Expanding Data Governance Across Company Boundaries – An Inter-organizational Perspective of Roles and Responsibilities

Marvin Jagals(✉)

University of Duisburg-Essen, Essen, Germany
marvin.jagals@uni-due.de

Abstract. The exchange of data between participants within inter-organizational networks becomes a prominent field of action. However, intra-organizational data governance mechanisms reach their limits across company boundaries. Current research barely addresses the need to model organizational data governance roles for managing inter-organizational networks. Therefore, this contribution aims to identify existing data governance roles in an inter-organizational context. A literature review is conducted to provide a holistic overview of data governance roles. Then, these results are concatenated with network management requirements, gathered from inter-organizational management research, to take a first step in shaping an inter-organizational role model for data governance. Limitations include the lack of evidence on the practical applicability of the results and the lack of heterogeneity in the research background.

Keywords: Inter-organizational data governance · Inter-organizational networks · Data governance roles

1 Introduction

Organizations support more self-service analytics or even create requirements for a collective comprehension of data across companies. Efficient data governance frameworks support organizations to reach that aim [1]. Simultaneously, companies seek to get involved in complex inter-organizational network structures due to increased competition, higher customer expectations, or environmental conditions [2]. However, sources of inter-organizational uncertainty emerge within network coordination [3]. This uncertainty demands role-clarifying, inter-organizational data governance (IODG) concepts. Data governance should build the frame for decision rights and accountabilities for data management. Subsequently, organizations must determine the who and the what of data governance within an inter-organizational context [4]. However, this research stream is still underdeveloped. Previous investigations have mainly focused on modeling data governance structures within an intra-organizational environment [4, 5].

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Prior research on inter-organizational phenomena laid valuable groundwork, which also influenced this research project [6–9]. For instance, Tiwana et al. [8] introduce a framework for understanding platform-based ecosystems. Indeed, they deal with governance-related constructs within platforms, but their focus is not on data governance specifically. Oliveira et al. [9] provided a detailed study of structural research on data-related roles and responsibilities. Governance roles are also identified but are only partially defined precisely. Likewise, there is no link to intra-organizational data governance research, although a knowledge synthesis of intra-organizational data governance and inter-organizational information systems (IS) research could be fruitful for addressing upcoming IODG challenges.

The identified research gap leads to the following research question: *How to expand intra-organizational data governance roles towards an inter-organizational environment?*

In the following sections of the paper, the author gives an overview of data governance and inter-organizational networks, where after the research background is described to locate the study. After providing details about the research method, the author presents the findings. The actual body of knowledge of intra-organizational data governance roles and their relations is gathered to reach the present research goal. To accomplish that, a systematic literature review is conducted [10]. These preliminary results form the point of departure to develop data governance roles and responsibilities towards a network environment by establishing a bridge between intra-organizational and inter-organizational research. This concatenation consists of network management requirements, adopted from Knight and Harland's study on network management core roles and, therefore, outlines this contribution's research background [11]. Generally, the present work strives to contribute to one of the first research attempts dealing with inter-organizational design perspectives of IODG in IS research. Finally, the results are discussed and placed in the overall context of IODG research.

2 Related Work

2.1 Data Governance

IT governance has advanced from corporate governance to a distinct concept [12]. Subsequently, Khatri and Brown [5] differentiate between IT assets and data. Therefore, they recommend separate governance for data to address the upcoming importance of data assets. However, conceptually, data governance overlaps with IT governance since it generally frames IT strategy regulations and brings IT management in line with corporate goals [13].

Data governance defines and manages the implementation and performance of data management [14]. Weber and Otto endow data governance with a structural, organizational design which "specifies the framework for decision rights and accountabilities to encourage desirable behavior in the use of data" [4]. This contribution unemptied follows this definition since the concept of governance was initially developed to manage decision-making rights, which also emerges as a fundamental challenge within data governance [12].

2.2 Inter-organizational Networks

Many terms are used in the literature to describe the characteristics of cooperations. The most common are value networks or networked organizations [15]. Moreover, the term inter-organizational network refers to all structures, such as strategic alliances, joint ventures, or industrial cooperations [16].

Further, organizational roles perform the tasks within a network. Huckvale and Ould define a role as "a set of activities that an individual or group generally carries out with some organizationally relevant responsibility" [17]. These activities are pursued with presupposed qualities such as experience, qualifications, and personal or social attributes that the actors possess to fill a role [18]. Developing a role model can prevent companies from restricting their innovation within organizational frameworks [19].

3 Research Background: Network Management Requirements

Knight and Harland [11] identified six core roles for effectively managing a network by synthesizing both findings. The *Innovation Facilitator* deals with the development and facilitation of product development and innovations. This role also promotes higher spending on research and development. The *Coordinator* serves as supervisor of inter-organizational operations or as project manager. This role brings the members from around the network together and is interested in managing the partnerships. The *Policy Maker* is charged with determining policy for the network structure and is responsible for setting standards for purchasing the practice and providing support for developing purchasing staff. The *Advisor* is responsible for formal and informal consulting within the whole network. The *Information Broker* is entrusted with determining network policy and is responsible for setting criteria for all activities within the network. The *Network Structuring Agent* evaluates and impacts the whole structure of the network and seeks opportunities for improvement. Knight and Harland [11] based their study on the contribution of Snow et al. to dynamic networks [20] and Mintzberg's managers' role theory [21]. The author seeks to adopt these essential core roles within the results section to shape the shift between intra- and inter-organizational data governance. Therefore, these requirements serve as research background.

4 Research Method

A literature review seems feasible to synthesize existing data governance roles and their mutual dependencies [10].

The review is conducted through a keyword-based search [22]. After a few trial searches, "data governance" was identified as the search term in AISeL, ScienceDirect, ProQuest, ACM, IEEE, and Business Source Premier Database in EBSCOhost. Since they comprise almost the entire range of conference and journal publications, these databases are selected as they are most significant in IS research and computer science.

The review was conducted in March 2021. This step resulted in a total of 1007 hits across all databases. Next, a qualitative assessment is carried out consisting of two steps. First, papers are filtered based on their titles and abstracts and removed those which not

deal with data governance roles in general or responsibility-related topics within data governance. One duplicate article was also removed. This step reduced the number of hits to 58. Second, those remaining articles were read, non-relevant papers were excluded. Then, the left 26 papers were included in the review.

Further, a backward and forward search was implemented. The backward search resulted in 12 relevant papers. For the forward search, Google Scholar was used. Additional four relevant papers were reviewed.

5 Results

5.1 Intra-organizational Data Governance Roles

In this section, all available data governance roles in IS and related literature will be synthesized. Mutual dependencies between individual roles are transferred to the entire construct (Fig. 1).

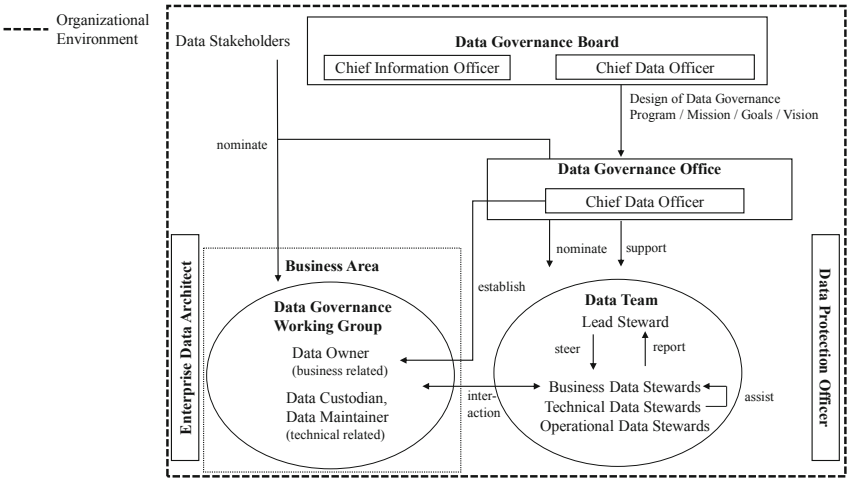

Fig. 1. Intra-organizational data governance role model

The Data Governance Board establishes a data governance system, including goals and roadmaps [23]. The literature similarly describes the Data Governance Council. The Data Governance Council monitors the mission goals, including current improvement projects [24–26]. In addition, it establishes guidelines and aligns its data governance program with its objectives [1]. In this context, other terms also refer to activities of the Data Governance Board, such as the Data Quality Board, the Data Governance Steering Committee, or the Executive Sponsor [24, 27].

The Chief Data Officer is the leading company-wide data manager and the responsible head of data governance processes. This role is responsible for the company-wide data preparation, use, and deletion cycle [28]. The Chief Information Officer also contains a leadership role responsible for managing the company's data assets [29]. There is

no adequate separation of the individual areas of responsibility between these two management roles. In general, both roles can work on improving information management [30].

The Data Governance Office forms the central hub of data governance in a company. Exemplary areas of activity are scheduling data-related workshops or dealing with data stakeholders, and providing for their needs. Besides, the Data Governance Office should promote transparency [26, 27]. The Data Governance Coordinator is part of the Data Governance Office and the head of operations related to data governance. This role sets up all data governance practices [23] and is accountable for the implementation and operationalization of the data governance program [25] and preferably one of the management executives [31]. Furthermore, the Data Governance Coordinator manages the operational tasks for data stewards and reports on data governance performance [32]. The Data Governance Office can be differentiated from the Data Governance Working Group, comprised of business and IT data stakeholders [27].

The Data Team is composed of Data Stewards. They are responsible for all data management activities, including executing data management systems, defining protocols, and harmonizing all standards and procedures [26].

The Business Data Stewards operate in a first context to maintain conformity with data quality and corporate policies. They are often liable for documenting data problems to the client and are subject-matter specialists from different industries [23, 32]. Technical Data Stewards are IT professionals who serve as Business Data Stewards counterparts. They must grasp the program framework, system connections, data processing approaches, data protection, and code quality [23]. Operational Data Stewards are liable for routine entering and updating the operational data transactions [23]. English [33] also creates a hierarchy within the data stewards level and introduces the Strategic Information Steward or Lead Steward, responsible for the whole Data Team.

Besides the Data Stewards, there is a second widely accepted role, the Data Owners. They are often business executives and are responsible for their business division or unit [1]. In this context, the Data Producer generates the data or collates and preserves the generated data, a prerequisite for functioning as a Data Owner. The Data Owner is usually a senior client stakeholder liable for one or more data sets [34]. Besides, Fadler and Legner [35] introduce the Data Platform Owner with a platform-related task focus and the Data Product Owner, who takes care of product-related data issues.

A Data Stakeholder is interested in how data is collected, processed, manipulated, reported, or archived [36]. Kooper, Maes, and Lindgreen [37] describe this role as Data Consumers who are just data users in an organization.

Furthermore, upcoming data protection regulations require a Data Protection Officer who deals with all kinds of data security issues at a personal data level [38]. Besides, the Enterprise Data Architect should be tightly associated with data engineering as other specialists in technology development are hybrids bridging IT and company realms [39]. In this sense, Al-Ajmi [40] suggests the role of a Data Maintainer. This function is responsible for conducting daily system analysis, end-user service, upgrading a master database with new data, and maintaining specified change management procedures.

5.2 Allocation of Network Management Requirements (ANMR)

Fundamental network management requirements of the core roles of Knight and Harland [11] are allocated to appropriate intra-organizational data governance roles. The allocation of tasks establishes a basis for designing the role model (Fig. 2). The current intra-organizational roles and relationships are located in the left section of the model (white background). Based on the prior findings, these are extended across company boundaries (shaded background) by three selected roles (Chief Data Officer, Data Governance Coordinator, and the Data Governance Board).

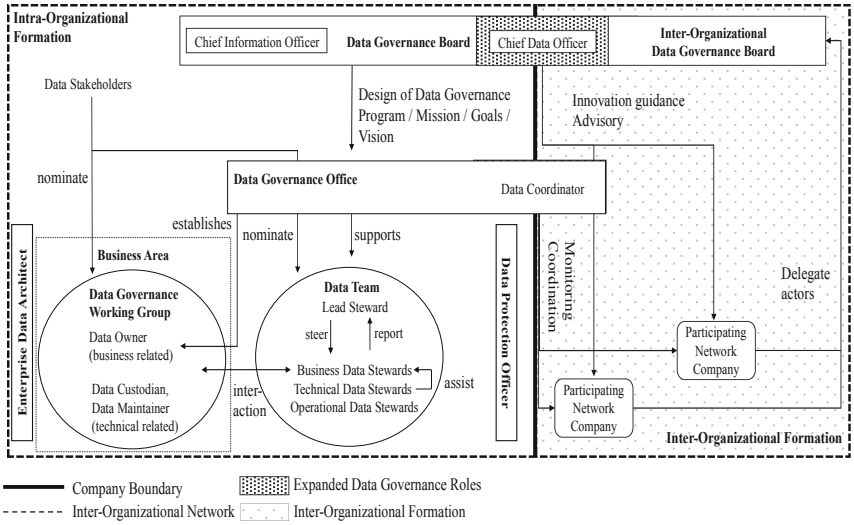

Fig. 2. Inter-organizational data governance role model

ANMR1: As the Innovation Facilitator covers promoting and facilitating product and process innovation [11], the linked tasks should be combined with the functions of the Chief Data Officer, as this role deals with innovation to enhance competitive value [30]. The Chief Data Officer is suggested participating with other executives in an Inter-Organizational Data Governance Board.

ANMR2: The Coordinator should be represented by the Data Governance Coordinator, as both roles have a coordinative task profile [11, 32]. Since the Data Governance Coordinator is part of the Data Governance Office [23], this organization entity will move closer to the company boundaries.

ANMR3: The Policy Maker should merge with the Data Governance Coordinator, and that role is responsible for developing the data governance standards. As the intra-organizational Data Governance Board provides strategic guidance, it should act as Advisor [11].

ANMR4: The network-related aim of the Advisor is the comprehensive consultation of individual actors within networks. For the appropriate allocation of the Advisor, the superior position of the Data Governance Board [24–26] lends itself.

ANMR5: The Information Broker appears as a center for transferring and distributing information within the inter-organizational network [11]. As this corresponds to the task profile of an executive, this role could be filled by the Data Governance Board [24–26] or through the role of a Chief Data Officer/Chief Information Officer [28, 30].

ANMR6: The Data Governance Coordinator represents the Network Structuring Agents. Both roles have monitoring and structuring responsibilities [11, 32]. The Data Governance Coordinator will act as boundary role and coordinates IODG projects with stakeholders from other organizations.

6 Discussion and Conclusion

For the next few years, IODG could present a crucial stream in IS research [9]. The entry of companies into networks is now occupying researchers with governance approaches for inter-organizational formations to assist corporate practice and government institutions in entering such ecosystems in a way that is data value-oriented and compliant with data protection. The initial contributions in recent years [41, 42] provide an excellent foundation for further developing this research stream. The present work aims to contribute to the young research field by suggesting inter-organizational role formations for future IODG endeavors. Therefore, this study examined the current knowledge of data governance roles and responsibilities by conducting a literature review. The identified roles were synthesized to provide an intra-organizational data governance role model with mutual relations between the included functions. That role model was extended by merging identified network management requirements and the initial results of the present literature review. Finally, these findings were introduced by designing a comprehensive IODG role model. This extension also answers the fielded research question on expanding existing data governance roles towards an inter-organizational environment.

Furthermore, this work expands previous research, primarily dealing with an intra-organizational focus on data governance roles and responsibilities. The findings also highlight the contribution of this paper first to take up and synthesize all existing data governance roles in the literature. It is also a systematic attempt to extend a data governance role model beyond organizational boundaries.

Literature has previously admitted many positive effects for organizations set up in networks. These findings underline the importance of research ventures in that field to develop a method to counteract the increasing data quantity and complexity on the one hand and structural heterogeneity of networks on the other hand.

Besides, Knight and Harland discussed network management roles [11] which form our requirements to form the presented IODG role model. Nevertheless, their research is based on empirical results within the National Health Service (United Kingdom) supplier network, which undoubtedly constitutes a particular form of a network. Therefore, the validity and applicability of both concepts in the context of networks in other industries

have to be questioned, which would impact the designed model in the present study and therefore is a main limitation of the study. This limitation could be challenged by evaluating the present model within existing IODG projects. Typically, some publications also may remain undiscovered within the literature search due to a lack of the used keywords.

In summary, the findings of this short paper have demonstrated that the inter-organizational analysis of data governance roles offers plenty of room for further examination on conceptual and practice-oriented research.

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