

# Understanding IT Governance Implementation from the Perspective of Actor Network Theory: A Study in an Australian University

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**Abstract:** *This paper presents the analysis of IT governance implementation at University X using the translation process from actor network theory (ANT). The focus is on how the human and nonhuman actors' diverse interests can be aligned to conduce successful IT governance implementation. Using ANT as a theoretical lens helps go beyond studying IT governance arrangements and IT infrastructure as a separate phenomenon. The findings suggest the importance of having a shared vision, an appointment of a representative and the use of appropriate strategies and tactics as a means to obtain full support and commitment from all IT governance players during its implementation. This paper provides rich insights into IT governance implementation as a process of network formation that needs to be maintained continuously.*

**Keywords:** *IT Governance arrangements, IT infrastructure, sociomateriality, actor network theory.*

## 1. INTRODUCTION

IT governance is defined as 'an integral part of corporate governance and addresses the definition and implementation of processes, structures and relational mechanisms in the organisation that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value from IT-enabled business investments' (Van Grembergen & De Haes, 2009a, p. 3). (IT Governance Institute, 2003, 2011). Literature on IT governance has been dominated by the theme that it provides practical value in assisting the achievement of strategic alignment and business value delivery (De Haes & Van Grembergen, 2009; IT Governance Institute, 2003; Luftman, 2003, 2004, 2005; Van Grembergen & De Haes, 2009a, 2009b; Webb et al., 2006). Despite its practical value, the literature also acknowledges that each organisation has its own IT governance arrangements. These arrangements, however, vary across organisations, due to factors such as the organisation's size, industry, business strategy and organisational structure (Brown & Grant, 2005; Sambamurthy & Zmud, 1999), as well as the

availability of appropriate funding and business value and culture (Viale Pereira et al., 2013; Weill & Ross, 2004). Yet, most of the IT governance research views people and technology as separate entities. As a result, the reason of how IT governance emerges in an organisation has not been revealed. Hence, in this paper, we will demonstrate that the relationship between the IT governance structures, processes, relational mechanisms, IT infrastructure and people are difficult to separate one from the other. Drawing on the sociomateriality perspective, we use actor network theory (ANT) as a theoretical lens to offer a new perspective for understanding IT governance implementation. This paper highlights the negotiations for achieving alignment of interests during IT governance implementation that occurs between people (i.e., the IT governance players), IT governance arrangements (i.e., the process) and technology (i.e., IT infrastructure) that takes place at University X.

This paper has been structured as follows. In the next section, an overview of IT governance arrangements and IT infrastructure, as well as ANT are provided. Following this, the case study

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methodology, analysis of IT governance implementation using a translation process and discussion of findings are presented.

## 2. IT GOVERNANCE ARRANGEMENTS AND IT INFRASTRUCTURE

Two important areas of the discussion on IT governance have focused on corporate IT governance arrangements (Sambamurthy & Zmud, 1999) and the locus of IT decision making authority (Peterson, 2004a, 2004b; Weill & Ross, 2004). Key issues include corporate IT governance arrangements with a concentration on centralised versus decentralised and federal types of governance; as well as the locus of IT decision making authority which focuses on (1) who is entitled to make the decision; (2) who is accountable for implementing the decision; and (3) what is the objective of the decision. Arising from this plethora of IT governance research, the contemporary view suggests that organisations should have a good balance of IT governance structures, processes and relational mechanisms to develop effective IT governance arrangements. IT governance structures focus on the roles and responsibilities of the IT/business committee, while IT governance processes refer to the IT decision making process and monitoring procedures. IT governance relational mechanisms emphasise the active participation and collaboration of corporate executives, IT management and business management to facilitate the coordination of IT governance structures and processes (Van Grembergen & De Haes, 2009a).

Both corporate IT governance arrangements and the locus of IT decision-making authority concentrate on how organisations can sustain their IT investments to support business functions. This view implies that organisations rely heavily on their IT infrastructure to support a wide range of organisational tasks for smooth business operations. For this reason, organisations need to govern the process of the acquisition and implementation of IT infrastructure. This is particularly important for them to reduce risks such as investing in an IT infrastructure that is incompatible with existing platforms. While we subscribe to Van Grembergen and De Haes' (2009a) framework of structures, processes and relational mechanisms to delineate what is included in governing IT, we are also concerned with the relationship of these arrangements with the IT infrastructure. This relationship is important because even though extensive research has been carried out, ranging

from the determinants of effective governance (Bowen et al., 2007; Ferguson et al., 2013) to IT governance's impact on business performance (Lunardi et al., 2013; Neff et al., 2013; Nfuka & Rusu, 2011; Pang, 2014), little attention has been paid to clearly understanding the entanglement of relationships between IT governance arrangements, IT infrastructure and people in an organisation.

## 3. THEORETICAL LENS

We demonstrate the relationships of IT governance actors as dynamic and complex by following the relational ontology that presumes the social and the material are inherently inseparable (Orlikowski & Scott, 2008). Actor network theory (ANT) is one amongst a number of sociomateriality approaches that treats the social and the material symmetrically, reciprocally interdependent (Orlikowski & Scott, 2008) and inseparable. In order to understand the entanglement of the social and the material, focus is directed towards the interaction of heterogeneous actors (human and nonhuman) that is continuously emerging to establish various forms of association. ANT is useful for understanding the interwoven relationship of the IT governance arrangements and IT infrastructure by treating them all as actors. In this context, the governance arrangements of IT are considered as processes for making appropriate IT decisions for producing practices related to the selection, implementation and usage of IT infrastructure. Such processes involve various participation and interaction from and between human and nonhuman actors that are continuously emerging to establish a network of relationships.

Under the sociomaterial perspective, the IT governance arrangements and IT infrastructure are viewed as emergent related phenomena, rather than individually separate and distinct. Both IT governance arrangements and IT infrastructure embody the characteristics of sociomaterial assemblages that continuously emerge over time. We conceptually developed our analysis using ANT to help us to identify the actors (human and nonhuman) and the relationships in which they are embedded. Table 1 summarises the key ANT concepts and corresponding descriptions that were used in this paper.

## 4. METHODOLOGY

By using an interpretive case study approach, various contexts of the elements of IT governance arrangements and IT infrastructure and their association to one another are traced and explored.

Table 1. Summary of key concepts used

Key Concept	Description
Translation	A process of creating alliances between human and nonhuman actors by aligning their interests with the focal (key) actor.
Actor and actor network	Actors can be human or nonhuman, or they may be hybrid (Callon, 1991). Meanwhile, an actor network is a heterogeneous collection of human and nonhuman actors with aligned interests.
Obligatory passage point	A situation or process that is specified by the focal actor such that all the relevant actors can achieve a shared focus in successfully pursuing the interests attributed to them (Sarker et al., 2006, p. 54).
Inscription	A process of artefact creation that ensures the protection of some interests (Sarker et al., 2006)
Punctualisation / black box	Treating a heterogeneous network as an individual actor to reduce network complexity (Law, 1992)
Primum moven	A primary cause or “mover” that initiates the network initiative development
Focal actor	The key actor who drives the translation process
Irreversibility	A situation in which it is impossible to go back to a point where alternative possibilities exist (Callon, 1991)

The case study method was chosen because of its ability to help the researchers to obtain richer information in its natural settings, enabling them to examine the social, technological, cultural and political influences on the IT governance implementation project. In-depth interviews were conducted with twelve subjects who were directly involved in IT governance implementation.

In collecting the data, the principal researcher used the concept of “follow the actor” (Latour, 1987; Tatnall, 2003; Yoo et al., 2005) by asking the interviewees to name other important actors who should be interviewed. This technique enabled the researcher to canvass the views of a range of actors important to the success of IT governance implementation in their organisation. Information was created through the interaction between the principal researcher herself and the actors by using semi-structured interview. The interviews lasted 60-90 minutes and were digitally recorded. Transcripts

of the interviews were subsequently created and the provided information was cross-checked with the interviewees. The interviewees included the Vice Chancellor, Librarian, IT manager, IT panel reviewer and IT staff.

## 5. DATA ANALYSIS TECHNIQUE

We use ANT to trace, explain and understand the dynamic relationship that exists between IT governance actors. It involves the process of how the interests of IT governance arrangements and IT infrastructure (i.e., heterogeneous relational actor networks) becomes align to create a stable IT governance network. Specifically, a network analysis technique, using the sociology of translation of problematisation, intersement, enrolment and mobilisation, was employed to guide the analysis.

In this paper, the translation process was adopted to the case study of University X to explain how a network of heterogeneous actors (i.e., IT governance implementation) was formed. In order to understand how such complex relationships are emerging and the degree to which the tight interplay between the actors and their interests could be revealed, the four moments of translation are applied as follows:

- i. **Problematisation** (how to become indispensable). In the problematisation stage, a focal actor, who is the key actor, drives the translation process by identifying the relevant actors and their interests, and establishes an obligatory passage point. At this stage, the efforts of the focal actor, in defining the interests of the punctualised IT governance structures, processes, relational mechanisms and IT infrastructure, are highlighted. A negotiation takes place in which the focal actor starts to convince the other actors to accept his/her solution in regards to IT governance implementation (i.e., the obligatory passage point). While punctualisation is the best way to reduce the complexity of the punctualised actors during the negotiation process, the elements (i.e., actors) inside each of the punctualised actors are required to be considered to prevent resistance to accepting the obligatory passage point from occurring. Resistance from these actors could result in unsuccessful negotiation for the establishment of the IT governance network.
- ii. **Intersement** (how the allies are locked into place). In the intersement stage, the focal actor negotiates and persuades the identified actors to accept the obligatory passage point by

using various strategies (i.e. the device of interestment) to win over the negotiation process. The focus of interestment is to impose and stabilise the identified actors (Callon, 1986) into an alliance. The creation of artefacts, or a desired program of action to protect the interests of the actors, occurs at this stage. This process is also known as inscription or intermediaries (Callon, 1986, 1991). Four types of intermediaries, namely literacy (e.g., reports, patent), technical artefacts (e.g., hardware and software), human beings (e.g., skills and experiences) and money (e.g., benefits) can be used as devices of interestment. Inscription is sometimes also referred to as an immutable mobile (Law, 1992). This classification came about because it contains elements that have strong properties of irreversibility that could mobilise across time and space (Walsham & Sahay, 1999).

- iii. **Enrolment** (how to define and coordinate the role). An enrolment takes place when the focal actor successfully convinces the other actors to accept the obligatory passage point and their new roles proposed by the focal actor. As a result, a network of alliances with aligned interests is formed. Inscription also occurs during the enrolment process (Sarker et al., 2006) as a result of successful negotiations. A job description is an example of how the interests of the actors are secured into a written document, indicating that the actors accept the new roles defined for them.
- iv. **Mobilisation** (how actors can have legitimate speakers to avoid betrayal). Mobilisation takes place when a spokesperson (or representative) is appointed to represent the enrolled actors in the network (Callon, 1986; Madon et al., 2004). Accordingly, actors start to follow the spokesperson, which then leads to stability and durability of the actor network. Mobilisation is considered important to prevent betrayal of actors from occurring.

During the analysis, we conceptualise both IT governance arrangements and IT infrastructure as heterogeneous actor networks that contain elements of collective human and nonhuman actors that are tied together. All actors have interests (Callon, 1986) and all interests need to be aligned in order for the actor network to become stable. We follow Law (1992) and treat the heterogeneous elements in the IT governance arrangements and IT infrastructure as individual actors to compensate for the complexity of the network (i.e., punctualisation). We integrate the concept of ANT in the IT

governance implementation to understand the relationship between IT governance arrangements and IT infrastructure. ANT offers the flexibility to understand IT governance implementation without specifying which actors might be involved, the influencing factors and the impact that will emerge from the analysis.

## 6.0 CASE STUDY: IT GOVERNANCE IMPLEMENTATION AT UNIVERSITY X

University X is a well-established research-intensive university in Australia. The university has adopted a devolved structure for the whole campus since its founding. The devolved structure and concomitant culture of collegial self-determination is claimed to contribute to a better decision-making process and accountability of outcomes from the decisions made by the business units to support the university's governance. Following the devolved structure of the university, the IT governance arrangements and IT infrastructure have been highly devolved. Faculties are given a significant level of operational autonomy, in both academic and budgetary matters. The Deans of the Faculties have been given wide responsibility for managing their own resources, including IT, to support their niche needs of the users. As a result, the faculties had a devolved IT structure and maintained their development locally.

Prior to 2006, the university had two layers of IT governance arrangements and IT infrastructure. In the first layer, the university had two IT central administrative units that were responsible for general IT infrastructure, networking services and university communication systems. These units were the Administrative Computing Services (ACS) and University Communication Services (UCS). The ACS and UCS fell under the responsibility of the Director of Finance and Resources. The second layer comprised of the faculties that had developed their own IT infrastructure with their own funding. The Deans of faculties had the ultimate power to make IT decisions and determine what would be the best mechanisms to support their faculties' needs.

However, the central IT administrations had no control over IT at the faculty level. Consequently, IT governance arrangements were not strategically structured, and there was significant duplication of IT infrastructure. The devolved IT structure resulted in several problems, such as lack of coordination and consistency in managing information. In addition, there was no standardisation on how IT decisions

were made and indeed different states of IT across the campus.

*... the university has a philosophy that is highly devolved so the departments have a good deal of autonomy, especially in the way they used funds... because of that, the various parts of the university had developed their own internal IT... (Former Librarian)*

The university conducted a review of the ACS/UCS in 2003. The review revealed that devolved IT resulted in IT infrastructure being under-resourced and affected the effectiveness and efficiency of IT services delivery. After her appointment as a new Director of Finance and Resources in 2004, and driven by the report of the ACS/UCS review, the newly appointed Director of Finance and Resources pushed the idea of having centralised IT. The idea was translated into the development of University X's IT strategic plan. The IT strategic plan listed the need for appointing an IT Director and was followed by the amalgamation of the ACS and UCS into one central IT unit. The new central IT unit was known as the Information Technology Services (IT Services). After the amalgamation at the beginning of 2006, the IT Director took on the role of focal actor to lead the transformation of the ACS and UCS to a centralised IT service in the university. The IT Services Director stabilised the new IT Services by relocating the "new" IT Services staff (i.e. staff from the ACS and UCS), who had previously worked in various sites across the university, to a central location with a new IT Services management structure. A new IT Services mission and an IT strategic plan for the university were developed. A new IT governing body of the IT Reference Group was also established to overview the overall IT governance processes in the university. In terms of relational mechanisms, the IT Services Director directed and coordinated the IT Services transformation plan in accordance with the IT Services mission. A new management team of IT Services replaced the existing IT governance structures of the ACS and UCS.

In relation to the IT governance processes, the IT Services started to develop a transformation plan that highlighted the need to put in place formal service agreements for most of the services expected to be delivered by them. In terms of IT governance relational mechanisms, the IT Services Director directed and coordinated the transformation plan of IT Services in accordance with the IT Services mission. Under the devolved responsibility structure, the Director had the

authority to control and manage the restructuring process of the IT Services to become the university's central IT unit.

### **Translation of the IT Governance Implementation at University X**

#### ***Problematisation***

The newly appointed Director of Finance and Resources was the *primum moven* who had decided to implement the suggestion recommended by the ACS and UCS review and to develop a formal IT strategic plan for the university. Her decision became the turning point to the centralisation effort in the university. One of the interviewees explained the following:

*... the centralisation didn't really happen until the appointment of a new Director of Finance and Resource... the new director wanted to implement that approach and really trying push it through ... so she started doing that... (Former University IT Manager)*

The problem that the *primum moven* wanted to solve was to overcome the IT decentralisation problem at University X. The director negotiated other actors to accept her solution. The proposed solution was to establish a centralised IT service unit (i.e., the obligatory passage point). The obligatory passage point was expected to improve the effectiveness and efficiency of IT services delivery that had been previously devolved for a very long time.

By passing through the obligatory passage point, the ACS and UCS could overcome the obstacles of their limited ability to provide university-wide IT services and financial exigency. The IT infrastructure, IT governance structures, processes and relational mechanisms were punctualised actors with inscribed interests of the ACS and UCS. During the negotiation process, the ACS and UCS represented the IT infrastructure, IT governance structures, processes and relational mechanisms.

#### ***Interessement***

The *interessement* moment focuses on the negotiation process between the Director of Finance and Resources and the identified actors to agree and accept the interests defined for them. At first, the university faced difficulties in pursuing the idea of having centralised IT because of resistance from the ACS and UCS. Both the ACS and UCS were aligned actors with their own IT governance arrangements and IT infrastructure. This became

evident when the amalgamation did not happen directly after the ACS and UCS review.

*... when ACS and UCS eventually combined... they took a long time for them to become one unit... folding in the same direction... (Faculty IT Manager)*

An artefact that was involved at this stage that exhibited the need to improve IT services was the ACS and UCS review report. The report embodied a strong inscription of the weaknesses of the existing IT services at University X. The impact of the review is described as follows:

*...the review initiated a process of significant change within the university... That significant change is to recognise that there are some fundamental standards that need to be adhered to by all, and there are core services that should be accessed by all, rather than a bunch of services that you will create for yourselves (IT Review Panel)*

The artefact helped the Director of Finance and Resources in developing two interestment devices to win the negotiation process. Firstly, the establishment of a new IT Services as a central IT body, and secondly, the appointment of an IT Services Director.

### **Enrolment**

After his appointment, the IT Director became the focal actor and led the amalgamation process of the ACS and UCS into the IT Services. Within a short period of time (i.e. the appointment of the Director was in May 2005, and the amalgamation was completed in January 2006), the ACS and UCS were successfully amalgamated (i.e., enrolled) into the IT Services.

*I believed he had authority from the highest level from the university to drive the centralisation of IT services (Faculty IT Manager)*

The establishment of the IT Services resulted in the betrayal of the ACS and UCS in their original network because both units were forced to abandon their existing alliances. The ACS and UCS did not have the power to protect their original network and needed to follow the new interests inscribed on them by the Director of Finance and Resources. The modification of interests (i.e. the establishment of the IT Services) affected not only the ACS and UCS network, but also the existing network of IT governance arrangements and IT infrastructure.

### **Mobilisation**

The IT Services network was mobilised through the adaptation of two strategies. Firstly, the new IT Services staff (i.e. the staff from the ACS and UCS), who had previously worked in various places across the university, were moved to a central location. The Director also appointed new staff to ensure there were sufficient human resources to support the IT Services operation. Subsequently, a new management structure of IT Services was introduced. Secondly, the Director and his new IT Services team inscribed the interests of all IT Services actors by setting up two inscriptions. These inscriptions included the following: (1) the IT Services mission; and (2) a set of plans to support the business needs of the university as listed in the IT Strategic Plan. After the mobilisation of actors into the IT Services network, the IT Services Director became the spokesperson who was responsible for ensuring the new network of IT Services was not betrayed in the future. The IT Services Director had a positive view of the new structure and elaborated his opinion in the IT Services briefing to the management of the university as;

*... within this new IT Services structure, we are building capabilities to better engage across all of the operational areas of the university (An excerpt from IT Services Briefing document)*

At this point of time, the faculties and schools were still maintaining their devolved IT governance arrangements, because they were not involved in the amalgamation process. The IT Services Director at this point in time was not concerned with IT infrastructure. The focal actor therefore overlooked the complexity within the punctualised IT infrastructure. Even so, the IT Services became a durable network with a strong property of irreversibility. The ACS and UCS could not return to their original network. With this strength in hand, the Director became the IT Services spokesperson and all of the IT Services members worked as one entity and achieved relative stability to maintain themselves in the network. In the University X's bulletin, the IT Services Director mentioned that,

*It will take a while before everything is running just as we'd like it, but everybody at IT Services is working very hard towards a common goal of improving IT services, and by this time next year we will have made good progress towards a much improved IT landscape" (An excerpt from University X's new bulletin)*

## 7. DISCUSSION

Using ANT as a theoretical lens, the taken-for-granted boundaries that exist between the relationships of the IT governance arrangements and IT infrastructure were removed. In this context, the entanglement between the social and the material in IT governance practice was acknowledged and analysed. Such analysis contributed to an understanding of the role of both human (e.g., the Director of Finance and Resources and IT Services Director) and nonhuman actor (e.g., IT governance processes) during the establishment of a central IT unit at University X. Given that ANT has its own vocabulary and methodology to explore such phenomena, this paper study has provided an insight that in order to produce stable IT governance network, the interests of both human and nonhuman actors need to be aligned.

The key findings from this study suggest that a success to align the interests of the actors is closely related to the ability of the key actor (e.g., top management, IT executive) to establish a shared vision (i.e., the obligatory passage point) to convey the IT direction and its linkages with business vision and mission. The vision needs to be aligned with the interests of all actors. The challenge is on how to convince the actors to accept the vision as the only option for them to achieve their own interests.

The role of a spokesperson (i.e., representative) to represent the actors (e.g., the ACS and UCS are the spokespersons for University X's IT infrastructure) during the negotiation process is necessary. For instance, Sarker et al. (2006) note that actors do not always participate in the negotiation process by themselves, but through speakers negotiating the interests on their behalf. It is a tactic used to expedite the negotiation process because rather than convincing all actors who were part of the IT governance network, convincing the spokesperson was found to be appropriate as he/she could "speak in the name of the others" (Callon, 1986, p. 214).

The use of various strategies and tactics (i.e., devices of interestment) can create sufficient space for the key actor to be able to directly negotiate their interests with the other actors. The analysis shows the use of strategies and tactics as devices of interestment can create a favourable balance of power state during the negotiation phase. The selection of appropriate strategies and tactics can successfully tie the interests of the actors to be part of the IT governance network.

## 8. CONCLUSION

In this paper, we subscribed to the perspective of sociomateriality to explore the emergence of IT governance at University X. ANT provides a foundation to understand how the human and nonhuman actors' interact and how they mutually define each other's identities to achieve alignment of interests. If the interests are all aligned, then the IT governance implementation is likely to be successful.

This paper has three implications for successful IT governance implementation. Firstly, the importance of having an align interests between all the IT governance players. This alignment can be achieved by developing a vision that is shared among them. A shared vision helps to define the values and guide the behaviour of IT governance players to make it happen. Thus, the role of the key actor that is appointed by management to lead the IT governance implementation is crucial. He/she has to ensure that the diverse interests of the actors can be aligned by getting them interested with the projects under the IT governance implementation, as well as negotiating the terms of their involvement to ensure successful implementation.

Secondly, an appointment of a spokesperson to represent the actors during the negotiation process is required. Convincing the representative who speaks on behalf of the actors, is more practical and uncomplicated as compared to negotiating with all individual actors. Once the representative agrees with the shared vision, the heterogeneous actors will normally follow the interests that have been inscribed for them.

Finally, the devices of interestment used by the key actor needs to be persuasive to convince the actors to accept the vision. In this context, the use of various strategies and tactics can expedite the process to obtain commitment and buy-in from the IT governance actors.

The case presented in this paper covers only limited time frame of IT governance implementation at University X. We draw upon only part of ANT analysis, whereby the analysis did not covers the discussion on the use of translation process to unravel the punctualised actors. In this context, this case study shows an example that the elements (e.g., actors and their behaviour) within a punctualised actor is often taken for granted. Even though this case study did not illustrate the impact of overlooking the complexity within the

punctualised IT infrastructure, we would like to highlight that action as precarious. Failure to consider the elements inside the punctualised actors could lead to resistance in accepting the shared vision defined by the key actor. This could result in unsuccessful negotiation for the establishment of the IT governance network. Nevertheless, the aim of this paper is to explain IT governance implementation using ANT as a theoretical lens.

The implication of this study for research is that the entanglement of the social and the material cannot be adequately understood without taking into account the fundamental elements that constitute its emergence. This study has shown that the IT governance arrangements and IT infrastructure are emerging through a process of translating the interests of various actors. Their patterns of interactions are unique and evolve over time. Through the lens of actor network theory (ANT), the research has revealed the complexity of the relationships between the IT governance structures,

processes, relational mechanisms and IT infrastructure and their emergence that shapes and is shaped by the process of interests' alignment.

As for practical implication, the findings of this paper suggest a way of helping practitioners to understand how IT governance is implemented in an organisation is introduced. The identification of the related IT governance players (i.e., the focal actor); an obligatory passage point (i.e., a shared vision to help the alignment of interests between all IT governance players); and the strategies and tactics (i.e., devices of interestment) used during the negotiation and enrolment of IT governance players, could assist them to evaluate the strengths, weaknesses, opportunities and threats (e.g., risk) related to their IT governance. This is in accordance with the conclusion that the key to successful IT governance implementation is the involvement of all actors, consideration of nonhuman actors (e.g., IT infrastructure) and the institutional context within which the organisations are situated (e.g., cultural and historical background).

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