THE AFFORDANCES OF TECHNOLOGY IN USE, IN TGP : THE TRUSTWORTHY GOVERNABLE PLATFORM

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ABSTRACT

The Trustworthy Governable Platform (TGP) is a conversational meta-platform model, that redefines the information paradigm for institutional communication platforms—particularly in relational enterprises—where complex social dynamics are at play. Examples include addressing accountability and ensuring contextual integrity.

This review essay examines the reported architectural design work of TGP.We adopt a design-oriented sociological perspective to uncover how the platform's creator ensured that its social use and meaning align with the specific situational needs from the outset. The study begins by examining the key features of social interactions that characterise relational enterprises, as identified and articulated by the author of the design process through selected theoretical approaches. Next, we analyse the communicative affordances of technology in action that are necessary to realise these social interaction features. Finally, we explore the design elements of the supporting information and communication infrastructure that the author deemed essential to enable the appropriate options for action. These elements ensure users experience the intended social usage and meaning of the technology in the context of relational enterprises.

The purpose of the essay is to stimulate discussion on what we deem a most promising enterprise. TGP has been under active technical development for a number of years and, at the time of writing, is undergoing initial trials for deployment and appropriation.

KEYWORDS

Relational Enterprises, Information Communications, Entrepreneurial, Management & Organisation Cybernetics, Socio-cybernetics, Complex Adaptive System and Theory.

1. INTRODUCTION

The study of affordances focuses on the concrete use of technology, illuminating both its potential and its limitations. This approach enables critical and constructive insights. For example, it identifies limitations when a technology restricts certain actions in specific contexts, such as the computerisation of medical records or the implementation of portable computing devices on construction sites [1] It also highlights shortcomings when technology fails to meet users' needs.

Technologically enhanced forms of social interaction and communication pose a new challenge to social studies: how to apply and integrate sociological insights into the development and design of these technologies. According to [2], design-oriented sociology represents an emerging

David C. Wyld et al. (Eds): SEC, DMA, AIAPP, CYBI, CoSIT, SIGL, NLPML – 2025
pp. 59-77, 2025. CS & IT - CSCP 2025 DOI: 10.5121/csit.2025.150805

field within the sociology of technology, addressing the communicative affordances of technologies [3, 4]—that is, the options for action these technologies enable.

Design-oriented sociology contributes to the design process by addressing the relationship between humans and technology, thus serving as a valuable resource. It facilitates the evaluation of design outcomes through what Luff et al. [5] describe as "the reverse engineering of the social usage and meaning of technology in action."

In this paper, we examine the design work of Mike Martin [6] on the architecture of a Trustworthy Governable Platform (TGP). This platform revolutionises the information paradigm in institutional communication platforms, particularly in relational enterprises where complex social affordances—such as accountability [7] and contextual integrity [8]—are critical. Using a design-oriented sociological lens, we explore how Martin ensured, from the outset, that the social use and meaning of the technology align with situational needs. Of course, any errors or omissions in the design process are subject to re-evaluation ex post.

The methodology we use in addressing the relationship between human parties and technology is straight forward: we start by considering the key social interaction features characterising relational enterprises, as exposed by the most pregnant theory approaches selected and declared by the author of the design process [6]. We then reason about the communicative affordances of technology in action required to grant the realisation of those key social interaction features. Finally we consider the aspects of the design of the support information and communication infrastructure the author considered capable of enabling the options for action that deliver to users the correct social usage and meaning of technology in action they need in relational enterprises. Thus our analytical results are directly compared with those of the author, the prose of which we report in summaries.

Our aim in this review essay is just to frame the recount of the design work, within the design-oriented sociology concept. This will capture in a holistic picture the several intertwined threads of concern that Martin has followed in his original work, striving to serve user's social needs.

We expect in our case that the reverse engineering of the social usage and meaning of technology in action [4] be straight forward, if not null, in terms of limitations or spurious side effects on the social usage and meaning of its technology in action w. r. t. what is needed in the situation, as TGP has been precisely designed for the purpose of respecting them. In particular, as the author's approach has been declaratively design-oriented sociology aware – albeit not in this terminology -, it has been intentionally *exceedingly careful* in selectively designing a socially respectful - albeit effective - conversational theory and model.

The final purpose of the essay is to stimulate discussion on what we deem a most promising enterprise. We wish to make clear that the TGP has been under active technical development for a number of years and, at the time of writing, is undergoing initial trials for deployment and appropriation.

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2. METHODOLOGY FOR REVIEWING

In Section 3 we describe the key theory elements called upon by the author to play a role in the design of TGP, listed here:

A. He characterises the key social interaction features of relational enterprises [9].
B. He introduces epistemic registers as a classification into a vertical stack, of the many different related aspects, and level of meaning, in the socio technical arena [10].

C. He reintroduces the lost paradigm of information to be used in institutional platforms: from Data Processing and Distribution to Information on Communications [10]
D. He calls upon a cybernetic thinker [11] to better define the specific features of the social situation at hand: of outmost cybernetic complexity, in which considering human experience is shown as mandatory.
E. In which authentic communicative action is the norm, as specified by a philosopher [12]. Thus requiring mutual understanding among participants through access to conversations about conversations: a well-known fundamental aspect of human communication and interaction.
F. He examines goal direction in terms of the value of actions [6], and considers its character in relational settings.
G. He examines information privacy and access control, in a systematic approach towards legitimate expectations of reciprocal respect in social interaction, in what is called contextual integrity [6].
H. Finally, he recalls key aspects of conversational modelling [6, 15], as a quest for order in representing social interaction by language use. Thus opening the way to define a conversation theory and conversation model design aiming at the concrete realisation of the desired affordances of communication technology in action.

From the analysis of these elements, in Section 4 we identify the desired list of theory derived affordances, which satisfy the social usage and meaning of technology in action, designed to supporting users in relational enterprises.

In Section 5 we then check the result against synthesis, by exposing it to a direct, implicit comparison with Martin's complete design work: a work in designing the support infrastructure that in fact localises the application of the entire set of these theory elements together, to the context and structure of relational enterprises, in which human experience is mandatory and authentic communicative action is the norm. For this, we report here, in summary, but in much of his own concepts and approach, the foundational detailed design work of Martin, of which the present paper is a sociological reading. The agnition event of each element, in the overall picture, is a rewarding one.

In Section 6 we let address novelty and significance of Martin's approach to the design of the TGP, introducing a comprehensive view on respecting people's right to participate in deciding policy and goals of purposeful social action [13, 14].

3. MARTIN'S SELECTION OF FLASHES OF THEORY TO BE INVOLVED

A. Relational Enterprises

The key character of relationality is concerned with peoples' experience, not just their interactions. It is direct human experience, requiring both human knowledgeable participation, and evaluation. [9]. With far reaching consequences. We need explore how relationality could be inscribed in information infrastructures and reflected in the management and governance systems they support. To do this, we must examine how relationality can be appropriately conceptualised and the nature of the information systems in which these conceptualisations could be inscribed and could evolve. Any relationship, whatever its starting point or domains of action, must involve change and learning.

B. Epistemic Registers

The concept of *epistemic registers*, illustrated in a published work on Inter-organisational systems [10 ex 5], It serves to examine the stack of epistemic registers of the architectural discourse of socio- technical systems, and operate hermeneutic distinctions in social affairs: a basic factual and constitutive engineering level, an informatics semiotic level above it, an hermeneutic conversational level above it, a fully socio-cultural level above all. A distinction necessary to elaborate and interpret cybernetic meta level concepts, like intention, accountability, and the cultural colouring of social affairs.

C. Sense making of Human Enterprise

The general and exhaustive cybernetic view of sense making in human enterprise requires including, besides actors actions and objectives, also principles, roles, responsibilities: meta issues with respect to functional, first order data, allowing the address of intention and accountability [6, 10, see also 16].

D. Lived experience in relational enterprises: a requirement of determinability of systems

From Krippendorff analysis [11] – a cybernetics theorist - of the determinability of generic systems, relationality, as a socio-cultural phenomenon, is characterised as *constitutively determinable;* meaning that:

a. users must take part in its creation and evolution;
b. being experiential – not just observable data -, it must include a second-order cybernetic.

From Krippendorff's distinction comes a disciplinary cross-over: the plan changes from social relationality to informational / behavioural aspects of purposeful, human activity, shifting epistemic register from the conversational to informatics: a second important result, exposing the causality, in why relationality demands a shift in information systems paradigm [13].

E. Authentic Communicative Actions

From Habermas definitions [12], authentic, communicative human actions are committed to mutual understanding. Tending to the satisfaction of this commitment requires a most demanding holistic approach to correctly enabling hermeneutic functions.

F. Valuaction

"Valuaction" which Halprin coined [17], is associated with our concept of relational governance. It recognises that, in creative, relational contexts, adding value, extracting value and evaluation cannot be alienated from each other and associated with different actors: they are all part and parcel of shared conversational work.

G. Contextual Integrity

It is defined by Helen Nissenbaum, while considering privacy, as the right to live in a world where our expectations about the flow of personal information are, for the most part, met; expectations that are shaped not only by force of habit and convention but a general confidence in the mutual support that flows according to key organising principles of social life, including moral and political ones." [8, pp231]

H. Conversation modelling

Here, the notion of conversation is analysed, a conversation theory developed and a conversation modelling language and notation presented. The objective is to create an architectural framework for structured communication service definition and to identify the high level requirements on and affordances of any technical service platform which claims to be able to support and sustain relational enterprise and services.

The approach is not the traditional one of the discipline of Conversational Analysis (CA). At variance from CA, we model conversations, not interactions. We do not nurture the aim to describe the competencies and procedures involved in producing forms of social interaction. Instead, we design a way of representing the normative aspects of interacting socially. For this purpose we model conversations in a way that can offer participants the language to allow them to manage the normative aspects of their interactions, while remaining entirely free of developing their interactions in any desired direction, independently from the otherwise transparent modelling language used for the conversations.

Below, for the sake of contrast, we recall the central elements of Conversational Analysis.

Conversation Analysis aims to describe the competencies and procedures involved in producing any form of social interaction. It focuses on analysing conversations between participants to uncover their intersubjective understanding of the interaction as it unfolds and their orientation toward the social actions being accomplished. [18]

The impossibility of achieving a strictly formal analysis of conversation highlights its value as a human science. Unlike a system governed by a closed set of formal rules that could infallibly predict the next conversational move—or even the range of possible moves—conversation is dynamic and emergent. Each new conversational turn reshapes our understanding of the prior turn, creating a process in which every utterance both responds to a preceding context and simultaneously redefines that context [22].

Thus, a purely formal, context-free description of conversation is unattainable. Instead, the analysis focuses on the participants' intersubjective understanding as it evolves moment by moment. This detailed attention reveals how conversation serves as the foundation for the architecture of intersubjectivity, upon which both simple and complex social actions are constructed. [18]

Consequences of theories, on the nature of Policy and Goals in Purposeful Social Action

What are the fundamental assumptions of human enterprise?

The first assumption of social goal directed actions is that a set of mutually compatible and practically realisable goals can be articulated and committed to, in the creation of a shared enterprise. These are defined in the context of a set of principles, rules, pragma and praxa, (that is to say, an organisational ethos).

The second assumption is that a set of processes and resources, that are conducive to the fruition of the goals, can be identified, deployed and operationalised.

Realising these assumptions involves conversations between sets of participants which produces a discourse. We refer to the first of these discourses as "Governance" and the second as "Managed Operation". Notice that each of these discourses involves two distinct epochs: the first is one of requirements definition and policy setting and the second on design and implementation.

If the enterprise is to maintain its viability, both its goals and the processes that must realise them must be continuously monitored and (re)evaluated in response to developments in the complex, evolving and emergent eco-socio-cultural context. [Beer, VST, System 4]

All this implies communication and record, which in turn, implies a shared language and vocabulary This vocabulary falls into two divisions: a terminology of intentions to articulate goals and principles, and a terminology of function and process (observable, measurable things or "extensions").

Since the complex eco-socio-cultural context is emergent and evolving, new demands may be created not just to modify the current goals and plans but to change the terminology itself. New shared experience of internal and external phenomena may demand new significations – new things coming to count and to require naming and others becoming no longer significant and, therefore, redundant. This, in turn, demands new formulations, that is to say, new shared theories, plans and practices.

This implies both a first order and a second cybernetic order (meta) theory of change and development. This second orderliness itself applies at two levels of discourse: The first to that of the governance and the managed operation of the enterprise itself and the second to that of the evolution and use of the language which embodies the evolving shared world-view of the participants in the enterprise, that is to say, to those who are committed to its goals and ethos.

An example of the evolution of significations and formulations: second cybernetic order change.

Security has always been a vital objective in banking but what has counted as "being secure" has evolved in response to the socio-technical context and has produced corresponding socio-cultural change. In the days before computing, security was embodied in principles of probity and trust established through teller procedures, manual cross checking and branch management. The introduction of information technology automated accounting and cross-checking procedures as analytic functions and shifted many aspects of security to partitioning and access control. With the introduction of Internet Banking, the concept of security in banking has again shifted fundamentally with high reliance on biometric identification and cryptographic containment mechanisms together with bayesian analytic cross-checking. Concepts of probity and trust have shifted away from the operational domain to those of procurement, technical design and implementation where they are reduced to contractual terms and conditions. Thus, what "secure" means for bankers has changed fundamentally over the years and over the technologies. And notice, these meaning have little or nothing to do with the use of the term in military enterprise or in a yachting marina! What counts as "secure" in human enterprise is locally determined, dynamically evolving and contextually sensitive. This is not simply a matter of interpretation but of socio-technical construction and reconstruction. [6]

4. DESCENDING DESIRED AFFORDANCES OF TECHNOLOGY IN ACTION

4.1. A Subsection Sample

From the corresponding theory elements described in Section 3, we derive the affordances:

A. Relational Enterprises -> The notion that an information system to support relationality must exhibit evolving structures and behaviours, is an important one. Any relational system must be in a constant state of re-determination, capturing and inscribing these developmental changes in its structure and operation, not just in the content that it records and communicates. Relational learning is not merely the accumulation of information, it involves both the

purposeful creation and spontaneous emergence, acceptance and an incorporation of new relationships and in the pragma, praxa and doctrines of the relational enterprise in which it is embedded. All this requires that principles of the community and rules of the game be explicitly defined, represented, shared and maintained; actors and actions be also identified and shared, as well as roles and responsibilities in management and in governance; so that intentionality and full accountability be available always.

B. Epistemic Registers -> The introduction of the concept of the vertical stack of epistemic registers is necessary to access and operate hermeneutic distinctions in social affairs. A necessary distinction to elaborate and interpret cybernetic meta level concepts, like intention, accountability, and the cultural colouring of social affairs. In particular, it enables the link of the conversational epistemic register to the underlying informatics one, and it exposes the causality of why relationality demands a shift in information systems paradigm.
C. Sense making of Human Enterprise -> Change paradigm of information on institutional platforms: from Data Processing and Distribution (DPD), to Information on Communications (IC) , for including and tracking besides actors actions and objectives, also principles, roles, responsibilities: meta issues with respect to functional, first order data, allowing the address of intention and accountability. For this we need separating functioning from questioning, executing from learning, acting a simple act from performing a role with responsibility, performance from intention, content from provenance, ability from accountability.
D. Lived Experience -> The social complexity of relational life has unavoidable consequences: here a very generic simple emergent seed (the primordial system) grows and is nurtured as relationality evolves from use, developing TGP a piece at a time (while commercial platforms need be completed to work); the infrastructural architecture here must evolve through experience by user involvement; conversations in the community service infrastructure take off from null content archetypes as events pointing to point of origin and to point of destination, filled with content by users as the social interaction proceeds, keeping track of provenance of each content, in a process of social interaction open to experiential learning and reconsideration.
E. Authentic Communicative Actions -> An interface set-up expose provenance and content in each turn of conversation, facilitating the performance of conversations on conversations, by allowing direct choice of the object conversation on a basic ground floor, and the deposition of the new conversation act on a dedicated upper floor, thus allowing to keep track in a transparent way – especially in the distribution of roles and responsibilities both for management and governance, what made sense to all, what was agreed, if it still made sense, and how and by whom it was agreed that it be changed
F. Valuaction -> All the conversational activities of, and in, the relational enterprise are valuactions which is equivalent to the normative assertion that all roles should participate, in some way, in governance, and the relational enterprise is necessarily co-creative and co-productive. Realising this assumption involves conversations between sets of participants which produces a two kinds of discourse: Policy and Goals. We refer to the first of these discourses as “Governance” and the second as “Managed Operation”.
G. Contextual Integrity -> Access control, and other tactics of relating content to provenance and to intended recipients, helping to reach integral respect of ownership, privacy, and legitimate participation both in management and in governance
H. Conversational Analysis -> Define an appropriate conversation model (publications, sessions, etc.) aiming at the concrete realisation of the desired affordances of communication technology in action of points C, D, E.

5. PUTTING THEORY IN CONTEXT IN MARTIN’S HOLISTIC APPROACH

We take Mike Martin’s design work on TGP from three recent publications:

P1: a book chapter entitled: *Moving towards Relational Services – the role of digital service environments and platforms?* [9]
P2: two related book chapters on: *How and why relationality demands a shift in information systems paradigm.* [13, 14]
P3: an article on: *The Trustworthy, Governable Platform: supporting accountability and governability in complex, multi-party enterprise.* [6]

The work described in these publications has two foundational antecedents by the same author:

- in 2009, a paper on the social informatics intervention, theory, method, and practice [16], in which the cybernetic character of purposeful human action is examined in detail
- in 2020, two papers introducing a new socio-technical approach to information systems [9. 10], in which the development and merging of the communication and computer industry is interpreted along the last forty years or so, explaining a) the surge and establishment, in the present installed base of institutional platforms, of the Data Processing and Distribution (DPD) information paradigm, limited to treating cybernetic first order, functional data; and b) the introduction of the concept of epistemic registers, necessary to access and operate hermeneutic distinctions in social affairs.

We shall first present in A. an overview of the work, taken from P2; we then summarise in B Martin's entire analytical construction, freely taken from this set of publications; in C. we compare the objective of P1, P2, P3; in D. we go deeply into P2.

A. An overview of Martin's approach to the design of TGP for relational enterprises, from P2

In this chapter the purposefulness and goal directed nature of relationality is analysed, from a cybernetic perspective, using Krippendorff's concepts of systems determination [Krippendorff, 2009]. We argue that current information system practice, based on the data processing and distribution paradigm, which is limited to observational and synthetic determination, that is to say, definition in terms of functions and capacities that are the consequence of designed structures, is expressively inadequate to address the requirements of relationality. Hermeneutic interpretation and the constitutive determination of lived experience are essential aspects of any complete conceptualisation of relationality.On this basis, we develop a model of relational enterprise as a map of conversational processes linked by information generation and interpretation processes.

The *key arguments* of the Chapter are clear. They are recalled here, with the main results.

The key character of relationality and of relational public service is direct human experience, requiring both human knowledgeable participation, and evaluation.

Exploring the epistemology of systems as black boxes, systems that are based on human participation are defined *constitutively determinable* by cybernetics scholar Krippendorff [11], who also indicates that these are by necessity second order cybernetic systems. In fact, authentic, communicative human actions are committed to mutual understanding (Habermas). The conversations taking place in the information infrastructures supporting evolving relationality, involve communicative actions. This implies that a) conversations on conversations will be part of these conversations, and b) they will regard, in addition to other things, second cybernetic order governance of all relational aspects.

Krippendorff's argument is here seen to be crucial in linking the socio cultural science of relationality of public service to the logics of informatics and platform engineering of support infra-

structures; offering, via the analysis of purposeful human enterprise, the pathway to a theory of relational enterprise, connected to a theory of conversational information communication.

This linkage is skilfully exploited by Mike Martin for constructing a logical architecture in his Chapter on the conceptual analysis of relational public service and supporting infrastructure.

P2 illustrated how this linkage is not just a philosophical consideration, but it constitutes the compass to explore and analyse systems and processes we have observed and experienced over the last few decades, that have been involved in the policy formation, procurement, delivery, management, and evaluation public services and support systems in the health, care and welfare sectors. As well as to explore and design new, more adequate systems and processes.

Relevant results:

1. Relational governance and human learning are (re)-istitutionalised in public service and infrastructure
2. Causality is exposed of why relationality demands a shift in information systems paradigm
3. Conversations must comprehend conversations on conversations, i. e., second cybernetic order governance
4. Relational socio-technical systems live in co-evolution with their socio-cultural context: they cannot be pre-designed, must emerge and grow from the appropriation of a simple primordial system; emergence with the operation and governance of a community of interest and practice
5. The role of the IT industry changes: from design and development of commercial infrastructure, to supporting user communities in structuring their own infrastructure.

B. Relevance of Martin's entire analytical construction, from P1, P2, and P3

Martin's worldview on information platforms and their functionalities, in information and communication service and infrastructure, *is generated by participative engagement and evaluation in the emergence of the globalised automation, media, information, and communications technology environment in Europe, over the last four decades.* [19]

The first of two basic tools applied in his socio-technical analysis, is the second order cybernetic of purposeful human activity, a concept they elaborated in a 2009 published work on social informatics intervention [16]. In his words, selected from the TGP paper [6], *Cybernetics focusses on the relationships between information and real-world processes. In processes involving humans, informational aspects cannot be restricted to first order. The socio-technical demands an overarching, second cybernetic order governance: guiding principles and values, with boundary constraints, in the context of the commitment to a mission. For multiple peer parties engaged in complex, risky, unpredictable emergent relationships, accountability is an overriding principle of governance. Harm or benefit require, and warrant, inquiry into responsibility. Accountability is right to ask and duty to respond.Current information platform functionalities are not sufficient to reliably underpin accountability in multi-party, safety critical, socio-technical contexts.Commercial platforms have deleterious social, economic and political side effects, in the pursuit to ensnare, surveil and exploit their users and enrich their proprietors.*

A new platform paradigm is required. What we need *is creating, deploying and governing domains, within and upon, existing technologies and infrastructures, as clearly visible and maintainable safe zones, operating under explicit rules and procedures which can be re-negotiated and evolve in use through governance.* This *ensures that the relationship between the published*

policies of each hub are the ones that are actually applied, and that policy can be renegotiated and republished, within the system, rather than as management and technical activities distinct from its operation and use.

To this end, to design the new service and infrastructure architectures, he thoroughly applies his second tool of socio-technical analysis, to structure in an incredibly concise effective way, in its real substance, the architectural discourse of public service and related information technology: the concept of *epistemic registers*, illustrated in a published work on Inter-organisational systems [10].

Socio-Cultural View	Individual and Collective Identities Values and Principles	New meanings and values come into being
Conversational View	Roles, relationships and responsibilities	Meanings include intentions
Informatics View	Codes, terms and objects	Meanings are pre- defined and concrete
Engineering View	Bits – terra-bytes, channels and bandwidth	Measurements but no meanings

Fig. 1.Epistemic Registers.

It serves to examine the stack of epistemic registers of the architectural discourse of socio- technical systems. With this armamentary, he tackles in the correct way the transition from transactional to relational service and its infrastructure, conceptualising the relational: *a relational service includes the interpretation of purposes, intentions and experiences.*

Thus, he goes on to illustrate *how and why relationality demands a shift in information systems paradigm*. He *explores the possibility and characteristics of a Trustworthy Governable Platform (TGP) which is based on the structured communications paradigm, and which addresses the need for the dependable maintenance of accountability among roles within peer organisations while still supporting the dynamic emergence and evolution of these roles and relationships.*

His worldview on the evaluation of information platforms and their functionalities, based on first principles, is absolutely original: it constitutes the mole on which Mike Martin stands, a vantage point in the academic and industrial arena of modern digital technology.

C. Comparing the significance of P1, P2 and P3

P1: *Moving towards Relational Services – the role of digital service environments and platforms?*
P2: *How and why relationality demands a shift in information systems paradigm.*
P3: *The Trustworthy, Governable Platform: supporting accountability and governability in complex, multi-party enterprise.*

P1, Chapter 11 of the CoSIE book [9]: *Moving towards Relational Services – the role of digital service environments and platforms?* written together with Rob Wilson and David Jamieson, has focus on central aspects of relational service, before *communicational and information of service platforms,* maintaining that *socio-technical involves both empirical observation and interpretation,* and that *co-creation is necessary because of* complexity of service contexts.

Core of the chapter is a theory of service: conceptualising a *relational service includes the interpretation of purposes, intentions and experiences. The intended experience is part of the definition: a different epistemic stance: idealist-constructivist rather than empiricist. A relational service provider accepts responsibility for both its operation and its outcomes. 'Conversation': a definition of rights responsibilities between roles in delivery and reception of a service. A definition of the stages of a service lifecycle follow, from service creation to delivery.*

This theory of service permits to analyse requirements. *'Relational', ongoing socio technical conversations, involve learning at the system level, resulting in new conceptual frames and new shared language.* They require *a sophisticated approach to negotiation (and renegotiation) of shared visions and intentions, closing the loop between design and implementation and replacing it with a system of ongoing collaborative evolution and governance.* In a Digital Government maturity model, *individual transactional service components are intermediated in context of relational services, supported by development and delivery platforms that render them governable: publications, identity, brokerage, catalogues, provenance, conversations: safety / privacy / governance.*

The chapter concludes by *establishing the core requirements of service development and delivery platforms for the infrastructural support of service environments: in the supporting infrastructure,* the primary enterprise core *distinction between internal/ external,* must be replaced by *a horizontal boundary* between *upper/lower*. This is because *the core issue for a relational infrastructure to support relational services is governability.*

P2, tackles in a correct way the transition from transactional to relational of service and its infrastructure, by illustrating *how and why relationality demands a shift in information systems paradigm.* The other two articles considered have a somewhat different albeit connected theme and scope. We shall try to illustrate the difference.

P3, the TGP paper, recalls how *the creation of Universal Infrastructure - rather than the creation maintenance of social (and commercial) spaces -, dominated the original conception of the Internet. The outcome has been the exploitation of the "above versus below" infrastructural demarcation to parasitise and monetise social interaction and to monopolise commercial channels. A side effect has been to place the creation and maintenance of shared, private, governable information and communications spaces beyond the reach of syndicates of peer entities and communities and the sacrifice of privacy has become the cost of network participation.*

Where we are: *Commercial platforms ensnare, surveil and exploit users and enrich proprietors. We need a new platform governing domains as maintainable safe zones, operating under explicit rules and procedures which can be re-negotiated and evolve in use through governance. Where policy can be renegotiated and republished, within the system, rather than as management and technical activities distinct from its operation and use. Functionality and affordances of social media are needed, provided however by platforms that maintain Contextual Integrity. Two foundational concepts: "Publications" accessed and generated in sessions defined in terms of the role, relationships and context of a user, Which consists of two parts, content and provenance, to establish and maintain the link between each set of information produced and exchanged in the system, and the agreed purposes and intentions associated with those processes. The system definition must be explicit not only about what they do but why.*

End point*: Helen Nissenbaum's approach* [8] *to privacy and information governance requires a TGP that delivers "Contextual Integrity", an IS property which maintains privacy.* In substance, the analysis of the concept of Contextual Integrity indicates the basic properties of the desired solution: *The communications paradigm includes an overlayed, conversational projection which*

defines roles and relationships in intentional terms, as sequences of purposeful acts, together with their associated rights and responsibilities. TGP renders Nissenbaum's concept of Contextual Integrity as systemic. The "owners" of publications systems remain the exclusive data controllers of the content, have authentication responsibilities for all the sessions. Generating the appropriate TGP framework has required three important moves:

- *Firstly, the (re)instatement of the IC paradigm and the concepts of the session and presentation layers which together define the structure and provenance of publications in a service oriented approach.*
- *Secondly, it has required the introduction of a level of self-specification in which publications and sessions are instances of architypes which are, themselves publications.*
- *Finally, we have defined governance as the ability to answer the question "Is this what we expected and intended?" on the basis of dependable evidence, and to make the consequences actionable within the system through the negotiation, configuration and dynamic deployment of new communication architypes and templates, and the orchestration of new work-flows around them.*

Comparison

P1 is dominated by the analysis of the concept of relational service. It points out to the need of an infrastructure that treats correctly the horizontal, above-below cut, for governability by its user community. This is a requirement on the TGP platform. The audience, for short, are professionals of the service industry.

P2 instead is dominated by Martin and Wilson's epistemic registers, by Krippendorff constitutive determinability of social phenomena, by Habermas definition of communicative human actions. These are the theoretical links between the requirement of P1, and the execution of P3:

P1 motivates the model structure, involving conversations, of the techno socio cultural system realising relational public service, and of the architectural framework, communication service oriented, of the IT infrastructure required to support it. The audience is mixed between service industry and Information Systems community.

P 3 is dominated by Helen Nissenbaum's approach to privacy and information governance, realisable in a TGP that delivers "Contextual Integrity", an IS property which maintains privacy. This is the way the TGP platform must operate. The audience, for short, is the Information Systems community.

D. Exploring the chapter's content of P2, exposing reasoning and extracting significance

Based on the notion of epistemic registers [10], the chapter motivates the model structure, involving conversations, of the techno socio cultural system realising relational public service as concerned with care and wellbeing, and of the architectural framework, communication service oriented, of the IT infrastructure required to support it.

The argumentation starts on sociality, the third register: considerations of relationality characterise relational service (and its technical infrastructure): relations evolve, involve learning; relations are experiential, involving interpretation and judgement. Relational service and its infrastructure therefore evolve, and involve ongoing interpretation. Here relational governance and human learning are (re)-institutionalised in public service and infrastructure: a first important result.

The next two foundational steps are performed with eminent theoretical inputs:

1) From Krippendorff analysis – a cybernetics theorist - of the determinability of generic systems, relationality, as a socio-cultural phenomenon, is characterised as *constitutively determinable;* meaning that:

    a. users must take part in its creation and evolution;
    b. being experiential – not just observable data -, it must include second-order cybernetics.

In step 1, from Krippendorff's distinction comes a disciplinary cross-over: the plan changes from social relationality to informational / behavioural aspects of purposeful, human activity, shifting epistemic register from the conversational to informatics: a second important result, exposing the causality, in why relationality demands a shift in information systems paradigm.

2) From Habermas definitions, authentic, communicative human actions are committed to mutual understanding.

From step 2, we deduce that conversations must comprehend conversations on conversations, i. e., second cybernetic order governance: a third important result.

And then a link to the forth, socio-cultural epistemic register: Relational socio-technical systems live in co-evolution with their socio-cultural context. And a caveat: they cannot be pre-designed, must emerge and grow from the appropriation of a simple primordial system: emergence with the operation and governance of a community of interest and practice: a fourth important result. And, a fifth important result: the role of the IT industry changes: from software design and development of commercial infrastructure, to supporting user communities in learning and structuring their own infrastructure.

The rest is a downhill construction showing how relationality will cause a shift in information systems paradigm.

Conversations of care in a conversational enterprise: carer conversations with clients, each other, themselves. Management conversations about capacities, capabilities, budgets and accounts. Conversations about the conversations of care are conversations of Governance.

A relational service must be considered in the context of a wider service environment; for instance, at times there is an urgent need for the transactional components of complex multi-agency care plans to be intermediated and brokered relationally.

Then comes a conceptual systematisation which represents the logically interrelated conversational processes of a relational enterprise together with their informational drivers and products. All conversational activities in the relational enterprise are *valuactions*[Halprin]. All roles should participate in governance, the relational enterprise is necessarily co-creative and co-productive. An example is detailed.

A conversation theory characterises governance and missioning conversations; it is situated, involves initiative and discretion, and subsequent interpretation. It entails: a declarative part that specifies the distribution of significance, mutuality, resource, initiatives, a protocol that defines the norms and expectations of initiation, turn taking and closures of conversational encounters, and identifies a set of "instruments" as a "datagram".

Valuaction is applied to the dynamics between governance and missioning conversations; it is situated, involves initiative and discretion, and subsequent interpretation.

Representing conversational models: a notational framework is indicated, with iconography, the use of little figures to represent roles; an ostensive semantic applies, meaning you can point at what you are referring to; boundary objects: conversational webs and graphs, around which the discussions, negotiations and valuactions of relational enterprise can be conducted and recorded effectively.

The Trustworthy Governable Platform ensues: publications, sessions including administration, conversations: in conversational interactions, role holders have rights and responsibilities in relation to shared norms, expectations and objectives, that can capture the purposes and contexts associated; commitments to engage in them is the outcomes of conversations, and these conversations must be ongoing, representing the inscription of evolving values and principles and learnings within relational enterprise.

Extracting significance

An outstanding conceptual construction showing how relationality causes a shift in information systems paradigm, where it is heading to. Thus fulfilling the scope assigned to this Chapter in the Book.

Here are, again, the fundamental results:

1. Relational governance and human learning are (re)-istitutionalised in public service and infrastructure
2. The link of the conversational epistemic register to the underlying informatics one exposes the causally of why relationality demands a shift in information systems paradigm
3. The authentic character of communicative human actions, which are committed to mutual understanding, implies that conversations must comprehend conversations on conversations, i. e., second cybernetic order governance
4. Relational socio-technical systems live in co-evolution with their socio-cultural context: they cannot be pre-designed, must emerge and grow from the appropriation of a simple primordial system; emergence with the operation and governance of a community of interest and practice
5. The role of the IT industry changes: from software design and development of commercial infrastructure, to supporting user communities in learning and structuring their own infrastructure.

A last word on Design for End User design in Use. In 2002 one of us wrote a paper entitled: *Use of use cases in design for end user design in use*. [20] At the time, design meant essentially software design and development. It was 6 years before Apple introduced Apps and Icons in I-phones, which proved the use of that concept.

The concept of *design for end user design in use* is now revived and applied here, to the innovative technical job, for the IT industry to do: develop Lego type blocks for users/members of relational service communities, to employ in configuring and developing further by themselves their infrastructure, under maieutic guidance. These blocks can be treated as transactional routines, as the Author points out, so that they can in fact be designed by using *use case* language.

6. DISCUSSING NOVELTY AND SIGNIFICANCE OF MARTIN'S TGP

Because in this paper we have been adopting the design oriented stance, we observe that in the TGP, the conventional domain of design in the Information System is transferred entirely to the

user community and the "technical" design domain is rendered entirely infrastructural, in the form of support services for user defined structured conversations. I.e. the shift from the DPD to the IC systems paradigm. A revolution of clear origin, and of far reaching consequences.

A. Starting with pragmatic considerations

Martin's papers illustrated above are primarily aimed at professionals who have been involved in "architecting" large scale, multi-agency socio-technical systems. Their work is situated at the interface between management, commerce, public sector commissioning and legal/statutory matters in the context of data and communications platforms and environments. This is a context which has been prone to outright failure and under performance for many years. The Author attributes this to the mismatch between the real world, emergent complexities that are being addressed and the architectural paradigms which are built into current technical, legal and commercial practices.

The papers presents a practical path toward a better way of deploying and governing the platforms that support the delivery of relational and transactional services, but that path represents a profound shift in thinking and practice. Strangely, in the face of technological "progress", this shift represents, in some respects, a reversion and re-establishment of principles that were elided and lost in the convergence and coalescence of the telecommunications, mass communications and information systems sectors business and technical architectures into the Global information infrastructure we have today [16].

The readers will gain a deep understanding of the reasons for the failures of the procurements of large scale digital infrastructures to support relational and transactional service environments in mixed economies. They will also explore an augmented architectural paradigm which allows the intentionalities and purposes of the system to be explicitly inscribed and maintained within the system. In this new approach to what the author calls the "Trustworthy Governable Platform" (TGP), this inscription and maintenance of intentionalities and purposes, i.e. policy, is a process that is embedded in the ongoing use and participation in the system rather than something that is fixed is a precondition and input to a specification and design phase.

Current challenges are the result of the simplification of Information and Communications architectures and their subsequent parasitic and exploitative appropriation by venture capital. This situation cannot be remedied universally but, the new approach presented in Martin's papers can create and maintain "islands and archipelagos" of trust and governability, in which consortia and communities of interest and purpose can coordinate with safety and mutually maintained accountability. While the problem these papers address is a current and acute one, if the approach it introduces and the set of open source resources that they describe are adopted, it will be seen as the instigation of a change of policy, business and systems paradigm.

There are many systems practitioners who wonder "why does it all go so horribly wrong so regularly?" The usual approach to answering this question is the try to identify mistakes or to assign blame; no one seems to question the fundamental nature of our information and communications systems paradigms. Public and community Sector procurement and deployment professional bodies are the target. It should be noticed that the approach presented is deeply antithetical to the conventional supplier side business models and relationships. It is designed to disable the supplier dependency and the need for "big bang" projects. A TGP hub is, typically, planted as a seed and grows incrementally and emergently.

In conclusion, nothing exists of this sort until now. It fills an important gap, in what has been called the new or Neo-Socio-Technical [10]. The new Information Communications (IC) para-

digm is required in today's complex multi-agency contexts, where dynamic relational aspects like changing intentions and negotiations about ongoing interactions, are what counts. Communicating higher cybernetic order information (roles and relationships, responsibilities and intentions) while exchanging traditional first order, functional data on business processes.

In complex situations, like social care and health services, the Author's field of experimentation, considering intention and responsibility is essential. The half a century old Data Processing and Distribution (DPD) paradigm, based on first order, functional data, falls short. No account of who knew what when, who intended what when. The research process bringing to the new ideas has lasted over 30 years, with local advancements created in the frame of specific European research projects [16].

B. Following up with disciplinary considerations

The approach creates from first principles a new paradigm for communicating on ITC platforms: the conversational paradigm. Offering practitioners with a roadmap towards application, and researchers with the rational to understand why is it so. It treats a crucial theme, with vast applicability. It provides practitioners the way out of present distress, the compass they need to realise why their things don't work these days: *epistemic registers*, and the various projections of the socio technical on them. And indications on how to make them work. How does it achieve this?

The concepts of relational enterprise and relational service, discussed in the sections above, imply a fundamental shift in information systems paradigm from the data processing and distribution (DPD) approach to that of information communications (IC) [10]. This is a consequence of the essentially conversational nature of relationality itself. Further, relationality implies second orderliness [11]: that is to say, there must be conversations about conversations in pursuit and maintenance of communicative action and shared purpose [12].

It has also been observed that all the conversational activities in the relational enterprise are valuactions: they inalienably combine value adding, value extraction and evaluation, in relation to the range of human and social capitals. [17]. If relationality is to be supported by appropriate technical infrastructure, then participation in the ongoing, second cybernetic order conversations on conversations must be open to the participation of any and, indeed all, first order roles in a co-creative and co-productive approach. The actual scope and inclusion in these governance conversations is, however, entirely a matter of policy in any particular instance of a Trustworthy Governable Platform. As we shall see in Martin's papers, the technical design and affordances of a Trustworthy, Governable Platforming *environment* must be strictly policy neutral. It is a requirement on such a platform*ing* environment that it provides the tools and language to model, and explicitly inscribe, *any* policy or moral ordering . This is in stark contrast to the "hard wiring" of policy and power structures in requirements modelling and design phases which are distinct and strictly demarcated from operational use and management.

In this work, the notion of conversation is analysed, a conversation theory developed and a conversation modelling language and notation presented. The objective of this work is to create an architectural framework for structured communication service definition and to identify the high level requirements on and affordances of any technical service platform which claims to be able to support and sustain relational enterprise and services.

C. Identifying key conceptual points of the design

In DPD, the world is modelled in diadic terms: entities with attributes having relationships with each other. In IC, the world is a mesh of conversations between roles and conversations are the locus for the generation and interpretation of instruments.
In engineering terms, instruments map onto publications. Each publication has a set of conversational acts in its history: generation, interpretation, archive. It also has a set of corresponding (engineering) actions: write, read, delete…

Act/actions are preformed by role holders in sessions. The session defines who the possible future roles that will interact with the publications.

The formal syntax of the graph model of conversational behaviours is a consequence of the (triadic) Role-Activity-Resource ontology and its encapsulations of Agent-Institution-Object.

This provides the framing for the first and second cybernetic order analytics of the TGP. In particular the latter involves the tracing of the moral ordering and power dynamics of a socio-technical system as well as responsibilities and accountabilities.
It also defines the structure of "blue stuff",and "pink stuff"[1], and the congruencies that should be exhibited between them: do we take *this* mean *that* round here this month?

D. Considerations on the novelty, by concepts

The concepts of relationality and its correlation to/mapping onto a triadic concept of conversation (1st and 2nd order) and thus the need for conversation theory and modelling. [9, 13, 14]

The notion of the instruments (of conversations) mapping to publication content and provenance via session and the fact that they are instances of architype publications (corresponding to classes and instances at the lower engineering/object level).

The rendering of the concept of contextual integrity as a systemic property of a TGP and extending this to accountabilities of action and purpose.

The adaptation of the concept of projections (this time based on epistemic registers) as a structuring principle for the socio-technical architectural discourse; the use of Floridi's method of abstraction [21] to organise the Pink (intentional) and Blue (extensional) projections and the conversations of commitment, in governance, which establish that we will take *this* pink bit to mean *that* blue bit. (Ostensive semantic in relation to a boundary object set of models - a la Living Lab).

Considering deeply and critically the significance of the novelty

P2 talks both about conversational approach to modelling and about relational platforms; butthese two things are taken together, and can't be separated, because:

[1]I.e., respectively, Blue: the concrete extensional entities and events which we detect in the operation of the system and which will be captured and appear in the systems logs; and Pink: the concepts that appear in our definitions and specifications of the norms and intentions of the system at the conversational level; as defined e. g. in the accountability paper [7]. For example, the term "Doctor" in the blue representation is an individual person with certain accredited capabilities performing certain actions. In the pink representation, clinician is a role defined in terms of a set of responsibilities to, and relationships with, other roles. The blue stuff is generated and maintained in the conversational projections of the system.

Point 1: Mike Martin's TGP is paradoxically a misnomer: there is no Platform, Mike provides no Platform. He just defines a modelling environment and indicates how instances of TGP should emerge from the life of the community.

Point 2. Mike's modelling does not model social structure, i.e., social relations and/or social exchanges, directly. It models policies and norms and expectations and commitments in social exchanges and social relations.

The modelling language and framework ensures that it is the users in their governance of the system who model and negotiate their conversations and relationship, and the system then provides the support services that are being committed.

7. CONCLUSION

Mike Martin's design work [6] is the matter of an intentional path genuinely aware of the socio-technical stance, opposite to technological determinism, declaratively aiming at the satisfaction of social user needs. Not only that work identifies the requirements of affordance in action for a satisfactory TGP design, but it also provides detailed and rich design solutions for it. While correctly identifying the essential list of theory elements of the problem, that work provides a holistic view, granting internal coherence and completeness.

The point of arrival of Martin's work has been interpreted in terms of detailed social usage and meaning in action of the affordances of the Trustworthy Governable Platform as an information and communication technology, satisfying user needs in relational enterprises: as in complex public services, or inter-organisational settings, two interesting context for communication and cybernetics studies.

The result of the socially aware design approach is seen to be rewarding: while allowing for accountability and contextual integrity, by taking into account the communicative affordances of technologies, the application of design-oriented sociology shows how the ensuing definition of structured communications adopted in TGP also frees user communities from the impingements of external policies; as currently performed unfortunately by providers and vendors of commercial platforms.

And now our significant, comprehensive final remark: as indicated at the beginning of the discussion Section 6, because in this paper we have been adopting the design oriented stance, we need underline that in the TGP, the conventional domain of design in the Information System is transferred entirely to the user community and the "technical" design domain is rendered entirely infrastructural, in the form of support services for user defined structured conversations. I.e. the shift from the DPD to the IC systems paradigm. This shows that design-oriented sociology, and its analysis of affordances of technology in action, have two consequences of rank: each TGP community is ultimately responsible of adopting, in social interactions, the degree of emancipation *latu sensu* that it desires, and that it can afford; and, the main known sources for distortion of the will of users, traditional motive for advocating critical system thinking, with TGP have dissolved.,

ACKNOWLEDGMENTS

The present author had access to much unpublished as well as published material of, and has enjoyed in numerous discussions with, Professor Mike Martin. For this he wishes to express his deep gratitude.

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