requirements”.

### 5. DIPs orchestrate networks

Besides these two forms of decided orders, DIP also orchestrate non-decided orders, i.e. networks and institutions. These are characterized by the fact that their underlying structures are not the outcome of decisions. Networks rely on “informal structures of relationships linking social actors, which may be persons, teams or organizations” (Ahrne & Brunsson, 2011, p. 88); institutions rely on “behaviour based on beliefs and norms” (Ahrne & Brunsson, 2011, p. 89).

With regards to networks, we first need to make a conceptual distinction between corporate networks and networks of people. Since the former have already been dealt in the part on complete organizations, we subsequently focus on the latter. Van Alstyne et al. (2016b, p. 5) emphasize that “[w]ith platforms, the assets that are hard to copy are the community and the resources its members own and contribute.” Interactions between external producers and consumers need to be facilitated and the value of the ecosystem is more important than the value of the product. This is well-known for transaction platforms (Reischauer & Mair, 2018), but it is also an important component of DIPs. Cusumano et al. (2019, p.88) even speak of a “shared sense of the collective” when looking at the complementor community. However, not only complementors, but also customers (Van Alstyne et al., 2016b) belong to this community, which is shaped by the orchestrator using measures like IT tools for all “contributors” (Grothe-Hammer, 2020) “to communicate” (Jansen, 2020) with each other.

### 6. DIPs orchestrate institutions

With regard to institutions, our hypothesis is that DIPs increasingly try to turn themselves into institutions: „[A] platform company offering a dominant platform design in its industry shapes a flexible platform-based ecosystem, which is open to a

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2 The relationship between corporate networks and ecosystems is discussed by Shipilov & Gawer (2019).
potentially unlimited pool of complementors” (Schüler & Petrik, 2020). By “rendering” (de Reuver et al., 2018, p. 126) decisions about what product to sell (a platform is only a product fragment) to the social processes within the ecosystem, DIPs ensure an “open-ended character and malleability” (de Reuver et al., 2018, p. 133) of their operations. This so-called „generativity” (Zittrain, 2006) of platforms brings along a „paradoxical nature of change and control“ (Tilson et al., 2010), i.e. the platform becomes dependent on ‘its own’ emerging social processes. It turns into something which is an organization both with and without actorhood (Grothe-Hammer, 2019).  

7. DIPs’ impact on the role of SPM

Ahrne et al. (2016) have proposed to broaden the scope of organizational analysis to domains such as standardization, meta-organization, organizing markets, and networks. We fully subscribe to this call and extend it further by claiming that this very extension is made by the empirical field itself. DIPs are organizations which orchestrate decided and non-decided forms of social order based on a technological architecture. They miraculously manage to “create boundaries that balance openness to outside developers with maintaining coordination across the entire system” (McIntyre et al., 2020). Instead of developing „theory on a small subset of the platform phenomenon” (McIntyre et al., 2020) by reducing platforms to market or mass media organizations, we propose to enlarge the research agenda of organizational analysis by incorporating DIPs as a relevant case of second-order decided orders.

Based on these conceptual considerations, the final paper will elaborate what this new organizational form means for SPM. As a starting point for this analysis, we resort to the dimensions of SPM proposed by Wagenblatt (2019, p. 8 f.) based on first considerations regarding such a change by Jansen (2020). The following table shows how these dimensions change for the SPMs of the DIP (left column) and for the SPMs of the partner organizations (right column):

<table>
<thead>
<tr>
<th>SPM-Dimension</th>
<th>Change for DIP’s SPMs</th>
<th>Change for Partner’s SPMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Viability</td>
<td>Mostly listens to partners’ feedback.</td>
<td>Additionally, ensures platform fitting.</td>
</tr>
<tr>
<td>Product Development</td>
<td>Mostly ensures requirement sharing.</td>
<td>Additionally, ensures platform fitting.</td>
</tr>
<tr>
<td>Product Marketing</td>
<td>Becomes less important.</td>
<td>Becomes even more important.</td>
</tr>
<tr>
<td>Software Demonstrations</td>
<td>Additionally, ensures documentation.</td>
<td>Does not substantially change.</td>
</tr>
<tr>
<td>Market / Customers</td>
<td>Changes heavily.</td>
<td>Changes heavily.</td>
</tr>
<tr>
<td>Organizational Maturity</td>
<td>Does not substantially change.</td>
<td>Does not substantially change.</td>
</tr>
</tbody>
</table>

Table 1: The impact of the increasing proliferation of DIPs for SPMs

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3 Today’s widespread criticism of platforms (both DIPs and others) downplays this problem, imagining them as purposive actors who know what they are doing (Zuboff, 2019). The fact that they, for their part, have become involved in a game that they can no longer control is widely neglected, although it has implicitly already been observed (e.g. Nicas & Alba, 2021).

4 We leave out the topic of family for various reasons. For a critical discussion on this point cf. (Apelt et al., 2017).
List of figures and tables

**Figure 1**: Digital innovation platforms (DIPs) as orchestrators of (non-)decided orders

**Table 1**: The impact of the increasing proliferation of DIPs for SPMs

References


"Proceedings of the Software Product Management Summit India 2021"