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MANAGER SKILLS IN VIRTUAL-NETWORK CONDITIONS – AN ATTEMPT AT IDENTIFICATION IN THE LIGHT OF SURVEY RESEARCH

Summary: Co-ordinating, motivating and building flexible teams, by using modern telecommunication solutions, are the elements of managing the virtual-network structure. Manger responsible for managing in virtual-network structure plays a co-ordinating role, making efforts to fully take advantage of skills and knowledge of the team members by inspiring and creating issues to solve in the scope of tasks realized by the team. Skills required for virtual manager who leads the virtual-network team are: ability to build the virtual, network team and co-ordinate it from distance, awareness of network, inter-organizational, virtual, international strategy, efficiency in communicating (individual emotional intelligence) by using modern IC techniques as well as building and maintaining organizational culture.

Keywords: virtual manager, virtual-network manager, virtual-network team, virtual organization, manager's skills, emotional intelligence.

1. Introduction

Corporate renewal expresses itself, to some extent, in a permanent revision of applied strategies and management conceptions that aspire to the requirements of changing economy. The complexity of available knowledge and processes means that, especially in enterprises which rely on knowledge, creativity and innovation hunting, the majority of tasks is carried out by teams that use modern technologies and ICT (information-communication) techniques. One purpose of seeking management strategies is to find ways of developing full team potential and running team work. [Urch Druskat and Wolff 2001, p. 9].

Key competences in the contemporary economy, which have influence mainly on small-sized enterprises success, are the ability to develop and co-operate via network, using IT and telecommunication resources with various business partners [Cellary 2006, p. 21]. Progressive globalization, breaking time and space barriers by using mobile solutions (Internet, intranet, mobile communications) modify traditional

management styles and give possibility to build new virtual-network structures. Managers face new challenges: values and relations distance-management with employees, associates, business partners using modern technologies. A new research question that comes into being is whether the skills used to effective management in traditional way are adequate for the management in new, virtual-network conditions. Another question concerns skills a manager who manage from a distance should possess [Kołodziejczyk 2008, p. 538].

This article is a continuation of previous research projects which make an attempt to find the answer to the questions asked in the available literature and research. The specific goal is to diagnose skills of the manager who functions in network-virtual structures (based on our own survey).

The article structure contains sections that elaborate on virtual management definitions, manager and virtual team, theoretical basis that concern manager's skills identification in virtual-network conditions, theoretical and methodological assumptions and ways of measure selected manager's skills in virtual-network conditions, general characteristic of enterprises that are the subject of research, comparative interpretation of survey results and summary.

2. Definitions of virtual-network management, manager and virtual-network team

Virtual-network management is the way of co-ordinating, motivating and building flexible teams in network structure using modern technological solutions [Warner and Witzel 2005, p. 183]. Virtual organization management refers to the organization, allocation, co-ordination of resources and actions of virtual organization as well as inter-organization relations to achieve virtual organization goals within the time, cost and quality required [Grudzewski et al. 2007, p. 182].

Virtual-network manager is a manager in a virtual organization who is responsible for managing aforementioned functional divisions and for co-ordinating various tasks for a specific goal [Warner and Witzel 2005, p. 169]; a person who is responsible for each group member, task or project in many locations. Crucially, relations and projects management from a distance define manager as "virtual". Simultaneously, virtual manager is responsible for building and managing effective and functional employee team, regardless of where employees are, or even, for which enterprise they are working [Garton and Wegryn 2006, p. 20]. In current organization conditions, in which virtual organizations have emerged, manager is a virtual co-ordinator.

Next, the team-task manager role in a virtual organization involves mainly exploring employees' potential, giving them problems to solve, discussing a *modus operandi* (not teaching), sharing information (not keeping for oneself) [Sikorski

¹ For Virtual, network organization see [Antczak 2005, pp. 83-95; Niemczyk 2006, pp. 24-34; Perechuda 2005, pp. 55-57].

2006, p. 8]. Virtual manager runs virtual team which carry out common tasks, crossing place, time and organization barriers by using technologies that support communication process [Lipnack and Stamps 1997]. Virtual-network teams have the following characteristics: not being a frontal element in static organization structure; carrying out tasks that go beyond existing organization divisions; consisting of experts and/or executives, acting periodically, constantly or depending on a situation. Furthermore, they are responsible in the scope of assigned tasks, fulfill existing organization structure without substituting it. Virtual team members have a specified position in a formal organizational unit [Perechuda 1999, p. 93]. Virtual teams are very often set up for a given project that last for a specified amount of time. Due to various specializations and competence levels of team members, the team terminates after reaching a defined goal and its members are assigned other tasks and in new virtual teams [Kołodziejczyk 2008, p. 230].

3. Manager skills in virtual-network conditions

One should pay attention to the skills which a virtual-network manager should have, together with team managed, to reach defined goals. Differences between skills that are used in traditional and virtual management are shown in Table 1 [Kołodziejczyk 2008, p. 539].

 Table 1. Manager skills that are used in traditional and virtual-network management

Manager skills that are used in management			
Hierarchical, traditional	Virtual-network		
Ability to build and run a local team	Ability to build a virtual, network team and co-ordinate it from distance		
Awareness of mission and the vision of an organization	Awareness of network, inter-organizational, virtual, international strategy		
Efficient communication	Efficient communication by using ICT (information-communication) techniques despite cultural differences		
Ability to transmit and support organization culture	Ability to build and support virtual, network, inter- organizational, international culture		
Ability to solve problems in a local team	Ability to solve problems in a virtual, network team		
Interpersonal intelligence	Interpersonal intelligence with global orientation		
Emotional intelligence	Emotional intelligence that is used to run a team from a distance		
Openness towards local team members individualism	Openness towards autonomy and individualism as well as different cultures of virtual, network team members		
Willingness to develop qualifications	Willingness to constant development and study		

Source: private studies based on the literature on the subject and own observations.

Table 2. Key characteristics of a manager in virtual-network management

Key characteristics of a virtual-network manager according to:		
Żukowska	Fleming	
Ability to proper team selection with reference to defined goals	Ability to run a team with the capability to inspire others and convince them to one's passions	
Defining visions, goals and ways of acting	One's own strong and weak points assessment – running a virtual team does not consist in knowing all the answers	
The choice of suitable communication channel	Being preventive, persistent and able to exert pressure	
Commitment increasing	Being reliable and trustworthy, aware of cultural differences, assertive	
Influence on productivity growth and factors of being successful	One's own suitable technical skills	
Communication development and streamlining	Being communicative	
Dissemination in a team, such behaviors as: supporting each other, decisions making, responsibility, aspiring to defined goals	Being an effective coach and mentor	

Source: private studies based on Fleming [2006] and Żukowska [2007].

Literature studies as well as author's own observations indicate that, in practice, the skills of the manager who run the virtual-network team are, in the majority of cases, on the initial stage. Many managers who have been functioning in traditional perspective conditions, face information technology challenges and possibilities that it gives. They try to transfer their experience and skills to conditions of the enterprise, functioning virtually. The literature on the subject indicates key skills for the manager who runs a virtual team (see Table 2).

Still, the greatest need in enterprises is to develop full potential of teams, i.e. to be more efficient, more creative and make better decisions. For this reason, research projects that observed most effective teams were carried out. One of the parameters studied was emotional intelligence. A belief that the team is good and can achieve more when its members work together and not separately was greater in teams which deal well with emotions (individual and collective).

In such teams, members can identify emotions and understand the way they affect teamwork effectiveness; members can regulate them and use in everyday work [Urch Druskat and Wolff 2001, p. 9].

4. Methodological and theoretical assumptions. The way of measuring selected skills of a manager in virtual-network conditions

For the needs of the research, one assumes the scope of emotional intelligence, meaning the skill of a) appropriate perception, assessment and emotion expression; b) accessing feelings, ability to generate them in moments when they can support thinking; c) understanding emotions and understanding emotional knowledge; d) adjusting emotions to support emotional and intellectual development [Salovey and Sluyter 1999, p. 34]. Some notion similarity appears at Salovey also with reference to competences/qualifications. Specifically, the author very often phrase them as skills. For personality measure, five-factor personality model was assumed according to NEO-PI-R inventory (psychometric tool used for personality measurement) created by P.T. Costa and R.R. McGrae (adopted to Polish conditions) that allows for showing five personality factors and six elements within each factor. Since its publishing in 1992, the inventory has been used in many research projects, whose results have been used in many publications.

For the purpose of the present research, we selected (intentionally) a group of small enterprises form IT-service sphere which includes, in its organizational space, virtual-network structures (project-task teams) and have their headquarters in Lower Silesia. The main assumption of the research is that the tests will show that essential element, conditioning virtual team functioning is the presence of specific characteristics/ predispositions of managers and team members (including higher results during emotional intelligence test, correlating with personality test results).

Our test-survey was based on testing, in the third quarter of 2009, Neurosoft and IKS – small IT-service enterprises with their headquarters in Wrocław – with PKIE (Popular Emotional Intelligence Questionnaire) and NEO-PI-R questionnaires and carrying out comprehensive interviews in 2008 with the managers from Comp Safe Support S.A. Personality inventory tests five areas: neuroticism, extroversion, openness towards new experiences, tendency to compromise, conscientiousness. Thorough interviews were carried out with respondents. Interpretation of the results was conferred with a participating observer. Data concerning the organization's economic performance, development speed and current directions were also collected.

5. General description of the enterprises

Neurosoft was founded in November 1992 as a limited liability company, *joint* venture with a share of foreign capital. According to the idea of its creators, in the near future PC software fitted with Neurosoft technology will make working with computer a lot easier for humans, as PC shall become more a partner than

a tool. Its name derives from the technology of artificial neural networks used in company products, among others in recognition of writing module (OCR), during the process of speech recognition etc. Neurosoft, since the second half of 2008 (despite a slowdown in the economy), has taken a note of vital receipts dynamics increase (in comparison to previous years). In terms of employees (or associates) number, also a substantial increase was noted (more than 30%). Intellectual achievements, such as scientific research results and ability to use them, make Neurosoft the most important capital, which is inextricably linked with employees of Neurosoft who are mostly graduates of the University of Wrocław and Wrocław University of Technology. Senior researchers of those Universities and other associates constitute the Neurosoft intellectual base. Company is a sort of *spin-off* for both Universities with a difference – Neurosoft owns all the created technologies [www.neurosoft.pl].

On the basis of the technology at the company's disposal, unique-quality products are created, the most important of which are: *Gram* (module used for morphosyntactic analysis of Polish texts), *Neurosoft BIP* (graphical format of recording a document destined for publication of one-page and multipage lenght, e.g. books or magazines on the Internet), *SynTalk* (a speech synthesizer), *NeuroCar* (software which recognizes license plates and, with another program, protects road surface; e.g. in Wrocław, where, on the specific spots, it serves for dynamic weighing of vehicles and – throughout recognition of license plates – assigning specific weights), *NeuroScope* (semantic search engine) and *NeuroNorm* (digital library of standards which includes DRM). The company's main services revolve around digitizing documents and creating dedicated systems.

IKS-NET – the group was founded in 1993. Originally, their work was done in the Institute of Computer Automatics and Measurements Systems in Wrocław. During this period, the company accomplished a lot of hard, innovative and, in the majority of cases, dedicated issues within the domain of the newest IT technologies implementation. The company is the owner of many original solutions concerning software and systems. Their business activity is carried out in many different sectors of economical activity, such as industry, public administration, banking, health service, education or military. The basis for their market activity is the realization of complete systems adjusted to individual clients' needs, including software production. All the installations and implementations include warranty and afterwarranty technical care. Mutual co-operation of particular departments distinguishes IKS-NET on IT market as a company which offers complex services within a chain: project – deliverance – assembly – after-sale service [http://www.iks-net.pl/index. php/o-firmie/o-firmie.html (07.12.2009)]. IKS-NET in 2009 did not note any vital receipts dynamics increase (in comparison to previous years). In terms of employees (or associates), a vital increase in their number was noted (more than 30%).

6. Manager's abilities in virtual-network conditions. Comparative interpretation of survey results

For a comparative quality analysis, we took into consideration only the results of those managers who in the enterprises survey had filled in the questionnaires that diagnosed their personality characteristics and emotional intelligence.

Table 3. Qualitative comparison of the results received by applying two research tools

	Individual emotional intelligence	Personality/characteristics
1	2	3
Manager		
Neurosoft	He or she is oriented on assignments; keeps increasing control over emotions (their unfolding); has slight problems with reading emotions of other people. He or she tries to keep distance towards fellow workers (so called cooling down the relations), what allows him or her to avoid internal conflicts while undertaking difficult decisions He or she is open to organizational reality and environment, showing readiness for taking risk and responsibility for its effects. He or she cares for the process of communicating within organization and with its environment. He or she strives for guarantee of decisionmaking liberty for him- or herself.	Neuroticism: he or she is emotionally stable, adapted and balanced. Extroversion: involved into interpersonal contacts, sociable, possessing high level of energy, pertaining to extroverts, assertive. He or she stimulates the situation and is cheerful by nature. Openness for new experiences: open for new experiences, curious of the world, finding pleasure in inventing new things, more intensively experiences emotions. Tendency to compromise: he or she treats other people with kindness, ready to help others, believing that if he or she were in need, other people would help him or her. Conscientiousness: he or she has clear goals, strong will and great determination to achieve them. Positively correlated with achievements in science and professional work. He or she is scrupulous, reliable, disciplined, punctual, diligent and hard-working.
IKS-NET	He or she easily shows feelings, thanks to which the environment can easily understand what he or she is going through and react properly. He or she, relatively easily and accurately, recognizes emotions of other people. He or she consciously	Neuroticism: he or she tends to be moderately adaptable and emotionally stable. He or she is rather happy, usually calm, balanced, relaxed. He or she deals well with difficult life situations. He or she has great sense of security. Stress situations do not cause irritation and he or she stays stable. Extroversion: socialized and sociable. He or she likes people and is active, talkative, prone to play, enjoying exciting situations. In social contacts,

1	2	3
	steers and controls his or her own emotions, controlling the degree of his or her openness. Average understanding of his or her own emotions and knowledge of the cause. He or she tends to possess more than good IE skills.	he or she shows tendency for domination in the environment. Openness for new experiences: open for new experiences, curious of the world, finding pleasure in inventing new things, more intensively experiencing emotions. He or she has vivid imagination, is unconventional, ready to question the authority and accept new ideas. He or she can apply himself or herself to the new system of values as conscientiously as the people with the conservative point of view. Tendency to compromise: the person has confrontational or antagonistic tendencies, egocentric, skeptical towards the intensions of other people and rather competitive than cooperative. He or she has a tendency to manipulate others, unwilling to co-operate, sometimes hard-faced or vulgar. Conscientiousness: he or she tends to have a moderately strong will and determination to achieve defined goals. Moderately disciplined, ambitious and reliable.
Co-ordinator		
Neurosoft	Has slightly better than average skills in showing to the others what he feels, what can cause difficulties in adequate reacting for his emotional conditions by people around him. Slightly better than average, he or she can accurately recognize emotions experienced by others and decipher their intensions. On the other hand, he or she is slightly worse in controlling his or her own emotions and the degree of its openness. He or she can very well understand his or her own emotions, distinguishing their intensity and the knowledge of their cause. He or she tends to possess more than good IE skills.	Neuroticism: moderately emotionally stable. Extroversion: moderate level in the involvement in interpersonal contacts, moderately socialized and sociable. Openness for new experiences: open for new experiences. Curious of the world. He or she is searching for new experiences and sensations. Tendency to compromise: he or she treats other people with kindness, ready to help others, believes that if he or she were in need, other people would help him. High scores in this area might be associated with dependable personality. Sometimes straightforward, meek or trusting. Conscientiousness: he or she has clear goals, strong will and great determination to achieve them. Positively correlated with achievements in science and professional work.
IKS-NET	He or she has average abilities of showing others what he or she feels, which can cause	Neuroticism: moderately adaptable and emotionally stable with manifestations of nervousness and hypochondria.

Table 3, cont.

1	2	3
	difficulties in adequate reaction to his or her emotional conditions by people around him or her. On average, accurate recognition of emotions experienced by others and ability to decipher their intentions. He or she consciously steers and controls his or her own emotions and controls the degree of their openness On average, he or she understands his or her own emotions and the knowledge of their cause. He or she has slightly above-average IE skills.	Extraversion: for the most part moderately socialized and sociable. Moderately talkative, active and prone to play. Openness for new experiences: moderately open for new experiences; moderately finding pleasure in inventing new things, searching for new experiences and sensations. He or she may manifest tendency for conventional behavior. Tendency to compromise: he or she treats other people with kindness, ready to help others, believes that if he or she were in need, other people would help him. High scores in this area might be associated with dependable personality. Sometimes straightforward, meek or trusting. Conscientiousness: he or she has clear goals, strong will and great determination to achieve them. Positively correlated with achievements in science and professional work. He or she is scrupulous, reliable, disciplined, punctual, diligent and hard-working.

Source: private studies based on observations.

Managers of enterprises among other things exhibit characteristic skills for managers who run the organization. PKIE questionnaire results shows that the managers of IKS-NET have more than good skills in the domain of emotional intelligence and they are higher than current capabilities of Neurosoft managers. However, one should mention the existence of deficits in the interpersonal relations within the co-operation with a project-task team in the current composition of this enterprise. Results in these three dimensions (neuroticism, empathy, openness for new experiences) proved to be convergent. Even more convergent are results of both enterprises' co-ordinators. Strikingly similar characteristics and abilities visible in the tests draw one's attention.

7. Conclusions

The comparison of two research instruments: PKIE emotional intelligence questionnaire and NEO-PI-R personality inventory, as well as the obtained results, allows for the following conclusions:

NEO-PI-R personality inventory optics is focused on the current characteristics
of the examined person; therefore its predictive power (usefulness e.g. for the
selection of workers to occupy different positions) is moderately high when the
correlation with described job requirements is taken into account. Specific functioning conditions can significantly revise value of results.

- PKIE emotional intelligence questionnaire is oriented towards cognitive-intellectual structures (processes) of human functioning over longer periods of time. Theoretically the predictive power of such results should be higher (provided that assessment criteria are maintained).
- Preliminary comparative analysis with previous research results and data included in the literature on the subject do not allow for establishing qualitative differences between skills of a manager who is functioning in the traditional (hierarchical) and virtual-network structures. Diagnosed differences are quantitative rather than qualitative.
- The role of the manager using the virtual-network management takes a modified form: co-ordination, leadership, creation of team culture, a collection of feedback, merging the entities with different qualifications and specializations to create one virtual cell which realizes a common goal. The possibility to measure emotional intelligence, allows virtual management to be more efficient and enterprises to function in the inventive way. It also allows for the procedures of reporting intellectual capital of the enterprise (operating in societies of knowledge) to provide, in an honest way, the value of IE important variable of human capital [Kołodziejczyk and Antczak 2010, p. 140].

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UMIEJĘTNOŚCI MENEDŻERA W WARUNKACH WIRTUALNO-SIECIOWYCH – PRÓBA IDENTYFIKACJI W ŚWIETLE BADAŃ ANKIETOWYCH

Streszczenie: Koordynowanie, motywowanie i budowanie elastycznych zespołów przy użyciu nowoczesnych rozwiązań telekomunikacyjnych składa się na kierowanie w strukturze wirtualno-sieciowej. Menedżer odpowiedzialny za kierowanie zespołami wirtualno-sieciowymi pełni rolę koordynującą, starając się w pełni wykorzystać umiejętności i wiedzę ich członków, poprzez inspirowanie, stawianie problemów do rozwiązania w ramach realizowanych przez zespół zadań. Umiejętności wymagane od menedżera, kierującego pracami zespołu wirtualno-sieciowego to: zdolność budowania zespołu wirtualnego, sieciowego i koordynowania nim na odległość, świadomość strategii sieciowej, międzyorganizacyjnej, wirtualnej, międzynarodowej, sprawność komunikowania się (indywidualna inteligencja emocjonalna) przy wykorzystaniu nowoczesnych technik informacyjno-komunikacyjnych a także budowanie i podtrzymanie kultury organizacyjnej.