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# Theoretical Foundations for the Study of Social Innovation in the Public Sector

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**Abstract.** Over the past two decades, there have been significant debates around the theoretical foundations for the study of social and material implications of technological change in organizational settings. Various scholars have looked at these foundations with a focus on either the social and the material as discrete entities, the social and the material as interactive, the sociomaterial as a concept representing the constitutive entanglement of the two, or the sociomaterial as imbricated but analytically distinct. These debates sometimes lead to statements about which foundations are the most appropriate upon which to build studies; however, it may be more productive to delineate what each theoretical foundation affords for the study of social innovation. This paper sets out the affordances of each perspective for the design and execution of research into technologically supported social innovation in the public sector. It provides relevant examples from child protection services to illustrate where and how these different theoretical foundations help researchers to understand phenomena associated with social innovation. In so doing, this paper seeks to clarify the diverse approaches to the study of technologically supported social innovation, their assumptions, and where they may be adopted most effectively.

**Keywords:** Technological change, public administration, social innovation, social and material, theoretical foundations.

## 1 Introduction

This paper aims to help moderate the sometimes heated debates around the theoretical foundations for research on the impact of technological change in organizations. Its objective is to set out a framework within which to better understand where different theoretical foundations are more or less useful for particular questions about social innovation in the context of public administration technological change. This paper will also provide examples to illustrate how these theoretical foundations can be applicable to the study of public sector organizational settings.

The hope is that this work will also allow for better scrutiny of when something is a true social innovation, when there is a failure of social innovation, and when something is simply the ‘#innobasics’, or something that government talks about as innovation, when it is actually something that people just come to expect as the most fundamental components of a technological change [16]. For example: “Making a website that works

well for its users at a reasonable cost in a reasonable timeframe. ... That's not innovation. That's just how tech works today. ... Of course, what is innovative today becomes tomorrow's basics." [16]. Ideally, we would like to analytically distinguish when basic technological expectations masquerade as innovation and when things that are considered basic in the private sector are innovatively deployed in the public sector.

This paper is structured as follows: section 2 sets out five predominant theoretical foundations from the literature, including techno-centric, human-centred, social and material interaction, sociomaterial assemblages, and sociomaterial imbrication. Section 2 concludes with a summary of the characteristics of these foundational theoretical perspectives. Section 3 provides some illustrative examples of how these five theoretical foundations can be productively used to answer important questions, while also setting out their limitations. It will then summarize where and when these theoretical foundations are most effective, as well as what assumptions need to be recognized. Section 4 discusses how these perspectives help illuminate different elements of social innovation in different use cases and what this means for the study of technological change and social innovation overall. Section 5 concludes with some thoughts about the applicability of these perspectives to social innovation in the context of public sector technological change and the opportunities they present for the design of future research.

## **2 Foundational Theoretical Perspectives**

There are five predominant foundational theoretical perspectives for the study of information technology in organizations and society, each has its own unique characteristics that distinguish it from the others, but each has a focus on either the material, social, or some combination of both. Prior debates about these perspectives often pitted them against each other in an effort to identify a dominant foundation. But it is possible to take a slightly different approach, focusing on the strength of a given perspective for the study of particular aspects of technological change in organizations, while illustrating how competing perspectives are not wrong, but useful in addressing different types of questions [8]. This approach will be applied here to the five theoretical perspectives, in order to illustrate where these perspectives could be most effectively adopted.

The first three perspectives are theoretical foundations which focus either primarily on the material or the social or the interaction between the two separate constructs [15]. The fourth is a sociomaterial perspective grounded in agential realism, which posits that the material and the social cannot be seen as separate, but only as an assemblage that is revealed through the performativity of practice [13, 14]. The fifth is a sociomaterial perspective grounded in critical realism that permits an analytical dualism between the material and the social, while nevertheless recognizing their imbrication [8].

### **2.1 Techno-centric Perspective**

The first perspective is from an empirical realist position that looks at the discrete material impact of information technology on organizational factors. This perspective has discrete entities as its ontological priority [15]. Under this perspective, technology is

seen as either an independent variable impacting directly on organizational characteristics [15], or as a variable that moderates the relationship between organizational elements and more strategic organizational characteristics [15].

The main criticisms of this perspective are that the empirical results are mixed and that this may be the result of inadequate theoretical foundations [15]. In addition, perspectives like this “entail conceptual commitments that generate some distinctive blind-spots in dealing with technology in organizational life” [15]. In particular, an approach that looks at the discrete material impact of information technology on organizational characteristics “suggests that technology is relevant to organizational theorizing only as specific technological events or processes occur” [15]. Further, this techno-centric perspective “reifies technology, ignores how technology is bound up with historical and cultural influences, and thus produces technologically deterministic claims about the relationship of technology with organizations” [14].

## **2.2 Human-centred Perspective**

The second perspective is from an empirical relativist position that looks at how discrete social factors shape technology. This approach has an ontological commitment to social phenomena and tends to prioritize epistemology and how social phenomena shape what we know about, and how we understand, technology [10, 12]. Under this perspective, interpretivism is adopted to better understand how social factors shape technologies in particular circumstances, as well as how they inform a multidirectional model of technological development [10]. Social shaping recognizes the social impact on technology as well as the mutually constituting relationship that exists, where technology does impose some influence on the social through its materiality [12].

The main criticisms of this perspective are that social factors are assumed to be discrete independent entities with inherent characteristics [15]. Further, social constructivism and social shaping are seen to ignore the consequences of technological choices, focus on ‘relevant’ social groups to the exclusion of other groups that are impacted by technological choices, and neglect the structural elements of the technologies that are so shaped or constructed [5]. Further, the material technology “vanishes from view in the preoccupation with the social” [14].

## **2.3 Social and Material Interaction Perspective**

The third perspective is from a post-empiricist position that looks at how structure and agents are assumed to be interdependent systems that shape each other through ongoing interaction. This perspective has an ontological commitment to the dynamic interaction between structure and agency [15] and tends to adopt an interpretive approach [15]. However, other work that has adopted structuration in the context of technological change recognizes that technologies are constructed and reconstructed in their production and use, but that this process of social construction needs to account for the affordances associated with technology’s physical properties [9, 11].

The main criticisms of this approach are that it assumes a duality and a separation between technology and social factors [15], that sometimes there is an emphasis on

social over technological factors [8], and that another duality sometimes emerged, where “technologies became phenomena that existed in the ‘realm of structure’ while technology use existed in the ‘realm of action’” [8]. This manifests as a tension between a form of soft technological determinism [8] and social practices [15].

## 2.4 Sociomaterial Assemblages Perspective

The fourth perspective is from an agential realist position that looks at how actors and objects, the social and the material, are constitutively entangled and analytically inseparable [14]. This perspective has an ontological commitment to the inherent inseparability of the sociomaterial assemblage and focuses on methodologies that can help to reveal the performativity of practice [15]. It has its roots in actor-network theory [7], relational ontology [4, 15], and phenomenologically-grounded research [19]. A sociomaterial perspective grounded in agential realism attempts to overcome the issues associated with perspectives that view the social and the material as distinct [13].

The main criticisms of this perspective are that it is conceptually vague, that the focus on performativity of practices ignores issues of power, role, and structure in organizations, and that it leaves out certain characteristics of organization that are important [13]. Further, while this perspective can describe a particular practice at a particular time, it is seen to have issues describing how practices are sustained and changed over time [8]. This perspective also treats all relations as mutually constitutive or co-dependent, which conceptualizes the social and the material as internally related, though in some cases these entities may be related, but in an external way, where the one does not need the other in order to exist [8].

## 2.5 Sociomaterial Imbrication Perspective

The fifth perspective is from a critical realist position that looks at how actors and objects, the social and the material, can be imbricated over time, while nevertheless retaining an analytical dualism [8, 13]. This perspective has an ontological commitment to sociomaterial agencies and focuses on methodologies that can look at both the realm of structure and the realm of action [8]. It takes the view that: “What the technology is does not change across space and time, but what it does can and often changes” [8]. It has its roots in Archer’s ‘morphogenetic’ idea that structure predates action, but that structural elaboration postdates action [1]. A sociomaterial imbrication perspective grounded in critical realism attempts to overcome the issues associated with sociomateriality grounded in agential realism and provide a platform for the study of how sociomaterial phenomena are reconfigured over time.

The main criticism of this approach is that it represents an essentialist and dualistic worldview, though it would argue that this is purely analytical [3]. Further, assumptions about the value of studying changes in the relationships between analytically distinct material and social agency over time could be perceived to discredit the value of research that looks into practice-based phenomena at a given point in time [3].

## 2.6 Comparison of Perspectives

The following table compares the five theoretical perspectives described above. It focuses on the characteristics of each approach rather than their guiding questions and conceptual contributions, which will be discussed and presented at the end of the following section on examples of these perspectives in use.

**Table 1.** Comparison of the five included theoretical perspectives

	Techno-centric	Human-centred	Social and Material Interaction	Sociomaterial Assemblages	Sociomaterial Imbrication
Ontology	Material and social are distinct	Material and social are distinct	Material and social are distinct	There is only the fusion of the social and material in the sociomaterial	Material and social are distinct, but become imbricated
Epistemology	Technology determines social and organizational characteristics	Social factors shape technology	The social and material are interdependent systems that shape each other through ongoing interaction	There is only a sociomaterial whole (though arbitrary agential cuts are sometimes needed for analysis)	Separate social and material elements become imbricated and reconfigure over time
Materiality	Material features of technology	Social construction of technology	Material features of technology that persist across place and time and that structure action	There is only the sociomaterial	Material features of technology that persist across place and time
Social	Social and organizational features	Social agency	Social agency	There is only the sociomaterial	Imbricated social and material agency
Unit of Analysis	Technological change	Relevant social groups surrounding technological development	Interaction between interpersonal communication, technology, and structure	Sociomaterial practice at a given time	Sociomaterial agencies over time

## 3 Examples of Foundational Theoretical Perspectives in Use

In this section, examples are provided to illustrate these five different perspectives and how they can be operationalized in practice to elucidate different aspects of the relationships between technology and social innovation. These examples help to demonstrate how each perspective may be appropriate under different circumstances in order

to address different types of questions. This section is intended to motivate diversity in the theoretical foundations for different types of research and encourage researchers to be explicit about how their foundational theoretical perspectives guide their decisions and help shape their unique contributions to knowledge.

### 3.1 Sources of the Examples

The examples used in this section are drawn from the study of the design, development, implementation, adaptation, and use of technologies in public sector child protection services. While the focus on examples from a particular social service sector may not offer a breadth of different use cases, it helps to illustrate how a diverse set of theoretical foundations can be used to design research that can tackle different questions about social innovation within the same sector. These examples are a subset of the potential research designs and questions that can be adopted under each theoretical foundation, but they provide some guidance on the unique affordances of each perspective, which will be presented in a table at the end of this section.

The five examples illustrate each of the five foundational theoretical perspectives. The first is a survey of social workers that looks at the impact of a technological change on social worker perceptions about administrative burden [18]. The second looks at the influence of two relevant social groups, social workers and information and communication technology (ICT) professionals, on the development of an effective case management information system in Australia [20]. The third looks at how the social and material can interact to produce changes in the characteristics of information technology over time that allows for re-prioritization in the privileged forms of knowledge within the information system [17, 22]. The fourth looks at the challenges experienced by social workers from a technology-in-practice perspective when new structured decision making and integrated case management tools that are focused more on accountability and compliance were introduced [2]. The fifth looks at electronic documentation from a historical perspective and the resulting novel interface that was developed to handle a heterogeneous bundle of documents that make up the social care record [23].

### 3.2 Techno-centric Example

A techno-centric perspective can provide insights into how technology is influencing organizational and social factors. In a period of technological change, a survey of 2,200 social care professionals in the UK found that more than half said that they spent more than 60 per cent of their time on administrative work as opposed to direct client contact, while more than one-fifth spent over 80 per cent of their time on such tasks, and 95 per cent felt ‘that social work had become more bureaucratic and less client-focussed over the previous five years’ [18]. Here quantitative methods provided insights into the impact of technological changes on the degree of administrative burden in social work, highlighting how social innovation does not always follow technological change.

While this particular study does not provide details about the specific change that led to a concern by social workers about a shift from direct service to administrative

requirements, it does provide some insights into the unintended impacts of technological change and the need for greater depth of understanding when trying to accomplish technologically supported social innovation. Techno-centric approaches can uncover high-level relationships between technological change and individual or organizational level outcomes, but it may not be able to reveal the details of that relationship. It may be able to reveal whether or not social innovation is taking place, but not why.

### 3.3 Human-centred Example

A human-centred perspective can provide insights into how technology is shaped by organizational and social factors. In the context of the development of an ICT solution in Australia, a study looking at the involvement of relevant social groups, including social workers and ICT professionals, finds that socially shaped technology has realized greater successes in adoption and use than similar technologies in other jurisdictions, which had a compliance focus and lacked user-friendliness [20]. This Australian study took a social constructionist view of technological adoption indicating that there was a close relationship between social workers and IT professionals. Its findings indicated that: "The development of ICT programs for child welfare is a long-term and intensive process requiring the use of extensive resources to understand the social setting for both the underlying social work knowledge and computerization. Extensive resources and skills have been needed to marry both technologies with the service system culture" [20]. Here qualitative methods provided insights into socially innovative design and how the involvement of relevant social groups in this design and development could lead to more successful information technology adoption.

While this study does not provide details about the material characteristics of the technology, nor the experience of the technology in practice, it does provide insights into the social conditions under which successful information technologies can emerge. This type of research grounded in social constructivism can provide insights into the social conditions under which social innovation in child welfare case management system design, development, adoption, and use can be successful.

### 3.4 Social and Material Interaction Example

A social and material interaction perspective can be effective in providing insights into how material features of technology can structure how social work is done and, in turn, how social work can restructure technology to rebalance what knowledge is privileged within an information system. In the context of the forms of knowledge privileged by new information systems in Canada and the UK, qualitative studies looking at the forms of knowledge built into the structure of information systems find that the privileged forms of knowledge can potentially evolve as social groups take actions to restructure the information systems to meet their work-related needs [17, 22]. Here historical analysis and an interpretive approach were used to provide insights into how information technology could structure what knowledge was privileged and how changes to the technology could restructure the privileged forms of knowledge, in this case from



knowledge focused on administrative compliance towards knowledge needed for holistic service delivery. Such knowledge was supported by basic data presentation tools, like dynamic genograms, that were commonly used in the sector prior to technological change and that helped support service provision.

While these studies look at structure embedded in information technology and the possibility of a restructuring based on social action, they do not look at the technologies in practice. They can provide insights into a process of interaction between structure and action over time. In particular, these studies can reveal how earlier structures that may look like failed attempts at social innovation can act as the foundation for either basic or socially innovative restructuring through social action.

### **3.5 Sociomaterial Assemblages Example**

A sociomaterial assemblage perspective can be effective in providing insights into how technologies-in-practice are performed within organizations. In the context of new structured decision-making tools within a new integrated case management system in Queensland, Australia, and a new centralized case management system in Ontario, Canada, observing the technology in practice revealed failures in design and use, primarily related to a focus on compliance, performance reporting, and accountability, rather than to case management and direct service delivery [2, 21]. For example, there were “the attempts of practitioners to ‘recode’ the experiences and situations of children and parents to fit with the structures in the [integrated case management system] and the [structured decision-making] tools” [2]. These studies look at how the performance of the technology-in-practice assemblage allows for a combined focus on the material constraints on how information is collected, and the ways that workers found to resist, exert their agency, and record the information they need, even if this resulted in challenges for other information users in the service system. Here ethnomethodological and phenomenological approaches were used to provide insights into how the material and the social were constitutively entangled through the technologies-in-practice.

While these studies do not provide insights into external relations, nor changes in the technological and social assemblage over time, they do provide insights into how technologies that may be perceived to support social innovation, may not achieve that social innovation in practice. They also provide insights into ground-level sociomaterial innovation in response to top-down attempts at social innovation.

### **3.6 Sociomaterial Imbrication Example**

A sociomaterial imbrication perspective provides insights into how material and social agencies become imbricated over time. In the context of the failed Integrated Children’s System in the UK, which “shows the limitations of a management regime based on standardisation, targets and command-and-control” [23], a study finds that subsequent workshops to develop an effective virtual workspace prototype, which involved social workers in user-centred design, demonstrates the benefits of a sociomaterial imbrication perspective when seeking to understand the progress of technology supported social innovation over time [23]. This study focuses on how user-centred design offers an

alternative design logic for socially innovative technology projects. Here an action research approach that included workshops and a prototype tool was used to provide insights into how the preceding material reality of the failed Integrated Children's System impacted social action and how the imbrication of the social and material could be re-configured in attempts to progress the structural elaboration of a new system.

While this study does not provide details about the technologies in practice, it does provide insights into the imbrication of the social and the material and how material agency that precedes action can be the subject of subsequent structural elaboration, which could lead to progress in social innovation. It demonstrates how the imbrication and reconfiguration of the social and the material over time can lead to sociomaterial innovation, where technology is an inseparable element in the generation and implementation of new ideas about social relationships and social organization.

### 3.7 Comparison of Contributions across Examples

The following table summarizes the guiding questions and potential contributions that each of the five perspectives offer. This allows for a determination of which theoretical foundation to adopt depending on the objectives of research into social innovation.

**Table 2.** Comparison of contributions across the five included approaches

	Techno-centric	Human-centred	Social and Material Interaction	Socio-material Assemblage	Sociomaterial Imbrication
Question	How does technological change influence social innovation?	How does the social shaping of a technology influence social innovation?	How does the interaction between the social and the material influence social innovation?	What can socio-material practice tell us about social innovation?	What can the imbrication of social and material agency tell us about the progress of social innovation over time?
Contribution	The impact of technological change on social or organizational factors	The influence of relevant social groups on the shape of technologies	The interaction between structure embedded in technology and action over time	The performative aspects of technology-in-practice	The imbrication of the social and the material, such that what technology does can change across time

## 4 Discussion

This paper illustrates how the existing foundational theoretical perspectives for research into the study of social and material elements of technological change in organizational settings do not need to conflict, but instead can be adopted relative to different research questions and research design strategies.

This paper began by setting out the five perspectives on the theoretical foundations for the study of social and material phenomena in organizations. It specifically looked at techno-centric, human-centred, social and material interaction, sociomaterial assemblage, and sociomaterial imbrication perspectives, the unique characteristics of each, and their relationships. It then provided a set of examples in the child protection service sector to illustrate how each foundation could help to elucidate a different element of the material and social features of social innovation in the context of technological change. In particular, the example of social worker perspectives on changes in the sector towards a greater administrative focus, helps illustrate how a techno-centric approach can demonstrate the impact of technological change on social or organizational factors. The example of the development of a successful ICT system in Australia helps illustrate the influence of relevant social groups on the shape of technologies. The example of changes in the forms of knowledge structured within different information systems shows the interaction between structure embedded in technology and action over time. The example of structured decision-making and integrated case management tools in Queensland and Ontario, shows the performative aspects of technology-in-practice. The example of the workshops and prototype document management systems in the UK illustrates the promise of the imbrication of the social and the material, such that the way that technology becomes part of social agency can change over time.

Across all of the theoretical foundations it is possible to understand whether something is socially innovative, a failure of social innovation, or is merely the basics. The examples help to illustrate this by showing how, due to the different frames of reference that they prioritize, each of these perspectives can reveal different underlying factors for the success or failure of social innovation. For example, the case of social involvement of relevant social groups in the development of an ICT project in Australia shows an instance of social innovation success, through the long-term and intensive involvement of developers and users in contextually sensitive design. The case of social care professionals' opinions about a technological change indicates a failure in social innovation. Finally, the case of privileged forms of knowledge in Canada and the UK shows how applying basic technological fixes is really just something that should have been done initially. The public sector is unique and the simple transplantation of private sector innovation is not sufficient. Instead, social innovation comes from tailoring existing innovations to the public sector context. Understanding the different but complementary reasons why or why not involves using more than one perspective. The theoretical perspectives that focus on interaction, practice, and imbrication over time, may serve to illustrate how simply adopting what is in the private sector is not innovative, but that taking technologies or design, implementation, and organizational change strategies that are tried and tested and adapting them for a public sector setting is more appropriately the place where we can hope to identify instances of social innovation.

## 5 Conclusion

The illustration of different perspectives on the theoretical foundations for the study of technology in social settings such as public sector organizations, can provide insights

into the applicability of each foundation to various questions about social innovation. They can also help to reveal different types of factors that can influence social innovation (for example, the materiality of technology, the social reality, the combination of these two, the idiosyncrasies of practices, or sociomaterial change over time). This analysis of the foundational theoretical perspectives also suggests that we should not only think in terms of social innovation, but in terms of sociomaterial innovation, where the social and material, people and technologies, are inextricably linked [6]. The hope is that the examples and summaries provided here can help researchers of social innovation in the public sector to make informed decisions about the theoretical foundations upon which they choose to build their research questions and designs. Through the adoption of these different perspectives, researchers will be better equipped to identify what constitutes #innobasics, what characterizes failures in social innovation, and where social innovation actually occurs.

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