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# CROWDPUSHING: THE FLIP SIDE OF CROWDSOURCING

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## Abstract

*Activities and initiatives of co-creation are traditionally seen as a way for organizations to gain value through the involvement of certain actors in their environment. We notice an implicit assumption in current theoretical conceptualizations that co-creation is initiated and driven exclusively by organizations. However, it appears that co-creation activities may also be driven by third-party actors outside organizations. Based on interviews and secondary data from a public transport company in Stockholm, Sweden, we noticed that third party developers of services, that gained a large and diverse user base, were driving co-creation activities with the respective organization. Subsequently, based on our findings, we introduce the term "crowdpushing" to denote externally driven co-creation activities and frame four propositions to describe how co-creation activities are motivated and driven. Our findings contribute to a broader understanding of co-creation and have implications for its design and deployment.*

*Keywords: Co-creation, Crowdpushing, Innovation, Open Data, Third Party Development, Public transport.*

## 1 Introduction

*In February 2009, a swift decision was made at a Stockholm-based public transport company to halt their web site deployment due to a perceived on-going denial-of-service (DOS) attack which has persisted since the new web site went public. Further investigation revealed that the source of the server overload was not a deliberate attack, but rather a non-sanctioned travel planning application that was utilized by thousands of users and heavily relied on the no longer available formatting of the previous web site design. Subsequently, once the previous web site design was restored, the gadget resumed normal behaviour and the problems ceased. This incident stimulated the present study by raising questions such as what forces were at play to cause this situation? How did such massive activity pass under the radar of the company? Could the company anticipate and avoid the widespread unauthorized reuse of its data? Should the company encourage such co-creative activities?*

Openness and exchange are inherent in co-creative approaches to digital innovation. Co-creation in the context of organizations and people is often seen as an organizational initiative that aims to gain competitive advantage through the involvement of a certain type of actor in organizational processes. The involvement of people may have different exchange formats and outcomes. For example, in co-production, people co-produce the product or service that they consume in exchange for added degrees of freedom. However in crowdsourcing, people provide organizations with new useful ideas in exchange for some monetary or immaterial rewards. So far, co-creation has often been seen as a joint activity in which organizations lead and people follow. In contrast, this paper describes an emerging variant of co-creation in which actors in the environment lead and organizations follow.

In what follows, we report on a study of distributed involvement in innovation at a public transport company in Stockholm, Sweden. We investigated an open data initiative of the company and found

that it was shaped to a large extent by the use patterns and on-going engagement of numerous clients who utilized "unauthorized" applications that were built by independent third-party developers who found ways to construct services which better fitted the users' needs. This finding was unanticipated considering the common expectation that open data or any co-creation initiatives are led by the host organization which tend to remain in control over the process, as in any other planned strategic manoeuvre. In this case, however, in spite of the initial strategic intent of the organization to curtail and if possible to thwart third-party attempts to reappropriate the company's data, hundreds of thousands of users who chose to rely on non-sanctioned services in their everyday life created a crowd-based thrust that forced the company to give in and to provide open and unrestricted access to portions of their data.

In view of the current literature that portrays co-creation exclusively as an internally-driven strategic choice, where organizations actively approach actors in their environment and get them engaged in some joint activities, our observations suggest that we need to assess and conceptualize an alternative type of co-creation that is externally-driven by third party actors who are backed and supported by an engaged user base crowd. To this end we bring forward the notion of *crowdpushing*. We define crowdpushing as a coercive public demand that compels an organization to engage with external interested parties in anticipated acts of co-creation. We argue that crowdpushing is enabled by the ubiquity of mobile devices, related platforms and wireless data networks and that it is contingent on the emergence of third party actors who have an interest in developing interfaces to the organization's resources.

The remainder of this paper is organized as follows: we first review the related literature on the relationship between organizations and crowds in the context of co-creation. Next, based on interviews and secondary data, we present a case study of crowdpushing. Building on our findings, we offer a set of propositions that differentiate between internally and externally driven acts of co-creation and conclude by suggesting implications for practice.

## 2 Theoretical background

A major theme within contemporary organizational research is concerned with how organizational boundaries are opened for exchange and how user value is co-created to a greater extent with a wide set of actors (Prahalad & Ramaswamy, 2004; Normann & Ramirez, 1993). In order to be successful, co-creation must provide increased value for all involved parties. Therefore, understanding the key to co-creation success must draw on the *motivations* of the relevant stakeholders to engage in the process. These motivations may be placed on a continuum that spans from gaining a concrete finite reward to gaining a capability or affordance (Figure 1). For example, whereas crowdsourcing illustrates a reward-based motivation on one hand, smartphones, web 2.0 services, and open-data initiatives illustrate affordances-based motivation on the other hand. Naturally, there are instances in between these two poles, such as living labs (Bergvall-Kareborn et al., 2009) that are partly motivated by gaining rewards and partly by gaining affordances.
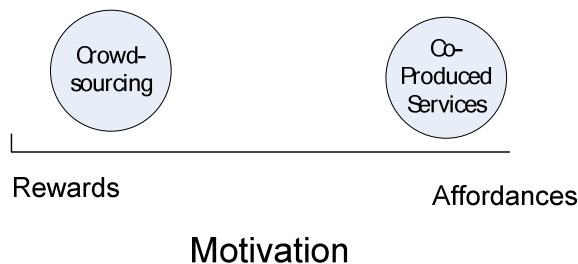


Figure 1.        *The range of motivations in co-creation*

Rewards-based motivation refers to both economic value as well as immaterial value. For example a quite spectacular rewards-based co-creative relationship can be observed in *crowdsourcing* (Howe, 2006), in which organizations draw on the value produced by a collective intelligence (Surowiecki, 2005). Through platforms like Innocentive and Top Coder, organizations are given access to an abundant set of independent contributors, where even marginal contributors are able to provide them with otherwise unattainable knowledge (Jeppesen & Lakhani, 2010). In crowdsourcing, organizations typically initiate a 'broadcast search' by disclosing information about the problem at hand and inviting solutions from anyone who can solve it (Jeppesen & Lakhani, 2010). As individual members of the crowd submit potential solutions, the organization rewards (financially or through other means) the providers of those solutions that they find the most appropriate. Thus, in crowdsourcing the organization retains the control over how to proceed with the suggested solutions. In this sense, crowdsourcing seems - when it works - to take the best out of two worlds by drawing on the collective wisdom of the crowd while maintaining control over how the proposed ideas and solutions are used.

While research on crowdsourcing has highlighted how rewards-based co-creation works in favour of organizations, we see other, more continuous approaches to co-creation. The affordances-based motivation refers to co-creation of a capability of some sort, e.g. the ability to co-design and customize a service such as a smartphone. Even though a smartphone is sold to the customer in a fully operational default state, its design allows major modification (Germonprez et al., 2007). Thus, after obtaining a smartphone, the typical user often engages in a secondary design process in which s/he modifies the smartphone by applying personalized settings, applications or even operating systems. The design of smartphones allows any user to co-produce the service for it to meet situated and emergent needs (Germonprez, et al., 2011). Affordances-based motivation may also be the ability to co-create content, e.g. through web 2.0 applications. For instance, by using a wiki-based documentation for frequently asked questions about a product or service, users are able to add or alter substantial information based on their personal experiences (Wagner & Majchrzak, 2006). Furthermore, affordance based motivation may be the ability to view and modify data (Kuk & Davies, 2011). One example is Application Programming Interfaces (APIs) that enable organizations to provide third party developers with programmable interfaces to their data repositories. Through this structured data access organizations encourage and empower third party developers to co-produce new services which may use data in unanticipated contexts or visualized it in an innovative way (Kuk & Davies, 2011).

While existing theoretical conceptualizations of co-creation have emphasized motivation as an important dimension of co-creation, next we present our empirical investigation which revealed driving force or thrust as another critical dimension in understanding co-creation activities.

## 3 Research Method

Case studies are suitable in particular for the exploratory research of a complex phenomenon that requires in-depth on-site investigation (Dubé and Paré, 2003). We investigated the underlying phenomenon using the case study method. More specifically, we used a single exploratory case study to explore a novel and underexplored phenomenon. As we have yet to see theoretical conceptualisations of crowd-driven approaches to co-creation, building on Yin (2009) and Darke et al. (1998), we find a single exploratory case study to be a suitable approach.

The focal organization in this paper is Storstockholms lokaltrafik which we label here Stockholm public transport company (SPTC). SPTC is owned by the county council of Stockholm and has a board of politicians. SPTC holds the overall responsibility for infrastructure, ticketing and customer information about the public transport network. SPTC's main operations have been subcontracted since 1993 to bus, train, metro and light-rail operators such as Veolia Transport and MTR Corporation. On a daily basis 700 000 customers make use of the transport network of SPTC. Together with other public transport companies in Sweden, SPTC owns the Association for Public Transport Companies (APTC), which is a company that provides nationwide ticketing and nationwide journey planning.

We chose to study SPTC because it demonstrated a case of crowdpushing. Through a variety of data sources we were able to follow the process in which SPTC has turned its approach to data access from a strictly controlled policy to open access with very few restrictions, and how this change was influenced by public demand. Furthermore, access to data and intimate knowledge the target organization, which is crucial in case study research, was secured by one of the authors who was a previous employee of SPTC. Overall, data included interview transcripts and internal documents such as presentations, e-mail conversations and other relevant documents as described in Table 1.

Respondents were selected both from personnel who worked at the target organization during the time period studied and from companies and individuals who tried to gain access to company data from SPTC during this period of time. In order to select a relevant set of respondents, the authors initially identified four phases of the process within the organization. Potential respondents relevant for each phase were identified and put into the initial set of respondents. Most of the respondents were identified as relevant to more than one phase. In total 13 semi-structured interviews were conducted using a pre-crafted interview protocol. To elicit the respondents' views on the unfolding of the organizational shift of perspectives regarding open data and cooperation with third party developers, the interview started with broad questions in this vein. To further understand the details of this process, a number of significant events related to the relevant phases were then brought up and discussed in detail.

All interviews have been audio taped and transcribed. All transcribed audio material and reports have been coded using Atlas.ti, a data analysis software package. Transcribed utterances and other text materials addressing the scope of research have been identified and coded accordingly. Given the disruptive nature of the changed policy, we approached the data analysis through a lens of punctuated change (Newman & Lyytinen, 2008). Such a lens allows researchers to understand critical incidents (Flanagan, 1954) which significantly alter socio-technical trajectories within the studied setting and the interventions the organization initiates as a response (Newman & Lyytinen, 2008).

The data collection approach used had some limitations. The potential number of relevant respondents was limited because only a small fraction of the employees at the company were engaged in the phenomenon under investigation. To enhance the limited number of respondents, the initial set of respondents was complemented by a snowball sample (Sarantakos, 1998), that is, at the end of each interview, the respondents were asked to name other persons who may be able to contribute to the study. In order to reduce problems related to selective descriptions or problems in recalling certain actions relevant to the story, we also triangulated the interviews with historical e-mails and documents from the company (Eisenhardt, 1989). Equipped with a priori knowledge based on these documents before conducting the interviews, we were able to bring up events not mentioned by the respondent at the end of the interview in order to refresh the respondent's memory.

| Data Type | N | Data Source Description |
|---|---|---|
| Interviews | 8 | Interviews at SPTC with Head of the Passenger Information Dept Head of Internet services, IT-project manager, Business developer, IT-system administrator, Head of Business Development, IT-system administrator, IT-controller |
| Interviews | 3 | Interviews at APTC with CEO, CIO and Head of Business Development |
| Interviews | 2 | Interviews with third party developer of the two leading smartphone applications |
| Documents | 16 | E-mail conversations at SPTC |
| Documents | 5 | Presentation material of SPTC |
| Document | 1 | Strategy document of SPTC |
| Usage statistics | 2 | Detailed usage statistics for the two leading applications |

*Table 1.        Data description*

# 4 Crowdpushing at work: The case of Stockholm Public Transport

The analysis of the case data revealed four key phases (each triggered by critical events) related to crowdpushing, as described in the following section and summarized in Table 2.

| Phase/ Date | Description | Critical Event *(leads to →)* | SPTC Organizational Response |
|---|---|---|---|
| Phase 1 09/2007 | Travel data services go live | Dynamic travel data becomes available to the public via the company website (mobil.sl.se, personalized services, real-time information) | All customers were referred to the web site and encouraged to use it |
| | | Subsequent requests of third-party developers for data access | Denial of all requests and development of a clear policy aiming to control directly the dissemination of all public data |
| Phase 2 11/2008 | Crowdpushing: Unsanctioned services gain popularity | The emergence and increasing adoption of unauthorized third party services | No organizational response. Services developed by third party developers are ignored. |
| Phase 3 02/2009 | Service malfunction | Web services malfunction due to apparent Denial of Service (DoS) attack following architectural change of the company website | Launching investigation to identify the source of attack and to develop proper security measures. |
| | | Discovering that the source of malfunction is not DoS attack, but rather unsanctioned applications used by thousands of clients | Attempting to bind the third party developers with legal agreement |
| Phase 4 09/2011 | Open access to data | Realizing that the company has not been successful in binding third party developers, and that with no legal leverage the only workable solution to regain control is through the provision of a public API | Changing data access policy and reaching out to third party developers with a public API |
| | | Third party developers adopt the newly available API | Promoting the services provided by third party developers and embracing the developers as part of their provision of information |

*Table 2.        Summary of the critical incidents*

## 4.1   First phase: "We want them to come to www.sl.se"

The delivering of timely and relevant information assisting travellers to go from point A to B has been a core mission for the SPTC for decades. In the late 1990's the company began a series of large and visionary IT projects aiming to provide functionality such as interactive journey planning, real-time departure information and disruption information. Among the services offered was a mobile website (mobil.sl.se), ability to save preconfigured trips and favourite stations on the web site and a real-time web page for computer desktops. The main hub (signs at bus stops and stations excluded) through which all digital services were offered, was the company web page www.sl.se.

*"It was made in the traditional way, systems for presenting information at our own webpage and our own signs, and everything had to be huge and big. We were building space rockets, and then things takes a lot of time."* (Head of Internet services, SPTC)

As the project progressed a growing interest from external parties emerged. Typically they wished to present information about public transport through alternative media channels. For instance the largest yellow pages service in Sweden wished to publish the location of bus stops in their map service. However, these proposals were refused and pushed back:

*"Several parties got in touch to me and expressed that they wanted to build things with our data, and that they wanted to cooperate with us. It was this and that, everything from screens at refrigerator doors to very local travel planners. […] I was pretty quick to say no to them since we didn't have the resources, technology nor the right type of thinking for that kind of collaboration."* (Head of Internet services, SPTC)

The internal strategy not to provide information to external partners was motivated in terms of control. If other parties were to create their own services SPTC would lose control over how the information was presented to passengers which, in the case of e.g. incorrect information, could lead to dissatisfied customers and ambiguities with regard to the company trademark. Further, allowing free access would contradict other goals such as potentially selling the information in the future:

*"We were afraid of how our information was presented when we have no control over it. [...] We just wanted them [our customers] to come to www.sl.se"* (IT-controller SPTC)

*"Well, it was like some policy at SPTC that we did not want to share any information, since someone else could then do something that was better than what we provided."* IT-system administrator SPTC

In September 2007 APTC, initiated an export of data (including data from SPTC) to Google, thereby making nationwide coordinates of bus stops and stations in Sweden available through Google Maps. SPTC reacted promptly and contacted APTC in order to clarify that SPTCs data were not to be distributed to third parties. At this stage, the strategy was clear and firm – SPTC did not accept other parties to present information about public transport in Stockholm.

*"[SPTC] watched a presentation where Google showed their information, and the reaction was like 'How the hell did you get this information?'. And when they answered 'Through APTC' the ball was set in motion. [...] It was then that SPTC showed that as soon as something happened that was beyond their control, in any other channel or by someone else, it was all negative. It was one hundred percent 'What the hell, we don't have any control over this, so we'll put an end to this.' It was reflex behaviour that 'this must be removed, remove it immediately!'"* (CEO, the Swedish Association for Public Transport Companies)

*"Suddenly we had become side-lined by our own service company that we paid fees to, and afterwards we are told that they basically have signed a commercial contract [with Google]. Then my eyes started to glow, I can tell you that."* (Business developer, SPTC)

As APTC was controlled by formal agreements and through ownership it was possible for SPTC to regain control over how information from SPTC was used and the export to Google ceased.

## 4.2   Second phase: "We've lost control"

During 2008 a growing number of external services suddenly appeared. In spite of the policy at SPTC that information about public transport was not to be provided through external parties, these unsanctioned services gained a large user base. The services were created without any permission from SPTC and the information for those services was screen scraped (extracting selected parts from SPTC's webpage) from existing services provided at the company website. For example, information from the journey planner system and the real-time information system started to appear through a number of applications for iPhone, Android, Windows Vista Gadgets and similar services for

Macintosh computers. The most popular application for iPhone was distributed through Apple App Store and became available to iPhone users for the first time on November 9th 2008 and rapidly gained a large number of users. The application was created by a student in Stockholm as a hobby project, without any formal agreements with SPTC.

*"The fact is that this is something of a hobby project so we felt like it's fun to do something, not to get involved and try to get into various agreements to the right and left. So then I solved the problem so to speak. [...] It worked great. [...] I have thought that if one has a fairly large user base it's not as easy to dismiss my application with 'no, but we do not want anyone else to access or view our information'"* (The developer of the leading iPhone application)

For Android a number of services emerged in a similar way, and in this case too it happened without prior permission from SPTC. The most popular service for Android was called "STHLM Traveling"

*"It was pretty straight forward because I lived outside Stockholm, so I needed to have something that took me from point A to B when I was in the city. And something that was quick and easy and so that I did not have to go through the website. [...] In a simple and intuitive way really. That was my motivation to build it and that is what it still is. [...] That many people used it and got in touch was extremely fun."* (The developer of the leading Android application)

As SPTC became aware of the new services available and the screen-scrape technology used for getting data, different types of actions were discussed internally. One application was investigated from a legal perspective regarding data ownership and trademarks, but no action was taken.

*"I think people were a bit shocked actually, 'Oh, we've lost control'"* (IT-project manager, SPTC)

*"Suddenly we became aware that this is something that is ongoing and it has been ongoing for several years but we did not know about it. Well, knew about, that's no secret that they did but there was just nobody at [SPTC] who had reflected upon that they did it."* (Head of Business Development, SPTC)

As the external services increased in popularity and use, without SPTC taking any action, it became more and more apparent within the organization that the prior position not to share information was unsustainable:

*"We thought that whatever action we took, it was not possible to stop this in the long run. [...] The only way to gain value to our brand was to make data available."* (Head of Passenger Information Department, SPTC)

## 4.3   Third phase: "We had to write adapters and my God what misery it was."

One of the new services, externally developed without permission from SPTC, was programmed to get information from the real-time information system on a regular basis. However, if the information was not delivered within a certain timeframe, the system was again asked the question. This bad way of handling errors in the code of the gadget, together with an extensive distribution of the gadget through the Microsoft Windows Vista Gadget gallery, created a critical situation for SPTC. When the real-time information system was slow in answering requests, this resulted in a large number of questions from the Gadgets distributed to thousands of computers running Microsoft Windows Vista. This could for example occur in the case of bad weather conditions with a large number of passengers searching for information or when new internal systems were deployed at SPTC.

*"We noticed that there were problems with the real time information for the commuter train, and that the database server suddenly went into high gear as the CPU was like running at like one hundred percent. Then we started to explore a little bit and found out that it was this gadget that caused problems. We saw that it made a lot of calls because it sent a parameter that we normally do not use. The gadgets are all open source so we could see that the gadget sent the parameter. And in this way we could reduce the number of requests to the database. Then everything was okay for a while, until it completely started to run amok, and completely killed our servers... This was when we deployed our*

*new interface of the company webpage, even though we were entrusted with a very powerful server environment. The complete webpage went down just eight, nine hours after launch and it took very long time until we really could deduce the whole thing and fix it. So I mean of course it has cost the company an enormous amount of money."* (IT-system administrator SPTC)

As a consequence of the issues with the externally developed services, an internal process was initiated to formulate a new strategy. Formally, this process consisted of three workshops ending up with a strategic document named "Guidelines for cooperation on passenger information". This document stated that SPTC should now reach out to external developers in order to manage the external channels and services. The new strategy nevertheless came with restrictions on usage and who could use the information. All external requests should be handled and matched up against certain criteria, retaining some control on SPTC's behalf. The document also highlights the importance of the SPTC Trademark and that SPTC should be presented as provider of the information in the third party services. The new guidelines were decided in the management team after some discussions about the economic value of the information:

*"We really thought for a while that we had a commercial opportunity. That we could sell this information. [...] It was this sudden awakening when we realized that, first we thought that we could get paid for this, and yes the people out there was very much interested in it. But if we demanded payment, [people] would ensure that they had access to that information anyway. To think that we could sell it, the idea was useless. They would just get the information from the journey planner at all times anyway."* (Head of Business Development, SPTC)

The consequence of the new strategy was that developers of existing screen scraping applications would sign agreements with SPTC. Hence, the developers of the most popular applications were contacted and had to sign an agreement in order to prevent SPTC from taking legal actions.

*"We came to meet SPTC and started talking. [...] It was of course long, big contracts with many things we had to sign. [...] There were requirements for how the information would be distributed [...] 'You may only use it for a travel planner' and all that. I felt that it was much about trying to protect so that someone else not could get the data. [...] It was not allowed to store anything on the [users'] phone and so on. [...] It prevented me from doing stuff that I wanted to do."* (The developer of the leading Android application)

Nevertheless, even though SPTC had opened up the possibility of getting information by signing an agreement, new problems occurred. Firstly, it was not possible to provide a good technical solution replacing the screen scraping technique.

*"It was well-sealed containers, I would say. Then we had to create the APIs in retrospect for a system that was not really built for APIs. We had to write adapters and my God what a misery that was."* (Business developer, SPTC)

Secondly, the new strategy required considerable overhead to manage a growing number of agreements as well as an increasing number of technical questions raised by external developers - it was difficult to design an organization that could serve external requests in line with the demands.

*"I think that what I feel I've missed it is actually a good regular contact with SPTC. [...] 'Pity that it did not work but we got it on Monday' and just 'Okay'. They shut down the office on Friday afternoon and it feels like you want to say 'Yes, but come on, there are many people out there using these APIs'"* (The developer of the leading Android application)

## 4.4 Fourth phase: "An initiative for open transport data"

At the end of 2010 a joint project between the Swedish Association for Public Transport companies and SPTC was formulated. The aim of the project was to create a more sustainable and less time consuming way of distributing information to third party developers. At this time SPTC had signed more than 25 agreements and there was an emerging need to find more efficient ways to manage

existing and new relations, both with regard to technical solutions and the dialogue with the external developers. From the association's point of view, the project was a project for the industry of public transport in Sweden, with a result that could be used by several of the owners of the association. In this case, it was also beneficial to communicate with developers as a united industry distributing open information about public transport in a common way for the whole of Sweden.

*"We had limited resources at the IT-department and the IT-department were concerned that if we were to do those things ourselves we would have to spend more time, have yet another one thing to manage, provide documentation etc. [...] It sounded like a brilliant idea to do this together with other companies that think in the same way."* (Head of Internet services, SPTC)

*"It's good to work together so that you get all those APIs under one roof so to speak. And also we can share a technical solution. [...] And then we do not ourselves need to go ahead and develop solutions."* (IT-system administrator SPTC)

In September 2011 "Trafiklab.se -- an initiative for open transport data" was launched as a result of the joint project between the two organisations. The solution was described as an initiative to open up information about public transport in Sweden to external service developers. In the external communication about the initiative, external services like the leading application for iPhone are highlighted as examples of what can be achieved when opening up information.

*"-[The most popular iPhone application] is a prime example of that is not necessarily we at SPTC who best can produce useful digital services for travellers. We hope that this initiative will lead to many more smart services to accommodate different types of travellers, says [Head of Internet services, SPTC]."* (Joint press release from the association and SPTC, September 12 2011)

At www.trafiklab.se it is possible to access the information from SPTC and get documentation by registering an account directly at the website as well as the possibility of posting questions and providing feedback to SPTC. Merely one week after launching trafiklab.se more than 160 third party developers had registered in order to get access to the API's (to be compared with the 25 legal agreements the approach in phase 3 had rendered).

# 5 Discussion

As stated in the introduction of this paper, one objective of the study was to solidify and extend knowledge about the drivers of co-creation. Whereas the current literature portrays co-creation exclusively as an internally-driven strategic choice, where organizations actively approach actors in their environment and engage them in some joint activities, the case of SPTC suggests that we need to assess and conceptualize an alternative type of co-creation that is externally driven by third party actors who are backed and supported by an engaged user base crowd. In other words, we can broaden our understanding of co-creation based on the identification of the driving force that propels the resulting joint activity, or the directionality of its thrust which may be internally or externally driven.

To that end, Figure 1 can be extended with an additional *thrust* dimension. As described earlier in the paper, based on the literature, the *motivation* to engage in co-creation activities can be seen on a continuum from rewards (e.g. crowdsourcing) to affordances (e.g. co-produced services). However, our case data underline that the *thrust* – i.e. the propelling force of co-creation activity – can also be driven by entities located outside the boundaries of an organization and beyond its control. Figure 2 portrays the revised space of co-creation activities that includes both the motivation and thrust dimensions. In what follows, we present an extended view of co-creation that builds on the expanded model.
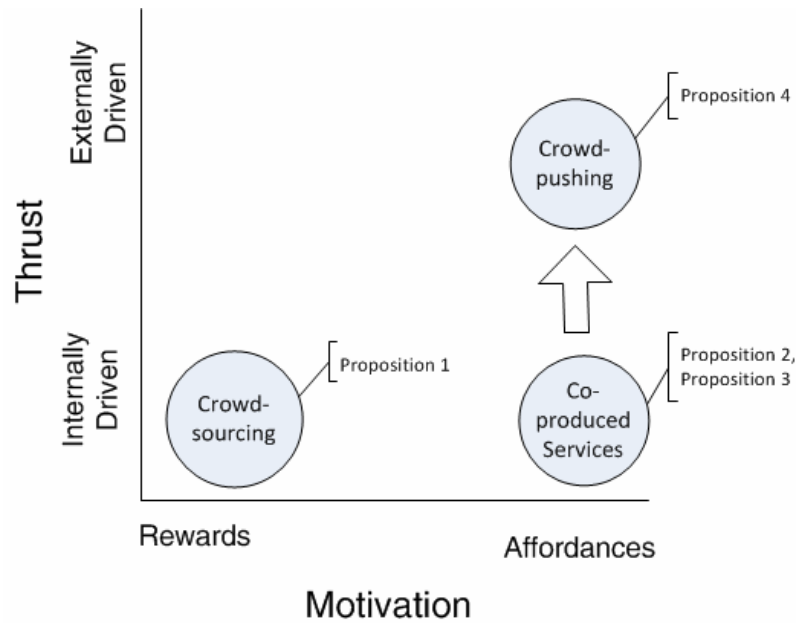
*Figure 2.        Co-creation as a product of thrust and motivation*

The most frequently described co-creation activities are driven by organizations and motivated by rewards. For example, crowd participation in *crowdsourcing* is motivated by the rewards offered in the challenge (Jeppesen & Lakhani, 2010). This observation leads to our first proposition:

**Proposition 1**: *Internally driven reward based co-creation is likely to be successful*

The SPTC case data suggest that we cannot apply a similar proposition to affordances based co-creation. In contrast, we find several examples in our dataset of how organizationally driven *co-produced services* failed. For example, even though SPTC offered mobile services through its mobile web site, people with smartphones seemed to abandon these organisationally offered services and instead turn to unsanctioned services offering additional affordances. Further, as SPTC eventually acknowledged that they needed to establish relationships with third-party developers, they initially approached them with unacceptably stiff legalistic. As a consequence, most of the third party developers simply ignored SPTC and continued to use unsanctioned data channels.

Whereas in the case of SPTC, internally driven affordances based co-creation failed, the literature exhibits several instances of co-produced services where such internally developed technology is rolled out successfully to end-users and able to serve situated needs (Germonprez et al., 2007; 2011). We suggest that success in instances of affordances based co-creation depends on thrust and user base complexity. As illustrated in the literature, organizationally driven affordances based co-creation within the realm of a particular technology (e.g. a single platform) and a more uniform user base population is likely to be successful. However, as more new platforms emerge and the user base population becomes more diverse, the host organization (as demonstrated in the case of SPTC) simply cannot meet the diverse technical as well as functionality demands of the market population. Subsequently, failing to meet the diverse needs has far-reaching consequences that result in failure. This leads to the second and third propositions:

**Proposition 2:** *Internally driven affordances based co-creation for homogenous user populations is likely to be successful*

**Proposition 3:** *Internally driven affordances based co-creation for heterogeneous user populations is likely to be unsuccessful*

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Finally, externally driven affordance based co-creation is likely to be successful. As revealed in our observations, third party developers and the crowd compelled the company to engage in co-creation (as happened with the establishment of trafiklab.se). The SPTC case also suggests that the external forces were mobilised effectively only as the user base became more heterogeneous and the demands more complex. This leads to the fourth and last proposition:

> **Proposition 4:** *Externally driven affordances based co-creation for heterogeneous user populations is likely to be successful*

## 5.1   Implications for practice

The results of the study provide several insights for the design of co-creative activities. Organizations who wish to deploy co-creative activities need to identify and acknowledge the motivation of the target population. Motivations may run from finite reward-based incentives to the acquisition of perpetual affordances. Further, successful deployment of co-creation activities requires an a priori understanding of the nature and level of complexity of the target population. Based on the study, we suggest the following: In cases in which the target population is motivated mainly by rewards, the design and execution of the co-creation activity can be driven by the host organization. Similarly, if the target population is motivated by affordances and the user base population is relatively homogenous in terms of functionality needs and technology in use, again the organization may drive the effort in increasing value for involved parties. However, if the target population is motivated by affordances and the user base population is relatively heterogeneous – that is, it has diverse functionality needs and it utilizes diverse platforms – then intense involvement of third party developers in designing and orchestrating the co-creation activities is critical for their success. Overall, and particularly in the cases of heterogeneous user base, partnering with external third parties, drawing on their resourcefulness, and including them in the value chain of the co-creation activities may offer substantive benefits to the host organization that subsequently can partially or fully withdraw from dealing with end-user capabilities. For example, in our case, SPTC has stopped developing all smartphone applications, yet the company is able to serve successfully the current diverse user base of mobile devices.

Any successful co-creation endeavour is based upon establishing win-win relationships between all parties involved. In crowdpushing, where by design third party developers take a dominant proactive role, the available resources at the organizational boundary play an important role in establishing such relationships. This is a critical point and organizations must pay careful attention to designing interfaces that cater to the third party developers' needs and to the appropriation of the necessary resources that allow them to serve the user base and to create value for all. Moreover, as demonstrated by the SPTC case, organizations need not only to understand the incentives and to meet the needs of the co-creators, but also to refrain from posing unnecessary restrictions and constraints. Failure to do so may not only hamper co-creation but also steer away the independent developers towards alternative and unsanctioned resources. In summary, we believe that the key to successful co-creation activities lies in an active, reciprocal dialogue that provides a basis for win-win relationship among all stakeholders.

## 6   Conclusions

We have explored the drivers of co-creation and the relationship between an organization and its co-creating crowd. Building on single-case data from a Swedish public transport company, we found that co-creation as an activity can be driven by forces external to the organization, something that has so far gone unnoticed in the literature. Subsequently, we introduced the notion of crowdpushing, a type of co-creation that is externally-driven by third party actors that are backed and supported by an engaged user base crowd. Given that the basis for research presented in this paper is a single case study, there is

a need for further explorative studies on crowd-led co-creation activities, as well as rigorous testing of the hypotheses presented in this paper. Moreover, we see a need to reach a deeper understanding of how to design the resources necessary to support successful crowdpushing activities.

Given what we witnessed in the SPTC case, crowdpushing may lay bare entirely new possibilities in which an organization can help in creating value for their customers. Nevertheless, while we can envision the possibilities that crowdpushing might bring, we do not maintain that crowdpushing is the only mechanism in play in the context of co-creation. Rather, we hold that anticipating crowdpushing and designing for it ahead of time can mitigate some pitfalls in the deployment of co-creation activities, let alone being a source of much value for all.

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