

VIRTUAL ORGANIZATIONS IN TELECOMMUNICATIONS INDUSTRY – CASE OF MONTENEGRIN COMPANY

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Jasmina Četković¹, Miloš Knežević², Mija Nenezić³

¹Faculty of Economy Podgorica, Montenegro

²Faculty of Civil Engineering Podgorica, Montenegro

³Ministry of Economy, Montenegro

Abstract. *Telecommunications represent one of the most prosperous and growing industries in the world, since it is placed on the source of transformations occurring on all markets. The purpose of this research is to explore the optimal solutions and practices in telecommunications, relative to the improvement potential in efficiency, effectiveness, profitability and competition, by establishment and operation of certain modes of virtual organization, while the subject of the research is exploring feasible ways to establish, manage and operate a virtual organization in telecommunication industry, based on a study of a Montenegrin company. Potential modes of operation and recommendations stem from the case studies of a globally renowned and highly successful international telecommunication company, which has, continuously and effectively, applied various mechanisms of virtual organization in its business operations, as well as based on PEST and SWOT analysis of the current state-of-art in Montenegrin telecommunication sector. Overall conclusion of the research allows for improvements in efficiency and effectiveness of business operations based on the configuration of the most suitable type of virtual organizations, given the specific conditions of Montenegrin economy and size of the market, as well as taking into account the transformative characteristics of the telecommunication industry.*

Key Words: *globalization, communications, telecommunications, virtual organizations.*

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Corresponding author: Jasmina Četković

Faculty of Economy Podgorica, Jovana Tomašević 37, Podgorica, Montenegro

Tel: +382 67 652 016 • E-mail: jasmina@ac.me

INTRODUCTORY REMARKS

Today we observe fast-paced changing conditions in the business environment, where rules and conditionalities change in the midst of planned activities. Business environment is exceptionally heterogeneous regardless of the unifying characteristics that are the epitome of globalization. Communication progressively assumes the increasingly important role in all business processes, relations and phases, becoming at the same time more complex and comprehensive, and process of innovation is becoming more and more strategically important, slowly replacing efficiency as the core word for increasing productivity. The characteristics of today's market behavior and business trends demand a new form of management and organization.

Business environment and markets, heavily relying on knowledge and information, influence the organizations to become "shallower", forcing the creation of organizations that question the dependence on geographical distances and time differences. These organizations, commonly recognized as "virtual organizations", consist of cross-linked network structures that are without boundaries and continuously learning. In other words, virtual organizations are the ones to adapt to today's exogenous changes in the most effective and efficient way, without losing the required comparative edge.

Analysis of the telecommunications market in Montenegro shows a strong growth trend, mostly subject to exponential growth in the mobile network segment. Furthermore, structural changes and technological developments that are typical of telecommunications sector, such as liberalization of the infrastructure for mobile and fixed network access and extensive integration of Internet and Web application, significantly contribute to dynamic and intensive growth of this economic sector. Since Montenegrin telecommunications companies are part of big multinational corporations that maintain their competitiveness mostly by continuous improvement of their business processes and implementation of innovative solutions, these experiences and good business practices can be transferred onto Montenegrin telecommunication market.

Moreover, most of the telecommunications companies in the world, given the specific market conditions in which they operate, are bound to create some modes or forms of virtual organizations, aiming at optimization of their business operations and links, as well as safeguarding and improving their position on the fast-paced and unpredictable markets. Consequently, Montenegro has ripe markets, one of which is definitely telecommunications, for creation of virtual organizations that would render certain companies more profitable and productive. Situation analysis shall demonstrate the feasibility of the establishment of virtual organizations in the Montenegrin telecommunications sector.

The main objective of this research represents the exploration of feasibility and applicability of creation of virtual organizations in Montenegro, focusing on the telecommunications sector. Specific objectives refer to the development of the knowledge base on the state-of-the-art in Montenegrin telecommunications, possible development trends and growth directions, challenges and opportunities that are characteristic for Montenegrin market and environment. Additionally, specific objective examines parts of the processes that require establishment of virtual organizations, as well as underlying reasons that would discern disinclination, incapability or unfeasibility to adhere to principles thereof.

The research was conducted in the following manner:

- Data collection:
 - Secondary data
 - In-depth interviews
 - Desk research of exogenous factors
 - Observations
- Data analysis and interpretation:
 - Case studies of international and domestic telecommunications company
 - Benchmarking
 - Interpretation of results of the in-depth interviews
 - Conclusions drawn from observations
 - PEST analysis
 - SWOT analysis

Data collection from secondary data included international scientific and research articles, as well as similar sources of information that offered objective overview of relevant facts necessary for this research. Furthermore, online desk research was necessary so as to obtain specific and updated information concerning legislative, institutional and regulatory framework for the telecommunications sector in Montenegro, as well as strong background for development of given case studies, PEST and SWOT analysis. Obtained data was supplemented by essential in-depth interviews that offered "insider" and subjective, mostly qualitative perspective on the potentials of development of virtual organizations, while the PEST and SWOT analysis created number of useful and relevant recommendations and suggestions that would create environment for improvements in productivity, efficiency and comparative advantage, based on the establishment of virtual organizations.

In-depth interviews included representatives of the middle and top management of Montenegrin telecommunication company, aimed at understanding attitudes, opinions, perspectives, motivation and decision-making factors that include intention to implement or not to implement virtual forms or work organization and business operations. The main purpose of this methodology was to define specific issues and determine relevant causes so as to perform problem analysis and direct further research towards a core of the problem and propose suggestions on how to improve the situation. In-depth interviews included 3 representatives of the middle and top management and offered concrete examples of the underlying motivation and managerial principles relevant for the establishment of virtual modes of organization.

PEST analysis was possible after the thorough desk research was conducted, in depth interviews took place and were interpreted, specific observations were recorded, and appropriate guidance was provided. After the PEST analysis, SWOT analysis was necessary so as to obtain main directional points to create specific recommendations relevant for the establishment of virtual organization applicable to Montenegrin environment and conditions and explicitly beneficial for improvement in efficiency and productivity of telecommunications companies.

SWOT analysis included all factors and conditions relevant for pinpointing directly dependent variables that influence further developments in the telecommunications sector, relative to the aspects of virtualization of the organizational structure. Strengths and weaknesses included both positive and negative factors that are directly relevant for vir-

tual organizational aspects in telecommunications industry, taking also a larger outlook on developments in information and communications technologies (ICTs). SWOT analysis was conducted based on the following factors: legislative and regulatory framework, global business environment and "glocalization" opportunities, economic and business activities, infrastructure and services, human resources, technological progress or technological integration, as well as strategic planning. Given a comprehensive and thorough analysis, relevant and objectively feasible recommendations were presented so as to initiate necessary changes to establish and maintain an effective virtual organizational structure necessary for increase in productivity and efficiency.

■ Developmental trends in telecommunications in the world

Most economic and business experts, specialized in domain of market growth and expansion, agree that these processes heavily depend on accurately identifying the moment a "critical" mass for demand is to be reached, leading to an exponential growth of any good or service, in any given market or economic sector. There are numerous theories that focus on investigation of the life cycles of product, organization or market development/evolution, but when service sector is concerned, the most relevant and suitable theory is "supercycles or wave theory", developed by a Russian economist Nikolai Kondratiev in 1925. Among other things, this theory postulates that there is a long term order of economic behavior and could be used for the purpose of anticipating future economic developments. In other words, he detailed the number of years that the economy expanded and contracted during each part of the half-century long cycle, which industries suffer the most during the downwave, and how technology plays a role in leading the way out of the contraction into the next upwave. Number of schools argued on what were the most relevant factors influencing the sinusoidal movements in long term, settling mostly on technological innovations, capital investments and war [1]. If, for instance, the innovation theory school is consulted, the argument would settle on the observation that waves arise from the number of innovations taking place that launch technological revolutions that in turn create leading industrial or commercial sectors. Several papers on the relationship between technology and the economy were written by using the logistic function, providing insight into market penetration, saturation and forecasting the diffusion of various innovations, infrastructures and energy source substitutions, all relevant for the appropriate understanding of the developments in the telecommunications sectors worldwide.

Ayres gave a comprehensive historical overview of the oscillations in the world economy, starting with the Industrial revolution and covering the momentum of the introduction of computers and telecommunications (ICT) in the everyday life and work, marking the year of 1995 as the year the ICT markets started to exponentially grow.

The last Kondratiev's wave or supercycle that shows at its core developments in ICTs, coincided with political and historical overturns, characterized by the collapse of communism and rigid monopolistic structures, as well as expansive liberalization and globalization of various markets. As an adequate response to given changes and macroscopic processes, taking into account technological and technical progress, as well as fostering the necessity to improve and upgrade existing telecommunication networks, the privatization of numerous telecommunications companies, mostly national monopolies, was initiated during the 90s of XX century. Understanding that the inevitable and unpredictable

changes in the markets worldwide required fast and bold response, concurrently bringing positive ramifications and specific comparative advantages newly identified due to globalization processes, many countries embarked on the strategy of investing heavily in Research and Development (R&D) and funding innovation in most profitable new and emerging markets, which included telecommunications and ICT.

A number of revolutionary inventions and changes, Internet and WWW being the most conducive ones, led to the acceleration of changes and further developments in practically all markets in the world. Information and telecommunication technologies, which during 2000s technologically and strategically merged into combined and mutually-enforcing operation, caused a complete restructuring of business and interpersonal relations. A fact that Internet acquired in 5 years an equivalent number of users that took telephone 100 years (in USA) speaks boldly in contribution to the above given observation [2]. These facts demonstrate fulminant changes and developments that represent both cause and effect of technological progress observed in telecommunications sector over a rather short period of time, exerting an unremitting influence on all life and work spheres of people and organizations alike. Generally observing, rapid developments in telecommunications sector are mostly attributed to radical technological changes and technical solutions, as well as to extensive application of Internet and other information technologies [3].

Telecommunications around the world experienced a common denominator when attempting to define factors influencing growth and change in this sector: state-owned monopolistic structures that were heavily regulated. All countries with strong telecommunication industry had strong PTT infrastructure (postal services, telephone and telegraph), which showed high levels of inefficiency and rigidity at times of high levels of intense market changes and liberalization processes. Many proponents of market liberalization propagated that revolutionary changes in the telecommunications can only happen by elimination of existing monopolistic structures, since these structures did not have a clear picture of specific consumer needs and preferences. In other words, various experts and analysts agree that convergence of technologies, deregulation and globalization represent fundamental drivers for changes and developments in the telecommunications sector [4].

Furthermore, main factors influencing the competitiveness of a certain telecommunication company, which are also used as "criteria" for strategic planning and establishment of strategic alliances, are unpredictability, dynamics and time schedules, and knowledge dispersion. All given factors are directly proportionate to technological changes and innovations, while unpredictability is also dependent on the irrationality of consumers and volatile changes in their preferences. Since knowledge is no longer concentrated in one single company or corporation, or in one geographic area, the need to establish cooperation between complementary partners, or even among competitors is increasingly evident, leading to the creation of various strategic alliances, joint ventures and consortia. Additionally, capitalizing on intellectual capital is one of the strategic orientations of many competitive companies, and associated transaction costs are nowadays lower, since this type of capital is much diversified and geographically dispersed.

Given the previous discussion, a number of observations was presented by economists so as to explain developments occurring in telecommunications sector. Godoe identified several radical changes and revolutionary innovations that expansively improved during the 70s and 80s of the XX century. Most of these innovations were technological in nature and included: digital switches, semiconductors, digital mobile and radio communications,

satellite communications, optic fiber cables and networks and complementary technologies [5]. All these changes and developments required a complete reorganization of work processes, acquisition of new knowledge and skills, as well as creating a comparative advantage so as to respond expressively to changes in the market. Specifically, Rosenberg affirmed that, taking into account constant turbulences in telecommunications market, as well as high and intense level of R&D activities, managers should concentrate resources so as to continuously modify and update organizational structure and introduce new technological solutions in business operations, with the aim of creating and maintaining a necessary comparative advantage in erratic markets [Rosenberg, cit in Ibid, p. 1037].

Telecommunications companies worldwide are becoming more and more network organizational structures, with specific and concentrated core competencies created in each one of them. In the telecommunications sector, a core of competencies mostly includes functions of the network operator, service provider, technical support, marketing and advertising, customer service, logistics and planning. On the other hand, installation, maintenance and repair services, including services on the repeater and antennas, as well as other infrastructural services are mostly outsourced to partners [6]. Most of big telecommunications companies, such as *Deutsche Telekom* or *British Telecom* divide their companies based on platforms or group of activities, in most cases implementing a loose divisional organizational structure with strong elements of matrix and project organization [Ibid, p. 214]. However, due to volatile changes in the specific markets on which they operate, their matrix or project structures often become relatively virtual, as demonstrated by numerous strategic alliances continuously created worldwide.

Finally, telecommunications industry integrated wireless and wired voice, video and data transfer, Internet service and web applications, fixed and mobile services, cable TV services and other services under one package, so as to contribute to the comfort of its customers, combine existing cutting-edge technologies and lower fixed and transaction costs. Emergence of broadband and 3G or 4G technology allowed for integrated transfer of all forms of data under high speed levels and with greater stability and security [Ibid, p. 216].

A summary of main technological developments that marked the main growth trends in the telecommunications sector are given below [7]:

- II generation of GSM networks offering besides standard voice and data transfer options, the WAP option (Wireless Application Protocol – or initial mobile Internet) and SMS (Short Message Service – text messages),
- Introduction of GPRS technology (General Packet Radio Service) for faster data transfer and simplified use of mobile Internet, as well as introduction of MMS option (Multimedia Messaging Service – multimedia messages),
- Full Internet service, including the adaptation for mobile phones (broadband, ADSL, wireless, fiber optic, etc.),
- Development of 3G and 4G packages and integration of telecommunications and information technologies specifically for mobile use (smartphones-Blackberry, Android, Symbian, iPhone).

■ Potential for establishment of virtual organizations in telecommunications industry

Recently, due to exponentially fast advancements and innovations in Internet services and ICT technologies, a number of telecommunications companies established within

their sector short-term and long-term alliances, work groups and task forces, with a common goal – to create an "extensive cooperation among organizations so as to develop new technological and innovative solutions and improve quality of offered goods and services" [3, p. 1038].

Aside from creativity and identification and implementation of new concepts, the main characteristic of the innovation processes in the telecommunications is timely identification of advantageous links in the system or network and readiness to exploit them by swiftly changing or modifying business processes or communication links [1, p. 699]. Key factors affecting successful implementation of virtual solutions in telecommunications can be grouped into the following categories [8]:

- precise and detailed needs assessment,
- senior and top management support,
- direct involvement of customers in development and planning processes,
- standardization in all aspects and domains,
- continuous and constant capacity development about use of tools and instruments for virtual organization of tasks and work.

During 1998, Andersen Consulting conducted a research on more than 350 executive directors and presidents of some of the most successful companies on the question of corporate vision of the organizational management in the year 2010. Most of the directors agreed that virtual organization represents the most effective mode of organizational design, since it is a flexible structure with a small number of full time employees in the core of competencies, who are constantly upgrading their skills and competencies in exchange with partners, suppliers and even competitors. These types of organization of work require strong, stable and highly secured telecommunications platforms and packages, which in turn would create a sustainable basis for the creation of necessary comparative advantage [9].

At the end, each telecommunication company must have certain competencies that would be considered essential for "surviving" in this highly unpredictable and volatile industry: identification and assessment of the trends and demand within the market, implementation of necessary technological solutions, and organizational networking – creation of virtual strategic partnerships and alliances, as well as supply chains [10]. In other words, attributable to specific characteristics of the telecommunication industry, the need to create virtual teams and organizations, either within one single company or among number of partners and even competitors and even outside this industry, is becoming increasingly unavoidable and objectively advantageous.

■ **Current situation in the telecommunications sector in Montenegro**

● ***Legislative, institutional and regulatory (LIR) framework of the telecommunication sector in Montenegro***

Regulatory framework of the European Union (EU) that was created in 2002 shows a result of an arduous and time-consuming process that included numerous discussions and analysis on the manner and procedure to establish the most adequate environment for a continuous sustainable and strong growth, as well as healthy and effective competition in the area of electronic communications. The regulatory model adopted in the EU repre-

sents the most widely used model even outside the EU. The most important regulation in the area of electronic communications is Directive 2002/21/EC of the European parliament and of the council from March 7th 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive), which is supplemented by a number of implementing directives and acts necessary for specific aspects of electronic communications:

- Directive (2002/19/EC) on access and interconnection,
- Directive (2002/20/EC) on the authorization of electronic communications networks and services,
- Directive (2002/22/EC) on universal service and users' rights relating to electronic communications networks and services,
- Directive (2002/58/EC) on privacy and electronic communications,
- Directive (2002/77/EC) on competition in the markets for electronic communications services,
- Regulation (2000/2887/EC) on unbundled access to the local loop.

By establishing a stable and strong legislative and regulatory framework, Montenegro initiated the process of creating institutions that would coordinate all activities in this sector. The institutional framework consists of the Ministry for information society and telecommunications and Agency for electronic communications and postal services, responsible for the development of policy, creation of favorable market conditions and business environment, as well as monitoring the trends in the electronic communications sector.

In regards to the legislative framework, the most important national legislative act for the regulation of the telecommunications sector is the Law on electronic communications, adopted in 2008, which determines the responsible institutions, telecommunications market, regulatory provisions, licensing, as well as other essential elements for a stable operation of the sector. A number of implementing secondary legislative acts were also adopted in order to more precisely define specific aspects of the telecommunications sector (i.e. telecommunications towers, internal loop, accessibility, preferential network provider and the like).

During 2004, Montenegro initiated a full liberalization of the telecommunications market, but even now, the licenses fees for the market players are still exceptionally high and insufficiently competitive. The council of the Agency for electronic communications and postal services adopted in 2009 the Decree on the relevant service markets and relevant geographic market. Decree determines the territory of Montenegro to be the relevant geographic market, as well as the relevant service market. Since Montenegro does not have the actual manufacturing industry for any of the products or parts used in the production of telecommunications equipment and materials, the relevant product market was not defined.

• *State of affairs in the telecommunications sector in Montenegro*

Telecommunications market in Montenegro is liberalized in greater part of its segments and the competition is on a considerably high level, mostly in the area of the mobile network, where there are currently 3 network operators: Telenor (integral part of the Norwegian telecommunication giant), T-mobile (part of the Crnogorski Telekom, a sub-

subsidiary of the German giant Deutsche Telekom) and M:tel. In the area of fixed network, T-com, which is the second part of the Crnogorski Telekom, holds a significant share of this market, with M:tel being a recent incumbent.

The agency for electronic communications and postal services (EKIP Agency) is required to conduct necessary analysis of the relevant markets, with the purpose of the identification of efficient competition on markets, control existence of the SMP Operator (Operator with Significant Market Power), adhere to obligations and provisions given in relevant EU legislation, as well as utilize necessary methodology for specific analyses. Consequently, a continuous market developments and trend can be monitored, as well changes in the market shares and market penetration of individual network operators, price changes, interactions among services provided and other market actions necessary for further improvements in the competitiveness of the telecommunications market in Montenegro.

EKIP Agency conducted research in 2007 with the purpose of identifying the level of use of ICT technologies in Montenegro, as well as the level of awareness of Montenegrin citizens in regards to the importance of the telecommunications. The survey demonstrated a constant rise in the levels of awareness and in 2010 Montenegro assumed 41. place in the World's ICT rankings [11]. Furthermore, annual reports and special analyses that EKIP Agency produced in the previous years showed that the participation of telecommunications sector in the total GDP of Montenegro is gradually and steadily increasing and is currently around 11-15% of GDP, which is above the EU-27 average, a sign of increasingly significant role telecommunications play in Montenegrin economics and positive growth [12]. Additionally, new tendencies and structural changes in the telecommunications sector, mostly related to the liberalized approach to the infrastructural developments in fixed, mobile and Internet services, led to dynamic growth of this sector in Montenegrin economy.

EKIP Agency conducted a survey on the usage of information and communication technologies in Montenegro; it was conducted in the period between 1st and 28th February 2011. Most of the data regarding mobile use were given through the investigation of the Case study of the Montenegrin telecommunications company. As for the data regarding Internet usage in 2010-2011, out of 1503 respondents in household section, 66.5% replied that they personally or another member of the household have access to the computer at home. The number is similar, though a bit lower, when it comes to internet access, 59.3%. When talking about internet connection, people dominantly use DSL connection, 55.8 %. Mobile phone is most used mobile device among respondents for accessing internet. The survey also shows that more than 95% of companies use internet and computer at work, but only very few enterprises, 13.4% of them, regularly used the open source operating systems, mostly due to the fact that these operating systems in some part are different from the one currently in use, so the transition to such systems requires additional investments in training staff to use them. Another reason is the lack of knowledge of the existence of such systems. The largest portion of enterprises that use open source operating systems, are using them for specific purposes, namely for servers and storage [13].

• ***PEST and SWOT analysis of the telecommunications sector in Montenegro from the virtualization perspective***

Taking into account collected secondary data, interpreted observations and analysis of the telecommunications sector in Montenegro from the perspective of available data and trends, PEST and SWOT analyses were conducted. The following table (Table 1) gives a summary of the PEST analysis of the market potential for telecommunications in Montenegro in regards to virtualization of business processes and organizational structure:

Table 1. PEST analysis

Political factors	Economic factors
<ul style="list-style-type: none"> • Stable political situation in the country • European integrations • Glocalization effects • Stable primary and secondary legislative framework • Governmental support to the telecommunications sector • Transposition of relevant EU directives (2002/21/EC, 3003/19/EC, 2002/22/EC, 2002/58/EC) • Functioning of Ministry for information society and telecommunications • Establishment and proper functioning of the Agency for electronic communications and postal services • Relevant service market defined • Liberalization of markets and promotion of competition • Strategic business alliances in the telecommunications • Capital diversity • Corporate social responsibility and focus on human capital • Harmonization with environmental standards • Defined tariff and fee system • Establishment of e-Government 	<ul style="list-style-type: none"> • Size and type of economy (small, open and liberalized economy) • Constant GDP growth • Free capital movement • Constant increase in foreign direct investments, growth of capital markets, privatization processes • Decrease of inflation, unemployment and average weighted effective active interest rate • High degree of investment in telecommunications sector (11-13% GDP) • CEFTA and SAA agreements • Service sector participation in GDP more than 60% • Increase in HDI index and global competitiveness index • Growth in area of economic freedoms • telecommunications companies subsidiaries of big multinational telecoms (Norwegian, German, etc..) • High penetration of electronic communications • Focus on optimization of processes, goods and services • Favorable investment and business climate • Removal of business barriers

Social factors	Technological factors
<ul style="list-style-type: none"> • Improvements in comfort and living standard • Digitalization • Importance of virtual social networks • Recognition of T-brand as an innovative and modern company • Focus of the telecommunications companies on individual customer and his specific needs and preferences • Increase in education levels • ICT awareness of citizens • Openness to global trends • Significant need for knowledge and know-how transfer from around the world • Social aspect of statutory symbol of mobile phone, TV and Internet for Montenegrins • "Brain drain" of highly skilled labor force • Recognition of telecommunications sector as creators of high value-added knowledge and innovations base • Interest for virtualization 	<ul style="list-style-type: none"> • Globalized networked information services and technologies and online technical and customer support • Direct access to data (market research, global financial data, data on competitors, most suitable and strategically advantageous partner companies, economic and business indicators and demand segregation according to various parameters) • Establishment of Intranet and electronic system networking • High degree of technology transfer and successful marketing strategies • Intertwined telecommunications and information technologies • Technological potential of exploitation of intellectual capital • Security for the increase of virtualization and virtual networking • Integration of processes across the globe

After all given factors were taken into account, analyzed and interpreted, SWOT analysis was consequently conducted so as to identify the current *status quo* and potential developmental directions in the area of virtualization in Montenegrin telecommunications (Table 2).

Table 2. SWOT analysis

	STRENGTHS	WEAKNESSES
Strategic framework, planning and operations	Harmonized EU <i>acquis</i> Long-term strategic approach to ICT developments Market and Capacity assessments Multi-annual strategic and development plans Knowledge and experience of mother companies	Possibility of global strategic approach to overcome local capacity development needs and local economic growth Market too small for inclusion and special reference in overall strategic planning
Legislative and institutional framework	Corporative social responsibility Cooperation with government and regulatory institutions Analyses conducted by EKIP Agency Decrease of monopolistic activities in telecommunications sector	Inadequate control and risk assessment Implementation of legal provisions Lack of effective mechanisms for increase in virtualization Lack of administrative and monitoring capacities
Economic and business activities	High penetration of the telecommunications industry Significant growth in Internet usage and ICT awareness Potential transfer of successful technologies and technological/software solutions for optimization of processes Increase in digital and e-awareness ICT business incubators and/or business clusters Service sector- a strategic priority for Montenegrin economy	Underdeveloped infrastructure Complicated administrative procedures Lack of proactive action and willingness to reduce or remove business barriers for the increase in virtualization Low level of R&D investments
Infrastructure and services (technological progress)	Developed telecommunications network and essential capacities Solid basis for implementation of advanced software solutions Technology and knowledge transfer from mother companies	Incompatibility and inconsistency of certain ICT sectors Security of the power supply system Security of information and internet inflows and outflows
Human resources	Available and capable human resources Relatively good potential for specialization Solid "knowledge base" for virtualization Integration of knowledge between mother and daughter companies Focus on team work and knowledge exchange	Inconsistency of supply and demand on the labor market Low level of awareness raising initiatives in regards to virtualization processes High brain drain of highly skilled workforce Fear from unknown and change

	OPPORTUNITIES	THREATS
Strategic framework, planning and operations	Integration of business units One company- one strategy Global strategic networking and alliances Focus on I3: integration, innovation, intelligence	Incompatibility of global trends and local demand Slowed-down virtualization opportunity Lack of implementation of adopted strategic plans
Legislative and institutional framework	Transposition of EU <i>acquis</i> and fulfillment of international obligations and requirements Institutional structure that does not allow monopolistic practices Digitalization and ICT requirements	Lack of absorption capacities of existing and future legislative and regulatory requirements Lack of institutional and administrative capacities for implementation of obligations and monitoring of relevant processes
Economic and business activities	New business operations trends in telecommunications Demand increase for "smart" technology and integrated service package "all-in-one" (mobile, fixed, TV, Internet) Improvement of business environment and attractiveness for foreign direct investments Inevitable digitalization process in all economic sectors ICT growth and innovation Knowledge and technology transfer	Low motivation to undergo virtualization of organizational structure and processes Impossibility to attract targeted investments and decrease in investments over time Drop in demand for certain labor skills Omission of benefits achieved by increased virtualization Investments in impractical software
Infrastructure and services (technological progress)	Impossibility to bypass virtualization and digitalization effects (social networks, communications, knowledge transfer, project development and implementation...) Global applicability of telecom products and services Constant upgrades in ICT technologies	Practical implementation of acquired knowledge and technologies from the mother company and adaptability to local market conditions Keeping up with ICT developments Outsourcing instead of virtualization
Human resources	Investment in life-long learning and constant career improvement Focus on teamwork and individual needs Increased investments in human and intellectual capital Support to creativity and innovation	Low awareness level on virtual organizations Lack of knowledge and skills for using virtual tools and mechanisms Recruitment and employment not based on knowledge and expertise Demotivation and brain drain

Case Study A: Global telecommunication giant Deutsche Telekom AG

Deutsche Telekom AG represents one of the leading telecommunications companies in the world. It is the world's fourth largest wireless service provider by market capitalization in the global telecommunications industry and biggest company in Europe by average market penetration index. Deutsche Telekom operates in over 50 countries in the Americas, Europe, Africa, Asia, with heavy capital investments in the United States and throughout Western Europe, more than 260.000 employees and 200 million customers worldwide. Main strategic focus of Deutsche Telekom is the increase in digitalization level in all areas, personalization and individualization of offered products and services, as well as increased mobilization and internationalization. Further strategic focus of the company is to work on convergence and integration of technologies, products and services in accordance with the cutting-edge and modern technological solutions, as well as global social developments on various planes. Deutsche Telekom offers mobile and fixed network services, Internet wireless and broadband access, as well as creation of intelligent networks and systems that integrate in one package smart solutions and intelligent design that combine various ICTs.

Deutsche Telekom represents a pioneer and even an *incumbent* in the telecommunications sector, not only in Germany but also globally. As most of the other telecommunications incumbents, the company was initially vertically-integrated monopolistic structure. The first phase of national telecommunication reforms in Germany occurred at the beginning of 1990s when the Federal Postal Service of Germany disintegrated into 3 independent state institutions: company for the provision of postal services, postal bank and telecommunications company - Deutsche Bundespost Telekom. As early as 1993, the telecommunications company started to enter foreign markets by means of mergers and acquisitions, buying a Hungarian telecommunication company and opening a sector for mobile network services in 1995. The same year a number of further institutional reforms, named Phase II, were undertaken, including the transformation into Deutsche Telekom AG and initial public offering (IPO) issued on German stock market. At the end of 1998, telecommunications market in Germany became exceedingly liberalized and became one of the most open markets in the world. In 2000, the company reorganized its structure, creating 4 strategic business units: Mobile network, Fixed network, Internet and Data transfer, while the integration of information and communication technologies into T-Systems unit occurred in 2001. Further changes in organizational design of the company were undertaken in 2006, when mobile network (T-mobile) and fixed network (T-com) merged into one business unit.

As typical as the big telecommunication operator goes, Deutsche Telekom focused on integrated operative functions: differentiation of products (mobile and fixed networks, possibility of different data transfers), inclusion of Internet in the service, capacity development of human resources and increase of market share. Furthermore, since the company started as vertically integrated structure, it initially concentrated on distribution and sale channels, marketing and technical support. However, after 2007, due to constant erratic and dynamic changes on the telecommunications market, Deutsche Telekom AG changes the strategy into "focus-fix-growth", with specific focus on individual customers, constant innovation and market penetration worldwide. Brand unification in 2008 brought new slogan of the company - "Life is for sharing", as well as new strategy "One Company: Fix-Transform-Innovate", with dual focus:

- stabilization of traditional mobile and fixed network markets,
- growth in high profit margin market segments:
 - further integration of mobile and fixed networks ("One Company")
 - further penetration of telecommunication markets worldwide
 - Gigabyte society development
 - further penetration of television market
 - cross-sectoral cooperation with energy, health, transport and media sectors

Since 2010, Deutsche Telekom became major shareholder of Magyar Telekom which was already a major shareholder of Crnogorski Telekom. As a big multinational company, with numerous mergers & acquisitions, strategic alliances and partnerships, Deutsche Telekom represents a leading company in the telecommunications sector, with more than 150 mobile users and more than 40 fixed network customers. The company announced more than 64.6 billion € of revenues in 2009, the majority acquired outside of German markets.

As a result of integration strategy and successful exploitation of positive ramifications of "glocalization" processes, Crnogorski Telekom accepted, implemented and modified a number of processes, procedures, structures, values and objectives from its mother company, Deutsche Telekom, and initiated the realization of sustainable and efficient solutions in the company.

Case study B: Montenegrin telecommunication company – Crnogorski Telekom

Crnogorski Telekom A.D. (Montenegrin Telecom) represents an incumbent in the telecommunications sector in Montenegro. Company consists of two main business units, T-mobile and T-com, which offer services of mobile and fixed network, Internet and cable TV, as well as complementary telecommunications services, such as telefax, telegraph, network databases and network rental services.

According to the Central register of the Commercial Court in Podgorica, the main area of business activity of Crnogorski Telekom is the exploitation and maintenance of the telecommunication system, development of telecommunication technologies and provision of telecommunication services to the customers. Since Montenegro at the beginning of XXI century started the process of abolition of monopolistic structures that were characteristic of the socialistic and communistic regime and economic system, and due to the successful market liberalization process of the telecommunication industry, the company's license for exclusive right service provider for fixed network was revoked in 2003, and concurrently new mobile service providers entered this segment of telecommunication market (Promonte, subsequently acquired by Norwegian Telenor, and M: tel).

After a successful tender process for privatization in 2005, Magyar Telekom NyRt acquired the status of a major shareholder of Crnogorski Telekom, with 76.53% ownership share. Deutsche Telekom AG was and still is the owner of 59.21% of Magyar Telekom shares. The selling price of equity share was EUR 140.5 million. As a next step, the company acquired 100% of Monet LLC capital share, which use to be up to that point the mobile network service provider, and 85% share in Internet Crna Gora LLC, which at that time was the only Internet service provider in Montenegro. At the end of 2005, Telekom acquired the remaining 15% share of the Internet Crna Gora LLC capital.

In reference to joint decision made by Deutsche Telekom and Magyar Telekom, Monet and Internet Crna Gora were renamed in 2006 "T-mobile" (for Monet) and "T-com" (for Internet Crna Gora), as integral parts of the "T-brand" marketing strategy.

Concerning the mobile network services, T-mobile currently provides the following technology: SDH (synchronous digital hierarchy) microwave networks, GPRS and EDGE technologies for both prepaid and postpaid users, 3G and HSDPA currently in partial coverage. Moreover, the company via its unit T-com offers Internet access service, either using dial-up or broadband technology, including but not limited to ADSL, fixed wireless access, mobile networks access, cable and rented line access.

The vision of Crnogorski Telekom is focused on the market leadership, individual preferences of customers and employees, broad range of activities, including the corporate social responsibility, as well as drive towards innovation and change. Main company values, which represent the foundation and integral part of the corporate culture of the company, are focus on customers, integrity, success, innovation, teamwork and dedication.

Given the key elements that represent the building blocks of the organizational design and culture in Crnogorski Telekom, the company adopted four main strategic objectives in 2008:

- Efficiency of business operations
- Superiority of services provided
- Expansion of services offered
- Full broadband potential

These concepts are integrated in one strategy "One company", which signifies integration of mission, vision, core values, strategic and organizational developments of Deutsche Telekom AG.

Beginning in 2009, Crnogorski Telekom had 949 employees, 50 more than it had in 2008. In accordance with the work efficiency and effectiveness plan, as well as the need to increase productivity and profitability, the company started the downsizing process in 2009. As one of the representative of the company states, "Telekom underwent a number of efforts to redirect the organizational and operational structure of the Group, and by reorganizing the Technical sector, a more flexible and flatter organizational structure was reached".

Reviewing the reports and market research of the EKIP Agency in regards to mobile and fixed telecommunications market penetration, as well as Internet penetration and financial indicators of Crnogorski Telekom (Table 3), the following trends can be observed.

Table 3. Trends and indicators on the Montenegrin telecommunications market

Year	Mobile usage penetration	Fixed line penetration	Internet penetration (households)	Internet penetration (population)	ROCE	EBIT	Share T-mobile	Share T-mobile post-paid
2004	78.26%	30.6%	52.3%	16.1%	5.90	10.8	42.42%	48.29%
2005	87.6%	25.38%	62.8%	19.2%	5.90	10.8	42.02%	47.81%
2006	103.8%	25.54%	73.28%	22.4%	6.98	18.7	42.29%	49.29%
2007	163.67%	26.88%	78.51%	23.92%	6.98	18.7	33.81%	46.08%
2008	185.71%	28.2%	82.41%	26.43%			36.13%	42.85%
2009	208.69%			31.3%			36.67%	44.46%
2010	197.58%						32.14%	44.08%

The table shows that the company was progressively losing market share in mobile network segment, although its post-paid segment is stable and has a largest share in this market, and it is still the largest provider of Internet service and fixed network services. This shows the room for improvements in the business processes and increase in efficiency and profitability. Possible virtualization of certain processes may be an obvious answer.

Crnogorski Telekom is formed as a strong hybrid organization. It is the company without strong-lined and formal departmentalization, due to the need to respond quickly to a fast and unpredictable market it operates in. According to Dainel Sas, President of the Board of Directors of the company, a full formal legal integration of all divisions took place, as a logical step towards the modernization and optimization of processes and service provided. In his words, "this type of integration leads to an increase of operational efficiency and simplification of business operations, allowing us to fully utilize our market potential. In the future, customers will fully experience the benefits of the integrated telecommunication services".

Given the above, the company operates as a combination of a project, matrix and network organization, depending on a signals from the market, tactical actions to be taken on a *ad-hoc* basis, as well as tuning of strategic priorities of the company according to everyday developments in the markets.

SITUATION ANALYSIS OF VIRTUALIZATION POTENTIAL IN CRNOGORSKI TELEKOM

Aiming at comprehending current situation and state of affairs in regards to the organizational design and behavior, as well as the potential for virtualization in Crnogorski Telekom, a number of in-depth interviews took place with the management of the company. After the interviews were conducted with managerial representatives in human resources, strategic planning, marketing and PR, the conclusion can be drawn that the company positively sees the need to increase virtualization, in accordance with the market needs and demand.

Interviews with management were conducted "face-to-face" and lasted on average 30-60 minutes. The questionnaire consisted of 20 questions that were all open-ended, and number of clarifying questions was asked, in order to obtain a more precise and clearer picture of the situation in the company.

Although the business environment for telecommunication companies is rather unpredictable and volatile, Crnogorski Telekom undertakes gradual, partial and evolutionary organizational changes. During the interviews with the management, interviewees confirmed the strategy adopted from Deutsche Telekom "One company - one team". This signifies that mobile and fixed network strategic business units, as well as functional units of Internet services and Extra TV cable network were all integrated into one company, and the emphasis was given on the creation of project teams and work segmentation based on the type of customer. Legal and business integration led to downsizing and decrease in number of employees. Given HR strategy includes study visits to the mother company so as to work on knowledge transfer and gaining of experience on utilization of the most productive and most efficient organizational and management methods for optimization of work processes. Managers at Crnogorski Telekom fully agree that together with the

mother company, they are dedicated to the creation and management of project and virtual work teams, with high degree of expertise and experience in given domains.

Crnogorski Telekom management is of the opinion that virtual teams and creation of virtual processes and organization within the company represents the reality for the telecommunication sector in Montenegro. However, they stress that formation of teams must include employees of Magyar and Deutsche Telekom, as well as a number of other experts from the ICT area, which gives a broader scope of knowledge and expertise to the team and contributes to company's market leadership in various segments of the telecommunication market. Managers further on emphasize that the exploitation of glocalization and integration of processes according to the best business practices is a systematic approach that is particularly beneficial in the long run and that is helpful to use experiences from telecommunication giant such as Deutsche Telekom and adapt it to Montenegrin market conditions.

Crnogorski Telekom has a significant degree of independence for identification and development of products and services that are targeted for Montenegrin market and Montenegrin customer, but it depends on the Deutsche Telekom decisions related to Marketing and Brand development. Given the above, the project teams that are being created are always very virtual because they include experts from both companies, as well as since marketing tends to be a rather creative area.

Finally, interviewees agreed that virtualization is not simply the process to optimize the productivity of the company's employees, but a process that should involve the entire Montenegrin society, since it heavily relies on the level of ICT awareness and skills, as well as various processes of networking. Moreover, Crnogorski Telekom places a great degree of importance to Corporate Social Responsibility (CSR) actions, which include direct contribution to raising levels of awareness in different target groups in the society, mainly pupils, students and women. Among other things, the company received the award for philanthropy for efforts in raising ICT capacities in Montenegro, and the overall sustainable objective of the company is to contribute to the improvement of Montenegrin society, believing that digitalization and electronic communications represent the future and should be used to serve to development of one society.

After conducting two case studies and interviews with management from Crnogorski Telekom, *ad-hoc* benchmarking was used to derive recommendations for improvements in competitiveness, efficiency, effectiveness, productivity and profitability. The following benchmark phases were undertaken:

- Determination of the area and problem to be solves - establishment or modification of certain type or mode of virtual organization in Crnogorski Telekom
- Process planning and data collection - using knowledge and experiences from the mother company (Deutsche Telekom) that already uses various forms of virtual teams and virtual functional organization
- Analysis and interpretation of parameters - analysis of the potential for the creation of the virtual organization in Crnogorski Telekom, using the experiences and information from Deutsche Telekom. The main objective is to compare state of the affairs and determine differences and areas for improvement. The main conclusion of this phase was that due to the strategic approach as "One company", which means creation of similar, if not same, processes in the mother company and its subsidiaries, Crnogorski Telekom uses examples of the best business practices,

adapts them to fit the Montenegrin market conditions and implements the policy of evolutionary organizational changes.

- Identification of potential improvements - Deutsche Telekom initiated a process of intertwining private and business life spheres, expanding it to the area of CSR and demonstrating that digitalization and virtualization are integral part of our lives. The company clearly supports and promotes all forms and types of virtual organizations that allow the utilization of relevant cutting-edge technologies, serves the needs of everyone in the team or organization, brings to one spot, albeit virtual one, the best possible expertise and qualifications, supports creation of innovative solutions and promotes extensive use of electronic communications whenever, wherever. Crnogorski Telekom already has the knowledge base, administrative capacities and motivation to follow in the footsteps of its mother company when it comes to management of virtual organization.

• ***Recommendations for Montenegrin telecommunications company***

With the transnational nature of the companies in the world where globalization is the key process defining business interactions, as well as with constant technological innovations, the creation of virtual partnerships and alliances is an inevitable process. These partnerships have the element of cultural, geographic, linguistic, social, economic and value-added diversity, becoming an integral segment of the virtualization process. When creating or modifying the organizational structure and behavior, this element becomes rather a crucial one since it influences the managerial decisions and work processes of the organization, be it one-time project or entire restructuring of the organizational design.

ICT technologies allowed the creation of new or the alteration of existing elements of organizational design. Basically, the virtual elements of organizational design should be constantly created and modified, with continuous improvements and raising of the knowledge of everyone involved in it. Some of these essential elements include creation of virtual teams, sub-units or entire sectors, reduction of managerial level and further delegation of authority down the managerial chain, simplification of management process, control and coordination, automatization of processes, production and supply chains whenever possible, extensive use of electronic communications, as well as virtualization of customer and technical support mechanisms.

Recommendation 1: Organization and management of virtual organizations

In order to improve efficiency and effectiveness, virtual organizations are to be created that are most appropriate given the specific Montenegrin environment and taking into account characteristics of the telecommunication industry. Changes need not be revolutionary and abrupt, but gradual and evolutionary, given that the telecommunication industry creates products, services and processes that strongly support virtualization processes, so the changes in organizational structure should be complementary to this. Simply put, mission, vision and core principles of the organization ought not to change as much as the management, organization, departmentalization and delegation of work and control.

The concept of the virtual active networking (VAN) leads to development and utilization of extensive range of network services, and even though introduction of new elements or services can seem complicated and time-consuming, modifications should take

into account the network infrastructure and the interconnection points [14]. Virtual communication and networking, individually adapted to each user, simplifies the entire process in the long run and reduces the time for the response to the changes in the market. Since VAN allows for installation and utilization of those services that one specifically needs, a sustainable framework for "creation and maintenance of VANs in telecommunications is essential" [Ibid, p. 60].

Furthermore, managers of virtual teams or organizations must learn how to compensate the lack of planned and spontaneous interactions "face-to-face", needed for the build up of mutual confidence and reciprocal dedication to the team or organization and its core values. Many experts agree that one of the burning questions in the field of organizational design and behavior is the establishment of a stable and sustainable system that maintains mutual trust among partners and units involved. Trust represents an independent variable and in most cases one of the main causes of successful partnerships and alliances, leading to improvements in joint performance and reduction of transactional costs [15]. The main suggestion is creation of a common group or team identity, which represents a critical prerequisite for efficient operation of the team or organization, leading to better and more effective cooperation, decision-making and implementation of activities [16].

Concretely, virtualization contributes to the enhancement of knowledge and competencies of all members of the team or employees in the organization, and transfer of knowledge and experiences leads to exploration of innovative solutions necessary for diversification of products and services on increasingly homogenous markets. An example of valuable exchange and enhancement of knowledge, within all phases of production process and including technological and economic aspects, is demonstrated when members of a team, when working on a new product or accomplishing a common goal, with their valuable set of different qualifications, continuously build capacities of one another, exchange experience and contribute to knowledge of all members, which in turn leads to the improvement in the quality of the product being created ("a whole is greater than the sum of its parts").

Strader affirms the existence of certain efficient mechanisms that facilitate management of virtual organizations, by simplifying the transition from conventional and traditional mechanisms [17]:

- Pre-formation mechanisms: identification of potential opportunities on the market, advertising capabilities and quality assurance of potential partner companies,
- External approach mechanisms: data collection, market research, promotion and advertising of a product or a service, virtualization on operational level, support during transactions and interactions among partners,
- Inter-organizational mechanisms: integration of processes and procedures among partners and support to intracompany operational functions (R&D, production, distribution, accounting and finances).

All given mechanisms are almost impossible without an appropriate support from ICT technologies, amongst which the following instruments are essential for efficient functioning of a virtual telecommunication company:

- globalized informational network, including electronic transactions, meetings and collaboration, as well as accounting and finance and online information services,
- electronic access to data anytime anywhere, including market research, global financial data, data on competitors, most suitable partners, economic and market indicators, and data on individual preferences of consumers,

- electronic links and connections among members and partners in the virtual organization for facilitation of business and work processes and integration of the system,
- electronic access to operational elements of the virtual organization, with high degree of security and protection, such as data on marketing strategy, organizational design and processes, production processes, distribution channels and logistics,
- intra-organizational system of support to software, hardware and server support, including Intranet,
- electronic 2-way networking with customers (feedback).

Certainly, since this is not a perfect world and irrational human nature is put at the core of most business and production processes, certain complications and inefficiencies are bound to occur during the virtualization process. Complications may include efficient use of communication channels, due to the heterogeneity of teams and their linguistic, cultural and socio-economical diversity, which may lead to erroneous interpretation of information, data, attitudes, work habits and the like. Furthermore, complications may arise from lack of mutual understanding and trust, which is the main unifying parameter and denominator for successful functioning of a virtual team or organization, and subsequent successful realization of a task or a project.

Finally, emphasis should be also placed on the intra-company virtualization processes. According to Feller and based on numerous researches conducted in this field, more and more companies in the telecommunication sector are turning towards the network organizational structure so as to "refresh" and enhance knowledge base and intellectual capital, as well as improve innovation processes [18].

Moreover, virtual strategic alliances offer new intellectual capital, since partners have the opportunity to combine their own cores of competencies and comparative advantages, so as to enhance their competitiveness and productivity, leading to greater market share, profit margins and further enhancement of their competences and resources. That is to say, high levels of knowledge complementarity among partners in the virtual organization affect motivation of all members to boost collaboration and simultaneously improve their intellectual capital [Ibid, p. 351-353].

Recommendation 2: Organizational behavior

A leading recommendation to managers and leaders of virtual organizational structures, includes the exhibition of following skills and competencies:

- Clear and concise objectives that are joint and applicable to all members, and continuously monitor their implementation
- Provide all necessary information to all members
- Problem-solving should be the exercise of the entire team/organization
- Prepare a SMART (specific, measurable, attainable, relevant, time-bound) action plan
- Promote development of specific culture/system of values within the team/organization
- Whenever possible, encourage rotation of posts (covering the knowledge gaps, acquiring new knowledge and experience, more unified team/organization)
- Encourage personal contacts among members whenever possible
- Engage entire team/organization, whenever possible, in the decision-making process

- Encourage members to support and motivate each other and jointly deal with issues arising on everyday basis
- Constantly build mutual understanding and knowledge

Empirical research showed that audio and video conferencing lead to positive effects of virtual team/organization dynamics and mutual understanding of all members (observing body language, gestures). Also, the more formalized standards and procedures are in the team/organization, the greater the potential for productivity and profitability enhancement.

Involvement of employees in the decision-making process represents one of the most essential tools that influence their perception on fairness and dedication to goals and values of the organization [19]. Nunmaker gave a sustainable solution for the establishment of cohesion and synergy within the aspect of organizational behavior and corporate culture [20]:

- Virtualization process must start with a clear statement that contains objectives, purpose, outcomes, expectations and results, so as to minimize the risk of misinterpretation
- Applied technological solutions, mainly communication and collaboration tools, must be in accordance with the level of technical skills of all members of the team/organization
- Each member must have precise set of responsibilities, tasks and deliverables, with specifically defined outcomes and deadlines for their attainment
- Constant, consistent, continuous, standardized and formalized communication channels
- Permanent capacity and team building activities

Recommendation 3: Collaboration tools/technical solutions

Collaboration tools include communication mechanisms in the organization, as well as tools that facilitate organizational processes in the virtual organization, but are also used in the everyday life: e-mail, chat, audio and video correspondence and conferencing, discussion forums and platforms, tools used for exchange and sharing of data, documents and other applications, calendars, virtual management software, as well as number of other sophisticated technical solutions that assist in the managerial and organizational processes of virtual teams and organizations. Collaboration tools are irreplaceable in the knowledge management processes and all managerial and strategic operations that aim at the reduction of time necessary to accomplish certain task, increase efficiency and contribute to innovation.

Collaboration tools are a necessary but not sufficient element in the era of digitalization, because they are useless without appropriate knowledge and capacities of persons operating with them. Generally speaking, technology cannot entirely replace or resolve certain business, organizational or HR issue. All members within certain virtual organizational structure must possess some elementary knowledge regarding the use of collaboration tools or certain CIT technologies. Also, these tools and technologies must be used continuously and in accordance with the upgrading dynamics, so as to continuously enhance knowledge and competencies in this area.

For certain virtual organizations and organizations that operate on markets with fast and unpredictable changes, such as the telecommunication sector, certain advanced collaboration tools that offer "all-in-one" packages are necessary due to certain level of cen-

tralization of all operational and work processes. Some of the most user-friendly applications include:

- **SharePoint** (Microsoft) – integrated server platform, used for sorting of all electronic content, corporative management and search, exchange of information and materials on all organizational levels. SharePoint contains very flexible collaboration instruments and useful applications for management and implementation of projects, as well as it facilitates collaboration by collecting and sorting data according to predefined criteria so as to enhance organization of work
- **NetMeeting** (Microsoft) – offers similar solutions as SharePoint, but it is less technologically advanced and therefore easier to use and much less expensive solution
- **Lotus** (IBM) – IBM is gradually shifting its R&D and innovation focus on collaboration solutions, making LOTUS with its various packages one of the most comprehensive and practical solutions for successful virtual organizing

Recommendation 4: Security of virtual organizations in Montenegro

Relying on ICT technologies in Montenegro is a challenging task. In order to solve the issue of security embedded in the use of ICT solutions, Ministry for Information Society and Telecommunications was established to create and implement policies related to use and safeguarding of ICT-bound processes and operations. One of the main strategic priorities of the Ministry is strengthening of the cyber crime defense system, which represents a serious problem in efficient functioning of any virtual organizational structure.

During 2008, national Program for Information Security was adopted so as to regulate and foster development in this area. In 2009, Information Security Law and Information Security Policy were both adopted and Community Emergency Response Team (CERT) was created, with the aim of responding to all emergency situation related to security threats and breaches in all electronic communications.

On the European level, and taking into account the fact that Montenegro started the process of European integrations, the EU Directive that regulates transparency and provision of information on online data flows, applications and services offered, standards and methodology used as well as mitigation measures for electronic security breaches was transposed. Consequently, this would lead to a strong regulatory and institutional framework, as well as administrative capacities that would lead to creation of a positive environment for secure functioning of virtual organizations in Montenegro in the long run.

CONCLUSION

This paper outlines conditions and aspects in view of enhancement of organizational design and behavior of a company, aimed at elimination of redundant and introduction of new communication channels and links among various organizational units and functions. Since the research was focused on a Montenegrin telecommunication company, and since virtualization is considered a decision to be made on a strategic level of the entire company, it was necessary to conduct strategic functional benchmarking and determine areas of improvement that will lead to higher efficiency and productivity levels. Hearing how virtualization can assist in targeting relevant aspects of valuable strategic positioning of

the telecommunication company on a market, and in reference to positive business practices and experiences of globalized telecommunication corporations, Crnogorski Telekom is in advantageous position to increase its level of virtualization and, consequently, work efficiency and productivity.

By process of "humanizing" digitalization of economies worldwide and adapting necessary ICT solutions to everyday work activities, a number of globally linked qualified and knowledgeable communities were created, which rely on high IT literacy, mutual trust and understanding, high degree of transferred knowledge and improved processes. This form of symbiotic coexistence of technological aspects ICT solutions necessary for proper functioning of a virtual organization on the one hand, and human aspects embedded in system of core values, trust, teamwork and common understanding on the other hand, leads to the creation of new organizational paradigms and market behaviors, demonstrating an inevitable force virtualization and digitalization exert on the world today.

As the surrounding environment and market conditions become increasingly unpredictable and reliant on ICT solutions, virtualization in all economic sectors, especially the ones directly linked to ICT is foreseeable. Emerging trend that speaks on behalf thereof is portrayed in the survey conducted in 2003 on current and future virtualization trends and impacts on companies, where the findings showed that more than 50% of projects, processes and activities in any given company are virtualized to some degree, and there is a concrete tendency to increase the level of virtualization. However, more than 68% of surveyed companies are still concerned with the informational security and overall protection of electronic communications in today's world [21].

Certain type of a virtual organization provides an effective structural mechanism that resolves issues of travel costs, time zones, geographical differences, coordination aspects, as well as reduces costs associated with bringing together a team of experts that is dispersed geographically and functionally. However, a specific degree of intensity of virtualization and application of number of electronic communication mechanisms is still not fully determined so as to render the optimal level of virtualization for one company. Each individual virtual organization should thoroughly and systematically assess and devote necessary resources, as well as strengthen its comparative advantages, so as to create the most efficient and sustainable strategy, compliant with requirements from increasingly digitalized and volatile world. In a way, the level and intensity of virtualization of a certain company will depend on the type of activity or project undertaken, units created or employed, products and services offered, technological progress adopted and human capital employed at any given time.

Taking into account a broader picture, and observing the issue of reducing negative effects of climate changes and rising energy prices of fossil fuels, transportation in any form, especially by plane, is not only costly in simple financial terms, but also imposes a big environmental and social cost on the world, which is yet another argument why virtualization appears as a pragmatic and efficient solution that additionally reduced both direct and indirect costs of implementation of any given task or functioning of any given organization. Many experts conducted the cost-benefit analysis of virtualization process, including de Pillis et al., showing significant reduction of costs, both in a long and short run.

Regarding telecommunication industry, there is a consensus among experts around the world that this economic sector is the most "global" and present in various world markets. Moreover, experts agree that telecommunication companies should capitalize on the vir-

tualization process by creating a so called "3x3x3" strategy, which represents a 9-year, 3-phased development plan that takes into account both short-term business cycles and macroeconomic trends in the planning process. Furthermore, telecommunications rely heavily on "emotional stimulants" of products and services offered, as well as on the individual needs of each individual customer. Virtualization enhances the timely and precise interpretation and delivery of these aspects of product development, and therefore, strategy should also include "emotional and sensory aspects"

Given this broader picture and understanding that current tendencies in world market almost require companies to become virtualized to some degree and exploit profitability opportunities rooted in this process, it can be perceived that virtualization and creation of learning organizations and organizations without borders represents a priority axis of repositioning in markets, so as to enhance products and services provided, as well as overall efficiency and profitability of their business operations.

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VIRTUELNE ORGANIZACIJE U TELEKOMUNIKACIONOJ INDUSTRIJI NA PRIMJERU KOMPANIJE U CRNOJ GORI

Jasmina Četković, Miloš Knežević, Mija Nenezić

Telekomunikaciona industrija predstavlja jednu od najprosperitetnijih grana u svijetu, jer je na izvoru transformacija koje se dešavaju na svim tržištima. Svrha ovog istraživanja je pronalaženje najboljih rješenja i prakse u telekomunikacionoj industriji, u odnosu na mogućnosti povećanja efikasnosti, efektivnosti, profitabilnosti i konkurentnosti formiranjem i podržavanjem određenih vidova virtuelnih organizacija. Predmet istraživanja ovog rada predstavlja mogućnost osnivanja, vođenja i održavanja određenog oblika virtuelne organizacije na primjeru crnogorske telekomunikacione kompanije. Mogućnosti i preporuke su izvedene iz studije slučaja globalno uspješne telekomunikacione inostrane kompanije, koja uspješno i održivo primjenjuje model virtuelne organizacije u svom poslovanju i na osnovu sprovedenih PEST i SWOT analiza. Generalni zaključak istraživanja je da u cilju poboljšanja efikasnosti i efektivnosti rada, potrebno je forsirati oblik virtuelne organizacije koji je najpodesniji za crnogorsko tržište i privrednu granu kao što je telekomunikaciona industrija.

Ključne reči: *globalizacija, komunikacija, telekomunikaciona industrija, virtuelne organizacije.*