MULTIDISCIPLINARY APPROACH TO AD HOC DE FACTO STANDARDIZATION: STANDARDS AND ORGANIZATIONAL DESIGN

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Abstract: *This article presents multidisciplinary approach to problems of "ad hoc de facto" standardization, utilizing synergy of intersection between organizational design and standardization. Ad hoc de facto standardization is standardization without support of standards developing organizations (SDO). The main task "in standardization process is to bridge the gap between the impulses of science and technology with the degree of acceptance at the user side" (Blind, 2004). However, standardization are often perceived by management as rigid, bureaucratic and opposed to innovative practices, although there are contrary examples. Related to that, development of consortia based standards is started to be covered by literature. As companies are urged to cooperate, and avoid problems of protracted formal standardization processes, "de facto" standardization becomes increasingly significant and is utilized in many different areas and industries. Companies find easier way to resolve matching problems with this approach, and in order for it to be functional, multidisciplinary approach, where standardizations is combined with various other management and technical disciplines is crucial. Practical example given in this article is development of non-public standard related to job classification in 21 communal and public-utility companies operating in Serbia based on the staff structure analysis, performance analysis, analysis of basic earnings and theoretical background.*

Keywords: *Ad hoc de facto standardization, Job classification, Public service companies, Restructuring.*

1. INTRODUCTION

Standardization is not main specialization of most managers, and in wide range of industries general dislike toward standards exists among managers of various hierarchical level, experience, scope and industry. In addition to having main expertise in discipline other than standardization, managers experience problems with "over routined" documented quality management systems often related to ISO 9001 and organizational work standardization. Negative attitude towards standards are predominantly based on not understanding how much freedom is allowed to organizations in searching its own successful way to accomplish ISO 9001 requirements and forced implementation of ISO 9001. Related research confirms that benefits suppose efforts well beyond the minimum requirements of the standards (Gotzamani, 2005) and encompass other approaches, initiatives and tools (Mijatović and Stokić, 2010). On the other side, innovation and standardization are often considered as mutually exclusive for corporate management, because the remaining space for innovative work is reduced along with the progress of work standardization – many cases confirm that they are complementary to each other (Kondo, 2000). However, uni-discipline and one-dimensional approach to standards as its own means and ends, along with resistance of managers in most cases cannot yield such positive results.

One discipline or knowledge can analyse characterize, classify, and finally specialize, but sciences or academic disciplines can generate multi-, trans-, inter-, and even cross-disciplinary approaches, investigations, researches, valuing and practicing their co-integration or their intersection's area or common fields. Together

The ideas of consensus, unity and simultaneity are the major factors in all these theoretical attitudes and scientific practices and the results or findings based on them can be exceptionally efficient and effective. The multi-, trans-, inter-, and cross-disciplinary approaches can lead to an important change (e.g. an increase or a decrease in the number of sciences or academic disciplines) but the most important result of all remains the coherence and the holistic. The holistic approach in sciences and academic disciplines is less and less of the one-sided type (an uni-disciplinary way of thinking), and, no doubt, the need is increasingly felt for continuous approaches of the multi-, trans-, inter-, and cross - disciplinary type, namely the need for modern research based on team work and through projects, along with the obvious obsolescence of unidirectional or exclusive observation, and the ultimate goal is also one of adequacy within today's globalized social and economic context. But above all, cross-disciplinary knowledge represents the best scientific translation, that which explains aspects of one specific science or academic discipline in terms of another. (Săvoiu and Iorga,2011). Indubitable that some characteristic approaches exist and persist, creating a so called specific national traditions within disciplines (Ohlsson, 1999).

2. ENVIRONMENTAL INFLUENCE ON IMPORTANCE OF NEW FORMS AND MULTI -DICIPLINARY APPROACH TO STANDARDIZATION

Current business environment is heavily influenced by prolonged economic crisis and on the other hand rapid advancement of technologies, especially ICT and its influence on organizational dimensions and forms. Swift development of the globalized and increasingly complex concept of knowledge economy not only demands new standards, but is also challenging the form of standardization (Blind, 2004). Common approach to definitions of standardization and standards has strictly defined terms and very narrow focus. According to ISO/IEC (1991) standardization is the activity of establishing, with regard to actual and potential problems provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context. According to ISO/IEC (2004) and CEN (http://www.cen.eu/boss/ Pages/glossary.aspx#s) standard is: "document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context". However, not all standards are consensus-based or approved by a recognized body and standards may have a

format other than document, e.g. software as in the case of Windows (Hesser, Feilzer & De Vries, 2007,pp. 8).

Different viewpoint, as well as different definitions of standardization and standard was introduced by professor Henk de Vries in 1997, and it largely contributed to establishing theory of standardization. Standardization is thus defined as the "activity of establishing and recording a limited set of solutions to actual or potential **matching** problems, directed at benefits for the party or parties involved, balancing their needs and intending and expecting that these solutions will be repeatedly or continuously used, during a certain period, by a substantial number of the parties for whom they are meant" (de Vries 1999). The same source defines standard as "an approved specification of a limited set of solutions to actual or potential **matching** problems, prepared for the benefits of the party or parties involved, balancing their needs, and intended and expected to be used repeatedly or continuously, during a certain period, by a substantial number of the parties for whom they are meant" (de Vries 1999). In these definitions, the **matching** problem is a problem "of interrelated entities that do not harmonize with one another and solving it means determining one of more features of there entities in a way that they harmonize with one another, or of determining one or more features of an entity because of its relation(s) with one or more other entities" (de Vries, 1999). Such viewpoint opens wider possibilities for combination of different disciplines in solving standardization issues.

Practicing and implementing standardization is faced with numerous obstacles in most organizations, and "the job of standardization is a hard job" (Kondo, 2000). It is often difficult to comprehend different features, concepts, complexity and technological, economic and social implications of standards and standardization, especially in common business envirnoment. The majority of studies on standards and standardization are based on experience and practice of developing countries. Little explanation has been provided regarding standardization for late-comer countries, "It is quite clear that the international standardization regime has remained an enclave for advanced countries and that the voices and interests of latecomer countries cannot be fully heard in this sphere, due to insufficient capabilities for standardization processes" (Choung, Ji and Tahir, 2011). Majority of organizations from developing countries belong to the group of passive standard adopters with no capabilities (basically technological) or experience to really contribute in developing formal international standard. Company or consortia based standards formed base for development of numerous international standards. However, national standardization organizations in developing countries mostly neglect development of new standards, or such practice is exceptional activity. According to Choung, Ji and Tahir (2011), there have been few papers on international standardization by developing or latecomer countries, and the suggestions therein did not extend beyond "adopt standards first and improve capabilities".

Related to such practicel, standards are a significant factor in who wins and who loses in the global marketplace and it's hard to win if you don't know the game (Bhatia, 2011). Practically, all standards developing organizations SDOs, (e.g. ISO, IEC, CEN, CENELEC, ITU, IEEE, W3C and others) have some action or calls for or in favor of education about standardization.The European Council conclusions on standardization and innovation (2008) encourages the Member States to improve the position of standardization in education programmes and academic curricula, in order to familiarize students with the strategic benefits and challenges of standardization, drawing on the expertise of standardization bodies" (http://www.cen.eu/cen/Services/Education/Education aboutstandards/Pages/default.aspx). United Nations Economic Commission for Europe recommended introduction by educational establishments of the subject of standardization into the curricula of educational establishments and particularly of universities for students majoring in technical and scientific subjects, as well as in legal, economic and management studies. Large European countries like United Kingdom, France and Germany explicitly address standardization education in strategy papers, whereas many smaller European countries tend to have no this strategy at all – while there is no any comprehensive national or European approach (Czaya, Egyedi & Hesser, 2010).

As a potential solution for standardization related problems, standardization community by and large expects general awareness and appreciation of standards' benefits to automatically result from possible recognition of standardization as a regular subject in higher professional and university curricula, (*Simons, 1999*). Furthermore Simons (*1999*) noted that – some sense of reality has to prevail in selecting forms of education in this field – "master of standardization are not needed" it is better to enlarge the group of people that are aware of the usefulness of standardization and acquaint possible future decision-makers with the subject. Community of standardization practice welcomes all opinions in favor of education about standardization, however a lot of questions is still left open. Implementing standardization education is not easy and despite its recent growth, it is an exception rather than a rule that the topic of standardization is included in education and some barriers have to be overcome (*de Vries, 2011*). Thus we cannot be sure that single measure will accomplish such diverse and complicated goals.

It is important to understand what learning outcomes are wanted. If what is wanted - providing formal information to students, familiarizing students or acquiring awareness – in educational theory, that learning outcomes might be identify as factual knowledge. Furthermore, it might be seemed that what is wanted are only future standards adopters, but it should be clear that future standards developers are of same or higher importance. Bloom's Taxonomy (*Bloom,1994*) states that skills in the cognitive domain revolve around knowledge, comprehension and critical thinking of a particular topic. According to Bloom's Taxonomy we can identify different types of learning outcomes, namely acquisition of factual knowledge, application of the acquired knowledge, and Analysis, Synthesis and Evaluation (ASE) of knowledge. If the acquisition of factual knowledge is desired, then the learning content (teaching material) is the most influential (*Mijatović, Jovanović and Jednak, 2012*). In that case, lack of extensive theory background might reject university teachers in serious attempt to include standardization into their curricula. On the other side, if higher levels of learning outcomes are to be achieved more sophisticated teaching and learning techniques have to be used. Such approach, e.g. usage of technology enhanced learning tools, incites further changes into organization which uses it *(Čudanov, Săvoiu & Jaško 2012).* Some researches confirmed that active teaching methods (either active teaching in the classroom or technology enhanced active teaching and learning) considerably contribute to

higher students achievements in quality management and standardization courses in transitional countries (*Mijatović & Jednak, 2011; Mijatović, Cudanov, Jednak & Kadijevich, 2012, Damnjanović, Jednak & Mijatović, 2013*)

The research of de Vries (*2011*) shows that the implementation of standardization in the national education system requires policy at the national level, a long term investment in support, and cooperation between industry, standardization bodies, academia, other institutions involved in education, and government. Standardization bodies have not always been chiefly supportive towards standardization as a subject meter in higher education – with possible reason that better position of standardization in higher education might lower demand for vocational education (*Czaya, Egyedi, Hesser, 2010*). Can theory of standardization sustain without practice? Can cooperation between companies and academia change current positions of education about standards? All proposed question require a multidisciplinary approach in order to be solved.

3. DE FACTO STANDARDISATION AS A MEANS FOR OBTAINING CORPORATE GOALS

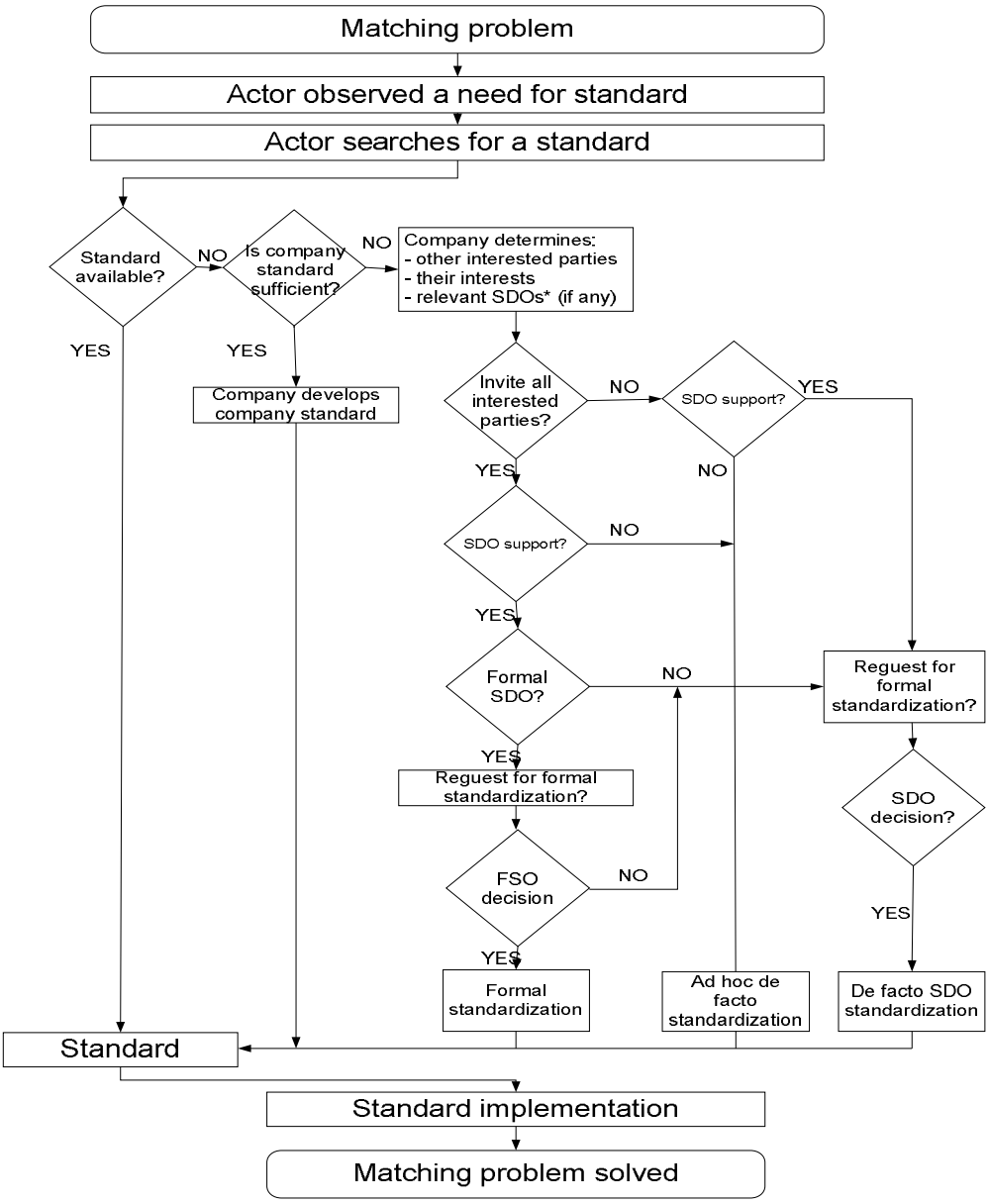
As widely accepted since Hank de Vries work in 1997, standardization can be used in area of internal or company-based standardization, cooperation-based or consortia-based standardization or national, regional or international standardization. The growing importance of the so-called "de facto" standardization can be seen in many areas because companies cannot operate in isolation, matching problems have to be solved and the process of formal standardization is time consuming. De facto standardization is standardization carried out by non-governmental parties other than formal standardization organization (*de Vries, 1999*). Many standards are developed by industrial consortia or in cooperation with other parties involved. The reasons for using consortia based standards instead of usage formal standards (developed by organizations for standardization) might be (modified in accordance to *Hesser, Feilzer & De Vries, 2007, pp 18*):

- *Swiftness.* Proposing new standard development to national or international organization for standardization is possible option but time and effort consuming. For example, there is yet no formal standard measuring level of adoption of ICT in the organization, although some measurement tools were proposed (*Čudanov, Jaško & Jevtić 2009; Čudanov, Săvoiu & Jaško 2012).* Consortia of companies with same and matching problems will have more interest in developing standards faster than SDOs.
- *Joined force for solving common or matching problems.* Many organizations out of consortia have not interest in solving particular problems. In many cases FSOs are not interested in development particular standards.
- *Intellectual property rights.* Formal standardization organizations (FSOs) allow the inclusion of patents in standards only when patent holder declares willing to negotiate licenses on reasonable terms. Companies that possess essential patents may prefer a consortium that allows high licenses fees.
- *Discretion.* In area of ICT, companies, that possess specific knowledge or developed technologies, may be interested in consortia-based standards to protect their specific intellectual assets, knowledge or technologies and in establishing cooperation with others companies of interest. In other fields companies may recognize interest in solving matching problems, but may not be willing to allow interference in solving that problem with others out of consortia.

Knowing that companies have many options in area of standardization one question has to be answered: How companies get standards they need? If a company needs standard and a satisfactory standard does not exist, the new one has to be developed (figure 1). The company must decide whether to co-operate with other companies and interested parties or not. The next important issue is usage of the standard development infrastructure of SDOs (Standardization development organizations). SDOs include formal standardization organizations (e.g. international, European or regional FSO); sectoral, professional or specialized standardization organization (SSO) and governmental or national standardization organization (GSO, NSO). Developing needed standards can be done without support of SDOs – that kind of standardization is called "ad hoc de facto standardization". More about this and other ways of standardization (formal or de facto SDO standardization) can be found in the work of de Vries (*1999, 2010*) and Hesser, Feilzer & De Vries (*2007*).

How company gets a standard it needs (*de Vries, 1999, pp 16*)

Figure no 1



*SDO – Standards developing organizations include formal standardization organizations (FSO), sectoral or specialized standardization organization (SSO), governmental or national standardization organization (GSO, NSO)

4. MULTIDISCIPLINARY APPROACH TO ORGANIZATIONAL DESIGN AND STANDARDIZATION IN PRACTICAL "AD HOC DE FACTO" STANDARDS DEVELOPMENT

The practical example of "ad hoc de facto" standard development presented in this paper results from consultant engagement of the project team from the University of Belgrade, Faculty of Organizational Sciences. A matching problem related to the lack of standardized systematization of job positions in the 21 public and public-utility companies in Serbia (employing over 18000 employees) was observed. All those companies belonged to different industries and have had different classification of jobs. It was very hard and time-consuming task to compare them. Further, lack of standardization caused that employees performing similar jobs in different companies have different job titles, and specific positions are often treated as different jobs, although in essence are not. It was therefore necessary to introduce a new solution (model) that would have the smallest set of typical jobs and to associate these jobs with jobs existing in observed companies. In the course of the project systematization of typical basic jobs was proposed in order to diminish a different number of jobs in observed companies by several tens of times. In order to solve the "matching problem" analysis of staff, performance and salaries had to be performed. The results of the analysis described current status within each company, but also to compare companies among themselves.

The first analysis that was performed was aimed at employees – so a staff analysis. Employee structure has been analyzed from the standpoint of its compliance with the efficient business performance (*Krivokapić & Čudanov, 2010*). The analysis included both qualitative and quantitative traits of the organizational structure. As secondary data source individual employee reports given by companies were used. These partial analyses consist of the analysis of the organizational structure and division of work in the company, the analysis of span of management control, analysis of organization units by the criteria of core/non-core activities, the analysis of the current job classification,

proposed systematization of jobs, the analysis of employee qualification, age structure, service and overall fluctuations. The analysis was made on the basis of the entire staff that was obtained from the personnel records of employees.

The staff structure analysis was based on:

- **Analysis of core/non-core activities on organizational unit level:** This analysis identifies core units, which directly contribute to carrying out basic activities of enterprises, and non-core units, which provide indirect contribution. Depending on the company size, the depth of this analysis was 2-5 organizational unit levels.
- **Analysis of core/non-core/support activities on employee level:** just as organizational units, each employee has his job description analyzed compared to main goals, aims and targets of the enterprise, and if needed further interviews were performed. Afterwards each employee is classified in group that directly contributes to the basic business activities (core), group that contributes indirectly to the basic activities of the company (non-core) and as further gradation third group, whose job is to provide support and assistance to other employees while performing their tasks (support staff).
- **Existing job classification analysis:** This analysis shows the total number of jobs in the existing classification, as well as the total number of standardized jobs in the company. For each organization, existing classification was analyzed, and a large number of jobs that were valued differently were observed. The main reason for that was different ability or commitment of particular employees who work on the same position. When employees leave the organization, the evaluation of that position still retained the number of points basically connected to the retired employee's past performance. A smaller number of standardized jobs with objective valuation is suggested. Individual performance would then be valued by variable part of salaries and related mechanisms.
- **Work division analysis:** Division of work helps to observe which model of organizational structure is characteristic of specific company, which are its organizational units, and what is the number of employees in each of them.
- **Typical jobs systematization:** In accordance with the conclusions of the analysis of the current job classification, a set of standardized jobs was proposed, through the enrichment of basic activities, with respect to technological limitations. The common services were conducted at the level of coordination of all public and public utility companies which were included in the project. For such defined positions, various categories that would depend on the level of education of an executor or any other parameter such as experience or previous results could be defined.
- **Employee qualifications analysis:** Employee formal qualifications were simplified to formal education. Education of employees is analyzed according to the current Serbian education system classification of the seven degrees of qualification.
- **Employee age analysis:** In each organizational unit, age structure of employees is analyzed by indicators of the average, minimum and maximum age. After that, two classifications of personnel were made. The first classification divides the workers into groups by age single culture – pragmatism, existentialism, or conservatism. The age group up to 30 years (specific manifestation depends of the organizational culture) has the core value of pragmatism, seeks success and ambitions that motivate them, and is ready to work hard with the use of new technologies. The group aged 30-45 has tentatively culture existentialism, where the main motivators are quality of life, nonconformity, seeking autonomy, and loyalty of employees is directed primarily towards themselves and their own family. The age group over 45 years is characterized by conservatism, which, depending on the environment, can be manifested differently, but in our environment is often expressed through the rejection of change, desire for job security and resentment with new values that are accepted in the enterprise (*Hofstede, 1990*). The classification analyzes workers by decades of age, where the first covers the period up to 30 years, next to 40 and so to the last, which includes workers aged 60 and older. This analysis includes indicators of average age, then determines the difference in years between the youngest and oldest employee in the company, the average age by the organizational units that were previously defined, and the prevailing culture of the company.
- **Employee overall experience analysis:** The analysis of total work experience of employees was completed by the companies. Experience was analyzed by average, minimum and maximum values for all organizational units at the highest level, and in a later analysis four groups were formed: a group of up to 30 years of service, a group of 31-35 years of service, a group of 36-38 years of service and a group of over 38 years of service.
- **Fluctuation analysis:** Fluctuation analysis showed the total number of workers who had come and the total number of workers who had left the company in the observed period.
- **Managerial span of control analysis:** The span of control shows the number of workers who are directly subordinate to a supervisor. This is highly linked with the cost of management and efficiency of task execution control in organization. This analysis shows the overall manager's headcount in the organization, average control span by each manager, as well as top and bottom value of control span for each organizational department in each organization

The next step was performance analysis. Performance of the company includes its ability to achieve a certain result, under the given conditions of operation (*Jaško, Čudanov, Jevtić & Krivokapić, 2013*). First, we have analyzed performance by the value-creation-chain (*Porter, 1998*) which includes a clear distinction between the direct value creation activities and support activities. All employees are divided into 2 groups – support activities and primary activities – and then can be divided to the subgroups integrating a partial set of activities by functions (*Dulanović & Jaško, 2009*). The elected structure allows the standardization of infrastructure activities and performance comparison of these activities in a variety of public sector enterprises, but also the adoption of joint recommendations for all companies, which can be viewed as a group on basis of similitude of their activities *(Săvoiu, Manea, Iorga – Simăn, Enescu, Čudanov, Jaško & Jaško 2011).* A similar analysis was performed for each of mass standardized jobs, output of typical jobs systematization, and used to ensure human resource sustainability, and to determine right number of employees, according to required amount of work in previous period (*Čudanov, Jaško & Săvoiu, 2012).* According to that model, sharing the overall organization's task is based on the different contributions of specific activities to competitive ability of the organization (Porter,

2001). Porter's value chain was combined with Mintzberg's model, which divides organization into the 5 elements, namely the strategic apex, middle line, operating core, techno structure and support staff (*Mintzberg, 1983*). Modified Porter's value chain and Mintzberg's model (*Čudanov, Savoiu & Krivokapić, 2010*), were basis for further classification of standardized jobs. which proved useful in further comparison between enterprises, because now each pair of enterprises could be compared by number of employees and workforce traits in each part of the chain of value creation, or in each Mintzberg's structural part. That served as an "ad hoc de facto" standard of job classification, presented in (*Jaško, Krivokapić & Čudanov, 2010*), where most differences of the model existed in the operative part of each enterprise.

5. CONCLUSION

This paper illustrates the multidisciplinary approach to organizational design and standardization, through examples of "ad hoc de facto" standardization. A non-public standard related to solving problem of job classification in 21 communal and public-utility was implemented and has beenproven as functional in practice for three years since. In synergy with organizational design analysis methods, one of the main tasks of standardization process "to bridge the gap between the impulses of science and technology with the degree of acceptance at the user side" (*Blind, 2004*) has been accomplished. The increasing significance of the so-called "de facto" standardization is not limited to communal and public utility enterprises, which served as an example. This multidisciplinary approach can be useful due to the fact that organizations in many fields cannot operate in isolation. Whenever matching problems have to be resolved and processes of formal standardization processes are time-consuming, "ad hoc de facto" standardization can use synergy with other disciplines. The problem is that despite awareness of matching problems, a large number of companies are not familiar with the benefits, or even the idea of "ad hoc de facto" standardization (*Mijatović, 2008, 2011*). The number of "de facto" standards – developed by parties other than formal standards developing organizations – is, however, still steadily increasing.

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