Out of the crisis of the quality profession:
The new renaissance in the quality discipline

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Abstract

In this article, the crisis of the quality profession is recognized and analyzed based on the authors' long term business perception and research and standardization involvement, the extensive reference material and collaboration with researchers and practitioners of the different disciplines. The prevailing conceptual thinking of quality is obscure and ambiguous without the valid scientific basis. As the reaction to the situation, the authors clarify the conceptual essence of quality and present a solid scientific baseline for the ontological fundamentals of the quality discipline. Also fragmented practices of quality management are categorized, and the preferred and natural paradigm is presented. Today's acute topics of expanded application area of quality including the 4th industrial revolution, are considered. As a particular challenge to the quality, profession, the article presents viewpoints for developing intriguing professional practices of quality management for SMEs and startups. With this article, the authors want to contribute to the world-wide conversation on the crisis of the quality profession and in this way to influence on the development of the renaissance, the new era, in the quality discipline.

Key words
quality, quality management, discipline, profession, scientific approach, quality of life, business, organization, quality of society, renaissance

Introduction

In this conceptual article, we recognize that the prevailing quality profession is waning or has become stagnant. It has not much benefited the development of general business management thinking and practices and failed to meet the dynamic needs of individuals, organizations and societies. The professional quality methodology seems to have alienated far from its own promises to the real global challenges. We adduce that the prevailing thinking of quality contains the problem of irrelevance and that the knowledge basis and the practices of quality are fragmented and vague and do not have consistent scientific foundation. Zairi (Zairi, 2017) has rightly pointed out that the quality profession is deep in crisis and that the future of the profession is uncertain.

   In this situation we have recognized that the solid scientific baseline is the necessity for creating profound knowledge needed for reviving the quality discipline and making it possible to respond effectively and efficiently to the existing and coming needs and for tackling the acute human, organizational and societal challenges. For our purpose, we have decided to base our approach of understanding the essence of quality and quality management through the philosophy of science (Kamaja, 2014). We present a solid scientific baseline that is a necessity for creating profound knowledge needed for reviving the quality discipline. In particular, our aim

is to respond to the existing and coming needs of quality management. Hence, our article focuses on questioning: What kind of renewed and refined body of knowledge should the relevant and responsive quality discipline comprise? With this question, we challenge to bridge the gap between the problems of the existing quality profession and the quality anticipation with regard to people, organizations, and societies. With our approach, we will contribute to the world-wide conversation on the crisis (Zairi, 2017) of the quality profession and in this way to influence on the development of the renaissance, the new era, in the quality discipline.

This article is based on the authors' long term insight into this topic, generated by our practical multidisciplinary experience in business practices, research and standardization, by reviewing a large collection of reference material and research results, and collaborating with a great variety of researchers, experts and practitioners of different disciplines. Our approach aims at:

- Conceptualizing the foundation for the revived quality discipline that can be applied for the benefits of the individual people, all kinds of organizations, and the society at large.
- Bringing out critical fact based comments and pitfalls of the prevailing quality discipline and profession and discussing these topics in order to understand the practical challenges.
- Providing the conceptual basis for improved empirical quality studies and evaluations.
- Itroducing our particular preferred paradigm, 'Quality Integration', for the business integrated quality management.

Recognizing the degradation and crisis of the quality profession and related reasons

We have observed that ordinary people and quality specialists talk differently about quality. The experts rely on the formal definition of the concept of quality and its applicable technical and managerial solutions, but ordinary people use the word 'quality' as a common expression that subjectively in a general sense means something good for themselves. Hence, for instance, quality aspirations and feedbacks of the consumers do not necessarily meet the experts' measures and efforts.

A lot of serious practical quality problems have been reported within many branches of industry and public civil service organizations (The Chartered Quality Institute, 2014). These may also have occurred in generally recognized companies that have been granted with quality awards and certifications (Reuters/rssbroadcast, 2010; Mathiesen and Neslen, 2015). Neither do the standard quality tools seem to ensure quality in the organizations' operations (Forbes, 2014). These examples indicate the poor quality of the management as the main reason for these problems.

Business development is often steered by authoritative leaders who are biased with ignorance, negligence or prejudice against the concept of quality, and instead emphasized the ideology of the free-market economy with aggressive cost-cutting (Hilsenharth, 2004) for short-term profits (Ferrara, 2011). In particular, narrowly focused empiricism with its financial measures - and their numerical goals and results (Deming, 1993) - have been overly emphasized in the business practices at the expense of human aspects and holistic, deep and timely recognition of the business fundamentals, including the quality imperatives like customers' satisfaction. This has even led to extreme examples of disastrous business incidents during the recent decades (Healy and Palepu, 2003; Salisbury, 2014; Kuisma and Seppänen, 2015). The researches have however also revealed a managerial dilemma (Christensen, 1997). The logical, competent decisions of management that are critical to the success of their companies can also be the reasons why they lose positions of leadership. The traditional way of planning better, working harder, becoming

more customer-driven, and taking a longer-term perspectives may exacerbate the problem. Keeping active in traditional management issues is critical for current success, but long-term growth and profit often depend upon a very different management formula that emphasizes change and creative disruptive renewal. Also certification-emphasized quality approach may be considered as this kind of management, since already very early the ISO Central Office warned (ISO Central Office,1994) that 'the worldwide rush by businesses to obtain an ISO 9000 certificate as an external sign of quality is to detriment of the primary use of standards. … The almost exclusive use of ISO 9001 as a mere checklist to gain a certificate is a corruption of the core concept of ISO 9000 standards.' This situation continues still.

We have learned from our own experience that experts of other disciplines have difficulties in communicating and collaborating with the quality experts. They even have highlighted that the professional quality measures in organizations impede or prejudice effective activities for their own discipline. We have confronted this kind of situation for instance between quality and information security experts. However, information security management needs quality, and quality management needs information security. In addition, we should understand that quality profession definitely is a multidisciplinary area of expertise.

Both the engagement of the business leaders and the professionalism of the quality experts are needed for the effective quality implementation in the organization (Anttila et al., 2012a). However, there seems to be a gap between the quality expertise and business priorities in comprehending the concept of quality. Business leaders are busy generalists who usually have a constricted view of quality in their ordinary business agenda, and even influential management experts are not often familiar with the detailed quality principles or practices (Thinkers50, 2013) or at least do not bring them up. However, business leaders generally highlight the importance of quality in their speeches and view the quality situation optimistically in their own business (Forbes, 2014). Experts on their part have a narrow outlook and do not see their own insularity.

The present professional quality methodology has alienated from responding to the significant business needs of organizations. This is not a particular problem of the quality discipline only but it relates to many specialized professions and sciences, too (Husserl, 1936). Views of the experts are difficult to be taken into account in the business management due to their conceptual and methodological specialization and complexity. For instance, the latest ISO 9001:2015 standard made by a large international group of quality experts has vagueness of the terms and definitions, ambiguity of the text and superficiality of the contents and has poor business-relevance (Anttila,and Jussila, 2015b). We also can recognize the general propensity that the researchers appreciate empirical studies for instance based on indeterminate interviews without consistent links to practical problems or existing phenomena (Husserl, 1936). In many expertise sectors, the general professional quality and principles are poorly known. We have found this in our research, for example, in the education sector and the fields of information security and innovation management (Anttila et al., 2012b; Anttila and Jussila, 2015a; UNESCO, 2005; Anttila and Jussila, 2015c).

In fact, the top business leaders and also the other core functions of the organizations need professional knowledge and skills of quality. For example, sales personnel has an important role in achieving customer satisfaction. However, they too often have deficiencies in the quality skills (Kano, 2015). The current organizational quality approaches have been compromised by the competing interests of experts of various disciplines.

The prevailing quality profession represents a stagnant or waning state, which has not progressively followed the development of general business management thinking and practices,

and has failed to meet the organizations' needs in their pressure of market-oriented trend. Additionally, it is obvious that quality experts have in this context lost clear and unambiguous self-awareness, and that the quality discipline has become fragmented and blurred with many competing trends, and evolved into diversified methodological schools, of which some have not successfully sustained, of which one example is TQM (Total Quality Management) (Dahlgaard-Park, 2011). Another example is the development of the ISO 9000 standardization, which definitely is one of the most important professional quality management reference influencing on millions of organizations all over the world. However, the development of these standards has not followed the changes in the organizations' business environments and technological innovations, and hence these standards have lost their business relevance. The latest ISO 9001:2015 revised standard, for example, still represent the situation of the 1990's (Anttila and Jussila, 2015b).

Originally quality methodologies were developed for a simple 'input – production – output' situation (Lillrank, 2015) for ensuring conformance to specifications. Now the quality profession is involved with a much broader area, which includes organizational operations and management of many kinds of organizations, their different stakeholders and the products that primarily consist of a great diverse of services (Anttila and Jussila, 2013b). Additionally business processes, especially interactive relationship processes, are so complex that their rational management does not succeed with the traditional means (Stacey, 2002; Stacey, 2004; Anttila and Jussila, 2011). Dynamism and agility (El-Meligy and Anttila, 2008; Cunningham, 2001) of the operations increases, when the number of interacting parties is growing and the size of the operational units is reduced, for example, due to the pressure caused by the transaction costs (Coase, 1937). The quality profession has not succeeded in creating consistent and concrete methodologies for these new situations (Lillrank, 2015). Furthermore, in the future completely new additional needs regarding the individuals' quality of life and quality of the whole societies (Anttila and Jussila, 2015a) are becoming more and more important and relevant.

Organizations' pursuit of profitability is not contradictory with good quality. Effective quality management may have positive influences in the cost reduction programs, for instance using problem-solving according to the Kaizen, Lean or SixSigma methodologies. The down-sizing measures may be inevitable and the root causes of sporadic spikes of poor quality costs should be eliminated (Juran, 1988; Anttila and Jussila, 2011), but these measures must be complemented with broader quality related activities, especially those enhancing customer value (Henkoff, 1990).

Despite the above mentioned problems, it is generally recognized that the professional quality measures are of crucial importance for the success (NIST, 2015; ISO/TC 176/SC2, 2017; JSQC, 2014) of all kinds of organizational and societal operations and the quality of life of the individuals. Additionally it is apparent that reductionistic thinking with its materialistic values, which has driven modern culture during the recent decades, cannot respond to the existing global challenges (Tuominen, 2010). Hence regarding the quality profession in a wide sense, we are facing a great challenge of contributing in enhancing and deepening understanding on the quality of individuals, organizations and societies.

Responding to the challenges

Many recognized quality experts and institutions have presented commentaries on the needs and suggestions for the new approach to the quality profession in order to preserve its relevance in

the contemporary business and societal environments, and in particular in responding to the challenges of the future (Feary and Armstrong, 2015; The Chartered Quality Institute, 2014; ASQ, 2015; Kano, 2015; Zairi, 2015 and 2017). An example was the joint project of EOQ and IAQ for developing a new European model for structured improvement for the 21st century (Saraiva et al., 2015). Similar initiatives have also been presented within the particular business areas like in the quality of higher education (The PHExcel Consortinum, 2014).

Primarily these attempts, however, are mostly repeating single techniques or manipulating the existing managerial tools, operational models and practices and hence not introducing any new innovations. We think that these approaches do not seem to lead to the necessary breakthrough in quality thinking and practices. In the worst case, this development may even increase the schematic and practical chaos and make business practitioners more confused when implementing practical quality solutions. This development reflects the old French saying, 'Plus ça change, plus c'est la même chose' (The more things change, the more they stay the same) (Karr, 1849).

Some recent researches consider strengthening the culture of quality as a possibility to give rise to a new drive to quality implementations in organizations (Srinivasan and Kurey, 2014; Forbes, 2014; CEB, 2013). In these top-down approaches, the realized quality activities will be seamlessly embedded within the organization's business processes but the real essence of quality or its creative solutions can not be clarified or achieved, and easily the quality professionalism is being replaced with general management doctrines. Also, the culture of quality should have strong roots in the theoretical quality foundation.

Innovation has also been viewed as another new 'wave ' of quality management (Osada, 2015; Watson, 2015; Chin, 2015). In fact, innovation is needed and has practically been used for a long time in the context quality improvement. However, innovation is a distinct discipline, and the modern professional innovation ideas and practices got their roots more than 100 years ago (Anttila and Jussila, 2017b).

Initiatives for the renewal of the quality profession have also grown from the enlargement of the quality concept from the established organizational entities and context to the needs of emerging businesses, human individuals and different forms of societies. This includes:

- Business and societal networking, globalization and ecosystems (Anttila, 2010; Friedly and Schneider, 2015; Anttila and Jussila, 2015a).
- SMEs, start-ups and dynamic business solutions (Lai and Chiang, 2015; Ries, 2011; Blank and Dorf, 2012; Microsoft, 2013).
- Well-being, quality of life, health care, and lifelong learning of everybody (CDC, 2013; Lillrank, 2015; UNESCO, 2015; Anttila and Jussila, 2015a).
- Sustainability, social responsibility and culture-specific realizations (Elkington, 2011; Deleryd, 2015; Al-Salmani et al., 2015; United Nations, 2015; Anttila and Jussila, 2017b).

All these different interest areas are searching their own role within the quality profession and discipline. However, no consensus has been achieved from the comprehensive quality point of view.

Our challenge and focus is in reviving thinking and practices of quality for the modern living, business and social circumstances by refining the theoretical conceptual basis of the quality discipline, and through that, approaching to better understanding, effective and efficient practical solutions and empirical validation. In this article, we present a sound scientific ontological and epistemological foundation for the whole quality discipline, and in this way also build the solid

baseline for the practical professional realization of the multidisciplinary '*Quality Integration'*, the general business integrated quality management approach. With this approach we contribute to create *the new renaissance in the entire quality discipline*. This new refined quality direction and profession follow the general business and societal development, and take into account of the needs and expectations of individuals, too. However, it holds its professional identity and consistently responds to the existing and emerging challenges. This situation today resembles the well-known general Florentine Renaissance 600 years ago, which led to the change and renewal and created a period characterized by innovation, imagination and creativity in art and architecture, literature, philosophy and science (Lorimer and Robinson, 2010; Jensen and Aaltonen, 2013).

  Our challenge is to be on the edge (Brown and Eisenhardt, 1998) of sound theories and the effective and efficient professional practices (figure 1), and hence we consider within our approach abreast three points of view that influence on each other:

1. *Science*: Science is the concerted human effort to understand the world and how it works, with observable physical evidence as the basis of that understanding (Railsback, 2013). Researchers emphasize the difficulty of defining science and its indistinctness (Niiniluoto, 1980; Niiniluoto, 1990). Science can be approached from a practical standpoint through characterizing its essential features. Science means socially institutionalized, systematic and critical pursuit towards the new knowledge on nature, people and society. This includes (a) a constantly evolving and developing system of knowledge, (b) methods to find and justify new knowledge with the criteria of objectivity, criticism, autonomy and progressiveness (Kamaja, 2014) and (c) professional and social networking within the academia and scientific organizations (Halonen, 2015). The expression of 'quality science' as the science of quality is not widely used in the quality references. In this context it is clearer to use the expression 'A scientific approach'. The modern broad concept of quality requires a interdisciplinary research approach.

2. *Discipline*: We have not recognized formal criteria for defining discipline as a concept. In this article discipline means a branch of knowledge established and maintained by an expertise community including a system of rules of conduct and the application of research, publication, standardization, and educating and training people (Oxford Dictionaries, 20115a; Ohio Department of Education, 2015; Kamaja, 2014). The disciplinary knowledge consists of basic concepts, principles and methodologies. The discipline includes a certain historical development, traditions and great teachers (Gurus). The knowledge of a discipline develops through the learning of the community (Anttila and Jussila, 2015a). The roots of the modern quality discipline date back to the time of the beginning of the industrial revolution around 1750 (Juran, 1995).

3. *Profession*: Profession means a professional ability and demonstrated practical accomplishment, and hence a strong social status (Klemm-Savonen, 2011; Kallio, 2014). Professionals are united by their experience and theoretical educational background. Education and training also ensure for the maturation into the profession's values and give capabilities of the continuous development in the profession. The profession operates autonomously and self-directed, and particularly the loyal membership ensures its special status. The profession can control and define its own duties and, for example, self decide on education. Today, the quality professionalism is very much focused on a variety of technical means and models and their application in the organizations. Now we

have recognized serious signs of crisis and decline in the legitimation and loss of trust in the modern quality professionalism, which is typical also in many other professions (Phadenhauer, 2006). Hence, quality profession has lost its distinctive character and the practical effectiveness, too.

We have recognized it very essential to understand and uphold the seamless and consistent relationships between these three levels of activity. This also is the prerequisite for the successful revival of the quality discipline. In particular, in the dynamic environments the discipline must continuously operate on the edge (Brown and Eisenhardt, 1998) of science and professional practice (figure 1) in order to regenerate its essence and to ensure its relevance.

Figure 1: The semicoherent approach on the edge (Ibid.): Balancing between science and professional practice, in striving for the new renaissance of the quality discipline. Improving what is, and what is not, or both; at the same time, and learning from the both.

Ontological and epistemological foundation for quality

When considering practical events, objects and problems here in this article, our aim is to combine the sound and justified conceptual and theoretical thinking and efficient doing with effective methodological means (Wheeldon and Åhlberg, 2012).

Foundations of our research consist of our beliefs about reality with regard to quality and about knowledge within that reality. Our ontological insights concern with the nature of reality, and it is also aligned with the established references, such as Deming's New Economy (Deming, 1993). Ontology is the study of being, which in our context is the nature of existence of the quality related entities, and what constitutes this reality. Epistemology refers to the nature of knowledge. It means questioning the sources of knowledge, the assumptions upon which it is based, and therefore we want to get answers what we 'do know' and 'can know' about quality and its implementation (Allison and Pomeroy, 2000; Gray, 2014).

The recognized starting point for our purpose is the Critical Scientific Realism (Niiniluoto, 1999) and its key theses:
  a) At least a part of reality is ontologically independent of human minds.
  b) Truth is a semantic relation between language and reality (Tarski, 1944).
  c) Science and scientific theories are the best means to create true knowledge from the real world phenomena.
  d) The knowledge can continually be refined through the scientific research and by collaboration among the research community.

Our other important scientific basis is Popper's three-worlds theory (Popper, 1978; Niiniluoto, 1990) (figure 2):

- World 1: The spatiotemporal world of physical objects and events, including biological entities, matter and energy and their relations.
- World 2: The world of conscious minds with perceptions, intentionality and mental states. The world 2 consists of mental objects and events inside both the human beings and certain animals, which includes, inter alia, perception, reflection and awareness of the World 1 entities.
- World 3: The world of the constructions of human mind and communities, which includes, among other things, such abstract objects as propositions, linguistic structures, scientific theories and natural numbers, as well as cultural and social products, such as reports, stories and myths, tools, engineering achievements, social institutions and works of art.
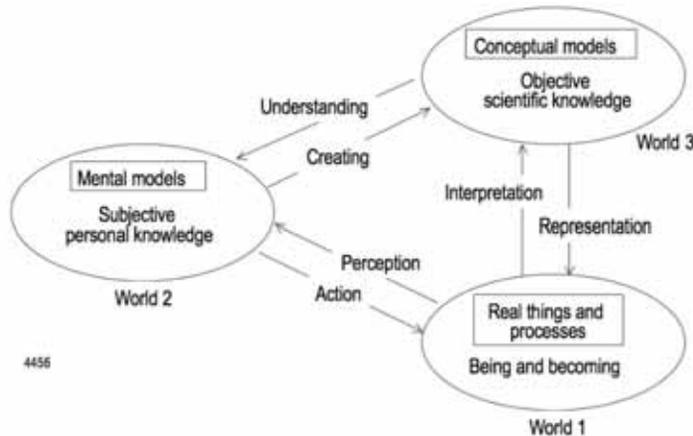

Figure 2. Understanding and conceptualizing the reality according to Popper's three-worlds theory (Hestenes, 1992)

This theoretical foundation provides us with the possibility to understand, why we do not have unambiguous understanding of the concept of quality; many recognized quality thinkers have created their definitions on the basis of their personal perceptions, experience, subjective knowledge and thinking processes. Most of these definitions were elaborated by individual experts. This theory also motivates ourselves to strive for refining the foundation of the basic professional concepts of quality and expanding their applicability for the broader scope including situations related to human individuals, organizations and societies. In these situations, the same general definition of quality should be applied, because today the consistent and professional quality considerations are required for all these areas, which are closely and complicatedly intertwined. This target also challenges us to understand, perceive and analyze more comprehensively all the related quality phenomena in the reality.

Clarifying obscurity and ambiguousness of the concept of quality

Quality is an age-old concept; it dates as far back as to Aristotle (Aristotle, 350 BC). Quality was one of his ten categories to enumerate all the possible kinds of things that can be asked to signify. Aristotle gave two meanings to the word quality: (a) Indicating how an object is

distinguished from other objects and (b) perception of the object as good or bad (Niiniluoto, 2017; von Wright, 1963)[1]. This understanding is well aligned with the word quality as it is used in everyday language, as according to the English Oxford Dictionary (Oxford Dictionaries, 2015b) quality means both (a) a distinctive attribute or characteristic possessed by someone or something and (b) the degree of excellence of something.

The concept of quality has widely been used in professional social and business information and communication, but it also is an everyday and philosophical concept. It is used in many various contexts by engineers, marketing people, business leaders, authorities, lawyers, media, architects, ordinary people, etc. Nevertheless, even among quality professionals we all do not generally seem to be in agreement on the definition of quality. However, conflict-free professional quality activities require that the definitions of basic quality concepts are unambiguously expressed. This also is the prerequisite for the undisputed quality evaluations. The professional quality language should also correspond to the eclectic character of the concept of quality in everyday language.

If we analyze in more detail what the concept of quality include in various situations, we are faced with a variety of different perspectives and perceptions. Following Garvin's ideas (Garvin, 1988) we categorize the various meanings of the concept of quality, which have been developed in the course of time, according to the following five groups of definitions (Anttila and Jussila, 2017a):

1) *Product-oriented definitions*, where quality comprises of measurable properties of the product, for example quality is speed, effectiveness, content of gold, etc. The differences in quality follow from differences in measurable properties, and hence it is possible to understand quality objectively. Price and costs can be associated with quality, so that a higher quality means higher production costs. For the same reason, it can be justified that with the high-quality product one can request and receive a higher price. This is how the marketing people often understand the concept of quality.

2) *Production-oriented definitions,* where quality is the fulfillment of and compliance with the requirements. These definitions are used in the traditional quality technology, which has its roots in the manufacture of material products according to the specifications and contracts, and prevention of manufacturing defects. Quality refers to the degree to which a product meets or products meet the specified requirements. Quality is an objective and unambiguously measurable quantity. Guideline in production is to achieve a good (i.e. acceptable) level of quality or faultlessness (zero defects). High production costs can only be avoided by doing all of the work always right the first time.

3) *The definitions based on the monetary value*, where quality is the monetary value of the object in use, when the object has been acquired for a particular purpose to achieve personal satisfaction or for other reasons. Quality is formed during the manufacture of the product along with the generated value added. In the classical free-market equilibrium, this value added must meet the exchange-value of the product (i.e. the purchase price to be paid). Quality is the ratio of the value in use and price.

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[1] Although the concept pair of good/evil, referring to ethical human features, is normally used in English translations, in his feedback Niiniluoto suggested to use the word 'bad' as the opposite of 'good', since 'bad' is ethically more neutral and applicable to broader cases. Furthermore, according to von Wright's 'The Varieties of Goodness' 'bad' is the opposite of 'instrumental good'. However, as multidisciplinary researchers we will not in this article try to break into the philosophical meanings of words or the essence of deep philosophical reasoning.

4) *Value-based definitions of the real economy,* where quality is the market value of the object. It is the value achieved from the product from fulfilling the needs during its lifetime, no matter what price has been paid for the product (i.e. what its exchange-value is) and how much value added the product represents. In this case, quality is the product's ability to fulfill the needs and expectations, even latent ones, of the user. Quality is bound to the needs of the purchaser and user of the product and, therefore, it is a subjective and time-depending concept. Quality can be assessed only subjectively. A guideline for the production is to collect the best possible information of the customers' genuine and latent needs and realize the product according to them. Quality does not necessarily mean high production costs. Quality is know-how and customer-driven activities.
5) *Heuristic and mythical definitions,* where quality is superiority, excellence, or luxury. Quality cannot be measured or even defined explicitly. You know what it is. Quality is based on the Platonic ideas. In this way, the concept of quality has been brought up a lot for instance in advertising and activities of 'Excellence' businesses,

The boundaries between these categories are in no way clear or sharp. The definitions are not usually based on clear ontological foundations, and ambiguity is typical in many definitions. Definitions are mostly related to the quality of product and organizational situations, and the broader needs of human individuals, organizations and societies are not taken into account consistently.

  In addition to the above mentioned categories of definitions, there is the international standard definition (ISO, 2015) of the concept of quality that has evolved from 1980's and is now used for all kinds of professional purposes, in business, production, servicing and marketing in millions of organizations all over the world.

  For ensuring the soundness and applicability of the definition of the concept of quality in the present complex situations, it is necessary to understand the theoretical foundations of quality. This means the ontological approach. In our research, the *quality archetype* (archetype according to Senge, 1990) is the ontological cornerstone of all quality considerations. It presents the original pattern of which all the quality objects and concepts are derived, modeled, or emulated, and which explicates all involved phenomena and events with regard to quality. This quality archetype comprises the *intentional interactive transaction between two persons with the co-creation and exchange of tangible or intangible entity or thing through which these parties perceive mutual value* (Figure 2).
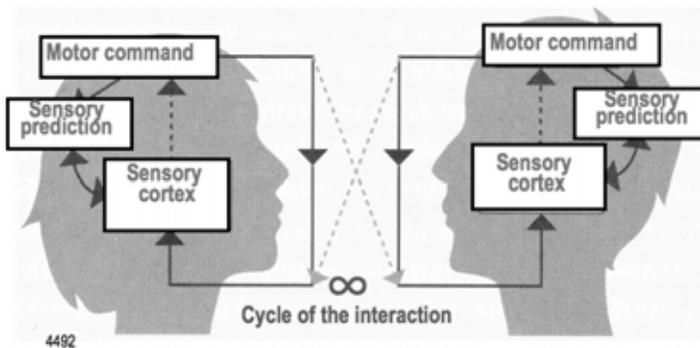

Figure 2. The archetype of the quality phenomena: An intentional interaction of two self-conscious independent persons. A schematic presentation of the action–perception loops of two persons (the cycle of the interaction); in which both of the loops close via the environment (Hari and Kujala, 2009).

The quality archetype implies the following essential features that relate to the general understanding of the concept of quality according to its everyday and ancient meaning and that also is valid in business and societal contexts:

- Interactivity, intentionality and awareness are intrinsic human properties. Interaction is related with certain needs and expectations of the persons or parties.
- The parties have their own purposes for interaction, and they independently affect and respond to each other and co-create tangible or intangible results (the object) and outcomes of the interaction to both parties. In the business context the object is called product, which includes goods and services (Anttila and Jussila, 2013b).
- The interacting parties perceive the features of the object and realize the degree of satisfaction with regard to their own particular needs and expectations. The purpose of the interaction comes true, when its results satisfy both parties.
- The parties or the expert observers can characterize the perception of the object by the means of the linguistic descriptions and traditional quality expressions. According to Chomsky (Chomsky, 2016) each human language is essentially an internal, individual and intentional instrument of thought, and a biological property of humans.
- The interaction can take place directly between the parties or through technology as extensions of the body and senses (McLuhan, 1964)

Our archetypical model is naturally applicable in the direct service transactions between individual persons, but it is also very relevant in the context of more complicated real world situations relating to organizations and society. The transaction of the parties may also take place indirectly through hardware products or interactive software services, for example social media (Anttila and Jussila, 2013b).

Our archetypical model leads us directly to the understanding and definition of the concept of quality. On this basis of the ontological and practical reasoning above we can recognize that the standardized ISO 9000:2015 (ISO, 2015) definition of quality corresponds to all of the essential features of our archetype model. Hence, the standard definition is suitable and useful for all situations of quality consideration. During the existence of ISO 9000 family of standards, this definition has been refined, and at present the definition of quality is *'degree to which a set of inherent characteristics of an object fulfils requirements'*, which corresponds to our archetype-related reasoning above. 'Requirement' means here needs and expectations, which may be related to all interested parties of the object and the interaction. In fact, this definition of quality is also compatible to Aristotle's original explanations, and to the prevailing understanding in everyday language.

In this context, we are faced with the aspects of all Popper's worlds: Its World 1, the world of physical *objects* and *events*, corresponds to our concept of the product (goods, including services) and the related interaction. The World 2, the world of *mental* objects and events, corresponds to the perceived satisfaction, and the World 3 relates to the concept and the definition of quality as an intellectual construction of the experts and researchers, and corresponds to the discoveries and findings of the realities in the world.

Categorizing fragmented practices of quality management

Conceptually quality management is quite clear. However, its implementations are very fragmented, and the vast majority of its implementations is based on the instrumental means of

the different methodological schools, which is confusing and detrimental to the understanding the concept itself (table 1).

The concepts of *quality management* is essential for achieving quality results in a professional way in practice. It also has the ISO 9000:2015 standard definition (ISO, 2015) that is compatible with the concept of quality. This definition can also be justified with our archetype model. Quality management in an organization implies the *management with regard to quality*. Quality management clearly refers to the case of an organization. In general, organizational management consists of activities to direct and control the organization and implies that someone is responsible for it. Single persons can be considered as a basic organization (Ibid.).

Table 1. The fragmented reality of the quality management implementations. Although the reality is fragmented, these quality management implementations are principally developed for organizational situations, and they do not provide satisfactory solutions for the situations of individual persons (quality of life) or quality of the society.

Professional quality management realizations: The profession has been developing over 100 years and fragmented by using numerous different tools and models for quality management, including: - Standard-based approaches, ISO 9000 standards, certification - Performance excellence models (Quality award criteria), Malcolm Baldrige Model, EFQM model - Problem-solving methodology, Kaizen, SixSigma (DMAIC), Lean, 5S, QC Story - The European structured improvement model (EOQ and IAQ) (Saraiva et al., 2015) - Business process management / Re-engineering - Human-based approaches, Investors in People (IiP) - Statistical quality/process control, Taguchi methodology - Time-based management (TMB), Agility models - Theory of constraints (TOC) - Hoshin Kanri, Balanced scorecard - ServQual, service quality models - Cost-based methods, poor quality costing, ABC/ABM, TDABC - Customer satisfaction methodologies, Kano model, CSI, QFD, Kansei engineering - Operational excellence
Discipline establishment: The discipline is divided into many rather isolated schools of thought that typically originate from the over-emphasized use of tools or models, including: - ISO 9000, SixSigma/Lean SixSigma, TQM/TQC and CWQC, and performance excellence
Scientific base: No holistic theoretical scientific foundation: - Distinct theories based on statistics, management theories, societal quality loss theory, human-behavior theory, value methodology, economic theories, etc. - Emphasis on formal deontology, objectivity or compliance to requirements
Scope: - Organizations (processes, activities, products) - Value chain approach

Quality improvement is a part of quality management (Ibid.), and it concerns the increasing abilities to meet the needs and expectations of the interested parties. Quality improvement is achieved through learning and innovation. *Quality assurance* is the part of quality management (Ibid.) that focuses on providing confidence among the interestested parties of the object that requirements will be fulfilled. Hence quality management is a communication activity between the parties.

Quality management and its activities are embedded within the organization's general management. That, in particular, involves engagement of the top management to organize quality management according to the purpose of the organization and effective management of the business processes (Anttila and Jussila, 2013a).

In order to obtain an overall understanding of the different practices, we have developed the paradigm mapping (Anttila and Jussila, 2016) (figure 3), which presents a scientific characterization of the different approaches. In all the different cases the same formal definitions of quality and quality management applies.
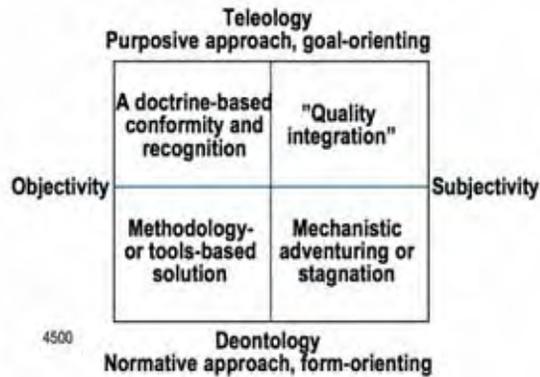

Figure 3. Paradigmatic positioning of the different quality management approaches, contructed by following Burrell and Morgan (Burrell and Morgan, 1979). Our preferred most natural practical solutions to realize the formal definition of the quality management concept are the teleological solutions that strive for the organization-specific quality targets, which we call 'Quality Integration'.

Objective approaches use generally recognized and well-known models or practices, for instance ISO 9000 standards, performance excellence models, maturity models, SixSigma methodology, lean methodology, etc. 'Deontological' solutions aim at applying a method in a right way for the conformity, for instance establishing and maintaining a formal quality management system according to the requirements of the ISO 9001:2015 standard. Objective 'teleological' solutions for instance include ISO 9001:2015 certificate or quality award focused practices.

Subjective implementations of the quality management use organization-dedicated or tailored means. Deontological implementations often are only an anecdotal approach without any clear targets. We prefer teleological solutions that strive for organization specific quality targets. This approach can also be considered as a natural solution to realize the formal definition of quality management. We have practical experiences of this approach that we call as 'Quality integration' (Anttila and Vakkuri, 2001; Anttila and Jussila, 2017a).

Quality Integration is the concept and paradigm to describe such organization-wide arrangements, where quality management practices are seamlessly embedded within the normal management activities and purposefully contribute to the organization's business goals. Quality Integration may be established in any kind of organization. Quality Integration includes quality management, quality improvement and quality assurance that develop as practical organizational solutions through organizational learning.

Responding to the expanded application area of quality

Quality considerations have been expended from organizations to human individuals, business communities and societies at large. In considering the quality phenomena and their characteristics in practical cases, we encounter three seamlessly interrelated areas of operations (Anttila and Jussila, 2015a):

- *Individual persons*: People are rationally, non-rationally (mentally) (Goleman, 1997) and irrationally (spiritually) (Zohar, 1997) behaving individuals; they have paradoxical existential freedom (Sartre, 1938; Tillich, 1963); they are free to choose their own way of being and thinking but on the other hand they are forced to do so, tied to their personal, organizational, societal and cultural positions and relations, and the 'hidden agendas' of the surrounding environment. Each person him/herself is responsible for his/her action.
- *Organizations*: Organizations are groups of people that have their own functions with responsibilities, authorities and relationships to achieve their objectives (ISO, 2015) through utilizing various assets (ISO, 2014); organizations are assumed to be manageable systems that may exist in many different forms, for example, one person can (also) be a singular organization, and a firm is a commercial organization that operates on the for-profit basis and participates in selling goods or services to customers (Business Dictionary, 2015). Top management is responsible for coordinated activities to direct and control the organization (ISO, 2015).
- *Societies*: Societes are aggregates of people and their organizations living together in a more or less ordered community (Oxford Dictionaries, 2015c); societies are not manageable systems but networks of independent actors consisting of individuals and organizations. Societes are managed by nobody but all the members of the society have possibility to influence within the society (Barabási, 2002).

Human individuals are at the heart of all these situations.

The concept of growth (European Commission, 2010) is today used in such a way that it has a lot of links to the quality discipline. In this context, growth is an extensive concept, which includes smart growth, sustainable growth and inclusive growth. Economic governance is the foundation for growth and understanding how interdependent the global economies are.

Especially the societal quality has become an area of quality profession, which relate to the society with high quality, or a well-functioning and well-developing society. Societal quality consists of many characteristic dimensions. Sustainability is a set of inherent characteristics of organizations and societies, and sustainability development consists of significant themes of quality and innovation (Anttila and Jussila, 2017b).

Recently also many other areas, viewpoints and methodological tools (Lozano, 2012) are linked together with sustainability including corporate social responsibility (ISO, 2010), risks (Faris et al., 2013), and resilience (Derissen et al., 2009). Also the Millennium Development Goals, MDG (United Nations, 2015a), and Sustainability Development Goals, SDG, (United Nations, 2015b) of the United Nations still further expand the scope of sustainability development to the level of countries and societies. In these contexts, also quality aspects are incorporated, but this could be more elaborated, and that is why the International Academy for Quality (IAQ, 2017) has created expertise contacts with the United Nations. Sustainability has developed towards a large scale question of the Planet Earth and humanity (Dunlop et al., 2015).

In the quality profession, this expansion of the scope and expectations of the quality profession means serious requirements in the innovation within the quality management and methodology. However, many organizations do not understand the need for development, and they are still building their quality systems. The clear conceptual, methodological and integratated quality approach are needed so that the quality profession could serve for these extended challenges.

Especially the new technologies have essential impacts on the product characteristics and the effectiveness and efficiency of the related processes. These technologies (Anttila and Jussila, 2013b) include information and communication technology (ICT), biotechnology, nano- and

micro-technology, optical technology, energy technology, social technology, wellbeing technology, etc. Examples of the ICT include: internet of things (IoT), intellectual robotics, 3D printing, 'Big data' and blockchain.

The new technologies have challenges for all managerial and operational factors in organizations of all areas and hence have strong impact on product quality, quality management and quality assurance; and on customer perception and satisfaction through environmental, social, health and safety, and security and privacy influence. The all inclusive 4th industrial revolution and Industry 4.0 development (Schwab, 2016; European Parliament, 2016) are acute challenges also to the quality profession. Also the world-wide Smart City movement (Mohanty et al., 2016) is a manifestation of this development.

In addition to the technologal progress, today all organizations operate in networked business environments and in ecosystems (Anttila, 2010). This means that also the professional quality concepts, principles, and practical means must be reconsidered in a new way because of radical changes that have happened inter alia in organization structures, business environments, interested parties (stakeholders), business targets and performance, management and leadership practices, products (goods and services), business processes, work and 'employeeship', customs, customers, and company culture.

Developing intriguing professional practices of quality management for SMEs and startups

Already Coase (Coase, 1937) reasoned how the transaction costs influence on the size of the business units, 'firms'. Transactions of those units take place via the interlinked business processes (Anttila and Jussila, 2013a). This also helps us to understand the emergence of small organizations by breaking out from large organizations or uniting individual entrepreneurs. Particularly today, this development is influenced also by the networking and commons-based collaboration (Benkler, 2002), which is especially enhanced by digitalization and the possibilities of the new information and communication technology. In today's business environment SMEs have been referred to as the backbone of the economy of countries and regions, providing a potential source for jobs, renewal of organizations and economic growth (Eurostat, 2011). More than 99% of the organizations are SMEs, for instance in Europe more than 22 million SMEs. Many of the SMEs can be considered as startups. Startups also have become a significant business area (Slush, 2016). The future is pioneered by startups, not existing companies (Blank, 2014). Typically, SMEs and startups exist also within large organizations.

Organized SMEs and startups are different. A startup is not necessarily yet an organization, but it has been defined as a human institution designed to create new products (goods or services) under conditions of extreme uncertainty (Ries, 2011). We now like to focus in our research particularly on startups. In order to approach their quality management in a professional way, we should analyze the basic nature and the involved phenomena in the startups. We have a lot of information on the successful and unsuccessful startups, and also recognized relevant literature references are available (Moore, 2000; Christensen, 1997; Blank and Dorf, 2012; Ries, 2011).

According to our experience especially from some acute practical examples, traditional quality approaches do not motivate startups to engage to professional quality practices. In fact, the old management methods do not function properly under these conditions; they require a new kind of management (Ibid.). A startup is not a small version of a big company. When recognizing this fact, some startups and their investors may accept and adopt the 'Just do it' principle, which leads to chaos and does not result in success (Ibid.).

However, the basic concepts of quality, quality management, quality improvement and quality assurance, as they were presented earlier in this article, are still valid and useful also in the business cases of the startups. The contents of the concepts only should be understood on the case basis. For instance, in the context of quality management, IPR (intellectual property rights) (WIPO, 2016) and information security should be taken seriously. Interestingly, the successful startups follow the principle of Quality Integration in a very natural way. For instance, they may not speak about quality at all; they have integrated its meaning seamlessly into their business activities and language. However in this case they lose links to the foundation of the professional quality culture, traditions and practices, which could give them competitive edge if only understood and applied in a creative way.

Quality in startups is not based on the established organizational systems, structured functions and defined managerial responsibilities but on the customer-centered process of searching and creating the business model. With this approach the startups strive for disruptive innovations (Christensen, 1997) (minimum requirements towards the vision of the startup founders) and appreciate lean thinking (Ries, 2011) (fast operations and minimum people waste time), and not all startups are alike. Successful startups use a scientific approach that consists of hypotheses of the product, customer and business model, their testing and evaluation with customers or users and learning through fast iteration loops (Ibid.).

A particular challenge in startups is how to manage effectively all relevant information that is needed in conducting the business. Traditional information systems may not necessarily be helpful, but modern social media applications have proved to be useful (Anttila, 2008).

Conclusions

Modern professional quality profession was established early in the 1900s, considering the production processes of the manufacturing companies (Shewhart, 1931). Juran called this Little q (Juran, 1964). After this, the focus was extended to other processes, and from manufacturing companies to other types of organizations. This resulted in understanding quality in the scope of the organization as a whole and as the management issue in particular. Juran called this as Big Q and Feigenbaum TQC. All along after this, the professional quality has strongly been focused on organizational questions. Due to the increasing number of fragmented methodologies, and diversity and complexity of organizations the quality profession has ended up in the chaotic situation, as described in the beginning of our text.

The archetype model and the theory-based consideration of this article provide us with the sound foundation and order to cope with the uncontrollable situation. In addition, when at the same time the organizations' business environment has decomposed into smaller and smaller functional networked parts and the role of individual people has been emphasized, our approach regarding the quality of human individuals and social networks allows us to consider the significant and acute questions of quality of life and quality of society in a professional way.

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In Out of the Crisis, originally published in 1982, Deming offers a theory of management based on his famous 14 Points for Management. Management's failure to plan for the future, he claims, brings about loss of market, which brings about loss of jobs. Management must be judged not only by the quarterly dividend, but by innovative plans to stay in business, protect investment, ensure future dividends, and provide more jobs through improved product and service. 3) Quality checks are directly implemented in the work process although slightly differing from the visions of in-process quality assurance as advocated by Deming (1986), since in this case the craftsmen primarily checks output quality of prior processes and craftsmen. Out of the crisis of the quality profession: The new renaissance in the quality discipline, IAQ Quality Forum, Bled Slovenia. Anttila, J., Jussila, K. 2017c. ISO 9001:2015 – a questionable reform. What should the implementing organizations understand and do? Total Quality Management and Business Excellence, DOI: 10.1080/14783363.2017.1309119. Understanding quality – conceptualization of the fundamental concepts of quality, International Journal of Quality and Service Sciences, Vol. 9 Issue: 3/4, DOI:10.1108/IJQSS-03-2017-0020. Anttila, J., Jussila, K. 2013. An advanced insight into managing business processes in practice, Total Quality Management & Business Excellence, DOI:10.1080/14783363.2013.791105. Anttila, J., Jussila, K. 2011. A crisis develops because of the necessity to make a choice between values. The decision-controlling factors are: the length of time the sacrifice must or can be tolerated, and the validity of the sacrifice in terms of survival and growth. Three fourths of all new businesses in the United States fail to survive their first year of operation, and less than half the remainder continue to operate after the second year. The key phrase became "shape up or ship out." Organizational discipline is hard enough to enforce among veteran employees; it is even more difficult to institute among members of a large family. Nevertheless, it was done, equitably and humanely, and the necessary organizational stability was achieved.