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Satisfaction of stakeholders with collaborative process and boundary-spanning activities - the case of inter organizational collaboration on Smart City projects

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Summary

Boundary-spanning activities play an important role in facilitating successful collaboration between organizations, particularly in the context of Smart City Initiatives (SCIs) where interorganizational collaboration is integral to the smart city concept. In the context of SCIs, lead managing organization is usually appointed to coordinate all the collaborative processes and hence engage in boundary-spanning activities. The lead organization is therefore determining how the collaboration will be realized which further influences the satisfaction of stakeholders involved. Satisfied stakeholders are important for delivery of successful projects and so looking at how boundary-spanning activities affect collaboration and therefore satisfaction of stakeholders is explored by this research. The main research question asks what influence do boundary-spanning activities of lead managing actor have on stakeholder satisfaction with collaborative process? Studying stakeholder satisfaction with collaborative process provides an insight of how a more successful interorganizational collaboration can be fostered. The study uses structured interviews to explore the contextually relevant boundary-spanning activities and different levels of satisfaction of stakeholders with both collaborative process and boundary-spanning activities. While it further explores possible explanations for these differences. The findings indicate a link between the boundary-spanning activities and stakeholder satisfaction with collaborative process. The aggregate satisfaction of each stakeholder with boundary-spanning activities seems to reflect the score for his overall satisfaction with collaborative process. Further, overlap between the general factors influencing stakeholder satisfaction with collaborative process and the boundary-spanning activities was found. The study also analyses emerging patterns within factors influencing satisfaction. As an example, factors influencing satisfaction with boundary-spanning activities mostly fall into groups of external factors, relationships, a working group platform or ability to perform an activity well. Future research with larger sample size would be beneficial to validate the findings.

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Introduction

Background

In general, Smart City Initiative (SCI) is a worldwide concept that aims to transform the city into a better living space by using the latest advanced technologies (Smart Prague, 2023). The concept emphasizes strengthening the efficiency and sustainability of all aspects of urban development through various innovations. The aim is to minimize the ecological footprint, increase competitiveness and at the same time maximise the living standards of the inhabitants (IPR Praha, 2023). As Karimikia et al. (2022) argue, public authorities often lack the knowledge and skills that are needed to work on the transformation. Therefore, multiple actors are usually involved in a complex collaborative network of stakeholders. Literature of SCI conceptualized collaboration as the city government being involved in “interorganizational intersectoral collaboration” (Mills, Izadgoshasb and Pudney, 2021, p. 4). In some cities, mediating organizations were set up to act as a “boundary-spanner” in response to this complexity (Karimikia, et al., 2022). These lead managing organisations are in charge of coordinating the intersectoral collaboration between organizations including public, private and even academic bodies. Spanning over boundaries has become one of the biggest challenges in contemporary public management and governance as boundary-spanning work is important for development of collaboration across boundaries (van Meerkerk and Edelenbos, 2018). In the case of SCI, the primary boundaries that are crossed pertain to organizational ones. Leung (2013) underlined how in the interorganizational collaboration, competent boundary spanning work can determine the collaboration success. There is a collection of research done on what kind of boundary-spanning activities are needed for better collaboration outcomes and involvement of stakeholders (Leung, 2013; van Meerkerk and Edelenbos, 2018). The involvement of stakeholders has additionally been found to have influence on stakeholder satisfaction (Leung, M., Ng and Cheung, 2004). And stakeholder satisfaction was in turn studied as one of the multiple factors that contribute to a project success (Erkul, Yitmen and Celik, 2020). However, none of the mentioned papers have been exploring how boundary-spanning activities could affect stakeholder satisfaction. Gaining insight into this problem can help public bodies decide what approach should they choose when managing collaboration between stakeholders to increase the chances of a project to be successful. Choosing to analyse this phenomenon in a context of Smart city projects will provide needed insight for the lead managing organization on how they can improve the collaboration with stakeholders and in the end create projects which contribute to the transformation of a city into a space with maximised living standards.

Research problem

The main aim of the research is to provide an understanding of how interorganizational collaboration can be better facilitated within a SCI with the help of boundary-spanning activities to foster high stakeholder satisfaction. Subsequently, the aim is to indicate which boundary-spanning activities have higher impact on the stakeholder satisfaction with the collaborative process. A Smart City Initiative in Prague is chosen to be studied in this research as very little existing literature is looking at smart city development in Central European Countries (CEE) (Varró and Szalai, 2022). As there is a lead managing actor or organization appointed the findings will also contribute to the research gap in literature of SCIs about what boundary-spanning processes and behaviours are used by leading organizations to create collaboration (Karimikia, et al., 2022). Furthermore, studying SCI in Prague will help the actors involved determine what shared characteristics or preferences they might have in connection to the process of reaching satisfactory collaboration.

The following questions were constructed to guide the research.

Main RQ: What influence do specific boundary-spanning activities of lead managing actor have on stakeholder satisfaction with collaborative process in an interorganizational setting?

RQ1: What boundary-spanning activities were performed by the lead managing actor?

RQ2: How satisfied are the stakeholders of the Smart City Initiative with the collaborative process?

RQ3: What effects did the boundary-spanning activities have on the satisfaction of stakeholders from the Smart City Initiative?

RQ4: What are the reasons behind different effects of the activities on stakeholder satisfaction?

Theoretical Framework

Stakeholder satisfaction

The basic definition of stakeholder satisfaction describes it as a comparative result of stakeholder expectations and the actual achieved outcomes (Van Du, Thuc and Tran, 2022). The existing research examines stakeholder satisfaction in differing contexts of public management. Most literature found does talk about stakeholder satisfaction in the context of construction and infrastructure projects (Leung, M., Ng and Cheung, 2004; Erkul, Yitmen and Celik, 2020; Van Du, Thuc and Tran, 2022). In context of mega transport infrastructure projects, Erkul et al. (2020) referenced that achieving high stakeholder satisfaction should be considered the main objective of a project. Their findings showed significant relationship between stakeholder satisfaction and the project success. Other research talks about the extent to which stakeholder attitudes toward a project influence their satisfaction (Leung, M., et al., 2013) or that management mechanisms like cooperation/participation among the project participants directly affect participant satisfaction (Leung, M., Ng and Cheung, 2004). Very little literature defines or analyses stakeholder satisfaction in context of SCIs or with connection to collaborative process and boundary-spanning activities. In many of the articles about public management, there are usually multiple factors studied that have an effect on stakeholder satisfaction. In this study, the main factor or variable that have possible effect on stakeholder satisfaction is the different kinds of boundary-spanning activities. As these types of activities occur in a collaborative process, the main focus will be the satisfaction of stakeholders with the collaboration between the lead managing organization and the stakeholder.

Interorganizational collaboration

One of the definitions for collaboration explains it as a dynamic process with multiple stakeholders engaging in activities together that are interdependent with the aim to achieve their shared goals. Collaborative interorganizational projects are usually connected with efficient coordination, shared interests between stakeholders and high levels of trust in the relationships (Ali and Haapasalo, 2023). As previous research already indicated how collaboration is intertwined with boundary spanning activities in a way that boundary-spanning contributes to successful collaboration (van Meerkerk and Edelenbos, 2018), this research will add another layer on the relationship between boundary-spanning activities and the satisfaction of stakeholders with the collaboration between organizations. This added layer would then indicate that not only boundary-spanning activities contribute to successful collaboration but also to high stakeholder satisfaction with collaborative process.

Boundary-spanning activities

Boundary spanning is defined as systems and processes by which policy actors in different sectors go beyond organizational and institutional boundaries in pursuit of public value co-creation (Conteh and Harding, 2023). As collaborative approaches are being pushed forward and the inter-organizational arrangements are becoming increasingly prevalent, the boundary-spanning work is gaining significance (van Meerkerk and Edelenbos, 2018). It can play an important role in developing and managing collaborative relationships and creating successful collaboration (Leung, 2013).

Types of boundary-spanning activities greatly depend on the environmental and organizational context. For example, in the public sector environment enhancing coordination and ensuring collaboration across institutional and organizational boundaries is a priority (van Meerkerk and Edelenbos, 2018). The boundary-spanning activities relevant to this particular research have been identified in the context of Smart City Initiatives (SCI) and public management environment.

Van Meerkerk and Edelenbos (2018) identified four different types of activities from a literature review of boundary-spanning activities in public management: relational activities, mediation and facilitation activities, information exchange and knowledge sharing activities, and coordination and negotiation activities. From these categories the most relevant ones which Satheesh et al. (2022) mention are forming and maintaining relations between organizations through relationships that are personal and informal, not only relationships that are based on contracts, creating consensus among the organizations involved, translating knowledge across different boundaries without overwhelming the recipient and coordination of the cross-boundary activities and processes. Williams (2002) adds to some of the already mentioned activities with pinpointing value of communicating and listening. The importance is especially given to two-way communication which is described by ability to listen actively. When a person, the boundary spanner, is actively listening, he is open to be influenced by opinions of people outside of his organization (Williams, 2002). Karimikia et al. (2022) identify boundary spanning activities which are relevant to the context of SCIs. The ones that were not mentioned by Williams (2002), Satheesh et al. (2022) or van Meerkerk and Edelenbos (2018) include creating motivation and understanding between all organizations of what has to be done on a project, informing about developments on the project and managing misinterpretations. Managing misinterpretations is described by them as one of the crucial factors to achieve smart city objectives. All activities are listed in Table 1.

Code	Boundary-spanning activity	Literature source
A1R	Forming and maintaining relations between organizations – personal and informal relationships	Karimikia at al., 2022
A2C	Creating consensus among the organizations involved	Satheesh et al., 2022
A3K	Translating knowledge across different boundaries without overwhelming the recipient	Karimikia at al., 2022; Satheesh et al., 2022
A4L	Active listening – being open to the opinion of other people	Williams, 2002
A5M	Creating motivation and understanding between all organizations of what has to be done	Karimikia at al., 2022
A6M	Managing misinterpretations	Karimikia at al., 2022
A7I	Informing about developments on the project	Karimikia at al., 2022
A8C	Coordination of cross-boundary activities and processes	Satheesh et al., 2022

Table 1. Adopted Boundary-Spanning Activities from Literature Sources

Conceptual Model



Figure 1. Conceptual model

The conceptual model visualized in Figure 1. depicts the expected causal relationship between the boundary-spanning activities and the influence they have on the collaboration in the interorganizational setting and subsequently on the stakeholder satisfaction with the collaborative process.

Methodology

Empirical context

The data collection and analysis were executed within a case of a SCI in Prague – called Smart Prague Initiative, where one public organization, Operator ICT, takes up the role of a boundary-spanner to manage the whole collaboration process with other stakeholders on projects under the Initiative. The Smart Prague projects revolve around six key areas, where the implementation of modern technologies will significantly improve the quality of life of the residents of Prague: Mobility of the Future, Smart Buildings and Energies, Waste-free City, Attractive Tourism, People and the City Environment and the Data area (Smart Prague, 2023). The Smart Prague Initiative exists since around 2016 as a response to the growing discourse of smart city innovations in European cities and the need to use the concept of SCI to develop the potential the city of Prague has (IPR Praha, 2023). As of before the city of Prague lacked a uniform strategy for sustainable development of the city that would guide all relevant actors in pursue of this goal. The actors collaborating mainly being city organisations but also organizations from private and academic sector (Smart Prague, 2023).

Operationalization, data collection & analysis

The research mainly looks at possible relationship between the dependent variable and the independent variable whose operationalization is visualized in Figure 2. On one side there is stakeholder satisfaction with collaborative process as the dependent variable and on the other is the independent variable – boundary-spanning activities. Interorganizational collaboration is considered to be the intermediate variable.

The cases for this study are the instances of collaboration on a project/s between two or more organizations, one of them being the ICT operator. The collaboration encompasses the multiple organizations working together on a project over longer period of time.

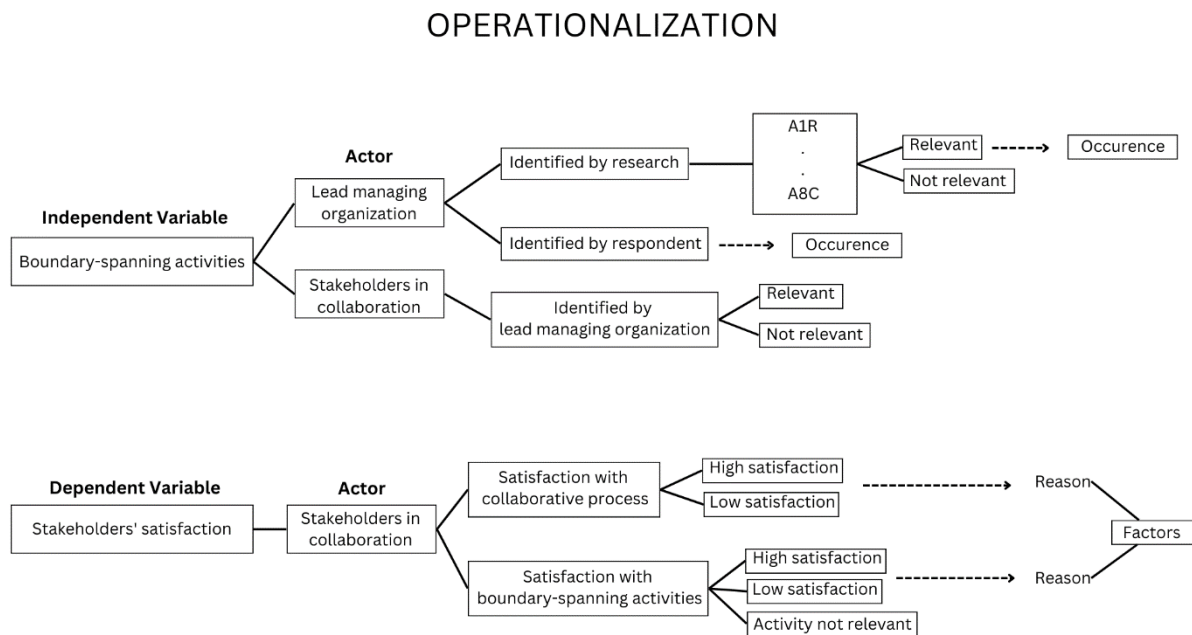


Figure 2. Operationalization of the Independent and Dependent Variable

There were two steps in the data collection (Figure 3.). In the first step, to identify what boundary-spanning activities are relevant in the empirical context of the study, members of the Operator ICT organization were asked to identify them before starting the main data collection. To guide the respondents with identification, a list of possible activities was constructed from existing research (Table 1.). Structured interviews were conducted with members who are part of the collaborative processes with other stakeholders from organizations outside of OICT. The choice in favour of a structured interview was made as the concept of boundary-spanning activities can potentially require further explanation for the respondent to understand the questions and because it gives space for open ended questions to be more elaborate. The detailed interview guide is included in Appendix A.

DATA COLLECTION & ANALYSIS

	Research questions	Respondent group	Data collection instrument	Data analysis
Step 1	RQ3: Boundary-spanning activities	Lead managing organization	Structured interviews	Transcription Identification Inductive coding
			↓	
Step 2	RQ2: Satisfaction of stakeholders RQ4: Effects of activities on satisfaction RQ5: Reasons behind effects of activities	Stakeholders in collaboration with lead managing actor	Structured interviews	Transcription Coding Content Analysis

Figure 3. Data collection & Analysis

In the second step of data collection, structured interviews have been done with stakeholders from organizations that collaborate or have collaborated with OICT in the past. Purposive sampling was carried out to select only those stakeholders who are involved or has been involved in a collaboration with the lead managing organization, OICT, for a longer period of time. The stakeholders are also chosen from multiple kinds of sectoral backgrounds and project areas that are under the coordination of Smart Prague Initiative. The classification of the stakeholders is divided into following categories based on sectoral division: public city organizations, private organizations, academic actors. The aim was to select actors from all mentioned categories to have a more representable sample of the whole population of stakeholders. The stakeholders were asked about their experiences with collaboration with the ICT Operator and how satisfied they were with the collaborative process. They ranked their satisfaction with collaborative process overall based on the Likert scale with scores ranging from 1 to 5. The stakeholders also ranked separately different boundary-spanning activities carried out by the ICT operator during their collaboration. Likert scale was chosen so the answers are more comparable in the analysis as there is a shared structure for the information regarding satisfaction. They were further asked to provide insight about the reasons for their satisfaction/dissatisfaction and factors that have an impact on it. The whole interview guide with stakeholders is available in Appendix B.

The possible relationships between the variables are explored in a qualitative way to gain more in depth understanding of the influence of different boundary-spanning activities on stakeholder satisfaction with collaborative process. The data were analysed in detail, with a combination of inductive coding and content analysis, given the exploratory nature of the study. The entirety of the

data was continuously revisited as new insights were emerging. With this approach it was possible to see any recurring patterns that occur in connection to the boundary-spanning activities and satisfaction levels of the stakeholders and to see the varying effects of different activities on the levels of satisfaction. After close examination of the data and the patterns, codes were made to categorize the data based on the repeating patterns. Entire coding was done in the Atlas.ti software.

Ethical considerations

In case of ethical considerations, all respondents were informed about the aim and nature of the research before deciding if they want to participate. It was possible for the respondents to withdraw their participation at any time. All potential respondents that were contacted had a right to decline to participate. The gathered data remain anonymous and no personal information is shared at any point in the process of collecting, analysing and evaluating of the data. All respondents who participated in the interviews have given consent that they want to participate in the study and that the interviews can be recorded for the purpose of analysis.

Respondents’ characteristics

Step 1 - Lead managing organization - OICT

Table 2. Lead Managing Organization – Respondents’ characteristics

Interviewee from Operator ICT	Date	Duration
Respondent 1	21/04/2023	14 minutes
Respondent 2	05/05/2023	13 minutes

Two participants were interviewed from the lead managing organization – Operator ICT. Information about date and duration of the interviews is contained in Table 2. The respondents will be addressed only through name codes to maintain their anonymity. Both respondents are in managerial positions and both are involved in the processes of collaboration on the Smart city projects with actors from other organizations. The extent of direct involvement differed a bit with one being more involved than the other but both respondents had sufficient overview of collaborative processes with stakeholders from other organizations.

Step 2 - Stakeholders from other organizations

For the second step of the data collection, 8 interviews were conducted with the stakeholders involved in collaboration with the OICT (Table 3.). In the final sample of respondents that were interviewed, all three sectors were included with the majority being from the public sector. The stakeholders from public sector are from 4 varying organizations and so it is only a small sample of all city organizations in Prague that are collaborating with OICT. Having data gathered from 8 stakeholders from 6 different organizations altogether is not representative for the whole population of stakeholders involved in collaboration with OICT. However, the data does provide good insight on how these collaborative processes work in the context of Prague as the stakeholders had experience with working on large number of projects from almost all key areas listed previously which are defined by Smart Prague Initiative. Additionally, majority of respondents have also been in collaboration with OICT long-term.

Table 3. Stakeholders - Respondents' Characteristics

Respondent	Sector	Date	Duration
Stakeholder 1	Private	28/04/2023	28 minutes
Stakeholder 2	Public	03/05/2023	51 minutes
Stakeholder 3	Public	05/05/2023	23 minutes
Stakeholder 4	Public	09/05/2023	44 minutes
Stakeholder 5	Public	10/05/2023	19 minutes
Stakeholder 6	Public	10/05/2023	41 minutes
Stakeholder 7	Public	10/05/2023	34 minutes
Stakeholder 8	Academic	12/05/2023	21 minutes

Results

Step 1 - Boundary-spanning activities

Before delving into the effects of boundary-spanning activities on stakeholder satisfaction first, boundary spanning activities relevant to the context of this study will be defined. Following section presents results from the first interview round with actors from the lead managing organization – Operator ICT, complemented by information from the second interview round to showcase how the boundary-spanning activities looked like empirically in the studied cases.

Both respondents from OICT unanimously agreed regarding the relevance of the boundary-spanning activities identified from the research for the context of their organization, and the way they are leading collaborations under the Smart Prague Initiative. Additionally, another boundary-spanning activity was recalled by respondent 1. He recognized the importance of OICT being open and transparent during the communication of the different project activities. Therefore, the final set of activities that will be discussed with the stakeholders in the second round of interviews together with a column which describes how the boundary-spanning activities occurred in the cases studied by this research is listed in Table 4.

Code	Boundary-spanning activity	Occurrence
A1R	Forming and maintaining relations between organizations – personal and informal relationships	First name basis, Informal calls / meetings, Smart Prague working group
A2C	Creating consensus among the organizations involved	Both verbal and written agreements
A3K	Translating knowledge across different boundaries without overwhelming the recipient	Smart Prague working group, upon request, informal/ project meetings
A4L	Active listening – being open to the opinion of other people	Listening to good ideas
A5M	Creating motivation and understanding between all organizations of what has to be done	Evaluations of the benefits and impact of a project
A6M	Managing misinterpretations	Little misinterpretations
A7I	Informing about developments on the project	Smart Prague Index, Smart Prague working group, project meetings
A8C	Coordination of cross-boundary activities and processes	Organization of meetings, informative publications, Smart Prague working group
A9O	<u>Openness and transparency in the communication of various project activities</u>	Smart Prague working group

Table 4. Final List of Relevant Boundary-Spanning activities

With regards to the occurrence column a reoccurring theme appeared to be the Smart Prague working group. As explained by actors from OICT, it is a platform organized by the lead managing actor as a scheduled meet up with large number of stakeholders from Prague’s city environment that takes place four times a year. The stakeholders share general information about the activities or projects that are currently taking place under the smart city concept. The Smart Prague working group seems to help with facilitation of a lot of boundary-spanning activities.

Step 2 – Satisfaction of stakeholders

Satisfaction of stakeholders with collaborative process versus satisfaction with boundary-spanning activities

To find the effects of different boundary-spanning activities on the satisfaction of stakeholders, it is necessary to first understand how satisfied the stakeholders are. The stakeholders were asked both to rank their overall satisfaction with the collaborative process as a whole, and to rank their satisfaction with boundary-spanning activities separately. In the process of interviewing, stakeholders were ranking their overall satisfaction with the collaborative process before ranking the boundary-spanning activities separately so their answers for the general satisfaction are not influenced by the satisfaction with boundary-spanning activities. All satisfaction scores are provided in Table 5.

Respondent	Overall	A1R	A2C	A3K	A4L	A5M	A6M	A7I	A8C	A9O
Stakeholder 1	5	5	5	4	5	5	5	5	5	5
Stakeholder 2	3-4	5	4	4	5	5	-	4	4	4
Stakeholder 3	4	4	4	-	-	4	3	5	3	5
Stakeholder 4	3	2	4	4	3	3	3	3	2	3
Stakeholder 5	4	5	4	5	4	4	4	4	5	4
Stakeholder 6	3-4	3	3	3	4	2	5	4	4	2
Stakeholder 7	3	4	3	5	2-3	4	5	3	5	4
Stakeholder 8	5	5	5	5	5	5	5	5	4	5
Median score	-	4,5	4	4	4	4	4	4	4	4

Table 5. Stakeholders' Satisfaction Scores

Score 5 represents the highest possible satisfaction and the score 1 represents the lowest possible satisfaction with the values 2, 3 and 4 being the levels in-between. All measured scores ranked from 2 to 5 with the score 1 not being assigned to any of the responses. Majority of the scores were given as whole points but in few instances the stakeholder indicated a score in-between the whole numbers. In one case the stakeholder rated an activity with two scores as he wanted to separate the activity into two parts.

When comparing the overall score per stakeholder with the scores the stakeholder gave to the separate boundary-spanning activities, there is no clear pattern emerging. The scores clearly differ from one stakeholder to another. In the case of stakeholder 1 and stakeholder 8, the most frequently used score for the activities is 5 with only one score of value 4. In those cases, the scores for the overall satisfaction also do have the highest possible score assigned to them. That means in that instance the overall score for satisfaction does mirror the majority of the satisfaction scores for boundary-spanning activities. It is not a rule that the scores of activities are reflected into the overall score but it does appear to happen in the answers of some stakeholders. This slight indication could mean there is a relationship between scores for boundary-spanning activities and the scores for overall satisfaction with collaborative process.

Looking at the scores for each activity independently, it is interesting to see how the pattern changes with every activity. Where some stakeholders are very satisfied with how the activity is being executed, others are dissatisfied. On the other hand, the aggregate scores for activities do end up being the same except for slightly higher satisfaction with A1R activity.

From the data on satisfaction scores solely, it is not possible to see what potential explanations could be causing these similarities and differences. Thus, this study shifted more towards analysing factors and reasons behind satisfaction scores to establish any possible relationship between the two main studied variables. As with the choice of methods and the final sample size a more general analysis of the satisfaction scores themselves was not plausible.

Factors influencing satisfaction scores

Factors influencing satisfaction with boundary-spanning activities

While answering the questions on satisfaction regarding the individual boundary-spanning activities stakeholders additionally provided explanations for their choice of satisfaction score. An analysis in the following section aims to uncover patterns within these explanations. By examining the results, insights will be gained into the reasons behind the specific effects of boundary-spanning activities on stakeholder satisfaction with them. Table 6. presents the reoccurring themes of reasoning that were grouped into factor groups.

Table 6. Factor groups influencing stakeholder satisfaction with boundary-spanning activities

Factor group	Examples	Connection to BS activities	Type of influence on satisfaction
<i>Smart Prague working group</i>	The working group itself – platform organized by OICT	A1R, A3K, A7I, A8C, A9O	Both positive and negative
<i>External factors</i>	Historically set structures among city organizations, competition between city’s organizations, the lack of tools available to fully coordinate the Smart city space	A1R, A2C, A4L, A5M, A8C	Negative
<i>Type of project</i>	Project initiated by OICT vs. project initiated by other organization	A4L, A5M	Positive vs. negative
<i>Improvement through time</i>	Willingness to improve, actual improvements	A3K, A4L, A6M, A9O	Positive
<i>Relationships</i>	First name basis, informal calls and meetings, close relationships, mutual trust, long lasting relationships	A1R, A6M	Positive
<i>Ability to perform activity well</i>	Not enough information, poor distribution of information, frequent meetings, good communication	A2C, A5M, A6M, A7I, A8C, A9O	Both positive and negative

Smart Prague working group appeared to be one of the most prominent factors to influence satisfaction with boundary-spanning activities. External factors also did appear to have significant influence. The acknowledgment from the stakeholders about the influence of external factors show how in some cases the lead managing organization is lacking the capacity to impact how satisfied can stakeholders be. In relation to factor group Improvement through time, no stakeholder pointed out at stagnation or worsening over time, which indicates that the ability of OICT to successfully coordinate and manage collaborations has been improving for the better over time, leaving stakeholders gradually more satisfied. Outside of the other listed factors, one factor group which is the most natural to appear is the ability of OICT to perform the boundary-spanning activities well. Therefore, this factor also was connected to highest number of boundary-spanning activities.

All recorded factors have varying effects, both positive and negative, on a mix of different boundary-spanning activities with no clear direct association emerging. The data do not provide convincing argument to lay out clear relationship between the activities and the groups of factors. The section nonetheless demonstrates that factors which influence satisfaction with boundary-spanning activities the most do have shared characteristics.

Factors influencing satisfaction with collaborative process

Following section will discuss possible connection between a stakeholder being satisfied with the boundary spanning activities and a stakeholder being satisfied with the whole collaborative process.

After looking at the specific factors affecting the satisfaction scores for the individual boundary-spanning activities, this section will look closer into factors that influence stakeholders' satisfaction with the collaborative process. The stakeholders were asked about general factors that are important for their satisfaction with collaborative process before being acquainted with the list of boundary-spanning activities. This could potentially show if some of the factors mentioned will match the boundary-spanning activities and therefore indicate a connection between the boundary-spanning activities and stakeholder satisfaction with collaborative process. The results from analysis are summarized in Table 7. Some listed factors were mentioned only by one stakeholder while others were repeatedly recognized. The underlined factors represent the ones that do show resemblance to the boundary-spanning activities used in this study. This makes up almost half of the list of identified factors from all stakeholders. Even though, the factors do slightly differ from the original activities there is an indication of possible relationship forming.

Factors that influence satisfaction with collaborative process	Connection to BS activities
OICT having a very good team of skilful people	-
Transparency and clarity from the beginning of collaboration – who does what, roles, what is the goal, realistic expectations, objectivity in decision making	-
<u>Communication – high quality, frequent, ease of communication – informal communication</u>	A1R
<u>Relationships – close, long term, trust created</u>	A1R
End product from collaboration – functional service, financial efficiency, end user important	-
<u>Motivation, interest of the parties involved – about the end goal of a project</u>	A5M
Final data outputs from projects well structured - automatic, data platform available for all stakeholders	-
<u>Getting information about other organizations /stakeholders and their activities</u>	A8C
<u>Enabling communication between stakeholders in the Smart projects' environment</u>	A8C

Table 7. Factors that influence satisfaction with collaborative process

The factors that include informal communication and close relationships can be linked to activity of forming and maintaining primarily personal and informal relationships (A1R). Another factor - motivation and interest of all parties involved could be directly linked to the ability of OICT to create motivation and understanding between all organizations on what has to be done on a project (A5M). There are two factors potentially connected to the activity A8C – coordination of cross-boundary activities and processes. One factor being Getting information about other organizations and their

activities and the other factor being Enabling communication between stakeholders in the Smart projects' environment. The connection can be made as the activity A8C includes OICT organizing meetings or enabling communication between partners.

Other factors that were identified and were not really comparable to the boundary-spanning activities are potential examples of other activities or factors that can play a role in reaching satisfactory collaboration. These activities should not be overlooked as stakeholders indicated them as the most important factors for their satisfaction with collaborative process.

Importance of boundary-spanning activities

While previous findings indicate a possibility of relationship between the boundary-spanning activities and the satisfaction of stakeholders with the collaborative process, there is still a question of to what degree could boundary-spanning activities really have an influence. Following section will discuss the possibility of boundary-spanning activities not being equally influential when it comes to stakeholder satisfaction.

All stakeholders provided their opinion on the differing importance of boundary-spanning activities. Their opinion was not only based on a list of activities formed for this study but also on their own addition of the most important factors for them. From the total of 8 stakeholders 2 stakeholders indicated that they think all boundary-spanning activities that were listed are equally important for their satisfaction. Stakeholder 3 commented:

„It's hard to say, I think. That those activities you named just form a package of skills to communicate and therefore to actually execute projects effectively in some time that is available. So, I don't think you can single out any of the activities.“

Boundary-spanning activity / Factor with more importance	Stakeholders	BS-activity from research
Informal relationships which result in ability to work as a team	Stakeholder 1	A1R
Effective and organized project management	Stakeholder 1	-
Mutual communication with ability to reach shared goal	Stakeholder 4	-
Coordination of communication between stakeholders	Stakeholder 5	A8C
Time effectivity of the implementation of the project	Stakeholder 4	-
Keeping each other informed while having long term constructive relationships	Stakeholder 6	-
Willingness and effectivity when starting a new project - agility	Stakeholder 8	-

Table 8. Factors with higher perceived importance for satisfaction

It seems that outside of the two stakeholders all other stakeholders have relatively dissimilar opinions on what activity plays the most important role. Only two stakeholders gave higher importance directly to the activities mentioned from research. One activity being forming and maintaining informal relationships (A1R) which results in the ability to work as a team in the eyes of Respondent 1. The other mentioned activity by stakeholder 5 was effective coordination of communication between the involved stakeholders (A8C). He explained how in his point of view this activity is facilitated by the Smart Prague working group platform. All listed activities both the ones in connection to boundary-spanning activities and the ones that are unrelated to them are summarized in Table 8.

The results do not show any indicative patterns of shared opinion between stakeholders on higher significance of some boundary-spanning activities. On the contrary it illustrates how each stakeholder does have personal preferences on what boundary-spanning activities/factors have the highest impact on his satisfaction levels. However, as only two stakeholders considered the activities to be equal in their importance it is plausible to say the activities do have varying degrees of effects on stakeholder satisfaction.

Conclusions & Discussion

Overall, this research was attempting to establish a connection between boundary-spanning activities employed by the lead managing actor in interorganizational collaboration and the general stakeholder satisfaction with the collaborative process. All following research findings also tried to contribute to the scarce research on how SCIs develop in the countries of CEE (Varró and Szalai, 2022). Firstly, all identified boundary-spanning activities from numerous literature sources (Williams, 2002; van Meerkerk and Edelenbos, 2018; Satheesh, et al., 2022) from the context of public management and SCIs were confirmed as relevant to the context of the SCI in Prague. With one additional activity indicated by respondent from the lead managing organization. All activities were further contextualised in a way they appeared in the analysed cases. These findings help to fill the gap in research described by Karimikia, et al. (2022) on what boundary-spanning activities are employed by lead managing organizations in the context of SCIs.

The findings on stakeholder satisfaction show that it is a complex topic with large number of factors affecting it. These factors are rightfully studied in order to increase the degree of satisfaction and consequently increase the degree of a project success. As influence of stakeholder satisfaction on the project success was established by Erkul, Yitmen and Celik (2020). The relationship between overall satisfaction with collaborative process and boundary-spanning activities was analysed through the factors as well through the Likert scale satisfaction scores. A pattern of possible overlap was discovered between the general factors influencing stakeholder satisfaction with collaborative process and the boundary-spanning activities. Moreover, similar indication appeared during the analysis of Likert scale scores. Satisfaction with boundary-spanning activities of each stakeholder seems to reflect the score for his overall satisfaction with collaborative process. If the connection between boundary-spanning activities and satisfaction with collaborative process could be validated, it would mean that not only boundary-spanning activities contribute to successful collaboration (van Meerkerk and Edelenbos, 2018), they also contribute to the satisfaction of stakeholders with the collaborative process. But no direct relationship was confirmed between overall satisfaction and boundary-spanning activities based on the data of this study.

Additionally, in the last section on importance of boundary-spanning activities the results show two possible findings. Firstly, it is possible that the activities identified for this research may not be the most significant factor influencing overall satisfaction. Stakeholders leaned to other factors when asked about the importance of boundary-spanning activities. Or secondly, it is possible that all activities are equally important for satisfaction, as was expressed by two stakeholders. If certain boundary-spanning activities would be identified as having greater impact on satisfaction, the managing organization could gain insights from this study into the important factors contributing to satisfaction in those activities. This understanding could then inform adjustments in their approach to better address those factors and enhance overall satisfaction. Interestingly, it is worth noting that when stakeholders indicated high levels of satisfaction, they repeatedly did not provide any reasoning for their choice. Leaving a gap in the understanding of the specific reasons and factors that contribute to the highest levels of satisfaction.

It is important to mention that stakeholders primarily talked about their satisfaction regarding the whole context of Smart Prague Initiative and their aggregate experience of different occasions of collaboration with OICT. They did not usually rate their satisfaction with the activity regarding collaboration on a singular project. Therefore, the results are reflecting on the whole Smart city projects environment and stakeholders' experience of that kind of collaboration and not on occasions of collaboration with OICT on a singular project. This could have been more clarified in the interviews

by guiding respondents into the context of individual projects. However, as stakeholders were mainly involved in collaborations on multiple projects with OICT it is logical their satisfaction was reflecting their entire involvement.

This study only looked at one empirical context of the phenomenon with a more in-depth analysis and small sample size. To be able to provide more sound findings and validate the indicated findings from this study, bigger research could take on more quantitative approach to explore the possible correlations between the two main variables analysed. This would additionally provide opportunity to make more general claims about the topic. If future research would confirm the findings, it would provide great insight for lead managing organizations in similar positions to work with the listed factors and potentially improve the approaches they use in collaborations with other organizations. As majority of factors mentioned are something that is possible to change from the position of the lead managing organization.

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Appendix A – Structured interview guide – Lead managing actor

Introduction

Thank you for your time / small talk / introduction to the topic of discussion / asking about recording / explaining how data will be handled

Interview questions

Collaboration characteristics

1. Are you involved in the collaboration processes with other organizations outside of your organization under the Smart Prague Initiative?
2. How would you best describe your role?
3. Can you name few organizations with whom you collaborated from the public sector?
4. Can you name few organizations with whom you collaborated from the academic sector?
5. Can you name few organizations with whom you collaborated from the private sector?

Boundary-spanning activities

Now, I am going to ask you about some of the boundary-spanning activities that were identified in the research about boundary-spanning in public management. With each activity, you can indicate whether you find it relevant to the collaborative setting you work in.

So, the question for all activities is whether or not ICT Operator did employ these activities during any of the collaborative processes.

1. Maintaining inter-organizational relations - including informal and personal relationships
2. Active-listening - willingness or openness to be influenced by the views of other people
3. Building consensus between the organizations involved
4. Creating a shared motivation and understanding of what has to be done
5. Translating and coordinating knowledge and information across different organizations - without overwhelming the recipient
6. Managing misinterpretations
7. Informing about the project developments
8. Coordination of activities and processes between organizations - e.g., organizing meetings, enabling communication between partners, ...

Are there any other activities you would add to the list?

Appendix B – Structured interview guide - Stakeholders

Introduction

Thank you for your time / small talk / introduction to the topic of discussion / asking about recording / explaining how data will be handled / any questions being answered

Interview questions

Collaboration characteristics, overall satisfaction

1. Is your organization belonging to the category of public institution, academic institution, private company or other?
2. On what project(s) under the Smart Prague Initiative did you collaborate with ICT operator?
3. Were there other organizations beside OICT that collaborated with you on the projects?
5. Can you briefly explain the nature of the collaboration?
6. How satisfied are you with the process of collaboration with the ICT operator? ---- scale from 1-5 — 5 being very satisfied – 1 being very dissatisfied
7. What are the main aspects of collaboration that contribute to your satisfaction?
8. Can you identify aspects of collaboration that have negative effect on your satisfaction?

Boundary-spanning activities and satisfaction

Now I am going to list individual activities that are usually executed by OICT during collaboration with other stakeholders. With each activity you can say how satisfied were you with the execution of the activity from OICT and why.

1. Maintaining inter-organizational relations - including informal and personal relationships
 2. Active-listening - willingness or openness to be influenced by the views of other people
 3. Building consensus between the organizations involved
 4. Creating a shared motivation and understanding of what has to be done
 5. Translating and coordinating knowledge and information across different organizations - without overwhelming the recipient
 6. Managing misinterpretations
 7. Informing about the project developments
 8. Coordination of activities and processes between organizations - e.g., organizing meetings, enabling communication between partners, ...
9. Can you describe the main factors that influence your satisfaction with the listed activities?
10. Can you think of some other activities that were not mentioned?
11. Are any of the activities more important to you than others when collaborating with other actors?
12. If so then why?

Appendix C – Factors influencing boundary-spanning activities

Coded quotes from interviews with stakeholders

Factor group	Respondent	Quote	BS activity
Smart Prague working group	Respondent 7	<i>„...I think they are definitely, it's the smart city gatherings, I think that works very well. That's where I would like maybe dare to put really the number one like the best collaboration.”</i>	A1R
	Respondent 8	<i>„I think in that last period I'm very happy that they can get those, like I said, they set up those innovation groups, it is crowned actually by a colleague, so it's working well I think.”</i>	A1R
	Respondent 2	<i>„...here I don't feel that there is any informing going on outside of the meetings that were regularly held within smart Prague.... Actually, there was passing of information through all those participants only at the regular meetings, which was once in 2 months... there was no information, which was also a bit like offering or presenting that they would send some informative emails if there was something actual (outside of the working group meetings). But the truth of the matter was that then it came to the point that they always did it at that meeting...”</i>	A3K
	Respondent 6	<i>„Yeah that's kind of what I was saying in how they're making these big meetings now, but they're not really contributing to it... because the way we learn these things it's through informal meetings or the moment we would meet them on a project...”</i>	A3K
	Respondent 7	<i>„Yeah they do, they have a yearbook smart Prague actually they send the notes from those collective meetings, where the projects are quite well written down. So when their certificate works, they have it pretty concisely described, so I think that's where it's like working well.”</i>	A3K

	Respondent 2	<i>„...because I didn't get the information continuously between the meetings, but of course it was mentioned in the meetings. Yeah, always the information, what it looks like. And so on.</i>	
	Respondent 4	<i>„...Yeah, otherwise in the presentations or the meetings that we have the ICT operator always has a nicely prepared presentation of what the information is, yeah, but like active information, well I had to ask often. Yeah, and like once in a while you meet at smart Prague and now, I don't remember if it's 1 in 2 or in 3 months so it's not enough.”</i>	A7I
	Respondent 7	<i>„Let's give it a three, because again those meetings work well, but otherwise beyond that. Some projects are like a little bit forgotten and then maybe they're like running and then we find out a year later that they're like running out of time or somebody's working on them, so. There I think it could maybe work a little bit better, so I guess the three, no.”</i>	A7I
	Respondent 2	<i>„They provided us at those regular meetings it was there. Wasn't there any, like, we did like smaller focus groups on that? That was also still in the thinking that not everybody has the same equal focus and that we could maybe just focus on transportation and focus on I don't know safety and so forth that didn't happen anymore so it was done in those regular larger groups. So that's why the four.”</i>	A8C
	Respondent 2	<i>„...because, again, it was like informing in those meetings, but I know that at one time there was an effort to inform about the European funds aimed at smart things, or if it could be used, and it popped up for 1 period of time that yes, we will deal with it, and then it disappeared very quickly.”</i>	A9O
	Respondent 4	<i>„On the other hand, within smart Prague, as an operator, it communicates a lot of these things. Well, put a 3 in there, yeah, because I'm</i>	A9O

		<i>going to say on smart Prague we're going to learn what they want to tell us. Yeah, but then of course I have these other things in my head that they haven't told us or others. Yeah, and of course that lowers the grade significantly."</i>	
	Respondent 7	<i>„It's a bit like the previous question. That it works again in the meetings, but you just have to, like, ask a lot of times, because it doesn't work by itself, but you have to push a little bit."</i>	A9O
External factors	Respondent 3	<i>„The negative comes more from the setup of the whole city system again, that we have companies that have some overlapping agendas actually, or have ambitions to have overlapping agendas. That means that there is sometimes a certain amount of bickering and space delineation between city companies, and this is not just about the operator."</i>	A1R
	Respondent 5	<i>„I wouldn't put the fault directly on my colleagues from the ICT operator, but some of these projects have historically attracted and attracted stronger interest, whether it was some competitive pressures from other municipal companies or perhaps just interest from external implementers who may have felt offended by the fact that some of these contracts were awarded in-house."</i>	A2C
	Respondent 7	<i>„But when it's their project, the consensus. Maybe they can't even like find it because of the way they have the process set up. Not that they don't even want to, but they can't."</i>	A2C
	Respondent 2	<i>„If I put it this way, maybe even 5 by saying that it's more the limitation that's there, then the contractors themselves that make the problems those subcontractors from the Operator prolong the problems. "</i>	A4L
	Respondent 4	<i>„So certainly, I wouldn't give a high grade here, more like a low grade, but given that it may not be quite like 100</i>	A4L

		<i>percent on that particular company, we'll give the sweet middle three here again."</i>	
	Respondent 5	<i>„...so again, I'd probably give it a four, but again, more for external reasons than for internal reasons."</i>	A5M
	Respondent 8	<i>„...because let's say that the operator probably doesn't have all the tools he could have for that coordination at the moment, yeah."</i>	A8C
Type of project	Respondent 7	<i>„I don't think that's where the influencing works very well, but again, it depends. If it's a project that we more or less initiated and they've taken it on as their own, they're listening a lot. But when it's their initiative, they usually don't want to budge."</i>	A4L
	Respondent 6	<i>„...but creating a common motivation they aren't very good, because they don't really get behind the projects. I've said that before yeah, they actually the person has to, when they get there with it (the project) they still take it as look, it's your project and we're helping you make it happen, but it's not there as such, it's the joint effort, we want it and now like yeah it's not really there so I would give them 2."</i>	A5M
Improvement of OICT through time	Respondent 6	<i>„...now in general the cooperation with them is much better than it was like 2 years ago,..."</i>	A3K
	Respondent 6	<i>„... But yeah, it was in the beginning if I gave them a 1 for this, but they're more like a 0 but they've improved significantly recently. So well right now I'd say like a 4. In that year they've gone into themselves because they've understood that they can't do whatever they want, they're trying to say the least..."</i>	A4L
	Respondent 8	<i>„...I'm trying to think of a situation and like I keep talking about the last period. Yeah, it's important that like I've had experience with Operator like across the board since it started and it certainly wasn't always like that, but it's in that</i>	A6M

		<i>last period that I think the willingness is there."</i>	
	Respondent 6	<i>„I have to say that it has an improving trend, they are trying to improve it but it is still such that there is a big room for improvement."</i>	A9O
Relationships	Respondent 1	<i>„We've agreed that we're all on first name basis during calls, at meetings and so on to just work better together, so it's a professional relationship purely but on a let's call it a friendship level so that we can work well together. I mean, informally, yes, we can even swear at each other without any problems, even very pejoratively. But we work well together sometimes we just need to blow off some steam so we do."</i>	A1R
	Respondent 2	<i>„We are very close with those people via whatsapp and we solve any problems immediately, and if I don't like something, thanks to the fact that we are on the first name basis, I can tell them straight."</i>	A1R
	Respondent 6	<i>„we have, with a couple of exceptions, a couple of technicians or people that we see a lot, so we can establish, or we've already established some kind of personal relationship or some basic trust and we'll call each other and like informally as things go and that works best."</i>	A1R
	Respondent 1	<i>„Of course some miscommunication things that somebody understood something a little bit differently, yes it can happen but we all have phones and as I said we are on a first name basis and that we work better that way so I don't have a problem...We normally pick up the phone outside of working hours and we can explain these things quickly."</i>	A6M
	Respondent 8	<i>„And that's where I think by like working so closely together, there's no problem here towards us."</i>	A6M
Ability to perform activity well	Respondent 6	<i>„...because they more or less, by making the management very much like a formal project management, they</i>	A2C

		<i>leave the consensus to us. They say you guys have to agree, so they delegate it to us on the other users."</i>	
	Respondent 6	<i>„The other part of it is they know how to do it. There I think we'll give them a 5 in that, like knowing what to do on a project they're good at that yeah."</i>	A5M
	Respondent 8	<i>„Well, that can vary a lot with these projects. But again, it's about what methods they choose to achieve some kind of common motivation and again I have no reservations about that."</i>	A5M
	Respondent 4	<i>„And they, well, they're more likely to cut them out, yeah? So, the way you're saying it, I guess it would work, but it doesn't quite have the positive effect for me."</i>	A6M
	Respondent 5	<i>„...because sometimes we have seen historically, and I feel that this has persisted to some extent, that not all of the relevant actors or actors who might feel entitled to have that information have had that information in all cases."</i>	A7I
	Respondent 4	<i>„They can organize meetings, yeah, but the communication across the companies. Well, it's a bit difficult and we have to somehow push them forward in a number of projects so that we talk to the right people, so that all the stakeholders are there to have a say."</i>	A8C
	Respondent 6	<i>„And actually, that's a good question. It has to do with the fact that we don't actually have a full understanding of what they do and how they do it and for whom."</i>	A9O