Reflecting on Scientific Rigour in Socio-Technical Research, spotlighting Husserl's Phenomenology and Amedeo Giorgi's Descriptive Phenomenological Method

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Abstract

Data production and data analysis play a pivotal role in establishing the prerequisites for scientific rigour. Socio-Technical (ST) research, being a human science, places paramount importance on data as "facts-in-the-conscience." Husserl's phenomenology presents itself as the fitting philosophical foundation for addressing these "facts-in-the-conscience" across all human sciences.

This line of reasoning gives rise to thought-provoking inquiries. How do we appropriately handle these facts-in-the-conscience? How can we effectively harness Husserl's phenomenology? For instance, what fundamental approach did Claudio Ciborra employ in his remarkable, extensive, and innovative work? Why did he revert to Martin Heidegger's ideas? Should we emulate Amedeo Giorgi in adopting his Husserlian Descriptive Phenomenological Method (DPM), a method tailored to establish a scientific foundation for psychological research? Could DPM serve as the pathway to validate "facts-in-the-conscience" as legitimate data for constructing Evidence-Based Proofs?

We present illustrative examples that offer insights into "eidetic"[1] responses to these inquiries.

Heidegger's hint: "How do we teach each other speak objectively about these subjective things?"

Keywords

Descriptive phenomenology, socio technical research, qualitative research, epistemology, scientific rigour, methodology.

1. Introduction

The reflections presented herein, drawn from own research, after a wordy introduction are illuminated by Amedeo Giorgi's insight—extensively quoted from the original text. The impetus behind these reflections lies in the prospect of applying to Socio-Technical (ST) research, Giorgi's expansion of Husserl's Descriptive Phenomenological Philosophy. Giorgi's adaptation, known as the Descriptive Phenomenological Method (DPM), was conceived to instill scientific rigour into psychological research and is applicable across the spectrum of human sciences (1-6).

To rethink and reflect is important, say Peter Bednar and Christine Welch (7):
"We … believe that it is both necessary and desirable to revisit and discuss again topics of significance. Only through reflection upon our own past work and that of others can we build productive learning spirals. Only in this way can we establish and extend a reflexive relationship to future practice."

Besides its practical use, rethinking and reflecting have a profound liaison to subjectivity in science. We shall see how in the Subsections to come below. Note: a watermark of concepts pairs will accompany our intellectual journey: autopoiesis and cognition, subjectivity and intention, science and reflection, ethnomethodology and professional attitude-community of practice.

1.1. Subjective Experience and Reflection, in Human Sciences

The distinction between subject and object is blurred in contemporary philosophies - so that we can't take refuge in objectivity - since an historical study on vision in frogs was undertaken. A pivotal mile stone in our contemporary linking of cognition to biology. What leads to the potential divergence between facts-in-the-conscience and facts in the real world? Consider an experimental example of the fact that our senses occasionally lead us astray: Maturana and Varela's (8) experiment on human color perception (described in 9, 10). An optical nerve's

[1] Eidetic, in Psychology: denoting mental images having unusual vividness and detail, as if actually visible.

The 9th International Conference on Socio-Technical Perspectives in IS (STPIS'23) 27.–28.10.2023, Portsmouth, UK
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negative feedback loop instantly reduces sensitivity to a specific color if it is excessively present in the visual field. When there's an excess of red, white is distorted to green, even in the absence of the color green in the image. This capacity for evolutionary adaptation – fabricating negative feedback mechanisms that modify our senses for survival – is termed autopoiesis, a pivotal concept today, identified as the defining characteristic of all living organisms. Negative feedback mechanisms in humans blur the boundary between subject and perceived object.

The experiment of Maturana and Varela rings a bell: human autopoiesis mechanisms extend beyond sensory experiences into the conceptual, non-sensory realm, with effects often termed prejudices, or hallucinations (8, 9). Prejudices pose challenges to human sciences in particular, as facts-in-the-conscience central to human sciences – perceptions, intuitions, emotions – are not directly accessible to objective verification. In absence of a "concept spectroscope", rectifying perceptual biases necessitates cultivating awareness through experience and diligence, as in professional training within a community of practice.

Further still, what are the evidences of interference of consciousness, and subjectivity in general, with the scientific discourse? Let's go back to the very beginning of phenomenology, by recalling Schutz, as done, again, by Bednar and Welch (11):

"When elaborating upon 'meaningfulness' Schutz … questions how it is possible for any mutual understanding or communication between people to take place … He reflects that such possibilities can only be approached via 'sedimentation' of pre-interpreted experiences built up through conscious life. Any justifiable methods for interpreting social interrelationship must then be based on careful description of underlying assumptions and their implications. He goes on to suggest that the methods of the social sciences cannot be regarded as adequate to this task." Note that, at Schutz times, human sciences performed with the objectivist epistemology of natural sciences. Bednar and Welsh then go on: "They require a philosophical analysis. And phenomenology ... has not only opened up an avenue of approach for such an analysis but has in addition started the analysis itself. … This concept of a 'sedimentation' of pre-interpreted, lived experience comes about, for Alfred Schutz, through reflection. … Thus, meaningfulness can only be attributed in retrospect. … "

The authors then go on to link these first thoughts on phenomenology to the thoughts on information systems, formed in a socio-technical perspective:

"In considering Schutz's view, the authors are reminded of the work of Börje Langefors, in the mid Sixties, with the Infological Equation. Reflecting on the nature of information systems, Langefors suggests that those people who are to interpret data in order to inform themselves must be viewed as part of the system. … Meaning (information or knowledge) is thus created by each individual. Pre-knowledge … is considered to be created through the entire lived experience of the individual concerned (cf Schutz's concept of 'sedimentation'). .. He observes that communication may be seen to approach success most closely where individuals interpreting the same data belong to a group, definable for example by …common professional interest, e.g. standardized accounting data among accountants."

Subjectivity, facts-in-the-conscience, reflection, professional attitude, communities of practice.

We recall Amedeo Giorgi's analysis of the phenomenological enquiry into subjective acts, confronted to the objectivist enquiry of normal scientific analyses (5): "The ultimate outcome of phenomenological analyses are eidetic expressions concerning the meaning of experiential events. What phenomenology adds to normal scientific analyses are the probing into subjective acts that are the correlates of worldly presentations." The term "correlates of worldly presentations" refers to "the inner experiences that correspond to, or are associated with, the external events or phenomena that we encounter in the world. Phenomenology recognises that our experiences are not just passive receptions of sensory inputs, but they involve active interpretation and consciousness. In mundane terms: the last statements emphasise how phenomenology contributes a unique perspective to scientific analyses, in contrast to more conventional scientific approaches. It focuses on understanding and exploring subjective experiences, particularly how individuals perceive and interpret the world around them. In "normal" scientific analyses, researchers often prioritise objective, measurable, and quantifiable data. They aim to uncover patterns, relationships, and general laws that apply to a broader population. This approach tends to overlook the intricate and rich nuances of individual experiences and the meaning people attribute to their encounters with the world". (5) It is all very clear.

1.2. Subjectivity in STR: Needs

Where then can, or do, we see the relevance of subjectivity of people experiences, in the Socio Technical Research (STR) story of the last 50 or so years? Perhaps in the relevance of serving the needs of the people, besides fostering technology use? We should look for the intention: Husserl says that the intention is the first character of conscious acts: " . the basic intention in which the experience from the outset aims at the object …". (12, p. 17) Kirsten Nygaard invented Object Oriented Programming for bringing the computer programming activity closer to humans, and in the '80s together with the Norwegian Trade Union founded project Utopia, trying to ensure that technology served to ameliorate the life of the workers in the workplace, not only to obey the interest of the capital. In the same time frame: a whole activity on Participatory Design has been introduced again in Scandinavia to serve the interests of computer users; similar was the intent of the coeval Language Action Perspective; and great was the reflection activity around this efforts: Finn Kensing and Terry Winograd even tried to integrate PD and LAP thrusts (13); of the same years the foundational book on "Computers and Thought" by Winograd and Flores (10) collected the philosophical bases for all of this, up to - last chapter - even an ontological project.

Bender and Welch in (14) read the STR story through the lens of the "critical" dimension: the intention to bring about beneficial change for the people: "Many scholars have attempted to define and encapsulate the essence of a "critical" dimension in research …. This dimension goes beyond interpretation of social phenomena, and seeks for understandings that could support efforts to bring about beneficial change … critical systemic thinking, exemplified by Gregory Bateson and Claudio Ciborra. Critically-informed research from a systemic perspective involves a desire to explore the unique and to question assumptions. … we can see different philosophical approaches to design reflected in various information systems (IS) development methodologies. As an example of an early interpretive, sociotechnical methodology for IS analysis, effective technical and human implementation of computer systems (ETHICS), supports a democratic process of bringing about change (Mumford). … Other methodologies, such as the soft systems methodology (SSM) (Checkland) … requires reflection on individual perspectives. … Multiview as a methodology combines several approaches into one (Wood-Harper et al.). … both sociotechnical and participatory design approaches … a paradigm shift is apparent in both managerial practice and academic discussion in recent years …. efforts to move away from a perspective of management as direction and control, towards one of management as leadership and dialogue… to focus on the way people understand their work as a fundamental key to performance. … a more interpretive approach where people are empowered to "understand" … … in work by Ciborra .. especially where he is questioning claims on human rational practice…. a mood pervading the Italian School of IS …e.g. social practice design involves efforts to support participating organizational actors to become change agents in their own environment. This provides a possibility for participants to create visions about problem solving and thus share in ownership/visions of solutions (Cattani and Jacucci …). … Resca and D'Atri … discuss how business operating in electronically-enabled markets can act as value makers, entering into relationships of co-production and co-design with individuals and other companies who are their suppliers and customers." Subjectivity, intention. Perfect for phenomenology: all the mentioned Italian groups were enjoying - among other affectionates - the illuminating unavoidable intellectual influence of the late much regretted Claudio Ciborra, great fan of Martin Heidegger's phenomenological thoughts and hermeneutic methods.

1.3. Scientific Rigour in STR: Needs

The matters of epistemology and scientific rigour within the realm of ST research - the boiling crucible described in the previous Subsection - have garnered explicit and particular attention from Francesca Ricciardi, who has penned over ten years ago a timely, remarkably original and profound paper:"Epistemology of Information Systems: Time for Something New? Positivism, Interpretivism, and Beyond". (15). She analyses the dichotomy between empiricist and interpretive approaches, exploring the ensuing tension with its "mirror prohibition" drawbacks, and the adverse impact these have on all endeavours to achieve seamless applications.

"I'm afraid it's not a chance that, during the last decades, academic research in IS (like, more generally, research in social sciences) has often been considered in crisis […], whilst most of the

major successes in this field (e.g., theWeb, or the systems for flight reservation) […] have occurred outside IS academic (or consulting) settings."

She presents a novel epistemological approach, as of yet not distinctly defined, but delving into pivotal dimensions of phenomenological philosophy. This approach is aptly suited for the undertaking in light of 20th-century research "… (that) complex, original contributions … has supplied about the question "how do we know?" Key dimensions she identifies are:
"1) Knowledge stems from the interaction between subject and object; 2) Knowledge is the very strategy of life itself; 3) Knowledge is not possible via rational thought only; 4) Is it not possible to achieve a complete and absolutely objective knowledge about an object; 5) A knowledge process can be more objective than another; 6) What makes knowledge valid? Our knowledge apparatus was selected … to guarantee survival; validation, then, has to do with survival, more than with "truth"; 7) What is the cognitive role of emotions? 8) How is knowledge basically structured … (in connection) with time? 9) What are the basic processes of knowledge development? They take place in the learning layer … ; 10)How can knowledge and reality be compared? …. The range of analogy is incredibly vast …"

These remarkably intriguing inquiries, pertaining to knowledge and existence, were of significant pertinence to Claudio Ciborra, and to "… Ciborra's concerns about the complex, unforeseeable and social nature of Information Systems." (16, 17). Furthermore, these inquiries concerned also Martin Heidegger in preceding times (18, see also 19, 20). We acknowledge Ricciardi's emphasis on life and the phenomenological facets of epistemology, as a pivotal element within STR (15,16).

As a central and concluding standpoint, Ricciardi asserts, surprisingly in light of the recently emphasised significance of epistemology, that "The peculiarity of scientific approach … is a matter of method, not a matter of epistemology." We are in complete agreement regarding the imperative focus on method. However, our perspective on this issue arises from a different angle, as Ricciardi's scrutiny delves into the intricacies of the subject: Layers of Learning (15). On the contrary, much like Giorgi, our approach reaches method directly through the lens of phenomenology. Amedeo Giorgi, having embraced Edmund Husserl's phenomenological philosophical framework for epistemology in his youth, has subsequently dedicated his entire research career to devising a method for scientific investigations in Psychology, rooted in phenomenology: Giorgi's DPM. His approach is adaptable to all human science disciplines.

1.4. Plan of the paper

The focus of the rest of the present conceptual paper revolves around Amedeo Giorgi's DPM. Parallel to Giorgi's perspective, we wholeheartedly concur with the pivotal significance attributed to the concept of method. Epistemology is philosophy, and here we align ourselves with Husserl's phenomenology. However, beyond philosophical deliberations, the attainment of scientific rigour necessitates the application of a method, in detail. So, Giorgi's DPM.

Our initial discussion delves into the fundamental criteria governing scientific rigour. Succinctly, we revisit the three foundational philosophies that underpin qualitative research methods: empiricism, hermeneutics, and phenomenology[3]. Within this context, we elucidate the distinct attributes, merits, and susceptibilities inherent in the methods they engender. Subsequently, we proceed to showcase the efficacy of these methods in producing robust research outcomes. We direct to specific instances of ST literature where these methods have been applied. In this endeavour, we comprehensively introduce Giorgi's insight and writings.

The purpose of this presentation is threefold: A) to reflect at ease on epistemology and method in ST research; B) to ensure that the ST Community is well-informed about Giorgi's DPM and to furnish an exemplar of our own ST research wherein the DPM assumes a critical role; and C) to formally propose DPM as a viable candidate for methodological employment in ST research. Purpose A) will be filled by Sections 2 to 6; purpose B) and C) by the rest of the paper.

2. Three qualitative approaches

Qualitative methods find extensive acceptance and widespread use in Socio-Technical (ST) research for Information Systems (IS). A multitude of methodologies have been introduced over

[3] Distinguishing more, and somewhat differently, than usual between hermeneutics, and phenomenology.

time. Yet, these methodologies are fundamentally underpinned by three distinct philosophies that provide the guiding principles for the scientific approaches stemming from them. To elucidate these philosophies we draw from Amedeo Giorgi's discourse on this subject (21).

2.1. Empiricism

Empiricism, the oldest philosophy of science dating back five centuries, originally designed to support scientific endeavours in the natural sciences, remains dominant across many fields of study. However, during the early 20th century, two other philosophies emerged: phenomenology and hermeneutics. At its core, empiricism asserts that all knowledge must stem from direct experience, with no reliance on a priori truths. Sensory modalities and tangible observations are given prominence. Subsequent verification, particularly by others, plays a crucial role in establishing robust knowledge, failing which information is regarded as provisional.

One of the earliest qualitative methods rooted in empiricism is Grounded Theory (GT), originating within Sociology. GT employs a comparative analysis approach wherein data examination yields hypotheses that form tentative theories, subsequently subject to ongoing data scrutiny. This methodology generates theory from empirical data, dispelling speculative conjecture. Simultaneous involvement in data collection and analysis, coupled with the construction of analytical codes and categories derived directly from data, ensures the development of stringent data-dependent codes and categories. Thus, all formulated concepts and properties must be firmly rooted in the data. Subsequent comparisons and distinctions within the data, viewed from disciplinary lenses such as sociology or psychology, facilitate the potential generation of initial theoretical hypotheses. A note of caution is echoed by Giorgi: "… GT emphasises conceptualisation and not description, abstracting from time, place, and persons in a way that description does not…. the researcher must transform the detected everyday meanings into disciplinary meanings, in order to build a theory. But this could be…" problematic, as the researcher, for example, "could interpret the everyday empirical meanings psychoanalytically, behaviourally, or cognitively and still be justified as a psychological interpreter" (21, p. 12).. Hence, GT is grounded in empirical foundations rather than being purely empirical. Nevertheless, in its practical application, it holds recognition as a scientific method.

2.2. Hermeneutics

To grasp the essence of "understanding," transcending mere methodical approaches for investigating human science phenomena, Heidegger (12) and Gadamer (22) established hermeneutics. At its core, hermeneutics asserts that comprehending human phen omena necessitates interpretation. Consequently, knowledge, at its best, embodies a plausible comprehension of a phenomenon, in contrast to the definitive, objective understanding typical of the natural sciences that permits no alternatives. The objective of such research lies in comprehending lived experiences through the meanings conveyed within them. However, texts are products of human creation, infused with perspectives and expressed through language marked by word ambiguity. Additionally, texts introduce context, giving rise to considerations of the author's intentions and the intended audience. The method guiding scientific research into human phenomena stands in stark contrast to that governing natural phenomena, governed by causes and effects. Hermeneutic thinkers contend that subjectivity exerts significant influence on human phenomena. Consequently, there is no independent starting point when dealing with human phenomena. To navigate this, hermeneutic researchers universally engage within the hermeneutic circle, a protocol suited to this situation. Hermeneutic reasoning is circular, though not a self-defeating cycle, as aptly expressed by Palmer (23):"The whole receives its definition from the parts, and reciprocally, the parts can only be understood in reference to the whole".

The hermeneutic method has two basic elements: "… 1) that the researcher produces the best interpreted meaning … not without other possible understandings … and 2) that the analysis requires the use of the hermeneutic circle with its fore-structure of understanding." (21, p. 14). It tends, albeit with a different route than empiricism, also to detect and clarify everyday lived meanings, as expressed by humans, and turn them into precise disciplinary meanings. Given the assumptions of the procedures, hermeneutic results are interpretations, theories with a degree of tentativeness.

2.3. Phenomenology

Husserl (24, 25) phenomenology employs a descriptive approach. For him, intuition is the basis for knowledge acquisition, not interpretation. Intuition is " … how phenomena present themselves to acts of consciousness. The modes of appearance of all objects are meant to be described …" (21, p. 20).. "… the phenomenological philosophical method … consists of three basic steps: experience or imagine a concrete phenomenon and carefully describe it; second systematically but freely vary dimensions of the phenomenon in order to ascertain its essential features; and, third describe the essence that has been discovered, once the method of free imaginative variations has been completed. This is also known as the idetic reduction of the concrete phenomenon. … " (21, p. 20).

Some adjustments are necessary to transition from philosophy to the realm of science and a human-focused scientific discipline (psychology, sociology, or other). This extension of Husserl's phenomenological philosophy and method to a human focused scientific discipline, is performed by Giorgi in Psychology with his PDM. "The ultimate outcome of phenomenological analyses are eidetic expressions concerning the meaning of experiential events. What phenomenology adds to normal scientific analyses are the probing into subjective acts that are the correlates of worldly presentations." And how does PDM really work? "Phenomenology … delves into the realm of subjective human consciousness. It seeks to understand the essence of human experiences, the way individuals make sense of their interactions with the world, and how they perceive and interpret phenomena. By examining the subjective acts (thoughts, feelings, perceptions, etc.) that accompany our encounters with the world, phenomenology adds depth and context to our understanding of reality." "(5). What are the specific results of the PDM method? "The result of the application of the scientific phenomenological method are eidetic descriptions that are general and based upon intuitions that are clarified with the help of the procedure of imaginative variations." (21, p. 22).. But the connection to the real world requires, in principle, further analysis. After solving this vulnerability, in the sequel we shall see how, descriptive phenomenology can lead to the establishment of scientific evidence.

3. The Empiricist approach, delved

The empiricist approach remains a traditional stance, with grounded theory still being its predominant methodology. In the space allocated to empiricism, we will demonstrate the broader value of employing a method in data analysis over relying solely on intuitive approaches. To illustrate this point, we reference a Participatory Design (PD) project that aimed to enhance the citizen services website of an Italian city administration (26, in Italian).

Our intent is to showcase the potency of employing a method to extract stable, comprehensive, and meaningful outcomes from data, surpassing the results achievable through direct, intuitive data inspection that can be inadvertently selective. The method in question, sometimes referred to as Concrete Abstraction(CA), involves grouping data units based on code similarity, followed by assigning cluster codes based on meaning (27). This method is a common approach for data analysis within Qualitative Research. The case study stems from a student thesis (26, in Italian). Primitive analysis relying solely on intuition had been performed by the student during an internship in a public organisation tasked with improving a website offering services to citizens. Subsequently, a systematic analysis of the same data was undertaken by the student in their thesis work after departing from the organisation. "During the internship, the communicative and relational acts implemented by the managers in the conversations with them had not been highlighted in the least, as the attention was aimed at solving and modifying the contents of the website. Despite this, even if they weren't understood initially, they were still perceived, collected in my memory , recorded on paper and subsequently analysed. The type of thing that went unnoticed is the importance of communication and emotions expressed by executives, as they initially were not picked up, as irrelevant. In particular, the anxieties of the executives were not considered, nor were those experienced by the trainee during the conversations. The phases of the Social Practice Design and the process consultancy unknowingly carried out have not been considered and identified. These approaches were activated by the intern in his complete unawareness, as he did not master these approaches and methods, giving birth to everything from improvisation and intuition into the situation. It has not been noted how much the actions carried out could have theoretical relevance." (26)

In the subsequent thesis work, the data underwent analysis using CA. The intern's written notes, encompassing observations and communications, were divided into discrete independent units. The meaning of each unit was distilled into a concise sentence. These sentences were then organised into clusters, forming a concept map structured as a tree with leaves. A comparable process was applied to the text generated from the intuitions gathered during the internship phase. A subsequent comparison of the two concept maps revealed that the method compelled the inclusion of all contents, even those that were not intuitively considered.
“Here … is the result for themes reported by the consultant during the internship, mapped on the tree produced by the method of Concrete Abstraction, once it has been stripped of its leaves. It can be seen that the results of the methodic analysis go much further than those of the internship: the latter gives rise to 12 leaves, against the 35 of the thesis research, leaving many of the branches of the tree completely bare. All the branches are less rich in leaves, since a total of about two out of three leaves are missing; in particular, the following branches are missing completely: - practical issues, and the way people in the department work together and with technology - confrontation of consultants with executives - attitude of the consultant. From here it can be seen that in the instinctive approach the attention of consultant appears to rather significantly neglect both the issues of ambiguity related to practical or concrete issues, and above all those having to do with one's own attitude and/or with one's way of approaching managers, to focus on the behaviours of managers. The very possibility of highlighting facts such as those just illustrated provides a demonstration of the power of the method over direct intuition, and the relevance of the result.” (26) The example's pertinence to the theme of scientific rigour is evident. Beyond any oversights stemming from internship inexperience, the example serves to elucidate the aspects that risk being omitted when the suitable method is not employed.

It is crucial to underline that the omitted aspects mostly refer to people experiences and their emotional functioning in relating with the world, be it with other humans or technology. While this points to a blind spot in the attention of consultants in normal scientific analysis, it also shows that this area of concern is indeed open also to investigations by employing the empiricist philosophy as basis for the approach, only however if using correct methods that do not omit “ … the probing into subjective acts that are the correlates of worldly presentations.” (5) Again, it is not a question of epistemology, it is a question of the details of the method used to implement it in practice. But it should be insisted that of the three approaches, objectivism is the least apt for subjectivity.

4. The Hermeneutic approach, exemplified

“The hermeneutic approach began with the interpretation of linguistically expressed meanings and has continued to work in that manner. What particularly differentiates it from the empirical approach is that it acknowledges it always begins with a complex, unclear situation, that requires the active participation of the researcher in order to achieve a certain degree of clarification. Since the ultimate clarified meaning arrived at requires the activities of the researcher, his or her engagement is essential and so it is committed to an interpretative strategy.” (21, p. 28)

Hermeneutics shines brightest when grappling with obscured meanings (12). ST research within Information Systems Development (ISD) inhabits a realm of meaning transformation, even linguistic evolution, languaging, occasionally necessitating the introduction of novel terms —an arena where hermeneutics thrives. To exemplify hermeneutics' application in qualitative data analysis, we reference three papers. First, Claudio Ciborra's exploration in the distortion of the original Heideggerian essence of the term "situation" within contemporary ISD literature (19, 20), a study that delves into the concept of phenomenological comprehension. Second, a Participatory Design (PD) venture introducing technologies for the elderly (28), which vividly underscores the necessity for nuanced expression. Lastly, interpretations in a PD initiative targeting the creation of an online marketplace for tourists (29). We offer concise accounts of each research scenario, outlining context, rationale, and outcomes.

Claudio Ciborra frequently embraced the hermeneutic approach. Through his meticulous examination of the mundane and existential, he methodically re-evaluated the meanings of all elements, aiming to capture the intricate essence of everyday existence, “ … to contribute to a transition of the field (of the social study of IS) towards an age of the Baroque in the deployment and management of technology in organizations and society. Passion and improvisation; moods

and bricolage; emotions and workaday chores; existence and procedures will become integral to systems design and use, casting new shadows and lights on the unfolding world of technology." (30)

In his paper Getting to the heart of the situation: the phenomenological roots of situatedness (19, 20) the very Heideggerian hermeneutic approach to the unveiling of meaning is recalled in detail, in the occasion of his analysis of the Paoline letters in Early Christians times (31): "… In the loose sheets for his course in 1919 - 1920 dedicated to the phenomenological intuition, Heidegger notes: "Understanding - as intuition - goes along with and into the fullness of a situation… The phenomenological understanding is nothing else than an intuitive going along the meaning. It must stay close and present to the total situation of the phenomenon… Capacity to accompany - being intimate, "love". Love as motivating ground of the phenomenological understanding - given necessarily in its sense of enactment." (18, p. 185 and 262) And, more generally, "The true philosophical attitude is never the one of a logical tyrant, who frightens life through his staring at it. Rather it is Plato's Eros." (18. p. 263) Heidegger is aware of the difficulty of carrying out this task with this method: "The first task is therefore the appropriation of the situation in which understanding is rooted; the full, concrete appropriation is by itself a task that will perhaps exceed the powers of the present generation… Those who attempt something else mistake in principle precisely what should be their aim…the pure cognition of the labyrinthine basic character of human existence." (32, pp. 32 - 42)"

The second paper: A second step back for managing ambiguity besides reducing uncertainty (28) is " … an attempt to chronicle and evaluate the struggle to innovate, to understand and to produce a sustainable response to the pressing problems of the care and protection of an ageing population. In that struggle, quite distinct world views of the lived experience of the older person and their families and carers, the pressures and challenges of practitioners, on managers and planners and on the politicians who strive to improve the experience of life of their constituents and the desire of technicians to design and build something useful and interesting come together not in a rational orchestration of interests but in the agonistics of real life. The reality of the distinction between what we have called North-South, hierarchical. and East-West, peer and partnership behaviours and attitudes, between Gregory Bateson's distinctions of first order and second order processes and deutero versus acquisitive learning together with the need to support and nurture sense making and co-production are very apparent in the experience of the project. The challenges of maintaining an appropriate balance have been significant. We have tried to describe, and provide some detailed evidence for, a style of intervention which we have claimed takes a step further than what is usually conceived of as participative design. This is not based on a reallocation of rights and capabilities between architect/designers and client/users in what are still linear or iterative but two sided design processes. Such reallocations still leave the definition of the objectives and the contexts of development as preconditions of design and assume that the architectural language and conceptual framework are available to the participants in which the problem and the solution can be articulated. In circumstances where these assumptions cannot be safely made, there is a need for an intervention which has the purpose of addressing this lack. In their classification of development processes, this necessarily implies the creation of what we have called East-West occasions which are furnished with material, exhibits and provocations around which the participants can engage with each other in sense making and the co-construction of a shared language." The data collected has been analysed with the hermeneutic approach (28).

The third paper: NOW: the participatory marketplace for a tourist destination (29) investigates a world of new meanings in people experiences, found in notes, observations, and exchanges during the social struggle for innovation of a tourist destination business.

The new meanings uncovered are summarised in three statements: " …

- Framing metamorphosis: In a unique, bottom-up, destination management case - exploiting mobile internet based communication – operators' competition is washed out, in favour of shared sense making, cooperation, and coordination. How is it possible? What are the drivers, enablers, and success factors? What makes it sustainable? What produces shared self-awareness in the community, to gain group access to online trade? What magic organisational intervention produces the "miracle"?
- Different perspectives: Qualitative analysis interpretation, in a soft, participated, action-case, yields: from a social perspective: adapt to various users' situation (location, context, and mood; don't take all, select on quality; cross marketing partnership); from an ST perspective:

local dimension and participation (sustainability of solution, convenience; a working online market; putting the tourist at centre); from an IS discipline perspective: social-practice-design intervention; mobile Internet driven business-model; APPs and user configurability.

- Theory stands: Digging into the conceptual fabrics of the case, unquestionably unveils the embodiment of some anticipated, crisp, phenomenology-based IS concepts, in the social structure back-bones of human behaviour of NOW: i) personal sense making and motivation (situation, context and mood, convenience, sustainability); ii) people participation to technology-based innovation (participatory-design, constructing well functioning socio-technical infrastructures, user-design in use); iii) intervention for consensus-based, organisational change by social-practice-design (facilitation for shared sense making, trust and cooperation building, bottom-up governance)." (29)

5. The Phenomenological approach, delved and exemplified

A century has passed since Husserl's assertion (33, 34) regarding Transcendental Phenomenology as the foundational philosophy for all sciences, including human sciences. Husserl's research based on Phenomenology has, indeed, been able to capture the distinctively "human" aspect.

Before plunging in descriptive phenomenological philosophy and method, exemplifying phenomenological applications in qualitative analysis using Husserl's Descriptive Phenomenology and Giorgi's DMP method, let's immerse in medias res of what happened in phenomenology during the past century, and try to understand better today's gap.

Then we illustrate details of studying phenomena by accurate descriptions of observations: unveiling the intersubjective dialogue between children and their mothers, and we describe Husserl's descriptive phenomenological philosophy in some detail, including Giorgi's modified approach of the DPM method for scientific rigour. Then the example of application of DPM.

5.1. The exploit of Husserl's transcendental phenomenology: outstanding contributions of followers, and oppositors

It is imperative to distinctly define the method to be used with Husserl's descriptive phenomenology in comparison to other variants that took place from or after him. Phenomenological research has profoundly enriched the realm of human sciences with innovative discoveries and ideas. Figures such as Harold Garfinkel in Sociology (35, 36, 37), Daniel Stern in Psychology (38, 39, 40, 41), and Claudio Ciborra in Organisations and Information Systems (17), to quote just three of them, have brought forth a remarkable array of new scientific insights in their respective fields. Their investigations into subjectivity and consciousness have led to substantial factual discoveries that have had undeniable impacts on the world. For instance, Harold Garfinkel's work on ethnomethodology and accounting practices (35), Daniel Stern's exploration of mother-child intersubjective dialogue (39, 40), and Claudio Ciborra's critique of rational methods in favour of passion and improvisation (17) have all made remarkable contributions.

It is important to note that not all philosophy research inspired by Husserl's phenomenology followed the same trajectory. While some of Husserl's students, such as Martin Heidegger, veered towards a more hermeneutical phenomenology, others adhered to Husserl's descriptive phenomenology. Moreover, when discussing specific researchers, it's crucial to differentiate between empiricists, hermeneutists, and descriptive phenomenologists. However, researchers often encompass multiple approaches, highlighting the complexity of categorisation.

Here we note that these phenomenological researchers conducted rigorous investigations. Garfinkel, Stern, and Ciborra approached their studies with systematic, critical, and methodical scrutiny. Their research was characterised by meticulous description of factual details, intuitive discoveries, and engagement with their research community for intersubjective sharing. Although the methodologies employed varied, they often employed a blend of approaches.

- Claudio Ciborra was not retaining theories but meanings, from his cases. Ciborra's work aligns with a hermeneutic approach, deeply rooted in Heidegger's ideas. He delved into interpreting and comprehending the intricate meanings and complexities within technological systems and organisational practices.

- Daniel Stern was observing and describing, advancing with intuitions more than interpretations. Stern, known for his developmental psychology contributions, particularly in infant development and attachment, is often associated with an empirical approach. More likely while studying infants. However, intention and tacit intuition in his consciousness from descriptive phenomenology are evidently responsible for his unveiling the peculiar function, in human social development, of the instinctive thrust of children towards the development of a special intersubjective dialogue between mother and child. A peculiar thrust of our specie towards social interaction that he pointed out is primarily responsible for our survival.
- Harold Garfinkel, a sociologist credited with developing ethnomethodology, which focuses on everyday social interactions, can be linked to a phenomenological approach. Garfinkel's work aimed to uncover the fundamental structures and meanings within people's experiences and interactions in everyday life, employing both description-based intuition and interpretation.

Despite the acknowledgement of the scientific merit of these phenomenological researchers' work, phenomenology sometimes faces challenges in being acknowledged as a rigorous scientific approach, particularly when compared to empiricism. This echoes the debates faced by humanistic psychologists like Carl Rogers (42, 43, 44) and Abraham Maslow (45) in the USA during the last century, as they were criticised by the empiricist psychology community for their perceived idiosyncratic and subjective approaches, in a context dominated by behaviourism.

For overcoming the criticism of insufficient scientific rigour of phenomenology based research, crucial in certain applications like evidence based practice proof, the option we have today is to follow Giorgi's DPM, the only method in phenomenology for which a claim of scientific rigour has been clearly advanced.

5.2. Studying phenomena by accurate descriptions of observations

Phenomenology is defined as the study of the phenomena of the world as experienced by conscious beings and as the method for studying such phenomena (46). "A phenomenological analysis of a research situation is performed to demonstrate what is essential to it …." (47).

Phenomenology is dazzling, original, profound. In the next section, our example of descriptive phenomenological approach to the investigation of phenomena is based on child observations, with noticing of facts about the level of development of their psychosocial behaviour (48). Here, we anticipate views from the pioneer on accurate child observations, an authentic phenomenological researcher. We quote Daniel Stern (38, page 2, emphasis added):
"The observations on which this book was based began in the late 60s. At the time only a handful of people were observing parent-infant interactions, especially naturally occurring ones, in minute detail. Such close observations had only just become possible, thanks to the new availability of portable television and movie cameras that were reasonably priced and not impossibly heavy. TV became the new microscope for seeing behaviours that passed in a split second. You could look in slow motion, freeze a frame, review as often as needed. A fascinating world opened up - a small world, but the foundation for so much else. When you have the opportunity to be among the first people to see a new world, many of its surprising features are striking enough that they force you to reevaluate your preconceptions. You quickly grasp a new perspective and new realities, such as the fact that nonverbal behaviours like those observed in animal ethology - a head pushed forward, or tilted up, or turned away rapidly to the side and down -, need to be the starting points for observing human social behaviour. This original perspective and the ideas that it gave me have played leapfrog with the ideas of many others over the years … Unexpectedly, the people that were originally most interested in these kinds of observations, were choreographers and dancers." Continuous video recording: therapists enact the same micro level observation of child behaviour in the example (48).

5.3. Husserl's phenomenology, philosophical foundation of human sciences

The strength of Husserl's innovative philosophy (24, 25, 33, 34, 49, 50, 51) is that facts from researcher's conscience, transcending natural objects, are considered just as real as those regarding natural objects. Husserl's phenomenology concentrates on what is essential of a phenomenon, accurately describing it, clarifying the meaning of its essence: description, not interpretation, not construction, not explanation. Descriptions of the essence of phenomena are taken as real, scientifically sound. When carefully cleaned by phenomenological epoché (no reference to expectations from past experience) and transcendental reduction (no

preoccupation of actual reality). Found in their factical details, guided by subject's intention, illuminated by discovery through phenomenological intuition, shared by intersubjective dialogue with participating research community, and subject to free imaginative variations. (5). We shall keep this in mind in the following (see Subsection 5.5.2.).

5.4. Giorgi's modified approach: the DPM method for scientific rigour

"Since Husserl's method is philosophical, any strict application of this method will produce philosophical results. As psychologists, we desire results that are psychological and scientific, not philosophical; consequently, some modifications were made to Husserl's method in order to produce results that are scientific and psychological.The justification for these modifications has been published elsewhere (4, p. 21), so we will only list the modified steps here. The scientific phenomenological method encompasses the following steps: (1) One obtains a description of a concrete experience from participants; (2) One then assumes the phenomenological psychological reduction as well as an attitude that is sensitive to the phenomenon being researched; (3) One reads the description provided by the participants in order to get a sense of the whole; (4) The researcher then rereads the description and establishes meaning units - i. e., parts of the description that have a relatively coherent sense; (5) One then transforms the meaning units into phenomenological and psychologically sensitive expressions; (6) Finally the researcher integrates the data and uses free imaginative variation to help determine the psychological essence of the experience. This essence is eidetic, but it is not universal. It is only general because psychological experiences tend to group according to typologies and thus do not comprehend the whole field of experience of the specific phenomenon being investigated." (21, p.21) Giorgi's DPM is not limited to Psychology.

5.5. An example of application of DPM

The example we present for the application of DPM to ST research, employs the DPM method in order to assist in the selection of appropriate design-choices in carrying out a Query Experiment (QE), ensuring that Giorgi's conditions for scientific rigour be in fact met in each experiment detail. The paper in question (48) examines the utilisation of a tailored scaffolding support within a clinic's information infrastructure. This support facilitates the promotion and documentation of therapists' descriptive data, expressed in their expertly trained professional language, based on their subjective observations, objectively carried out in a professional-psychologist attitude, while intuitively and inseparably merging (part of) the analysis with the observation. This process forms an integral part of a meticulous and precise descriptive phenomenological investigation into a child's behaviour during treatment. Human reporting and (the remaining part of) the analytical functions are executed through the information infrastructure, which solidifies, for analysis automation, select aspects of the intended human actions. Scaffolding structures and functions, particularly the Daily Treatment Notes (DTN), are accurately designed to meticulously capture, record, and restore the original conscious events and meanings. This encompasses both the observation of the phenomenon and the subsequent analysis of the child's behaviour data.

The key strength of this approach, facilitating the application of Giorgi's scientific method (5) by researchers, lies in the utilisation of the conceptual framework employed by therapists within their specific therapeutic practice. Specifically, the Developmental, Individual differences, Relational (DIR)/floortime treatment psychological theory developed by Greenspan and Wieder (52, 53, 54) forms the basis for articulating child development behaviour across distinct Functional Emotional Development Levels (FEDL). Of paramount significance are the particulars of uncompromising details of the FEDL scale, and the structure of the DTN, that suppress subjective biases. These are fully elucidated in the paper (48). These aspects are communally shared within the proficient therapist community of the clinic, functioning as a cohesive Community of Practice (55, 56) and benefiting from a Web of Shared Understanding (57). This shared framework acts as the dedicated scaffolding support, enabling the accurate encapsulation of therapists' insights using their own conceptual terms, while simultaneously ensuring adherence to Giorgi's stipulations (5). This framework inherently provides a means to control for essential scientific dimensions as prescribed by Giorgi's method: (a) transcending immediate sensory data, (b) disregarding common sense biases, and (c) proactively considering the potential influence of relevant free imaginative variations on the essence of the phenomena.

Devoid of the efficacy underpinning the FEDL theoretical framework and DTN, it would all amount to potentially valuable but haphazardly collected and reported opinions.

Summing up the crucial design choices of the experiment: observers-analysts performing in the professional attitude, members of the same community of practice, sharing the understanding of the conceptual structure of their profession as personal knowledge, characterised by uncompromising details, incorporated in the scaffolding information system that records their notes.

5.5.1. Consideration 1: FEDL scale in DTN helps respect ethnomethodology

The utilisation of routine conceptual language hold profound importance in ethnomethodology. Therapists convey observations of child behaviour within DTN using the language specific to their therapeutic practice and profession. We cite phenomenologist Harold Garfinkel, the pioneer in ethnomethodology: "The ensuing studies seek to treat practical activities, practical circumstances, and practical sociological reasoning as subjects of empirical study. By bestowing attention on everyday life's most ordinary activities with the same scrutiny reserved for extraordinary events, we endeavor to understand them as phenomena in their own right. The central assertion is that the procedures by which members generate and manage organized daily affairs settings are identical to members' processes for rendering those settings 'account-able'" (35, p. 1). In the QE of 5.5, the language, structure, and scale employed to depict child development (accounting) align with the clinical treatment (management) language, structure, and scale. While this fact ensures exact correspondence between observed and described, and absence of alterations in recording, the uncompromising details warrant control of subjective biases.

5.5.2. Consideration 2: Free imaginative variations

Three circumstances stand as evident candidates for significative, free imaginative variations: 1) the DIR theory, 2) the FEDL scale, 3) the clinic in which the experiment is conducted. After which, the resulting general meaning of the experiment are robust and stable upon “free imaginative variations” of contextual conditions.

One: Reference theory. Naturally the aligned structures of personal knowledge and mirroring reporting artefact cannot necessarily correspond meticulously to the structure and nature of the real world. And, the rigorously scientific answer of the experiment to the original question might be dependent on them. If the chosen knowledge structure is not too far from reality, the answer will be nonetheless meaningful, thus satisfying the QE question with scientific rigour.

Two: FEDL scale. This holds true for diverse Likert scale selections or even modifications to the DTN structure, within certain confines.

Three: Clinic. Envisioning the experiment conducted in an alternate DIR clinic with different organisational, cultural, and therapist training dynamics prompts a different perspective. Here, we acknowledge a limitation: the QE experiment simultaneously informs us about the efficacy of DIR as well as the proficiency of the specific DIR clinic under scrutiny. If the answer is affirmative, it signifies the effectiveness of DIR treatments, and the quality of the clinic at the same time. Yet it does not guarantee uniform outcomes of an experiment in other DIR clinics.

5.5.3. Consideration 3: Let’s see the Results of the QE experiment

The analysis aimed to derive overall meaning from DTN data, specifically by summing the differences in Likert scale values for each FEDL level before and after treatment. Statistical averaging helped distill a clear outcome. The average difference of values before and after treatment, calculated across all 75 entries—five therapists, five children per therapist, three FEDL sub-step values per child (5x5x3)—is distinctly positive, with an average value change of +0.33 units; accounting for an error, calculated as the mean square deviation (0.4 units) divided by the square root of 75, of+/-0.05 units. Therapists' reports the validity of the DIR treatment:

"We affirm its reality" (+0.33 +/-0.05 units)

The resultant impact is positive, with a final mean value some seven standard deviations away from the control point (0.0 units). This positive trend is denoted as "significantly above statistical noise," a robust finding in any quantitative inquiry. Therapists' subjective knowledge is firmly grounded in scientific, rigorous, objective foundations. This opens avenues for future

experimentation with greater statistical weight over extended timeframes, and larger therapist-child cohorts, and confirmation through comparable, independent experiments (41).

5.5.4. Consideration 4: The DIR treatment assessed as Evidence Based Practice

This most promising treatment, DIR, based on parent involvement, is not currently supported by public health care in the Western world, as it is not yet declared an Evidence-Based-Practice (EBP), due to the difficulty of scientifically controlling parent behaviour.

An EDP declaration can now be claimed by this experimental outcome, using subjective data. For this, the research outcome needs to gain credibility and recognition of scientific validity in concerned professional communities - paediatric (58, 59, 60) and educational (58, 61, 62, 63), This requirement has put stringent constraints on the methodology employed, and cogent demands on the transparency and non-intrusiveness of the conceptual scaffolding support.

6. Respective approach vulnerabilities *vis a vis* scientific rigour

"It should be noted that all three philosophies support methods that actually have an identical task and, while there is some overlap among them, ultimately, the approaches and methods are not identical. It turns out that they are parallel processes, the differences reflecting the different philosophies that support the methods. The identical task may be described as the attempt to come up with a precise disciplinary meaning of data expressed in the language of everyday life." (21, p. 27). The scientific attitude towards phenomena is quite different from the "natural attitude" exhibited by common people in everyday life, populated by common sense and "horse sense". Phenomenology has the same problem as empiricism, i. e., how to escape the "natural attitude". But " … the solution it tries out is the opposite of the theoretical and the objectifying, where the emotions are barred and the lived experience cleansed. Phenomenology looks for an a-theoretical comportment and interpretation beyond the natural attitude …" (19, 20)[4]. Their respective vulnerabilities are quite different as well. With respect to the theme of scientific rigour: empiricism contains a remnant of uncertainty in the choice of theory, hermeneutics in the choice of interpretation. Uncertainty can be reduced with objectivist criteria: by being methodic, systematic, general, critical, and by sharing and verification with others. These do not concern theorising or interpreting in particular, and those vulnerabilities remain in part. Descriptive phenomenology, conversely, can attain full scientific precision concerning facts-in-the-conscience, while its connection to the real world necessitates further scrutiny. Addressing, and responding to this vulnerability empowers descriptive phenomenology to establish scientific substantiation.

In experiment 5.5, this is done through criticality, achieved through A) the utilisation of a well-established developmental scale, universally understood by all therapists in their practice, and B) the participation of therapists from the same community of practice, immersed in the shared (Greenspan's) therapeutic culture.

The centrality of critical conditions lies in its capacity of establishing a genuine connection and adherence to the tangible world. Therapists' social engagement in treating children with developmental disorders, and their ensuing culture, reinforce consistent, shared, and critically validated experiences concerning real child behaviour. This framework leaves no room for preconceptions or illusions in the observations of expert therapists. It eliminates potential distortions of perceived worlds, such as "seeing non-existent colours". This approach, aimed at objectivity within facts-in-the-conscience, represents the highest attainable standard of adherence to the world existing out there.

Other facets of objectivity in the experiment involve employing a method that presents the critical presence of the control group (time zero as reference) to emphasise differences while eliminating extraneous factors. The approach engages multiple therapists for verification and employs a structured system to capture comprehensive descriptions of their perceptions of child behaviour. The inclusion of multiple children ensures a satisfactory signal-to-noise ratio.

7. The Query Experiment (QE): why does it work? what is its use?

[4] Note Ciborra's usage in this remark of the word phenomenology: he is implicitly including in it (his own) hermeneutics approach, at variance with our choice of word usage in this paper. Our choice of usage follows Giorgi's.

What is the lesson to be learned from the experiment described in sections 5.5? To utilise Giorgi's DPM to get direct, scientifically rigorous experimental answers to questions of interest.

At times, the aim in pursuing the objectives of a human science might not be just to rigorously unveil the genuine nature of a particular phenomenon. Instead, the objective might be to obtain a rigorously scientific answer to a specific question—one that might not be framed in the actual terms of the still-unknown phenomenon. In such cases, one might forego the privilege of phenomenological intuition's ability to meticulously uncover the true nature of the phenomenon, in exchange for the capacity to precisely obtain, with scientific rigour, an answer to the specific question of interest. This question can only be formulated in the context of an approximate, available theory, which can be employed as a point of reference in the experiment. A theory not to be 'bracketed', but used as comparison, while observing and intuiting.

How can we effectively apply DPM to conduct such a QE, successfully? Let's recall that Giorgi's DPM declaratively entails meticulous descriptions of the observed phenomenon, captured from a natural perspective, and faithfully conveyed by an uninitiated participant. To extract scientifically relevant meanings within the discipline, these descriptions are subjected to analysis by a researcher who adopts a phenomenological attitude, devoid of reliance on prior knowledge and unconcerned with congruence to the real world. This process involves verification through various free imaginative variations, serving as stringent controls to ensure scientific rigour in capturing the essence of the phenomenon, expressed in an eidetic form. In the QE experiment we intend to conduct, it's imperative that those exposed to the phenomenon hold the reference theoretical knowledge structure in their minds. This structure is not to be bracketed but meticulously compared with the phenomenon, structured in uncompromising details, in order to respond to the query. What measures can we employ to achieve this?

The delineation of roles in data acquisition and experiment analysis, distinguishing between the observer and the researcher, and the shift of phenomenological intuition from the observer to the researcher, are not necessarily the only configurations assumable in scientific experiments. In the instance described in 5.5, for example, it is advantageous to maintain observation and analysis in direct contact, precisely at the juncture of professional intuition. In such a case, directly applying the scientific controls inherent in Giorgi's DPM to the activities of this individual proves to be essential.

We propose in general an approach implementing DPM requisites directly to the observer, in scientific QE experiments. This approach amalgamates observation, description, and reporting, conducted by a conscious, experienced professional, within their professional attitude. It entrusts part of the scientific controls, linked with Husserl's phenomenological perspective, to the fusion of the professional's intuition with their tacit personal knowledge, and the mirrored structure of the reporting artefact. The therapists' personal professional knowledge (64, 65) grants the pure rendition of the object by their immediate intuition in front of the phenomenon, correctly reported because of the alignment, by design, between structure of personal knowledge and structure of reporting artefact. This framework is distinguished by its explicit meanings, leaving no room for uncertainty. Through their informed expertise, therapists possess a learned personal insight. Their observant and professional depiction of child behaviour is rooted in a conscientious and unbiased approach. This approach, driven by intention and intuition, aligns as phenomenological.

This as an authentic, direct application of Giorgi's method, extended to a scenario where truth doesn't emerge within an uncharted realm of consciousness, but instead surfaces within the context of a well-established conceptual framework – a scaffold nurtured by therapists' professional proficiency and shared within their community of practice. Part of data analysis is thus fused with the intuition of the therapist observers adopting a professional attitude, while their personal professional knowledge, structured in uncompromising details, fosters the absence of biases, hallucinations, or the interference of common sense. The rest of the accurate data analysis resorts by design to details of the information infrastructure. In this way, the requisites of DPM, including an attitude sensitive to the phenomenon, parsing descriptions in meaning units while keeping a sense of the whole, transforming meaning units into sensitive expressions within the discipline, resilience against contamination and free imaginative variations, assure the integrity of the scientific inquiry. This approach holds the potential to resonate credibly within the concerned professional communities.

QE is a good candidate to address the issues of method raised in ST research. (15, 16)

8. Role of this position paper, in prospect: a subjective view

Where from do we come, where do we go, what needs to be done in ST ISD research.
(A hint from Heidegger: "**how do we teach each other speak objectively about these subjective things?**").

8.1. Trends and revolutions in ST-IS research

While reflecting on epistemology and method, life in ST IS research was going on, and its trend have been object of exploration. Peter Bednar and Christine Welsh (66, 67) highlighted approaches, characterised by a focus on individual uniqueness, and socially-constructed, individual worldviews as generators of human knowing: "…(We) explore a particular philosophical underpinning for Information Systems (IS) research – critical systemic thinking (CST). Drawing upon previous work, the authors highlight the principal features of CST within the tradition of critical research and attempt to relate it to trends in the Italian school of IS research in recent years, as exemplified by the work of Claudio Ciborra but also evident in work by, e.g. Resca, Jacucci and D'Atri. … This is a conceptual paper which explores CST, characterised by a focus on individual uniqueness, and socially-constructed, individual worldviews as generators of human knowing. …"
In fact, individual uniqueness, and socially-constructed, individual worldviews as generators of human knowing, is precisely how started a new thread of work, on innovation in organisational interventions, and on contextual design, participatory design, user design, user design in use.

First, the Social Practice Design (SPD) proposal emerged with the 2007 paper: Paths to organisational change based on counselling and phenomenology, using Rogers' human actualising tendency, and Ciborra's improvisation, mood, and bricolage (68, 69). Innovation instances actually enacted in an organisational intervention, thanks to the presence of an external agent, just as recommended by Ciborra and Lanzara in: Formative contexts and information technologies: understanding the dynamics of innovation in organizations (70).

Then, double loop learning instances were identified in an SPD organisational intervention: Double loop learning elevates the innovation design of a paediatric clinic from media to intersubjective dialogue (71), in the clinic of example 5.5, where attention to intersubjective dialogue emerged, as a social practice of central role in the new organisation of work.

Then, always in the clinic, the need for the Evidence-Based Proof of the DIR treatment came to the fore: "We know it is real": harvesting consciousness with a descriptive information system (48). Provoking the bursting out of a Giorgi's DPM revolution in ST IS research: the quest for a methodology granting scientific rigour.

8.2. It takes time to become mainstream

Notwithstanding the quality of Giorgi's work of a lifetime, the Descriptive Phenomenological Method (DPM) is still not accepted as the mainstream approach to research in Psychology. Nor do we expect that it will immediately become mainstream in ST. But again, nor have they become immediately mainstream in Information System Development (ISD) practice or even theory, other ST powerful and dead-on mindsets in Organisations and Information Systems, like Language Action Perspective (LAP) - as Terry Winograd pointed out 35 years ago (72) - see for example: The language action perspective approach to system accountability for end user configurability: a new perspective on ict development (73, 74) that appeared in 2002-2005, well before Apple introduced the App Store for their smartphones on July 10, 2008; or even Participatory Design (PD) - see for example: A second step back for managing ambiguity besides reducing uncertainty (28), already going beyond PD in 2008. Or even LAP and PD blended together in DEUDU: Use of use cases in design for end user design in use. (75, 76)

And, have they really become mainstream, yet?

Meanwhile, naive assumptions regarding the meaning of science, that present challenges to conveying a Husserlian approach to ST, and poise against DPM's stand in the field, can and should be addressed, and responded to. Here are comments on this point (77), regarding research in Psychology, by Marc Applebaum, close collaborator of Amedeo Giorgi:
"Husserl framed his phenomenological inquiries as a response to the historical moment in which he found himself—a period of crisis in which, he argued, a pervasive attitude of

skepticism threatened to undermine peoples' trust in their capacity to discover meaning in individual and communal life through reasoned inquiry. Today, a range of naïve assumptions regarding the meaning of science present challenges to conveying a Husserlian approach to psychological research. This paper is intended to address a variety of assumptions which can be encountered when introducing students to Giorgi's phenomenological psychological research method. These assumptions are: 1) That the meaning of "science" is exhausted by empirical science, and therefore qualitative research, even if termed "human science," is more akin to literature or art than methodical, scientific inquiry; 2) That as a primarily aesthetic, poetic enterprise human scientific psychology need not attempt to achieve a degree of rigor and epistemological clarity analogous (while not equivalent) to that pursued by natural scientists; 3) That "objectivity" is a concept belonging to natural science, and therefore human science ought not to strive for objectivity because this would require "objectivizing" the human being; 4) That qualitative research must always adopt an "interpretive" approach, description being seen as merely a mode of interpretation. These assumptions are responded to from a perspective drawing primarily upon Husserl and Merleau-Ponty, but also upon Eagleton's analysis of aestheticism."

8.3. The gap to be filled by DPM

The emphasis now is on method: Giorgi's DPM in particular may foster acceptance of phenomenology as an approach granting scientific rigour in crucial QE experiments in ST research. Leveraging on aspects of method is the way towards greater acceptance of phenomenology. It's not coincidental we believe that Ricciardi advances further, in focusing on method, following her emphasis (15) on the need to overhaul epistemology within the ST IS field. In fact, to steer research out of its crisis, marked by inadequate practical impact in the Organisation discipline, she underscores (78) the dearth of robust Design Claims in research projects. Method, yet more method: "Design Claims introduce fresh methodological challenges … prompting the need for methodological innovations" If research are treated as art or poetry, design claims might not find acceptance or even be suggested within research projects. Let's disrupt the norm, declare that research adheres to a method capable of generating scientific outcomes, and elevate the significance of design with strong design claim; as the absence of design claims hampers the way towards adoption of research findings by practitioners.

The quest for scientifically acceptable qualitative methods is evident for all to see. A gap exists that requires filling—let's embrace this challenge in the ST IS field using phenomenology and DPM. Multiple avenues exist to utilise DPM for this purpose: adhering to using Giorgi's method as defined, or employing it as a guide to construct QE experiments that ensure scientific credibility, as we have shown. Either way, the DPM method guarantees scientific rigour, rendering research more appealing and beneficial.

In sum, the methodology for correctly implement QE requires: observers describers analysers members of an expert community of practice, operating in their professional attitude, recording their descriptions in a scaffolding information support structured in the same conceptual language and culture of their profession, involving in their description of the expression of the observed phenomenon in uncompromising details.

9. Conclusions

9.1. Subjectivity in Socio-Technical Research: Assets (Husserl, Heidegger, Giorgi)

Our reflections contribute to the awareness of the merits of subjective data in ST research, in particular using the methodology provided by Giorgi's DPM (see also J. Morley, 79), e. g., through the conduct of QE experiments with subjective data, as described in this paper.

Conceptual incentives for this came directly from Heidegger and Husserl:
Heidegger: "how do we teach each other speak objectively about these subjective things?"
"'Letting things be' is the theme Heidegger writes a great deal about in his post-World War II writings, but it is only another way of reciting the principal phenomenological slogan from Being and Time, "To the things themselves!" Our work of making social inquiries is not irrelevant, because we have the important descriptive task, Heidegger tells us, of raising "the

phenomenal content of disclosure existentially to a conceptual level". …… That is, our thinking must be kept appropriate to the events we are describing, and we must avoid submerging those events beneath our brilliant plans and theories, but we still need to reflect formally upon them. So now have our most serious task – **how do we teach each other speak objectively about these subjective things?**" (80, the bold emphasis is ours).

The philosophy of empiricism should not hold exclusive rights to be considered the sole source of scientific method. The vulnerabilities we've identified persist across all philosophical approaches and their respective methodologies. What's imperative is to eliminate the bias against methods relying on subjective data, particularly phenomenology. As descriptive phenomenology for scientificity is - quite the contrary - in an advantageous situation because description resides at the beginning of the conscious event:

" … the conceptuality of the object … must be drawn out of the mode in which the object is originally accessible", Heidegger declares (12, p.17).. And, as Giorgi points out (21, p. 30):

"Descriptive phenomenological psychology is a bit different from the first two procedures in several ways. Because it is descriptive, phenomenology's claim is epistemologically stronger: it says that this is how things present themselves to acts of consciousness. …. Consequently, while grounded theory comes up with theories and hermeneutics results in interpretations, phenomenology's descriptive psychological approach emphasizes presentational findings. Even though the results are expressed in terms of "lived meanings", they have the solidity of facts. The claim is made that the experiences were actually lived in the light of the discovered meanings".

Husserl: let's recall on this, in its integrity, Husserl's 'principle of all principles': " … all philosophical pronouncements must be grounded in something immediately accessible to us."

+" … the logic of the grasp of the object, and the conceptuality of the object … must be drawn out of the mode in which the object is originally accessible. Also decisive for the definition of the life situation in which the object comes to be experienced and, further, the basic intention in which the experience from the outset aims at the object (how the sense of the situation and of the anticipatory intentional grasp (the preconception)) is given 'its due'" (12, p.17). Life, thus, must be "understood in a primal scientific way as leaping out from its source" (81, p. 82). "The here and now of the situation offers such a primordial insight into life." (82, p.86)

Following Husserl and his phenomenological philosophical principles, Giorgi with DPM has provided the world with a method granted to achieve scientific rigour in human disciplines:

Life must be "… understood in a primal scientific way as leaping out from its source."

"… the conceptuality of the object … (is) drawn out of the mode *in which the object is originally accessible."*

"Even though the results are expressed in terms of "lived meanings", they have the solidity of facts."

9.2. Scientific Rigour in Socio-Technical Research: Assets (Objectivism, Hermeneutics, Descriptive Phenomenology, QE)

In many circumstances of ST research (see 83, for a classification of research in the itAIS Community) primarily subjective data are involved. What approach for ST? We conclude that scientific rigour can be pursued with all three approaches, Objectivism, Hermeneutics, Descriptive Phenomenology, using the appropriate method in its fine details, and sharing results among peers. The last two are intrinsically apt to "the probing into subjective acts that are the correlates of worldly presentations". Hermeneutics depends on interpretation, Descriptive Phenomenology depends on adherence of perceptions to real world. For both vulnerabilities there exist counter measures. Acceptance of results by the scientific community is the final litmus test in all cases. Fo this it is crucial that the method choice be appropriate, and care be taken in all its details.

Following Heidegger, Ciborra's work is a great example of successful use of Hermeneutics. We advocate Husserl's Descriptive Phenomenology, not mainstream yet in ST. We follow Giorgi and his DPM, by applying it to the guiding of design choices of Query Experiments. This is our response to the provocation of Francesca Ricciardi, and to the solicitations of Bender and Welsh.

Aknowledgements

We thank the referees for very appropriate and useful suggestions.

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