What is that Thing Called
Internal Quality Assurance System? *

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Abstract

Purpose─The main purpose of this paper is to explore and to propose a comprehensive definition and conceptualization of an Internal Quality Assurance System (IQAS) for Higher Education Institution (HEI) by using Work Systems Theory (WST) as a theoretical lens.
Design/methodology/approach − The paper follows a multiple method research approach by grounding on a literature review and validating against a published study case.
Findings − After analysing a number of IQAS definitions, the paper shows how these systems can be defined as a specific case of a "work system", the main unit of analysis and conceptualization provided by WST. To further demonstrate the academic relevance and practical applicability of the proposed conceptualization, we provide a concrete instantiation as a "work system" of the IQAS implemented in a real HEI case.
Research limitations − Additional instantiations of IQAS implemented in other different real contexts should be conducted to foster the generalizability of the proposed framework.
Practical implications ─ Using the same theoretical lens as a reference point, the paper provides insights and directions for further research as well as potential future uses and practical applications of the derived conceptualization.
Originality/value − To our best knowledge, this is the first comprehensive formal IQAS definition and first WST-based conceptualizing an IQAS for HEIs.

Keywords
Internal Quality Assurance System (IQAS); Higher Education Institution (HEI); Work
Systems Theory (WST); multiple method research; IQAS definition; IQAS conceptualization.

1. Introduction

Quality assurance has nowadays reached a central place on the policy agenda of modern universities all over the world (Asif & Raouf, 2013, p. 2010; Tarí & Dick, 2016, p. 273). The fact is especially relevant for european Higher Education Institutions (HEIs) which have been seriously affected by regulatory reforms fostered by the Bologna Process, which has lead them to the institutionalization of new quality assurance practices and quality management mechanisms (Pucciarelli & Kaplan, 2016; Vukasovic, 2014). Among other developments, HEIs were forced to plan, design and implement their own Internal Quality Assurance System (IQAS) from a set of quality standards, principles and recommendations established in the European Standards and Guidelines (ESG) (Manatos et al., 2017a, pp. 342–343).

Whilst both practitioners and researchers have recognized that IQAS implementation is a complex and challenging task for many HEIs (Papadimitriou & Westerheijden, 2010, pp. 229–230), research focused in establishing theoretically-sound definitions and characteristics of IQAS is still scarce (Cardoso et al., 2017, p. 339). Despite existing notable difficulties to reach a consensus, when looking at the specialized literature, it is possible to find several efforts devoted to the provision of more comprehensive and common definitions and understandings for concepts such as quality, quality assurance or even quality management in HEIs (Elassy, 2015; Harvey & Green, 1993; Ryan, 2015). In contrast, we were not able to identify a similar piece of work for the definition and conceptualization of IQAS. Thus, our main basic assumption behind this paper is that, to our best knowledge, there is nowadays no clear and comprehensive formal definition providing common understanding of what is an IQAS (Ali et al., 2018; Tutko & Naumov, 2014, p. 124).

Two main gaps may be inferred from the current existing body of knowledge to underpin such statement. On the one hand, at present several vague definitions of IQAS using different implicit or explicit conceptualizations have been used in the academic literature and the professional practice (Asif & Raouf, 2013; Chen, 2012; Kamat & Kittur, 2017) − *scope gap* −. In general, there are a lot of papers addressing topics related to IQAS that do not include a working definition of the concept – i.e. as an artefact "itself" –, not even in their introductory sections. For instance, many studies tend to explicitly mention the term, but next, they just assume what an IQAS is or means. In other cases, they simply rely on the more generic concepts of (internal) quality assurance/management in HEIs to introduce the paper.

On the other hand, and to further confuse the situation, semantic instability also appears − *terminological gap* − when alternative expressions like "*quality management system (QMS)*" (Moturi & Mbithi, 2015), "*quality assurance – or management – system*" (Rosa et al., p. 129), "*institutional quality assurance schemes*" (O'Sullivan, 2017, p. 191)*, "internal systems of quality assurance*" (Stensaker & Leiber, 2015, p. 337) "*system of internal quality assurance*" (Maciejczak, 2016) or even *"internal quality assurance management system"* (Aspranawa & Wiyono, 2017, p. 762) are commonly used to describe, essentially, the same phenomenon. Paradoxically, when looking to the UNESCO glossary of terms and definitions (Vlăsceanu et al., 2007) or the Analytic Quality (Harvey, 2004-18), none of the previous expressions appears formally defined. Only the more generic expression "*quality system*" is referred in the latter as "*a set of integrated policies and practices that structure the management, implementation and adaptation of quality assurance processes*", which, in our eyes, should be regarded as an insufficient definition. In sum, we believe that to better understand and research the relatively new phenomenon of IQAS in HEIs, a common terminology and more shared understanding would be helpful.

In this paper, we aim to bridge these gaps by using Work Systems Theory (WST) – and in particular, the concept of *work system* as the main foundation provided by WST – as a theoretical lens for proposing a consolidated definition and a shared conceptualization of IQAS for HEIs. We expect to contribute to the existing body of knowledge by: (i) providing new insights and better understanding on IQAS; (ii) showing how to regard and think about those systems as work systems. Such view may help to dismiss the current existing potential ambiguity, confusions or inappropriate assumptions regarding the phenomena, leading to clearer communication among practitioners and scholars. Nonetheless, we want to point out that, despite presenting an integrative theoretical point of view, this paper has to be typified as a conceptual paper. Hence, our intent is to share and discuss our view, impressions and findings with the research community in the area of excellence and quality management, with the aim to explore, at some point in the future, the fitness of our proposal, at least as a starting point. Readers are invited, thus, to send us their comments and feedback on this work.

The remaining of the paper is structured as follows: first, we briefly introduce WST and the methodological approach followed. In section 4, and based on diverse definitions of IQAS found in the literature, we develop a consolidated definition and a common "reference" conceptualization of an IQAS, using WST as a theoretical background. To further demonstrate the utility of the proposal, we next present a sample instantiation of the IQAS implemented in a real HEI case, in terms of our WST-based conceptualization. Section 6 discusses ideas and potential opportunities for research and practice that can be derived from viewing IQAS as work systems. Finally, we close up with conclusions and limitations.
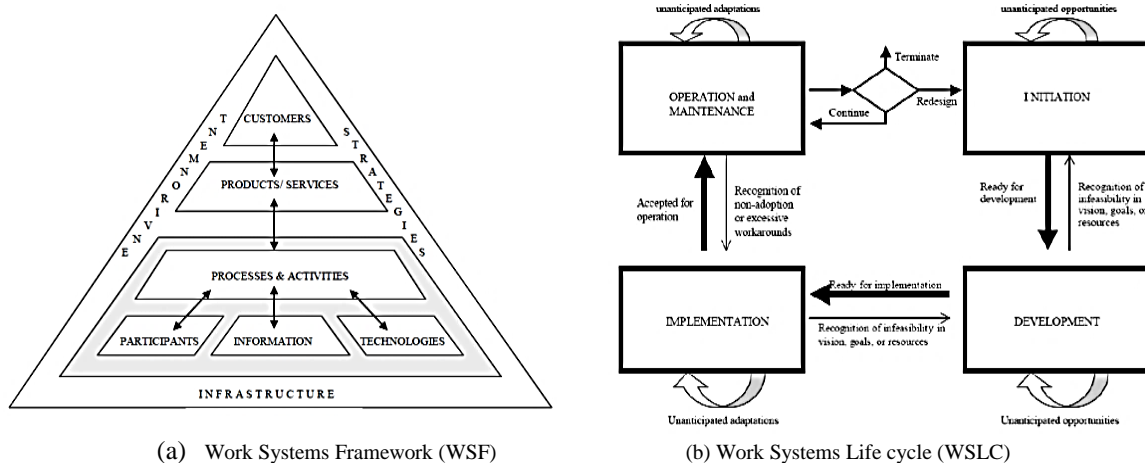
2. Work Systems Theory

Work System Theory (WST) is integrated body of theories born within the Information Systems (IS) discipline providing a socio-technical perspective and a systems-view for analysing systems in or across organizations, whether or not those systems make use of information technology in an intensive way (Alter, 2013b, 2015). It builds on the idea that the concept of *work system* is a natural unit of analysis for thinking about systems in organizations: "*in organizational settings, work is the application of human, informational, physical, and other resources to produce products/services. A work system is a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products/services for specific internal and/or external customers*" (Alter, 2013b, p. 75). Complementing the central concept of work system, WST incorporates two additional frameworks: the Work System Framework (WSF), the static view of a work system at a particular point in time, and the Work System Life Cycle (WSLC), depicting its dynamic evolution (Alter, 2013b, 2015).

On the one hand, WSF defines nine elements as the main components representing a work system in an organization (Figure 1a). The four elements (process and activities, participants, information and technology) surrounded by a grey trapezoid are considered as the core elements inside of a work system. Environment, infrastructure, and strategies are elements viewed outside the work system even though they may have direct impacts inside. Finally, customers and products and services may be viewed as *"partially inside and partially outside because customers often participate in the processes and activities within the work system and because products/services take shape in the work system*" (Alter, 2013b, p. 79). Arrows between components represent links through which change in one component may impact other

components, which in turn, should be appropriately aligned with the work system's goals. On the other hand, WSLC represents the dynamic view of a work system, that is, the iterative process through which it evolves over time due to a combination of planned and emerged unplanned changes that occur through improvements, adaptations, and workarounds (Figure 1b). For the purposes of the present work, however, only the central idea of a work system and the static part of the framework (i.e., the WSF) will be formally used. Readers interested in gaining a better understanding of WST are referred to the references included throughout the present section as well as the personal page of Professor Dr. Alter [†].

Figure 1 –Work Systems Theory Framework

(a) Work Systems Framework (WSF)

(b) Work Systems Life cycle (WSLC)

Source: Alter (2013, 2015)

Given the fact that work systems represent a general case for thinking about systems in organizations, several special cases of work systems that inherit most of the properties that are applicable to the general case can be identified (Alter, 2013b, p. 77). Examples of such special cases can be IS, generic projects (as temporary work systems), supply and value chains or service systems (Alter, 2013b, 2015). Considering this background, our main perspective in this paper is that IQAS can also be considered as a special case of work system.

The rationale for this assumption is as follows: (i) generic quality management systems have been characterized as socio-technical systems (Øgland, 2008, pp. 474–476; Prida & Grijalvo, 2008), involving both social systems – i.e., people, culture, structure, working practices, etc. – and technical systems – physical artefacts, software, hardware and other equipment supporting work practices, working and interacting together aiming to achieve a desired outcome (Winter et al., 2014); (ii) as a particular class of these systems tailored for HEI settlements, IQAS should also be viewed as socio-technical systems (Sahney et al., 2008, pp. 505–507); (iii), therefore, using WST as a theoretical lens for our study is justified insofar as work systems are defined as one particular socio-technical approach (Alter, 2013b, pp. 76,90-91). In other words, assuming that HEIs can be viewed as organizations consisting of multiple work systems (Díaz-Méndez et al., 2017) – student's admission, delivery of teaching activities, student's support services, etc. – we hypothesize that their IQAS can be considered as one of these operational work systems responsible for the establishment of adequate procedures and mechanisms to assure

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[†] See *http://www.stevenalter.com/work-system-basics-2/*

and ultimately improve the quality and performance of the educational services delivered by HEIs.

In addition, WST may provide an opportunity for studying in a comprehensive, holistic and unified way the maturity degree level achieved in the implementation of an IQAS in particular HEIs, in line with current calls for a more integrated view of quality management in HEIs (Kamat & Kittur, 2017, pp. 524–525; Manatos et al., 2017b). Whilst accepting that there already exits evidence of applying WST-oriented approaches to analyse work systems within a HEI (Basitt et al., 2013), to the best of our knowledge this work represents the first attempt to apply WST as a theoretical lens for the phenomena of IQAS implementation, and therefore, here relies the originality of the paper, together with the resulting IQAS definition itself.

3. Methodological approach

For the purposes of the paper, we adopt a multiple method research approach (Tarí & Dick, 2016, p. 290) inspired by similar previous studies devoted to analyse through a WST perspective existing work systems in different fields (Alter, 2008; Johnsen et al., 2016; Marjanovic & Murthy, 2016).

First, and following basic foundations for conducting traditional qualitative literature reviews (Hart, 1998), we have conducted a comprehensive but institutionally highly relevant literature search in order to identify existing definitions of IQAS for HEIs. We queried several multidisciplinary digital platforms (Scopus, Science Direct, Taylor and Francis, Emerald, ABI/Inform, Google, Google Scholar) using terms like "*internal quality assurance system*", "*IQA system*", "*quality management system and higher education*" as well as similar synonym expressions, as those ones mentioned in the introductory section. To widen the scope and coverage of potentially relevant information sources, no time period or document type restriction was set for the search. Hence, we deliberately sought to include materials used by both practitioners and scholars, including all types of documents representing as many as possible heterogeneous perspectives of the IQAS concept. Searches were executed iteratively between September 2017 and March 2018 in order to incrementally identify new emerging and relevant potential sources.

Next, and using "*key word in context*" facilities provided by several software tools (i.e. Acrobat Reader, Ms Word or Google Chrome) we both scrutinized and manually skimmed the full text of potentially relevant identified resources, looking for specific text sections or paragraphs containing definitions of IQAS. Signpost keywords and expressions – like "*an IQA system is...*" – were used for such aims. The main criteria for final inclusion of the uncovered definitions (besides credibility of the producer of the content) was to choose those ones referring to generic elements considered in the work system definition (i.e., stated by the WSF) as they were used afterwards to justify and provide the theoretical grounding for conceptualising an IQAS as a concrete special case of an operational work system.

Finally, to demonstrate the academic relevance and practical applicability of the proposed conceptualization, we developed a concrete instantiation as a work system of an IQAS currently implemented in a particular HEI. The core information for such instantiation was collected from a recently published study case. Two main criteria were used to pick the study case: (i) the free availability of the case, in order to facilitate readers access to it; and (ii) the completeness and richness of the information described by the case about the implemented IQAS, in order to highlight the potential explanatory power of our proposal.

4. Towards a consolidated framing and understanding of IQAS

Due to space constraints and assuming the purposes of the present paper, in Table 1 we show a representative sample of IQAS definitions found in the literature. The source type column refers to the origin and type of the heterogeneous information sources consulted, revealing a great diversity in nature. For each definition, core work system elements addressed (as stated by WSF) are highlighted in bold. Terminological alternatives used to describe de phenomena (see introductory section) are underlined too. Collectively, findings in Table 1 show that major concerns arise about the completeness of proposed definitions as, for one reason or another, they only provide a partial view of what an IQAS is, by emphasizing several items and ignoring others. For example, Daromes' (2016) definition primarily highlights accountability and compliance issues, whereas the Inter-University Council for East Africa's (IUCEA 2010) proposal mainly stresses HEI's enhancement and continuous improvement. Monkienė & Lamanauskas (2014) explicitly mention the dynamics of an IQAS, whereas Cardoso et al. (2017) focus on the structural components and elements. Finally, Sârbu et al. (2009) or Tavares et al. (2017) provide quite elaborated definitions, but perhaps they place too much emphasis on an internal perspective on how an institution views quality assurance. Contrarily, Kettunen (2008) offers a more simplistic vision of an IQAS, but placing more emphasis in environmental or external requirements.

Table 1 – Definitions of an IQAS found in the literature

Author/Year	Source type	WSF constructs	Definition
(Sârbu et al., 2009, p. 386)	Academic paper	customers (i.e. clients), information (i.e. policies), processes & activities, products & services (i.e. results)	"the quality assurance system in higher education refers to the mechanism by means of which the university grants, both to **the internal clients (employees, students) and to the external** ones, confidence that all the conditions are met to attain the assumed standards. It can be defined as a set of **policies,** systems **and processes** directed at the **maintenance and enhancement of educational quality**, relying on constant assessment and comparison between **intended results and obtained results**, with a view to identifying sources of dysfunctional **activities.**"
(Tavares et al., 2017, p. 1294,1298)	Academic paper	products & services (i.e. results) , information (i.e. quality policy) , technology (i.e. information system), participants (i.e. stakeholders) , processes & activities (i.e. procedures, responsibilities)	"an internal quality assurance system would entail the existence of a **quality policy**, the creation of formal **mechanisms and structures**, **participation** of **stakeholders**, articulation with **information systems**, **information transparency** and **continuous quality improvement**. [...]. Internal quality assurance is **expected to improve the institutions' core missions**: teaching and learning, research and activities related to community engagement. [...] We understand a formalised internal system to imply a coherent and structured approach which is **meant to ensure quality** in every aspect of the institution's **activities**. This presupposes the existence of a quality policy articulated with the pursuit of the **institution's objectives**, as well as clearly defined internal **procedures, responsibilities** and means necessary to attain these objectives."
(Daromes, 2016, p. 69)	Professional book	dynamics or lifecycle (WSLC) of the work system (plan, implementation, control), clients (i.e. stakeholders)	Internal quality assurance system is defined as a **plan, implementation, control, and development** of the university's quality standards in order to obtain **stakeholder satisfaction** and ensure that the quality of graduates in accordance with the standard competencies defined."
(Michalska-Ćwiek, 2009, p. 744)	Practitioners paper	strategy (i.e. structure) , infrastructure (i.e. resources), products & services (i.e. growth of workers, lowering costs)	"The quality management system contains the organization **structure**, competence division and responsibility, procedures, **processes** and **resources**. It defines the conditions and methods of education, establish **the proof of the value of the offered educational service**, makes possible the comparability of educational institutions [...],can decide in advance about the choice of the university, makes the chance on **the growth of workers** motivation to better work and **leads to lowering the costs**"
(Mårtensson, Roxå, & Stensaker, 2014, p. 534)	Academic paper	products & services (i.e. evaluation/monitoring of teaching), strategies (organizational control)	"there is increasing evidence that higher education institutions have also built up internal quality assurance schemes – here understood as **formal systems of evaluation** and **monitoring** of their **teaching and learning** provision under strong **organizational and managerial control**"

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Author/Year	Source type	WSF constructs	Definition
(Kettunen, 2012, p. 519)	Academic paper	information, strategy (i.e. administrative units), process & activities, clients (management, personal, students, products & services (public confidence)	*"The quality assurance system produces information about how the institution and the extent to which its administrative units have succeeded in their activities. The information is used to improve the activities and ensure that the processes are reasonable and can be controlled. The quality assurance system communicates the outcomes and activities of the institution to the management, personnel, students and external stakeholders. The system enhances public confidence in the quality of education and other activities."*
(IUCEA, 2010, p. 9)	Governmental organisation handbook	products & services (and improving quality and standards teaching, research, service to community)	*"An Internal Quality Assurance system (IQA system) is a system aiming at setting up, maintaining and improving the quality and standards of teaching, scholarship (student learning experience), research, and service to community. The overall objective is to continuously promote and improve the quality of the core activities and the institution as a whole."*
(Monkienė & Lamanauskas, 2014, p. 47)	Academic paper	dynamics or lifecycle (WSLC) of the work system (i.e. maturity stages), information (i.e. documentation)	*"Quality management system implementation in a higher school is not a short- term process. There can be distinguished several organisation quality management system maturity stages. According to certain criteria, college quality management systems are ascribed to some maturity stage [Quality management system creation, documentation (I stage); Quality management system is created and functions (II stage); Quality management system works and develops (improves) (III stage)."*
(Visscher, 2009, p. 7,171)	Professional book	information, technology (i.e. computer supported)	*"Quality Assurance Systems (QASs): this term refers to systems that have been designed and built to support the collection, processing and presentation of data relating to institutional quality".* *"QASs can be seen as information systems (computer supported or not) providing schools with information on their functioning".*
(ENQA, 2015, p. 7)	Quality assurance standard	information, products & services (i.e. accountability, enhancement)	*"A successfully implemented quality assurance system will provide information to assure the higher education institution and the public of the quality of the higher education institution's activities (accountability) as well as provide advice and recommendations on how it might improve what it is doing (enhancement). Quality assurance and quality enhancement are thus inter-related".*
(Cardoso et al., 2017, p. 334)	Academic paper	strategy (i.e. link with governance), technology (i.e., information system), infrastructure (coordination & support structures)	*"IQA systems' structural/managerial component encompasses institutional structures, processes and procedures designed to assure quality [...] Six issues emerged as relevant to characterise the systems: documentation structure; coordination and support structures; scope and processes covered; quality assurance mechanisms; support information system; and link with the institution's governance and management".*
(Fyhn Ullern, 2014, p. 29)	Quality body paper	products & services (i.e. assess quality, obtain knowledge, improvement and variance, tool for strategic development)	*"The quality assurance system should act as such a tool to assess the quality and obtain knowledge of education at the institution [...]. However, it should also be used to identify what works well. A well-functioning quality assurance system is created in an organisation that understands the meaning of the system and which is motivated to use the quality assurance system as a tool for strategic development. In this way, learning in the quality assurance leads the organisation to recognise improvement and variance".*
(Klenk & Seyfried, 2016, p. 231)	Professional book	environment (i.e., regulation), strategy (i.e., structures, statutes), process and activities (i.e. procedures)	*"internal evaluations of teaching and learning as one of the core procedures of quality management in higher education. Due to the fact that internal evaluations are more and more a matter of regulation, the actors responsible for evaluation are recorded in the universities' evaluation statutes. [...] We do not claim that all these actors have the same position in the quality management system; neither do we assert that the mere number of actors provides information about the actors' potential to shape quality management structures".*
(Kettunen, 2008, p. 325)	Academic paper	environment (i.e. national and national quality assurance	*"The quality assurance system may refer to the environments and quality assurance systems of the international and national levels and the environment and quality assurance system of an individual HEI".*
(Duarte et al., 2014, p. 944).	Academic paper	technology & infrastructure (i.e., technological development, data mining & analytics), strategy (i.e. leadership, fact-based management), environment (external pressure)	*"The availability of student data in HEI has grown considerably as a consequence not only of the technological development but also of the external pressure for accountability [...] The availability of student data has even justified the emergence of the 'educational data mining' and 'academic analytics' research fields which aim at data-driven decision-making at all levels of the HEI. [...]. The integration of the above-described process in a HEI quality management system contributes to committing the leadership to management based on facts and to a positive image of quality management systems in the HEI".*

Source: Own elaboration

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All in all, it can be argued that existing definitions are unsatisfactory and present several limitations. Hence, it is advisable to pose a more holistic and consolidated definition for what is an IQAS. WST provides a unified and single theoretical point of view that permits to integrate the different points of view, perspectives and nuances presented by each individual definition. For instance, we propose the following three-fold definition of IQAS, building on the more generic concept of work system provided by WST:

I. *A work system is a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products and/or services for specific internal or external customers.*

II. *An IQAS is a work system whose processes, tools, methods, policies, actors and resources are devoted to retrieving, collecting, storing, processing, displaying, and transmitting all the information and documentation required to ensure (i.e. define, monitor, assess and enhance) the quality of the educational services and products delivered by a HEI in its various fields of activity, according to its own established strategic vision, mission and operational goals as well as to meet both the internal and external standards, requirements, and criteria chosen and/or derived from the environment in which it operates.*

III. *Thus, an IQAS is a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce informational quality assurance products and/or services for the internal and/or external customers of a HEI.*

In Figure 2, we further extend the previous definition by presenting what can be viewed as a "reference" or generalized conceptualization of an IQAS, which represents in a more explicit way what those systems could be in practice. We do so by drawing principally on knowledge learned from previous definitions (augmented with complementary information included also in the information sources reviewed) and personal background from our own professional experience. To further enrich it, we also rely on the basic quality principles considered in two well-known standards, as the European Standard Guidelines (ESG 2.0) (ENQA, 2015) and the recently developed ISO 21001 (ISO, 2018). Compared with Alter's original framework, the following alterations have been considered in several of its main components to better reflect the specific context and terminology associated to IQAS (Cardoso et al., 2017; IIEP-UNESCO, 2017; Klenk & Seyfried, 2016; Tavares et al., 2016):

- *Customers* has been changed to *Stakeholders* to better reflect the great number and variety of individuals, bodies and entities that can be concerned with an IQAS. Distinction among internal and external stakeholders has been respected.
- *Participants* has been renamed as *Actors,* which represents a much more commonly used term in quality assurance-oriented educational contexts. Students and other HEI's stakeholders also may be engaged as *Actors* in the implementation of the IQAS.
- We use the term *Results* to refer to the diverse product/service mix that an IQAS can provide. Generally, the products and services behind IQAS relate to information either as a product or a process stored, collated or delivered by the system, as for example ratios and indicators. Many results provided by IQAS can be classified in terms of the concrete stakeholder to whom the result is referred – *Outputs* (students and teaching staff / short term), *Outcomes* (graduates / middle term) or *Impacts* (society and enterprises / long term). However, we also consider other plausible results which can be provided by an IQAS, as for example, quality assurance oriented reports.
- *Process and activities* has been renamed as *Process, tools and mechanism* to reflect the wide heterogeneity of instruments that are commonly used in quality assurance contexts.
- Finally, a great number of *Information* products and records created by the different actors of the IQAS are usually stored in the form of digitalized documents, forms or reports. We

reflect this fact by explicitly considering a *Documentation* subcomponent block embedded within the *Information* component of the original model.

As said before, readers should consider the proposed conceptualization as a summary representation of what could be an IQAS. Hence, alternative configurations and perspectives derived from readers' own views or by existing implementations of IQAS in particular HEIs are absolutely plausible. For example, our representation in Figure 2 assumes that an IQAS would probably be complex enough to require the support of a Data Warehouse or a Document Management System for storing and consolidating information records and products. However, this configuration may be not necessary in an IQAS in the initial stages of its lifecycle, when such kind of capabilities may be not yet implemented (or may be very basic). Moreover, we have placed the previous components within the *Technology* block of the WSF, as we consider that they are governed by the own work system. Nonetheless, it could be the case that in many HEIs, those items were shared resources simultaneously used and governed by other work systems outside the IQAS. In those cases, they should be considered as part of the *Infrastructure* block of the IQAS work system.

Readers should also be aware on the fact that several elements considered in Figure 2 within the *Process, tools and mechanism* block are represented with textured shapes. We pretend to indicate in this way the different possible scopes for an IQAS. Nonetheless, they should not be understood as "core processes" of an *IQAS work system*. Alternatively, the "core processes" of an IQAS work system are those devoted to ensure (formalize, monitor, assess and enhance) the quality of a HEI, represented in Figure 2 as a Plan-Do-Check-Act cycle for the IQAS management within the *Process, tools and mechanism* block. In sum, the presented conceptualization may be understood as a reference abstract tool that has to be adequately parameterized to incorporate the many different situational factors that affect an IQAS system implemented in a particular HEI. We provide further insights in this line of inquiry in the following sections.

Figure 2 – A generic summary WST-based conceptualization of an IQAS
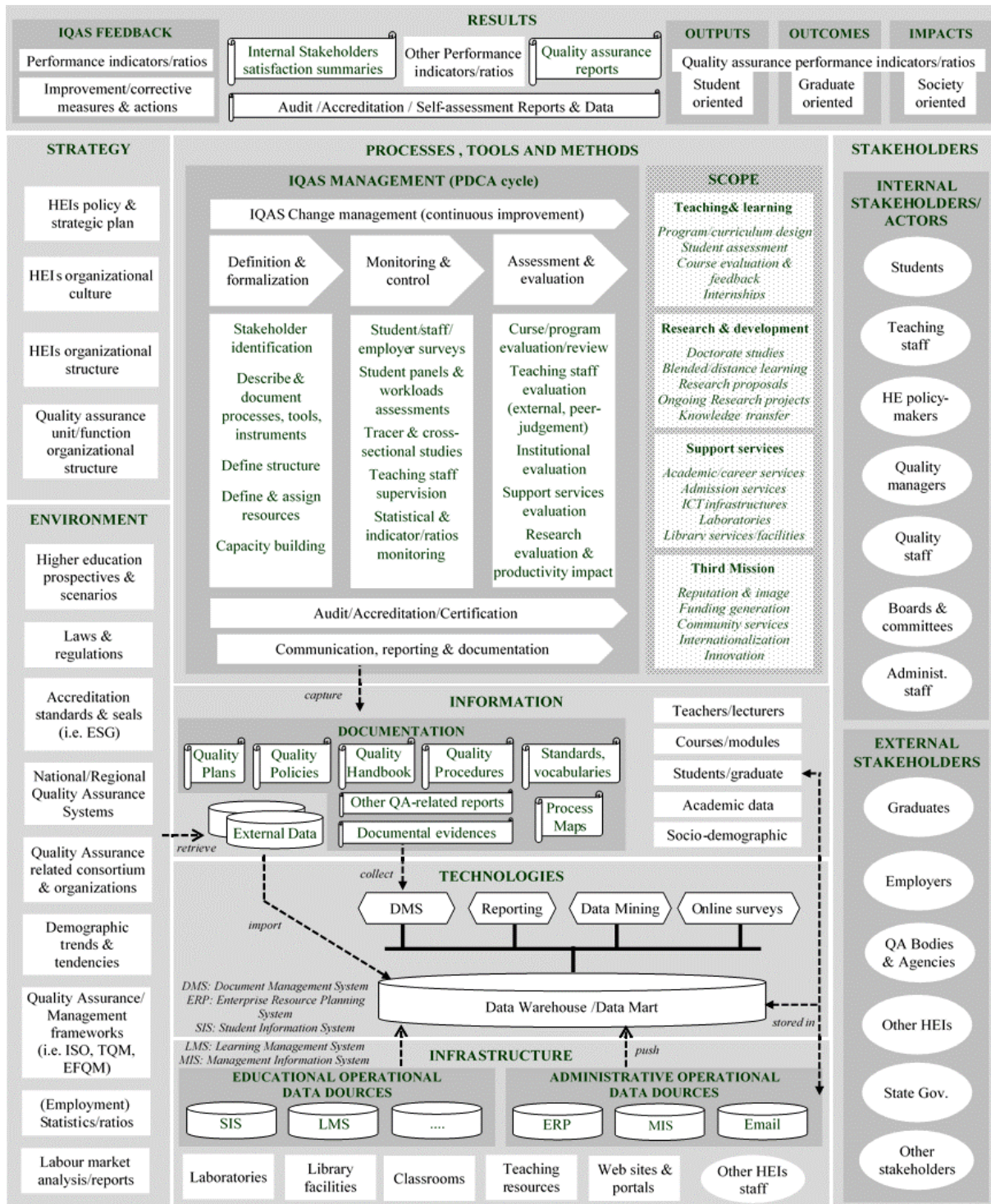
Source: Own elaboration

5. Practical instantiation

To validate and demonstrate the relevance and practical utility of the introduced approach, in this section we present a concrete instantiation of an IQAS implemented in a specific HEI in terms of the previous WST-based conceptualization. The instantiation is based on the information extracted from one real study case. Our intent is to show the possibilities of the instrument to represent and capture the very particular situational factors that contextualize the implementation of IQAS in a specific HEI settlement.

Regarding the selection of the study case for the present paper, we have prioritized aspects related with: the (i) accessibility to the reference source study case, understood as the potential barriers for the audience to obtain in an easy and free way the document source containing the description of the IQAS instantiated; and (ii) the richness and quality extent of the descriptive information contained in the HEI study case regarding its IQAS. However, additional situational or contextual factors supporting (or not being alien) to effective IQAS implementations prompted in the literature could have also been considered for the selection of the study case (Cardoso et al., 2017; IIEP-UNESCO, 2017, pp. 257–277; Mourad, 2017; Papadimitriou & Westerheijden, 2010; Tavares et al., 2016; Vukasovic, 2014). As a matter of fact, in Table 2 we show the whole set of factors portraying the IQAS to be instantiated in the present paper, which in turn, may provide readers with a basic understanding of the context applying to the study case instantiated.

Table 2 – Panoramic overview of factors characterizing the IQAS instantiation presented in this paper

Institution name	University of Duisburg-Essen (UDE)	*Quality assurance approach*	European Standard Guidelines (ESG 2.0)
Institution foundation year	2003	*Type of IQAS*	Bottom-up (emerged from earlier quality-related unformal activities)
Institution nature	Multidisciplinary (medicine, humanities, sciences, engineering)	*Structure of the IQAS*	Hybrid (balance among of institution-wide & faculty-level activities)
Institution type	Public University	*IQAS lifecycle*	Implemented, not yet accredited/certified
Institution dimension	Large (40,000 students, 172 study programmes)	*WST focus*	Static point of view (WSM)
Institution location	Rhine-Ruhr, Germany, Europe	*Information source*	(Ganseuer & Pistor, 2017)
Institution budget	€549 million (2015)	*Accessibility*	Free download from the UNESCO – IEEP website

Source: Own elaboration

According to the previous background, we finally decided to instantiate (in terms of our proposed WST-oriented conceptualization) the IQAS implemented in the University of Duisburg-Essen (Germany). Such instantiation has been developed exclusively on the basis of the concrete information provided by the study case produced by Ganseuer & Pistor (2017). Additional case studies reported in a recent research project by the UNESCO Institute for Educational Planning (IIEP-UNESCO, 2017) as well as others recently published in diverse well-known outlets addressing HEI-oriented quality assurance topics (Moturi & Mbithi, 2015; O'Sullivan, 2017; Santos & Dias, 2017) are also suitable resources for producing new

instantiation examples. They necessary have to be developed to further validate the proposed conceptualization to extend its generalizability to as many as possible different and heterogeneous educational scenarios. The previous list of factors suggested to portrait the study case presented in this paper might also play a role as a classification framework for identifying, classifying, indexing and characterizing those new developed instantiations. In Table 3, we provide the details of the referred instantiation in a compact-style format.

Table 3 – IQAS of the University of Duisburg-Essen instantiated as a work system

STRATEGY	***HEIs Strategy.*** The university's wide development plan sets out its main guidelines, strategies as well as its future aims and objectives. The following guidelines frame the development of the university (pp. 21-22): to offer an academic education based on science and research; development of teacher training in the research and education and balance between a central profile and a decentralized system of self-governance and self-responsibility. *"Faculties and organizational sub-units are responsible for their own strategic development and receive a budget for this purpose"* (pp. 23). *"Deaneries are responsible for writing the development plan of the faculty, in accordance with the university-wide development plan, and for the autonomous management of financial and human resources"* (pp. 23). ***WS Strategy*** Alignment between organizational strategy and Work system (IQA) strategy: quality policy is based on recognition of the importance of a balanced relationship between central and decentralized responsibilities for assurance and development of quality. "*The framework for quality development was established in the university's strategy for developing teaching and learning*" (pp. 25) *"A deputy vice-chancellor (DVC) for institutional planning and resources is responsible for quality assurance at the central university level, while at faculty level it is the responsibility of the deanery. […]. Both central and faculty levels are supported by a central service unit, the Centre for Higher Education Development and Quality Enhancement (CHEDQE)"* (pp. 22). *"CHEDQE is responsible for the quality assurance system at the UDE […] ensuring quality in in research and teaching, service, and management areas is devolved to the particular organizational sub-units (faculties, etc.)"* (pp. 24-25).
ENVIRONMENT	Mainly driven by the conditionings derived from the European Higher Education Area) and local federate state regulations. ***Regulatory environment.*** "*The federal states are responsible for the basic* funding and organization of HEIs *and each state has its own laws governing higher education […] Regulations applying to the accreditation of degree programmes may differ from state to state*" (pp. 11-12) ***Demographic environment.*** "*Political objective to* **increase the academic participation rate** *to 50 per cent, with its consequent demands on levels of academic inclusion*" (pp. 14) ***Organizational culture.*** Characterized by a high degree of autonomy at faculty level: "*commitment to extending decentralized responsibility, including creative freedom within the core processes of teaching and learning, and supported by a culture of mutual trust in the drive to enhance quality*" (pp. 25). Heterogeneity of students viewed as an opportunity to promote diversity (pp. 23). ***Labour market.*** "*procedures for curriculum design at UDE ensure that the expected learning outcomes of its study programmes are oriented towards* **the demands and current developments** *of the jobs market, either by including* **jobs market analysis** *or involving employers in the curriculum design process*" (pp. 37)
ACTORS	**Deputy vice-chancellor** for institutional planning and resources and **deaneries** of faculties (pp. 24). **Central service unit (CHEDQE)**. Flexible composition, depending on which staff members are working on the different tasks. **40 employees** working on continuous standard tasks. Two teams have specific responsibility for quality assurance: (i) the data **management team** (5 members) + (ii) the **evaluation team** (2 members) (pp. 24). Teams also comprise **temporary staff members** (pp. 24). *"During preparations for system accreditation, the communication process has been supervised by: a* **steering committee** *consisting of representatives of the rectorate, the administration, and the faculties, coordinated by CHEDQE; and a* **project advisory body** *comprising deans, administrative directors of faculties, unions, and students together"* (pp.36). *"Some faculties have introduced* **employers' councils to factor employers'** *(…) into study programme design & revision* (pp. 36)
RESULTS	***Outputs and outcomes*** (pp. 29-30, 34-35) **Key performance indicators & ratios** **Annual quality assurance faculty reports** **Target and performance agreement reports** **Institutional evaluation self-reports** **Institutional evaluation peer review and external reports** **Student course satisfaction reports** **Summaries** (graduate tracer studies, faculty QA annual reports) ***Improvement actions and measures*** *"system accreditation involved communication about the* **adjustments** *and the* **newly** *developed* **tools**, *and* **implementation** *of the necessary* **changes**" (pp. 28) *"The information gathered is used in the* **ongoing development** *of the* **university's study programmes**. (pp. 32) *"the task of preparing UDE for system accreditation involved communication about the* **adjustments and the newly developed tools, and implementation of the necessary changes** (pp. 28)

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INFORMATION

Information records

An **annual data set** is the basis for the developmental activities carried out within the framework of annual quality conferences and faculty evaluations (pp. 29) All **data collected** is compiled & supplemented with **statistical data** by the CHEDQE (pp. 33).

Documents

UDE's **quality policy** & **quality handbook** (including Flowcharts, written descriptions, glossaries) (pp. 25)
Annual quality assurance faculty reports (pp. 29, 34-35)
Target agreement development plans and action charts (pp. 29)
Institutional evaluation self-reports (pp. 29, 34-35)
Institutional evaluation peer review and external reports (pp. 29, 34-35)

Other summary reports (pp.29, 33)

Table 4 – IQAS of the University of Duisburg-Essen instantiated as a work system (continued …)

PROCESSES, MECHANIMS & TOOLS

Development **processes** take place at a **decentralized** level and are **incentivized centrally** through respective **target and performance agreements**. Quality assurance **tools and procedures support** these processes by **providing** relevant **information**.

Scope

"most distinctive quality-assurance activities can be observed in the teaching and learning units" (pp. 25)

"research, service, and management, where applicable" (pp. 34)

Core elements (pp. 28)

institutional evaluation of all faculties, research, and service units resulting in target and performance agreements in a fixed cycle;

decentralized data-supported discussion of the quality of study programmes, followed by the development of improvement measures;

permanent provision of counselling, moderation, and support on the core processes, such as through support for curriculum development, capacity building in higher education didactics, and so on, and institutional planning by the CHEDQE, the administration department, and the legal department

Quantitative tools (pp. 29-32)

Student course evaluation surveys (paper-based questionnaires)
Module (academic feasibility) **evaluation** (optional)
Students' academic workload recording (online survey)
UDE **student panel** (longitudinal cross-sectional study). Includes student access surveys, student study cycle surveys (success, drop-outs), post-graduate surveys
Graduate (subsequent life and career trajectories) **tracer studies** (external cooperative survey project)

Qualitative tools (not officially part of the system) *(pp. 32-35)*

Teaching analysis poll (qualitative mid-term evaluation)
Course evaluation via student representatives (feedback meetings)

Processes for quality analysis (pp. 33-35)

Faculty Annual **"quality conferences"** (forums to reflect on the quality of teaching and learning at both department and study programme level)
Institutional evaluation applied to functional sub-organizational units, - i.e. teaching and learning, research, service, and management (six year cycle)
Target and performance agreements (three year cycle)

Accreditation/certification

*"Task of preparing UDE for **system accreditation** (...) should be implemented in 2012 (all university bodies voted unanimously for it), UDE chose the German Accreditation, Certification, and Quality Assurance Institute (ACQUIN) to start the system accreditation process. It aims to be accredited in early 2016." (pp. 28)*

TECHNOL. & INFRAESTRC.

Technology

Data management system and strategic decision-making system ('SuperX' **DataWarehouse**). (pp. 37)
Quality Reporting System (pp. 33)

Human infrastructure

*"A **training plan** for UDE personnel in the field of IQA was drafted" (pp. 28)*
*"There is also [associated at the CHEDQE] a **consultant to the managing director** [in the CQDE center] who is responsible for the implementation of system accreditation at UDE (pp. 24).*
*"The UDE polls are conducted by a **TAP consultant**, who (...) cannot be a member of faculty (pp. 32)*

Technical infrastructure

*"Once CHEDQE have processed the questionnaires, teachers receive an automatically generated report of their results via **email** […] Advice on how to interpret the results and prepare for the class discussion is available on **CHEDQE's website**" (pp. 30)*
Results of the institutional evaluation negotiations are formalized in a contract between the rectorate and the unit. All documents mentioned above, and the contract, are published on the **internal web space of UDE** (pp. 35)

Information infrastructure

*"data set (...) is supplemented by **statistical data** (including common key performance indicators such as student numbers, student to graduate ratios, etc.) **provided by the financial control department**" (pp. 33)*

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STAKEHOLDERS	***External stakeholders*** The **Accreditation Council**, *Quality assurance* (**QA**) *agencies*, **Central administration** *(pp. 7-17)* *"Graduate tracer studies have been part of the performance agreement between the university and the **federal state** (pp. 31)* ***Internal stakeholders*** *"results of student course evaluations are provided to the **deaneries** so they can be used as a basis for staff appraisal"* (pp. 29) *"**students** are asked about their level of satisfaction with their courses via paper-based questionnaires"* (pp. 30) ***teachers** receive an automatically generated report (...) is presented to the **students** (...) and discussed in class* (pp. 30) *CHEDQE checks the quality of the data (...) also prepares a comprehensive report for the **rectorate**"* (pp. 32) *"data sets are made available to **faculties** and **departments** annually"* (pp. 33) *"The framework for institutional evaluation at UDE takes account of every functional area (...) are assessed by **stakeholders from the organizational unit itself**"* (pp. 34) *"Communicating the changes is to ensure that the information reaches a **wider audience**, in particular **the remaining staff members** who have no official function within the faculty"* (pp. 36) *"involving **employers** in the curriculum design process" (pp. 37)*

Table 5 – IQAS of the University of Duisburg-Essen instantiated as a work system (continued …)

OTHERS	**Relationships among WS components** *"UDE's IQA system is **interconnected** with many other key management processes, the most important being **curriculum design**, **human resource development**, **organizational development**, **institutional planning**, and **data management**"* (pp. 37-38) *"SuperX [DataWarehouse System] not only provides common key performance indicators drawn from higher education statistics, but also is directly **linked to UDE's system for financial management**"* (pp. 38) *"the data are analysed in the context of diversity monitoring, with findings presented to UDE's **decision-making bodies**"* (pp. 31) **WS Lifecycle** *"UDE's quality assurance system has evolved over time, from the implementation of **tools for information gathering** (e.g. course evaluation), through to **processes for quality analysis** based on the information collated (e.g. quality conferences), and, finally, to **procedures to ensure QM results are fed into planning and decision-making** (process of developing target agreements)"* (pp. 28)

Source: Own elaboration

6. Implications for research and practice

WST has been formally defined as a theory for describing, analysing and designing different types of systems for any type of organization. Additionally, it has also been prompted as a platform to bridge the gap between research and practice in terms of thinking on how to improve existing operational work systems (Alter, 2013b, 2015). In this line, we strongly believe that it has a tremendous potential for generating important avenues for further research as well as for being used as a practical tool for improving the quality of the professional practices conducted in different HEIs. In this section, we present some of the possibilities that we envision for applying WST (and several of its extensions) to the concrete application domain of IQAS for HEIs.

6.1. Implications for researchers

WST can be viewed as a "*platform for many future applications and extensions in IS and in and across other disciplines […] It has value when used directly, but it also can be built on in valuable ways, many of which may not be anticipated*" (Alter, 2015, p. 495). Hence, several extensions complementary with the original theory, have been progressively constructed, boosting its possibilities for integrating and generating new knowledge from distinct complementary fields, as for example service-oriented architectures/enterprises or business process management (BPM), to cite a few (Alter, 2015). For instance, the foundations can be applied in order to explode potential synergies between IS and quality management systems

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(QMS) – and more specifically, to IQAS for HEIs – as suggested by (Barata & Cunha, 2017) in their systematic review.

We believe that the contributions presented in this paper can be viewed as an extension (from a theoretical perspective) to the list of research areas considered by the Barata and Cunha in their focal category of "*shared view of IS and QMS*". We concur with them when they state that "*a shared organisational view of IS and QMS is appealing and considered desirable in the literature, but there is a lack of practical guidance on how to do it*" (Barata & Cunha, 2017, p. 289). Therefore, and in line with several initial experiences of using BPM for partially automating IQAS in HEIs (Cerverón-Lleó et al., 2014), we argue that the adoption of a WST-oriented perspective for conceptualizing IQAS may lead to interesting opportunities for future research. For example, academics may consider to investigate the application of some of the 27 WST-oriented use cases proposed by (Alter & Recker, 2017) to uncover new ways on how could BPM help to improve the use and effectiveness of IQAS in HEIs.

Moreover, as previously suggested, developing chances for new WST-oriented instantiations of other implemented IQAS in different educational settings are also evident. Such instantiations may be further extended including concerns regarding the dynamic view of the WST (i.e. the WSLC), as it suits quiet well with a traditional Plan-Do-Check-Act lifecycle for continuous improvement (Chen, 2012). Hence, opportunities arise, for example, to establish different "archetypes" – i.e. standard or typical configurations of the constituent blocs of a work system – representing the different stages of maturity that an IQAS can reach over its temporal lifecycle.

Finally, we also perceive important possibilities for additional research in terms of two recently developed extensions of the original WST framework. On the one hand, Theory of Workarounds (Alter, 2014) could be used as a theoretical lens to explore and evaluate the efficiency, efficacy and effectiveness of the improvement/corrective actions or change measures generated by the continuous improvement mechanisms associated to the IQAS. On the other hand, Systems Interaction Theory (Alter, 2018) could be a valuable framework to explore how well integrated is an IQAS with other subsystems within the HEI, as other management information systems or the wider governance and management system (Manatos et al., 2017a, p. 344; Martin & Parikh, 2017; Mourad, 2017).

6.2. Implications for practioners

WST also accomplishes the requirements for being considered as a theory for practice (Alter, 2013a). For instance, it could be a useful tool for practitioners concerned with quality assurance responsibilities in HEIs. Generically, as WST provides convenient ways to zoom in/out between different levels of detail for describing and visualizing a work system at different depth levels, it can be postulated as an ideal tool to explore the details and concerns that may not be apparent at higher levels of aggregation (Alter, 2013b, pp. 83–84, 2015, p. 491). Therefore, we deem our proposed conceptualization as a plausible tool to provide new ways for analysing the information workflows, interactions and misalignments among each one of the components of an IQAS or even to re-evaluate its overall performance. Such innovative approach may lead practitioners to uncover improvement actions to boost the overall efficiency and effectiveness of an IQAS, which may have been overlooked otherwise.

We also see opportunities for using WST-oriented instantiations of an IQAS as a boundary object facilitating collaboration among different stakeholders of a HEI (Star & Griesemer, 1989). For example, since boundary objects are well-accepted tools for cross-disciplinary

collaboration, we envision potential utility for adopting our suggested approach as a summarized visual model for communicating the current state of an implemented IQAS among all HEI's stakeholders engaged in its daily operation. Hence, semaphore codes could be used to represent the different status or maturity levels of each one of the constitutive elements encompassing an IQAS. Such a simplified representation would not probably require genuine expertise for being understood by the different actors engaged in the IQAS design and operation.

To conclude, HEI's practitioners might consider the use of a WST-oriented perspective to envision opportunities for further automating a running IQAS through more intensive uses of technology. In this vein, a recent review performed by Haris et al. (2017) provides insights on how technology can be used to leverage quality assurance and accreditation issues by HEIs.

7. Conclusions, limitations and further research

Using WST as the theoretical lens, in this paper we provide a new consolidated definition and a comprehensive conceptualization of IQAS for HEIs in terms of a work system. Backed by different definitions and perspectives identified in heterogeneous but relevant sources, we propose a common unified vision for such critical socio-technical artefacts for modern HEIs. An initial version of a generic WST-oriented IQAS is presented by adapting the structure and terminology of the original WST framework for the particular context of IQAS. The practical use of the new conceptualization is shown by providing a situated instantiation representing the current state of a running IQAS in a German HEI. Finally, and using again the same theoretical lens, suggestions for research and practice are enumerated to complete the paper.

As in any other research piece, several limitations should be mentioned regarding the topics covered in this paper. On the one hand, and due to inherent subjectivity reasons, it is likely that some readers may have a different perception of what we have assumed to be a generic WST-oriented conceptualization of an IQAS (see Figure 1). Future research would be helpful to explore (and eventually confirm) the fitness of our proposal. Moreover, new instantiations in terms of a WST perspective of IQAS currently implemented in different HEIs should be conducted to further validate it and to extend its generalizability. Anyway, and besides all of the above, the new definition and conceptualization presented in this paper could be of utility to conceive new constructs and more integrated instruments and tools for measuring and evaluating the usefulness and effectiveness of IQAS in HEIs, an issue which, to date, is still pending of conclusive empirical validation (Kamat & Kittur, 2017, pp. 524–525; Papadimitriou & Westerheijden, 2010, pp. 229–230; Sahu et al., 2013, p. 70; Tarí & Dick, 2016, pp. 291–292). In this line, we are currently envisioning and designing a new instrument aimed to assess the maturity of IQAS implemented in HEIs.

Whatever the case, we hope that the ideas considered in this paper may prove beneficial to both researchers and practitioners to better understand and to increase future chances of success in the implementation of IQAS in different HEIs.

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