INTERDISCIPLINARITY AND SPHERES OF MEANING - THE CASE OF INFORMATION SYSTEMS

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Abstract. *Solving complex social problems requires interdisciplinary research. However, there are a lot of barriers to successful interdisciplinary studies. It is considered that philosophy could help in understanding of interdisciplinarity. It has been recognized a need for better understanding human life for improving inter-disciplinarity, as well as a need for understanding barriers impeding interdisciplinarity. In this paper it is considered how the philosophy of Dooyeweerd, who has interested in human everyday experience, recognizes barriers impeding interdisciplinarity and how his spheres of meaning could help in building understanding of human life needed for better interdisciplinary activities. That consideration, together with extant deliberation of definition and dignity of the IS phenomenon (in which problems are similar to ones of other interdisciplinary phenomena), suggests a way of thinking, a multi-aspectual one, towards better understanding of interdisciplinarity.*

Keywords: *Interdisciplinarity, Dooyeweerd, Spheres of meaning, Information systems*

1. INTRODUCTION

Interdisciplinarity has become synonymous with all things modern, creative and progressive about scientific research. The interdisciplinary imperative has arisen from complexity of existing problems ([9]). However, interdisciplinary researches are often unsuccessful because there are differences in values, differences in theories and differences in epistemologies in them ([11]). Besides that, extant social view on importance of different disciplines is often a barrier to success of interdisciplinarity. It has been recognized a need for better understanding human life for improving interdisciplinarity ([1], [15]), as well as a need for understanding barriers impeding interdisciplinarity ([11]).

Since theoretical thought always tends to narrow and distort human understanding of everyday experience, it is considered that philosophy, as an integrative discipline, could help in understanding interdisciplinarity itself ([2]).

Dooyeweerd was a philosopher who was interested in everyday experience. His interest was in the whole breadth and depth of reality. He differentiated two "sides" of reality: entities and laws. Entities are subject to law in their functioning and, in their structure. Functional laws are relating to functioning (activities) of entities as subjects or objects. They are called aspectual laws too. Dooyeweerd recognized the suite of aspects, which are irreducible and in harmony. An aspect is distinct sphere of meaning, distinct way of being, distinct rationality, distinct mode of being, distinct way of functioning, distinct sphere of law, distinct kind of normativity, distinct type of repercussion, and distinct way of knowing ([2]).

A brief description of interdisciplinarity is given in the section 2, and a brief presentation of Dooyeweerd's theory of modal aspects is given in the section 3 of this paper. After that, in the section 4 it is considered how Dooyeweerd's philosophy recognizes barriers impeding interdisciplinarity and how his spheres of meaning could help in building understanding of human life needed for better interdisciplinary activities.

Dooyeweerd's philosophy has been applied in the IS field, which requires some interdisciplinary combinations of the social and technical spheres of organizational studies and computer science. The description of IS as an interdisciplinary field and the case of applying Dooyeweerd's suite of aspects for defining and dignifying the IS phenomenon ([3]) is presented in the section 5.

Concluding remarks, given in the section 6, are relating to possibilities of using the spheres of meaning as a way of thinking towards better understanding of inter-disciplinarity.

2. INTERDISCIPLINARITY

2.1 Definition

There are many different interpretations and definitions of interdisciplinarity. They disagree on details, but they do agree that the participating scientists work together on a common question by somehow exchanging concepts and tools in order to solve problem.

Nowadays interdisciplinarity is seen as communication and collaboration across academic disciplines. Interdisciplinarity is supposed to integrate knowledge and solve problems that individual disciplines cannot solve alone ([9]). Interdisciplinary studies may be defined as a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession ([15]). Some previous interdisciplinary fields have become disciplines. There is an attitude that when inter-disciplinarity is successful it becomes a discipline ([1]).

Nowadays the degree of mutual dependency of scientific fields is high. Intellectual fields generally exhibit (among other things) weakened boundaries, increased mobility of ideas and skills across those boundaries, and increased inter-field coordination of research objectives, strategies, and results ([9]).

2. 2 Terminological ambiguity

The literature is characterized by considerable terminological ambiguity. The different terms ("intradisciplinary", "crossdisciplinary", "multi-disciplinary", "interdisciplinary", and "transdisciplinary") are used to distinguish between low, moderate, and high levels of interconnectedness or intellectual integration.

Intradisciplinary analysis involves work within a single discipline. Crossdisciplinary activity views one discipline from the perspective of another. Multidisciplinary and interdisciplinary analyses draw on the knowledge of several disciplines. In multidisciplinary analysis each discipline provides a different perspective on a problem or issue and makes a contribution to the overall understanding of the issue, but in a primarily additive fashion. Interdisciplinary analysis, on the other side, requires integration of knowledge from the disciplines so that the resulting understanding is greater than the sum of its disciplinary parts. Transdisciplinary analysis is concerned with the unity of intellectual frameworks beyond the disciplinary perspectives; it may deal with philosophical questions about the nature of reality and the nature of knowledge systems that transcend disciplines ([15]).

However, everybody doesn't make such distinctions and uses the terms "interdisciplinary" and "interdisciplinarity" as general ones for describing interrelationships among academic disciplines. In this paper these terms are used in that general meaning.

2.3 Significance of interdisciplinarity

In recent years, interdisciplinarity has become synonymous with all things modern, creative and progressive about scientific research. Almost every new research effort calls itself interdisciplinary. Interdisciplinarity has become a kind of sales argument. It has become a label of good research ([9]).

The interdisciplinary imperative has arisen from complexity of existing problems. Thinking collectively about complex problems requires crossing boundaries both horizontally (across disciplines) and vertically (across experts, policymakers, practitioners, and the public) ([11]).

There are assumptions that interdisciplinary research has vast potential for societal good in the form of new kinds of knowledge. It is believed that more interdisciplinary research is better than less ([9]).

2.4 Barriers to interdisciplinarity

There are numerous barriers impeding inter-disciplinarity: the difference in values, the difference in theories and models, the difference in epistemology, the difference in the way in which society interacts and organizes academia; the relative absence of motivation ([11]).

Values are embedded in all inquiries and at all stages: in the choice of questions, theoretical positions, and style of research. However, scientists are loath to acknowledge that. Since they are expected to provide "objective" advice for problem solving, acknowledgment of value not-neutrality and importance of researchers' normative positions is even more difficult. Because of that unrecognized difference in values, the collective judgment required in interdisciplinary research is especially difficult.

The same phenomenon is often studied by different theories or models in different disciplines. The superiority of one theory over another in a particular case is difficult to prove. Commitment to one's school of thought often is so important that a need for exploring assumptions embedded in used theories and models and their suitability

for considered context is neglected.

The epistemic barriers have been the most emphasized ones in the literature on interdisciplinarity. They involve incompatible styles of thought, research traditions, techniques, and different languages ([9]). Very often there is epistemological sovereignty in interdisciplinary research, i.e., the research ends up entitling a single discipline or epistemology, incorporating others only in a support or service role ([12]). Research questions for a project are formulated and then, because of the complexity of the system under study, a scientist from another discipline is invited to help in the investigation. But, the research usually remains framed by the theory of the researcher who formulated research questions, what limits the scope of other researcher's contribution.

Because of epistemic differences, a researcher in the interdisciplinary team often finds that other members of the team define the problem quite differently or seek different types of answers. That's why too much effort for communication and sharing knowledge within the team is required. Moreover, collaboration between scientists even within the same broad area can be difficult from the same reason ([11]).

The way in which society interacts with and organizes academia influences on interdisciplinary research. The importance of a certain discipline or a particular disciplinary crossing is often determined by society, i.e., outside academia. There are significant differences in the manner in which society treats the social and natural sciences. There is a deep-rooted belief of the superiority of the natural sciences over social ones. That's why, for example, social problems in which some importance of the technical dimension is recognized are often solved by teams of researchers from the natural sciences. Extant social viewpoint on different importance of sciences contributes to the relative absence of motivation of researchers from some disciplines to work together ([11]). Society doesn't value enough the problem driven knowledge because of its lack of abstraction ([9]).

The superficial success of the label "interdisciplinarity" goes together with an enormous resistance against interdisciplinarity by the most powerful groups in society ([1]). Whole human culture founded its success in fragmentation and specialization of labor. The idea of interdisciplinarity is, however, contrary to the idea of the labor division in the intellectual domain ([9]).

2.5 A need for changes in understanding human life

It has been recognized that some changes in understanding human life are needed in order to improve interdisciplinarity. There is a need for answering some basic questions such as "What is a human being? How does a human being function normally in a normal environment?" ([1]). There is a need for understanding and appreciating diversity of human life. There is a need to understand that drivers of human behavior seen from different views (for example, material benefits from view of mainstream economists, power from the view of certain schools within sociology, and cultural norms and value systems from certain schools within anthropology) aren't mutually incompatible ([11]). There is a need for epistemological pluralism which recognizes that, in any

given research context, there may be several valuable ways of knowing, and that accommodating this plurality can lead to more successful integrated study ([12]).

Social science theories and their adherents have to take into account the constraints imposed by natural resources and processes on human actions ([11]). The dimensions of values, interests and power have to be acknowledged in any knowledge building ([16]). Participants in inter-disciplinary research projects must overcome various biases and prejudices that accompany disciplinary training; they need to be self-reflective about the value judgments embedded in their choice of theories and models, willing to give respect to and also learn more about the "other," and able to work with new models and theories used by others ([11]).

Reflecting on how to think across academic disciplines is only a first step toward bridging the various divides involved in collectively addressing complex problems ([11]). It would be clear what means that fields across the natural and social sciences are well-connected in the web of intellectual ties. There is a need for system wide shift in structuring academic careers ([9]).

An understanding how people function in everyday life might be helpful in understanding interdisciplinarity. In order to make everyday decisions, interpret phenomena, and generally make sense of the world, people do informal interdisciplinary analysis drawing on and integrating diverse information ([15]). They have multiple personalities (for example, the economic one in the market, the political one in elections, and some other personality in the interaction with other people). They are driven by different factors in different activities.

3. THEORY OF MODAL ASPECTS

The diversity and the richness of human life require consideration of several aspects. Dooyeweerd's theory of modal aspects, presented in this paper according to [2] and [3], shows how aspects account for diversity and coherence, being and doing, normativity, etc.

3.1 Spheres of meaning

Aspects are spheres of meaning. Each aspect is some kind of origin, which enables being, doing, knowing, and the like.

Aspects cannot be directly observed, but only as they are expressed in things, events, situations, and so on, as ways these can be meaningful. Each entity has aspect(s) that determine its nature, its purpose. Each aspect is centered on its kernel meaning.

Dooyeweerd formed a list of 15 aspects of everyday experience: quantitative, spatial, kinematic, physical, biotic, sensitive, analytical, formative, lingual, social, economic, aesthetic, juridical, ethical, and pistic. The list of aspects with their kernel meaning is given in the table **Error! Reference source not found.** (columns "norms" and "sciences" are used later).

Aspectual meaning is grasped by the intuition. Intuition isn't absolute and it is subject to cultural, experiential and pistic modification. From the analytic aspect onwards, the full meaning of aspects cannot be understood without reference to human living. So, for example, the lingual aspect is not about abstract notions of symbolic signification but about the human activities of recording, informing, and communicating.

Aspects are irreducibly distinct in respect of their meaning. Irreducibility, usually called sphere sovereignty, means that no aspect can be eliminated in favor of another. Aspectual irreducibility provides philosophical grounds for understanding diversity and helps us to avoid overlooking important factors. In everyday experience, every aspect is important: none can be dismissed as less meaningful, less interesting, or deserving less of our attention.

Aspects are in harmony. Their laws are not in conflict. No aspect is absolute. No aspect can be the foundation for all the others. No aspect has its full meaning within itself. Each aspect refers to, or relates to each of the others.

Dooyeweerd's suite of aspects/spheres

Table no. 1

Sphere	Kernel meaning	Norms	Sciences
Quantitative	Amount	Sequence	Mathematics
Spatial	Continuous space	Simultaneity	Geometry, topology
Kinematic	Movement	Dynamism	Mechanics
Physical	Energy, mass, forces, material	Persistence	Physics, chemistry, materials and fluid sciences
Biotic/organic	Organism, life functions	Health: integrity of organism	Biology, ecology
Psychic/ sensitive	Sense, feeling, response	Sensitivity, responsiveness	Psychology
Analytical	Distinction, concepts, logic, pieces of data	Clarity, non-contradiction	Logic, analytical science
Formative	Structures, construction, processing, goals, technique, technology, history	Achievement	Design science, engineering
Lingual	Symbolic signification	Understandability	Linguistics, informatics
Social	Social relationships and institutions, roles	Respect	Social sciences
Economic	Management of scarce resources	Frugality	Economics, management science
Aesthetic	Harmony	Rich harmony	Aesthetics
Juridical	Due, rights, responsibilities	Justice: due, appropriateness	Legal science
Ethical	Self-giving love, generosity	Self-giving love	Ethics
Pistic	Vision, commitment, belief	Faithfulness	Theology

Source: (Basden, 2010), pp. 13-20

Different aspects, as different spheres of meaning, provide different rationalities. The aspects pertain, across all situations, all cultures, all times, whether we acknowledge or understand them, or not.

3.2 Aspects and norms

The earlier aspects (especially quantitative to physical) are determinative while the later aspects (especially from the analytic aspect onwards) allow more and more freedom. Freedom means that the future is opening (it is not determined). People have freedom to go against laws of non-determinative aspects, but they are never free from repercussions of their doing. Beneficial or positive repercussions come from functioning in line with the laws of aspects and detrimental or negative repercussions come from going against the laws of aspects.

Aspects are spheres of law that establish a variety of norms (see table **Error! Reference source not found.**). Normativity distinguishes what is "right" or beneficial from what is "wrong" or detrimental. It yields a distinct type of good and evil for each aspect. In general, time-response of repercussion lengthens with the aspects, from almost immediate in the earliest aspects to centuries in the pistic aspect.

Human activities, in order to be sustainable, have to be in line with each aspect. Since each aspect is important, neglecting any of them threatens successfulness of human activities. That's why all aspects and inter-aspectual dependencies have to be considered.

3.3 Aspects and science

Since universality, which science seeks to know, is of the law side, the role of science is to study the laws of aspects. Different aspects are studied by different sciences (see table **Error! Reference source not found.**). Integral scope of reality is reflected by philosophy. Philosophy concerns itself with the connections between aspects.

When human beings engage in a disciplinary activity, they focus on certain things that are meaningful to them. The things that are the most meaningful may be thought of as forming a sphere of meaning. Things that are less meaningful are in other spheres of meaning. That's why, though centered on a single sphere, the work and research of the discipline reach out to other spheres, which are progressively less meaningful ([3]).

In other words, each aspect defines the central interest of a scientific area, determining the types of entities, processes and laws about which each science concerns. Each discipline may, therefore, be seen as centered on one sphere of meaning, while also concerning itself with others. If a discipline has two aspects at its centre, one of them is usually primary.

Disciplines in the same aspect are sibling ones. Each of them has different links with other aspects.

4. TOWARDS OVERCOMING BARRIERS TO INTERDISCIPLINARITY APPLYING SPHERES OF ASPECTS

Since Dooyeweerd's philosophy could help in understanding human life, it could be used for building understanding of interdisciplinarity. In this section the barriers impeding interdisciplinarity are examined from the view of spheres of meaning and the need for improving understanding of human life is considered by applying Dooyeweerd's philosophy.

4.1 Spheres of meaning and barriers to interdisciplinarity

In order to understand the barriers impeding interdisciplinarity using Dooyeweerd's theory of modal aspects, we have to consider what it might tell us about them.

The difference in values

The difference in value exists. It could be explained by different perspectives of researchers and their life-and-world-views (LWVs). A LWV (Weltanschauungen) embodies deep assumptions, aspirations and quality criteria. It is often centered on one aspect and, as such, it is often reductionist one ([2]). Thus, researchers in an interdisciplinary team have different aspectual profiles. Since different aspects are spheres of different meaning with different norms and different rationalities, researchers in an interdisciplinary team do have different values.

Dooyeweerd has very explicitly stated that there is no truth in itself, i.e., there is no truth which is self-dependent and able to stand as truth without reference to anything else ([2]). In other words, there is no objective knowledge and no objective advice from an interdisciplinary research could be expected.

Difference in theories and models

Different aspects are different sphere of meanings and are studied by different methods ([2]). Since all aspects are important, no method form one aspect is superior over a method from some other aspect. The main sphere of meaning of a science and its links to other aspects (sciences) could help in understanding assumptions embedded in a method and possibilities of its linking to other method.

Difference in epistemology

Dooyeweerd has pointed out that each aspect requires distinct way of knowing. In other words, there is difference in epistemology in different aspects, i.e., in an interdisciplinary team.

Recognizing importance of inter-aspectual links in a problem which has to be solved in an interdisciplinary research could help in better understanding what styles of thinking and research approaches have to harmonize, as well as whether initial research question reflects well these links.

Difference in the way in which society interacts and organizes academia (and relative absence of motivation)

Understanding that all aspects are important could help in building understanding that no science from any aspect is superior over a science from some other aspect. Understanding main sphere of meaning for the problem under consideration, and how this sphere is connected to others, could help in forming good team and proper evaluation of its result. Causes for relative absence of motivation would be removed.

Intellectual labor division reinforces further division of research domains. Narrowing of domains makes more

sibling disciplines and so more links in a web of domains of an interdisciplinary research. Since each sibling discipline is somehow distinct from others, the web is more complex, and there are more barriers to successful implementation of interdisciplinary research.

4.2 Dooyeweerd's philosophy and a need for changes in understanding human life

Dooyeweerd was a philosopher who was interested in everyday experience. His interest was in the whole breadth and depth of reality.

It is the philosopher who tried to understand diversity of human life and how human being functions in everyday life. He recognized the suite of aspects, which are irreducible and in harmony. An aspect is distinct sphere of meaning, distinct way of being, distinct rationality, distinct mode of being, distinct way of functioning, distinct sphere of law, distinct kind of normativity, distinct type of repercussion, and distinct way of knowing.

In other words, Dooyeweerd pointed out to a need for epistemological pluralism, for consideration constraints of natural resources and processes on human actions, and vice versa. He recognized that building knowledge is dependent on pistic, ethical, social, and other aspects.

In order to function well in an interdisciplinary research, all participants have to behave well in all aspects. They have to care about colleagues and their values, theories, methods, and assumptions, as well to try to harmonize research approaches of all participants.

Thus, Dooyeweerd's philosophy supports understanding a need for changes in understanding human life. Well functioning of all involved in an interdisciplinary work, in Dooyeweerd's sense, would allow better interdisciplinary work, and better organized academia and greater social benefit.

5. INFORMATION SYSTEMS–INTERDISCIPLINARY FIELD OR SCIENCE DISCIPLINE?

The field of information systems is a relatively new research field. An information system is seen as an interdisciplinary combination of the social and technical spheres of organizational studies and computer science. There have been a lot of crises in the IS field, similar ones in other interdisciplinary fields.

Dooyeweerd's notion of spheres of meaning has been used for consideration a direction which might be taken if IS were to be a discipline. A proposal of the definition and dignity of the IS discipline was given ([3]).

5.1 Information systems as inter - disciplinary field

The field of information systems (IS) is a relatively new one. Its development is closely linked to the development of information technology (IT) which is very recent. The first computers were built in the 1940s and first business application supported by IT at 1950s.

The core concern of the IS field is taken to be orderly provision of data and information within an organization using IT, so that provided information are relevant to ever-changing activity of the organization and / or its members ([5]). The potential of IT has been so seductive that IS researchers and practitioners are often not interested in wider questions as what new IT really brings to their users

and what the social implications of IT are.

The idea of nature of an IS has been changed. An IS was seen first as a technical one, then as a technical system with some social repercussions, and afterwards as a socio-technical system, i.e., as a social system with technical implementation ([8]). Thus, nowadays an information system is often seen as an interdisciplinary combination of the social and technical spheres of organizational studies and computer science ([3]). However, since information is a rich phenomenon and very important one for IS, it has been suggested that an IS could not be seen only as a technical system and as a social one, but also as a knowledge system ([10]).

As well as interdisciplinary studies in general, there are many barriers for success in the IS field. Very different assumptions have been made in the IS field, and they led to very different schools of thought in IS work ([5]). Those schools imply different values, different theories and methods, and different epistemologies. They effect IS departments position in university. IS departments are most often situated at technical faculties or at schools of business and management.

All IS developers approach to their task with a number of explicit and implicit assumptions about the nature of human organizations, the nature of their task, and expectations of them. Very important assumptions for IS development are ones associated with the way of systems developers' knowing (epistemological assumptions) and ones relating to their view of social and technical world (ontological assumptions). Different assumptions lead to different systems development approaches, different roles for IS developers and different system outcomes ([7]). About hundred theories, including the theory of modal aspects, are used in IS research ([14]). These theories are from different science disciplines.

Such state in the IS field leads to different, often unrealistic, expectations of IS users. For example, if a IS user sees IS developer as an expert, he will be expected to know how to develop IS that optimally supports organization. Such IS developer could assume a rational organization, with discoverable objective cause-effect relationships. But, the nature of modern organization isn't such. On the other hand, if the IS developer has different assumptions, his values and assumptions will be in conflict with ones of their users. Even if IS users and developers have the same beliefs and assumptions, they, by a rule, have different education, and that's why they will use different theories and models, and probably they will be not able to understand well each others because of their different professional languages.

Besides that, if IS developers or researchers use social not-acceptable approaches, they could be evaluated as unprofessional ones ([13]). Because of extant way of scientists' evaluation, researchers are unwilling to do right, hard investigation, but prefer easier and better evaluated technical ones ([4]).

In other words, the barriers impeding interdisciplinarity has been recognized as barriers to developing an IS. The barriers of different values, different theories and models, different epistemologies, as well as the way in which university is organized, have been recognized. That's why the fact that IS practice is very different from IS theory

([6]) is not very much surprising.

5.2 Information systems as a science discipline

In order to define the IS discipline, by finding its dignity and destiny and suggesting how the IS discipline can relate to other disciplines by way of responsible application, foundation and anticipation, Dooyeweerd's spheres of meaning has been used ([3]). In that research the focus was not on what is meaningful within IS discipline itself, but on what is meaningful to IS researchers and practitioners, to others and to the broader scheme of things. Respecting other disciplines allowed understanding what future for information systems is worthwhile and beneficial in the broader scheme of things. In that way, a proposal for the dignity, destiny and responsibility of the IS discipline was established.

It was determined that most meaningful sphere of meaning for the IS discipline is the lingual one. It is the sphere in which the human activities of crucial importance for an IS (i.e., recording, informing, and communicating by means of signification, by symbol-as-expressed-meaning) are expressed and guided by a norm of understandability.

Sibling disciplines to the IS discipline are languages, linguistics and semiotics, and media. The presupposition of advanced technology differentiates the IS discipline from languages. Treating IT users as full, multi-aspectual human beings rather than as mere language-users, signifiers or audience differentiates it from linguistics, semiotics and media.

IS links to other spheres of meaning was investigated too. It was considered how they affect, and are affected by, human informing, recording and communication.

The neighboring aspects are very important. The formative aspect, as the neighboring foundational aspect, offers important topics for the IS discipline: the structure and processing of information, the creative human activity of IS development, and technology, techniques and artifacts involved in an IS. The IS discipline is interested in social topics relating to recording, informing and communication from the informational angle, not the social per se.

The analytical aspect is exhibited in IS as individual pieces of data. Availability of data types determines what can be easily said or understood. The economic aspect is important because of widespread use of IS in business, as well as because of the topics of information resources management.

The IS discipline itself should not penetrate far into formative and analytic matters as such, and should rely on disciplines centered on those aspects to do so. Thus the IS discipline would relate to foundational disciplines with mutual respect. The IS discipline relates to anticipatory disciplines in a spirit of willing service.

Of course, all aspects have been considered in order to build a fuller picture. For example, the juridical aspect is relating to emancipatory IS, and the aesthetic aspect to IS architecture in that picture.

In other words, the IS discipline can be defined and suited by reference to the spheres of meaning that are most important to it. The dignity, destiny and responsibility of information systems as a discipline is that it opens up new potential of the lingual aspect in the service of other aspects in a way that no other discipline can.

6. CONCLUDING REMARKS: TOWARDS MORE SUCCESSFUL INTERDISCIPLINARY RESEARCH

It has been recognized a need for philosophy in a deliberation on interdisciplinarity. Needs for better understanding human life in order to improve interdisciplinarity ([1]) and for better understanding the barriers impeding interdisciplinarity ([11]) have also been recognized.

Dooyeweerd was a philosopher who was interested in everyday human experience. His interest was in the whole breadth and depth of reality. His theory of modal aspects shows how irreducibly distinct aspects account for diversity and coherence, being and doing, normativity, etc.

In this paper it was investigated how his philosophy recognizes barriers impeding interdisciplinarity and how his spheres of meaning could help in building understanding of human life needed for better interdisciplinary activities.

On the other side, investigations on applying spheres of meaning in the IS field, have shown that the spheres of meaning cast a different light on interdisciplinarity, that interdisciplinarity can be seen, not as bringing different processes or phenomena together, but as looking at different aspects of the same phenomenon ([2]). By looking at different aspects of the phenomenon of information systems, the frameworks for IS understanding and the proposal for the definition and dignity of the IS discipline have been given.

Since the spheres of meaning could be helpful in better understanding and improving interdisciplinarity and that they have been used for IS phenomenon, in which there are problems similar to ones of other interdisciplinary phenomena, a similar way could be helpful for other interdisciplinary phenomena. In other words, a central focus of interdisciplinary research phenomenon should be found, as well as its links to other aspects (and disciplines) by way of responsible application, foundation and anticipation.

It should be expected difficulties in disclosing the central sphere and links to others in some cases, but thinking about spheres of meaning of the phenomenon and their links should help in building more understanding of extant and possible barriers impeding that interdisciplinarity activity.

Defining and suiting the phenomenon by references to the spheres of meaning, like in the case of the IS phenomenon, might be an indication that it matures to be a discipline, with disclosed definition, dignity, destiny and responsibilities.

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