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Determinants of Clarity of Roles and Responsibilities in Interagency Information Integration and Sharing (IIS)

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Abstract. Interagency information sharing (IIS) has been identified as a powerful strategy to improve information and services in the public sector. In order to accomplish effective information sharing across organizational boundaries, the definition and clarity of roles and responsibilities are very important, particularly when the number and diversity of the agencies involved is high. However, there are very few studies that analyze the variables that affect this clarity in interagency information sharing efforts. Based on a review of current literature and a national survey conducted in the US, this paper quantitatively explores the determinants of clarity of roles and responsibilities. Consistent with existing literature, we found a significant and positive influence of diversity of participating organizations, the use of boundary objects, and communication skills on the use and emergence of need for clarity of roles and responsibilities in IIS project. Our findings open avenues for future research about the role of clarity of roles and responsibilities, its determinants, and other variables may play in mediating or directly explaining IIS success.

Keywords: Interagency information Sharing, Role Clarity, IIS, Boundary object

Track: General e-Government Track – Ongoing Research

1 Introduction

Information integration and sharing (IIS) are the foundation of government efforts to develop and execute public policies that are smart, efficient and more responsive to nowadays social problems. IIS often involves collaboration of participants across various domains and beyond the boundary of individuals, units and organizations [2]. Working on an IIS initiative within such a collaborative setting might pose challenges for government officials, who were unaccustomed to working collaboratively across their respective agency's boundary [2]. The government officials might be more accustomed to the "need to know" as compare to "need to share" culture [3].

Clear roles and responsibilities enable the building of trust among members of IIS initiatives [15]. Having clarity on roles and responsibilities in collaborative efforts precipitate the formation of mutual expectations; a clear understanding of what are expected from them and from other participants [19].

While research has demonstrated the importance of clarity of roles and responsibilities (CRR) in IIS initiatives [15], very few or even not one have attempted to systematically test the determinants of CRR using quantitative analysis. We adopt Pardo et al. [15] three determinants of CRR and add three other determinants based on our review of existing studies. The objective of this paper is to examine the determinants of clarity of roles and responsibilities in IIS project using data from the National Survey conducted by the Center for Technology in Government. We tested whether three determinants of CRR identified in Pardo et al. [15] and other three determinants from the literature truly influence the use or emergence of CRR in IIS project. Hence, this paper addresses the following research question, what are the determinants of clarity of roles and responsibilities in interagency IIS.

The rest of the paper is organized in 5 sections, including the foregoing introduction. Section 2 highlights studies evaluating the influence of clarity of roles and responsibilities on organizational and inter-organizational information sharing and performance. Section 2 also presents the main hypothesis and the preliminary model used for this study. Section three describes our research methodology, including the data distribution, variable measurement and analysis technique. Section 4 discusses the results from the statistical analysis. Finally, Section five offers some concluding remarks and suggests areas for future research about this topic.

2 Determinants of Clarity of Roles and Responsibilities

Clarity of roles can be defined as "...the presence [or absence] of adequate role-relevant information due either to restriction of this information or to variations of the quality of the information ... [or] the subjective feeling of having as much [or not as much] role-relevant information as the person would like to have [12]. Consequently, role ambiguity arises when a person is not aware of what the expectations of such role are [9] or from poor communication practices [16].

Studies have found the great importance of clarity of roles and responsibilities in an interorganizational setting where several organizations or agencies must interact with each other. Lack of clarity regarding roles and responsibilities hinder interagency collaboration [13, 17] and hamper an effective communication in interagency collaboration [4,7]. On the other hand, clarity of roles and responsibilities could positively affect the success of collaboration in multi-agencies setting such as IIS project [15]. Having clear sense of what should be done for achieving common goals through collaborative effort gives ideas to participants about what they need to do and what they can expect from other participants [19].

Clarity of roles and responsibilities are crucial in multi-organizational collaborations because individuals who accustomed to work within their respective boundaries have to traverse the border and interacts with other boundaries. These "people at the boundary" often feel that they "sort of belong and sort of don't" in between the

boundaries [18]. Thus, having clarity of roles and responsibilities alleviate the burden for the “people at boundary” in interactive circumstances.

Despite the positive effect of clarity of roles, a systematic assessment of the determinants of clarity of roles and responsibilities is not so well understood, particularly in IIS setting. An initial proposition of the determinants of clarity of roles and responsibilities was suggested by Pardo et al. [15]. They propose a three determinants of clarity of roles and responsibilities in interagency information sharing, namely: past experiences, diversity of participating organizations and exercise of formal authority. Past experiences in the collaboration provides indication of the participant’s expectations about collaboration [8]. Acknowledging and acting on the differences among the participants facilitate the creation of clarity of roles and responsibilities in the IIS project [15]. Sensitivity to the different interests of the participating organizations help the project leaders to delineate roles and responsibilities that minimize potential conflicts. Similarly, interagency collaboration entail variety and distributed power and authority relationships. Given the diversity of the agencies involved, agency had no authority to mandate the roles and responsibilities of other agencies. As such, ensuring efficient collaboration necessitate a judicious way to exercise formal authority [15].

In addition to the three determinants proposed by Pardo et al.[15], studies have identify three other determinants of clarity of roles and responsibilities and inter-organizational information sharing: (1) extent of boundary object use [10, 14], (2) degree of respect for autonomy of participating organizations [19] and (3) collaboration, coordination, and communication skills [1, 5, 11] . Due to the crossing of boundaries, the use of boundary object is key to generate shared understanding and commonalities [19]. Boundary objects are necessary to establish and maintain clear roles and responsibilities [10] and by doing so, it becomes critical for the success of interorganizational information system [14].

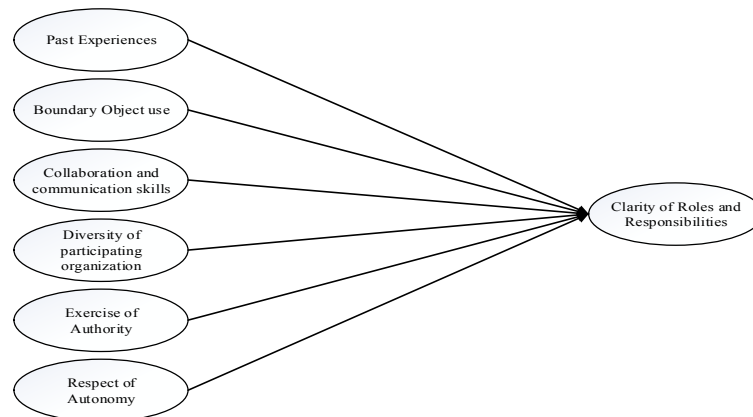


Fig. 1. Research Model

Fear of losing agency identity and autonomy create a major barrier for interagency cooperation [6]. Thus, the participating agencies will strive to protect their interest and to maintain their identity [6]. Presumably, respect to the autonomy of the participating agencies induce willingness to cooperate which can lead to success in IIS collaboration. Finally, collaboration and communication skills are important in generating clarity of roles and responsibilities and lead to success of IIS. Communication and collaboration skills are paramount because learning each other's objectives, roles and constraints constitutes the first starting point in inter-organizational initiatives [11]. Clarifying and achieving the agreed upon roles and responsibilities can be achieved through intensive conversations among the participants in the collaboration process [5]. Subsequently, the agreed upon roles and responsibilities must be communicated and coordinated to avoid ensuing ambiguity [1]. Based on the review of the literature, we proposed a model in figure 1 above connecting the determinants of clarity of roles and responsibilities to the success of IIS project. Likewise, based on extant studies, we propose the hypotheses as follows.

H₁: Past experiences significantly influence the clarity of roles and responsibilities in IIS initiatives.

H₂: Boundary object use significantly influences the clarity of roles and responsibilities in IIS initiatives.

H₃: Collaboration and communication skills significantly influence the clarity of roles and responsibilities in IIS initiatives.

H₄: Diversity of participating organizations significantly influences the clarity of roles and responsibilities in IIS initiatives.

H₅: Exercise of formal authority significantly influences the clarity of roles and responsibilities in IIS initiatives.

H₆: Respect of autonomy significantly influences the clarity of roles and responsibilities in IIS initiatives.

3 Research Methodology

3.1 Data and Data collection

This study analyzes data from a national survey conducted by the Center for Technology in Government (CTG) in April 2008. The use of older data should not be a problem considering that this study aims to test theory, hence it is expected that the relationship among the variables is generalizable and stable over time. The original random-sampled dataset consists of 171 responses. After data cleaning, the regression analysis was based on 158-160 responses, with about 7-8% of the responses being dropped from the analysis due to missing values.

3.2 Variables and Measurement

In this study, all variables or sub-variables were derived from extensive review of literature from information science, information system and public administration and policy studies. We use Boolean search by combining keywords of interagency information Sharing and role clarity to search academic databases such as Academic Search Complete, Scopus or Web of Science. We use variations of synonyms for the keyword role clarity to include clarity of roles and clarity of responsibilities.

All variables or sub-variables in this study were measured in a 7- point Likert scale, ranging from “Not at all (1)” to “To a great extent (7)” Due to the variation in 7-point scale, we regarded the variable as continuous variable. The summary of data is provided in Table 2 and the description and measurement of each variable is provided below:

a. Independent Variables

- Exercise of formal authority [auth] measure whether leaders and/or participants misused the power of their official positions.
- Collaboration and communication skills [colcom] measures the extent to which communication within the IIS initiative was effective.
- Diversity of participating organization [dive] measures the extent to which the organizations participating in the initiative were diverse.
- The use of boundary object [boun] is a composite variable measuring how valuable: a) written materials, b) the use of prototypes, c) charters, and d) stories (of personal experiences) were in the initiative.
- Respecting the autonomy of participating organization [resp] is composite variable measuring: a) presence or absence of interference from other organizations, b) respect for the specific limitations of the organization, and c) respect for the specific needs of the organization involved.
- Past experiences [exp] is composite variable measuring whether participants had previous positive experience working together as a group.

b. Dependent Variables

- a. Clarity of roles and responsibilities [crr] measures the extent to which the roles and responsibilities of organizations participating in the IIS project were clear to the participants.

Table 2. Means and Chronbach’s alpha

| Variables | abb | μ | std dev | ii-cor ¹ | α |
|--|------|-------|---------|---------------------|----------|
| Clarity of roles and responsibilities | crr | 0.012 | 1.2821 | 1.011 | 0.8070 |
| The use of boundary object | boun | 0.004 | 1.5597 | 1.798 | 0.7798 |
| Respecting the autonomy of participating organizations | resp | 0.003 | 1.5437 | 1.408 | 0.8617 |

| | | | | | |
|--|--------|--------|--------|-------|--------|
| Previous experience | exp | -0.007 | 1.3089 | 2.211 | 0.8199 |
| Exercise of authority | auth | 1.563 | 1.2157 | 1.563 | - |
| Diversity of participating organizations | dive | 5.552 | 1.6281 | 5.552 | - |
| Communication and collaboration skill | colcom | 0.016 | 1.5956 | 0.016 | - |

¹ ii-cor refers to the average of interrelation correlation for composite variables

The reliability of the resulting variables was examined using Chronbach's alpha values (Table 2). As mentioned previously, all the Chronbach's alpha values were above 0.70, representing acceptable levels of reliability. We ran multivariate regression analysis to test the causal relationship of the determinants to the clarity of roles and responsibilities variable. We used robust regression to account for the possible heterogeneity issue.

4 Results: Testing the Determinants of Clarity of Roles and Responsibilities

Building from the case studies on the Public Health and the Criminal Justice information sharing network, Pardo et al. [15] posit three determinants of clarity of roles and responsibilities in a cross-boundary information sharing initiative. We add additional three determinants based on our review of the literature. Our first analysis was to evaluate the extent to which these six determinants influence the clarity of roles and responsibilities in a IIS initiative.

Table 3. Regression Result for Clarity of Roles and Responsibilities

| Variables | abb | Coeff | Beta | SE | |
|--|--------|---------|---------|--------|----|
| The use of boundary object | boun | 0.1919 | 0.2263 | 0.0600 | ** |
| Previous experience | exp | 0.0525 | 0.0053 | 0.0688 | |
| Communication and collaboration skills | colcom | 0.3270 | 0.3986 | 0.0822 | ** |
| Diversity of participating organizations | dive | 0.1459 | 0.1812 | 0.5017 | ** |
| Exercise of authority | auth | -0.0684 | -0.0626 | 0.0956 | |
| Respecting autonomy of participating organizations | resp | 0.0462 | 0.0556 | 0.0688 | |
| Constant | | -0.7041 | | 0.3362 | |
| N | | | | 159 | |
| R2 | | | | 0.367 | |
| F(6,152) | | | | 13.86 | |

** Significant at 0.05

Table 3 shows that three variables emerge as significant and positive predictors of clarity of roles and responsibilities. The results indicate that the use of boundary object is positively and statistically significant in influencing the clarity of roles and responsibilities in an IIS project ($t_{value} = 3.20$; $p_{value} = 0,002$). The coefficient for the use of boundary object is 0.1919. Because the use of boundary object is a composite variable, we have to interpret it in terms of increase or decrease in standard deviation. The predicted effects of the use of boundary object is an increase of $1.5597 * 0.1919 =$

0.299. An increase of one standard deviation in the use of boundary object will increase clarity of roles and responsibility in IIS project by 0.2335 standard deviation (0.299 / 1.282). The standard deviation of the use of boundary object (1.5597) and clarity of roles (1.282) was derive from the descriptive statistics in table 1.

The same transformation was used for interpreting the rest of the composite variables. The collaboration, coordination and communication skills [colcom] was also found to be a significant predictor of clarity of roles and responsibilities in IIS project with ($t_{value} = 3.98$; $p_{value} = 0,000$). One standard deviation increase in the collaboration and communication skills will bring clarity on roles and responsibilities in IIS project up by 0.4069 standard deviation. The influence of diversity of participating organizations is positive and significant for bringing clarity of roles and responsibilities in IIS project. If diversity of organizations participating in the initiative increases by one standard deviation, the likelihood of fostering clarity of roles and responsibilities among the participants increases by 0.1853 standard deviation. This result indicates that the participants gauge the needs for clarity on roles and responsibilities of the project based on the numbers and diversity of the participants in the IIS project collaboration.

Comparing the three significant variables, the results in table 3 (see beta column) indicate that collaboration and communication skills are the most dominant predictors with beta value of 0.3986, followed by the use of boundary object (0.2263) and the diversity of participating organization (0.1812). Based on the beta results in table 3, the other three non-significant variables have a very low magnitude of beta coefficient. The results further authenticate the significance of the three variables – use of boundary object, coordination and communication skills, and diversity of participating organizations – to predict the need to have clarity on roles and responsibilities in the IIS project.

5 Concluding Remarks and Implications

5.1 Concluding Remarks

Our analysis results strengthen the importance of the use of boundary object, communication and collaboration skills, and diversity of participating organization for the use and emergence of need for clarity of roles and responsibilities in IIS project. Our results demonstrate the strong influence of using boundary object to determine the use and need for clarity of roles and responsibility. The findings suggest that the use of boundary object in the IIS project influences the participant need to have clarity in roles and responsibilities. The use of boundary object facilitate the creation of shared understanding among the participants. As such, the use of boundary object is very instrumental in bringing about clarity and acceptance among the organizations involved in the IIS project.

Our regression results suggest that the likelihood of framing clarity of roles and responsibilities among the participants increases with an increase in the diversity of organizations participating in IIS project. Thus, we posit that participants judge when and how much clarity of roles and responsibilities are needed early in the collaboration from their assessment on the diversity of organizations participating in IIS project. Presumably, during the process of framing and setting of the IIS project's goals, the

participants gauge and correlate the numbers and diversity of participants with the likelihood of success. Based on their evaluation, the participants assess the needs for clarity of roles and responsibilities to help them achieved the IIS project's goals. Further research is needed to ascertain the connection between diversity of participants, clarity of roles and success of IIS project.

Our findings also strengthened the importance of communication and collaboration skills in bringing clarity of roles and responsibilities in the IIS project. The intensity of communication is crucial so that the diverse perspectives and interests of the participants can be accommodated and the agreed upon roles and responsibilities is communicated and coordinated to avoid ensuing ambiguity [1].

5.2 Research and Practical Implications

The main finding of this study implies implications for future research as follows.

1. Our findings indicate that clarity of roles and responsibilities as variable possess unique characteristics. Clarity of roles can emerge as independent predictor as well as mediating variables in a relationship. For that, it is necessary re-evaluate the significance of clarity of roles and its determinants by considering other variables such as leadership, communication, organizational capacity to the model. Future research could test the relationships using non-linear methods such as structural equation modelling or partial least square.
2. Our findings also point to the possible connection between clarity of roles and its determinants to the likelihood of achieving success of IIS project. For instance, in effort to correlate between the diversity of participating organizations with the likelihood of IIS success, the participants might decide on the need to have clarity of roles. Such research thus could ascertain whether the effect of clarity of roles is mediated by other variables in determining success for IIS projects.
3. Our result also signifies the importance of diversity of participating organizations which presumably affect the likelihood of IIS project success. Public managers could use this knowledge to evaluate when and how deep role clarity is needed for IIS project through the assessment of the numbers and diversity of the participants.

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