OPTIMIZING OF COMMUNICATION PROCESSES MANAGEMENT

E + M

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1. Introduction

Nowadays businesses and enterprises have to face competition, but not each of them is ready to do it. In recent years growing roles in economic development have been assigned to small and medium sized enterprises (SME). In 2006 the share of SME in SR GDP was almost 91,3% [7], but in compare with big enterprises SME have a few cardinal competition disadvantages, e.g.:

1. disadvantages resulting from financial barriers required to start business and its support due to complex, non-transparent and frequently changed legislation,
2. legal uncertainty resulting from a different point of view concerning legal interpretation in connection with a high rate of corruption,
3. limited access to sources due to a complicated way to obtain business loans,
4. high rate of contributions and tax duties.

For all that the risk of doing business is closely related to the need of good knowledge in business area and terms of business in real condition by their partners as well as by their competitors - it's the key to whichever successful business deal. Enterprises must also monitor the organization's environment and promptly react to its changes; they must use the manpower as an information source, as well as upgrade and minimize the set of business rules (i.e. legislation, standard specifications and instructions). This knowledge is essential for doing business on any foreign market, where companies are supposed to cooperate with foreign partners. They must flexibly adapt to different economic, legislative, social, demographic and cultural environment. This situation brings the requirement to look for a simple solution aimed at risk elimination. Also to increase the competitive advantages enterprises have to pay attention to effective collaboration between partners or clients.

Therefore it is necessary to:
- contact the right person immediately (to achieve information about partners),
- provide information they need quickly, accurately and helpfully (information about the enterprise for partners),
- be able to interact with partners in a way that suits them best, whether personally, over the phone, SMS, via email or a website.

It is required to achieve unified communication that provides an integrated access to people, information and other knowledge sources. The reason is to find such solution that assures an effective utilization of enterprise communication network supported by common information and communication technologies (ICT) where the right information is always available to managers and front line staff. They help to eliminate barriers between voice, email, conference, video and instant messaging. It means to bring solutions that support:
- clear and consistent processes for handling partners interactions,
- back office systems accessible through a common interface - so partners and product or service information are instantly retrievable,
- highly motivated staffs who come across as helpful and well informed.

Consequently, to make communication and collaboration process more effective, it is needed to create an opened and optimized communication structure that supports on-line exchange of information necessary for more flexible and operative decision-making and managing processes. This means to find the right solution concerning optimizing and investments to development of network, communication and information systems as well as people knowledge databases which help the managers to concentrate on their core competencies.

2. SME and Information Gaining Process Analysis

More possibilities how to increase the competitive advantages is effective exploring of enterprise information sources to make claimed decision in expected reaction time. For an effectively hyper-connected enterprise this means to achieve reduction of time to make a decision, increase of productivity and the ability to provide simple and consistent user experience by means of all types of communications. Generally, it means to have right information to succeed in communication with their partners. Acquired data must provide information not only about common aspects of analysed processes but may be decomposed in time and by a location which will use them in a decision-making process.

Next, as we have appointed, an enterprise must provide information about itself - not only legal information, goodwill of management but also by acceptation of global policy and corporate culture. It is the role of external communication system. All the terms and rules must be set strictly; they are supposed to reflect a real situation, support assignment and transfer of several changes in and out of the enterprise in accordance with changes in the enterprises goals. [10]

For all that if we want to bring an effective utilization of information to a top position in the business market competition process it is needed essential to know the weaknesses of enterprise communication network and consequently decide where it is necessary to invest finance to develop or innovate the functionalities of such network in accordance with achieving above mentioned needs.

Nowadays we know that people suffer from information overload; there's much more information concerning any given subject than a person is able to access. The result is that people are forced to depend on each other due to their knowledge. Know-who information rather than know-what, know-how or know-why information has become the most crucial. It involves getting to know who has the required information and being able to reach that person [6] and being able to know how and from whom the information can be achieved - to know information source.

Opened information technologies help to remove the barriers between existing used communication tools to do claimed decisions. Unified communication solutions have to aggregate people, as well as systems and ICT to unified communication systems which create a unified decision support. [8]

Gartner, Inc. analysts specify in the information technology research [4] - the unified communication conditions that are focused to answer the following questions:

What? - unifying of communication ways, systems, devices and applications:

- telephone data label, mobile voice, fixed voice, pager, chat, e-mail - allow connections with managers everywhere and anytime. These communication tools have technological restrictions due to various solutions and their accessing. There it is needed to know what solution to use to be successful by communication at the given time in its enterprise.

Why? - to achieve more effective, faster and simple communication. Various tools are used in different situations.

How? - through using common and new ICT more effectively.

Today more SME have ICT support of information and communication systems but they always don't exploit all abilities of their advantages. Just there is more risky to decide about changes in the enterprise communication system due to limited finances. Incorrect leverage has to invoke weaken even bring to end all business activities of SME. There is needed to analyse not only information sources but also factors like enterprise strategy, management concept, organizational structure, corporate culture, employee`s knowledge, their abilities and finally their demands concerning information.

3. Information Sources and Social Network Theory Analysis

To increase competition factors in SME business activities we paid our attention to analysis of real condition in a small enterprise aimed at using of communication system as a support of business activities. Determination of the concept of information demands, their tactics, methods, tools, rules as well as decisions how to use ICT more effectively are the basic points of information process analysis. We focussed our attention to monitor actually applied rules and tactics and according to them should provide an answer to processes and activities used in the analysed enterprise.

Consequently it is necessary to prepare not only data evaluation but evaluation of all used communication and social sites elements of the enterprise. For all that it is necessary to manage social networks effectively to gain access to the proper pieces of information. The result of such analysis gives more possibilities to collect information demands to be answered due to all processes inside and in outside an enterprise. It provides more possibilities as well as determination of the rules and activity sequences that are unique, minimal, and consistent and follow the areas and aims they were aimed at. In this context, understanding of determination, development and utilization of social network becomes more important. We have to focus our attention to social network theory.

A social network is a set of people (or organizations or other social entities) connected by a set of social relationships, such as friendship, co-working or information exchange. At their work they often utilize an information network. Researchers working at the intersection of information systems, sociology and mathematics are interested in information networks as well. They study the uses of social networks and the ways in which they are mediated in a society and at workplaces through ICT such as Intranet or some other networks (LAN, MAN, WAN) or the Internet.

The power of social network theory results from its difference from traditional sociological studies, which assume that it is the attributes of individual actors - whether they are friendly or unfriendly, smart or dumb, etc. - that's matter. Social network theory produces an alternative view, where the attributes of individuals are less important than their relationships and ties with other actors/participants within the network. This approach has turned out to be useful for explaining many real - world phenomena, but leaves less space for individual agency, the ability of individuals to influence their success which depends on a particular structure of their network. [6] Such process strongly depends on employees' relations, entrepreneurial objectives, as well as on employees' loyalty.

In SME there is specific a situation because most of employees at top positions are family members. They have high-ranking management competences due to their specific position, but they do not always have topic and actual information. They often gather it from own employees whose sometimes don`t dispose with required tools needed to obtaining such information (often obtained as a result of specific data analyses or from ulterior information sources). But it is needed to invest finances to such tools as well as people skills. The real challenge is to develop a member of intelligence analysts who are encouraged to „think creatively" and to acquire intellectual capital in the form of substantive expertise on a broad range of topics. The need for creative thinking runs directly into the need to reform secrecy and compartmentalization of information. A better balance is needed between investments in the emerging collection systems and enhanced forms of analytical capability. The latter means a greatly expanded investment in high quality personnel and new technologies that help analysts, instead of overwhelming them. To say it in a simple way - huge amounts of collected but unprocessed and unanalyzed data are useless for any policymaker - accordingly for SME.

Network theory is similar to the system theory and complexity theory. Social networks are also characterized by a distinctive methodology encompassing techniques for collecting data, statistic analysis, visual representation, etc. We can use many different methods and models to analyse such properties of information network and its data flows used as a support of enterprise communication system. Great mass data processing methods based on exploitation of common IT and visualisation provide modelling of precision final solutions by means of acceptation of real or expected conditions. But just in SME it is necessary to estimate whether is more needful to invest to ICT or into analysis tools to make information and communication system more effective. The most important question to consider is which type of membership activity and where most affects the information and communication network? As we have appointed before enterprises must also monitor the organization's environment and promptly react to its changes. It is possible if they better know both advantages and disadvantages of their communication system. To do it, we can apply such analyses which give more opportunities to set up if this network operates effectively or if financial resources or people potential are exploited efficiently.

4. Properties of Social Network Analysis

The purpose of social network analysis is to identify important actors, crucial links, sub-groups, roles, network characteristics, answer

- Distance: number of person between,
- Co-occurrence: is in the same position as, has the same relation as...,
- Mathematical: is two links removed from.

If we study network properties we have to analyse parameters like:

Fig. 1: Network variables

Causes → Network variables → Effects
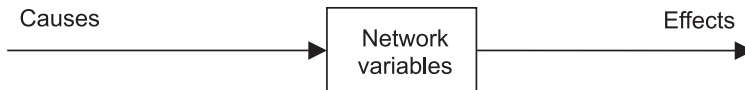
Source: own

substantive questions about its structure, etc.

There are three main levels of interest: element, group and network level. As to element level, one is interested in properties (both absolute and relative) of individual actors, links or incidences. An example of this type of analysis is bottleneck identification and structural ranking of network items. On his group level, one is interested in classification of the elements of a network and properties of subnetworks. Examples are - actor equivalence classes and cluster identification. Finally, on the network level, one is interested in properties of the overall network such as connectivity or balance.

If we want to make a network analysis we must study social relations among a set of actors. Network researchers have developed a set of distinctive theoretical perspectives as well. Some of the points of these perspectives are:

- focus on relationships between actors rather than attributes of actors,
- sense of interdependence: global rather atomistic view,
- structure affects substantive outcomes,
- emergent effects.

Social relations can be thought of as dyadic attributes. Whereas mainstream social science is concerned with monadic attributes (e.g. income, age, sex, etc.), network analysis is concerned with attributes of pairs of individuals, of which binary relations are the main kind.

Some examples of dyadic attribute [9]:

- Social roles: a boss of, a teacher of, a friend of, etc.
- Affective: likes, respects, hates,
- Cognitive: knows, views as similar,
- Actions: talks to, has lunch with, attacks,

1. Substantive effects of social network variables
- Attributes of ego network → access to resources, mental/physical health
- Network closeness → influence, diffusion
- Similarity of position → similarity of risks, opportunities, outcomes
2. Substantive determinants of social network variables
- Personality → centrality?
- Similarity → friendship ties? (homophily)
- Reduction of cognitive dissonance → transitivity?
- Strategic „networking"
3. Network determinants of network variables
- Relationship between density and centrality.

If we want to make an ego network analysis, it can be done in the context of traditional surveys. Each respondent is asked about the people he / she interacts with and about the relationships among these people. Ego network analysis is extremely convenient because it can be used in conjunction with random sampling, which enables classical statistical techniques to be used to test hypotheses.

We speak about a complete network analysis in situations where we try to get all the relationships among a set of respondents, such as all the friendships among employees of a given company. Most of rhetoric surrounding network analysis is based on complete network. All the techniques such as subgroup analysis, equivalence analysis and measures like centrality require complete network.

Network analysis is conventionally criticized for being too much methodological and too little theoretical. Critics say that there are few

truly network theories of substantive phenomena. This is not a well-considered argument, however, because when examples of network theories are presented, critics say „that's not really a network theory". This is natural because theories that account for, say, psychological phenomena, tend to have a lot of psychological content. Theories that account for sociological phenomena have sociological independent variables. Only theories that explain network phenomena tend to have a lot of network content. [5]

5. Utilization of Social Network Analysis and Aettings of its Properties by Small Enterprise

In spite of all expectations communication system is often strongly dependent on its elements that bring up unexpected situations or processes. Such elements are people and their activities. Hence it is essential to know that the social network theory can be also used to examine how company's members interact with each other, characterize many informal connections that link executives together, as well as associations and connections between individual employees of different departments. Such analysis tools provide the proper ways for companies to gather, reject, or achieve information about competition and also about any unexpected collusions occurred in business activities.

A social network theory is interpreted as a network with nodes (often referred to as actors), i.e. entities such as persons, organizations, or simply objects that are linked by binary relations such as social relations, dependencies, or exchange. Both nodes and links may have additional attributes to be of any type, and numerical link attributes may strengthen or weaken the tie between two nodes. In its most simple form we can use a social network diagram as a map of all of the relevant ties between the nodes being studied.

Such network theory and its model can also be used to determine the social capital of individual actors. It is used to illustrate the data continuity analysis process. Each node in this network represents a person that works in a particular knowledge domain.

To understand properties of such analysis we analysed the small enterprise in its social network diagram, where nodes are the points and ties are the lines. Nodes often present the individual actors within the networks, and ties are the relationships between the actors. People are displayed as nodes Y_i and their social relationships are ties $X_{i,j}$, where the social network diagram had the following structure (Fig. 2).

The Y_1 is a chief, Y_2 is his wife and Y_3 is a sale and marketing manager, Y_4 is an accountant and

Fig. 2: Social network diagram
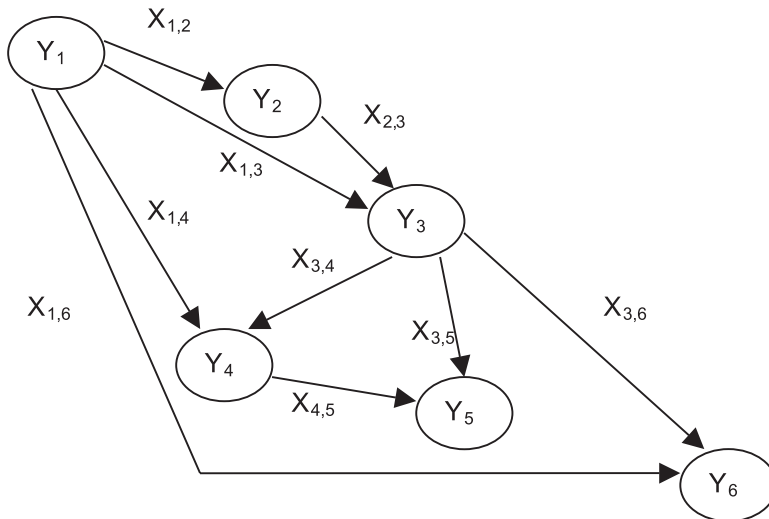
Source: own

other two are regular enterprise members. People have cumulative workduties according to small business where it is necessary to do it in this way. Neither of people have different knowledge than the others so there can be many kinds of ties between the nodes. So we can easily analyse the structure of network as well as closed points of such social network.

Next in that social network we must know the most significant nodes and their properties - centralities. One of the ways to understand social network needs includes accounts of centrality and of one node's relationship to other nodes in a network. That is why Linton C. Freeman's article concerning centrality in social networks is important. [3] Freeman explored how „graph centralization" is based on differences in point centralities. He also outlined three competing theories regarding the definition of centrality based on degree of a point, control and independence. Because social networks are fundamentally social tools in which people are constantly monitoring and growing their social network, most social network media depict growth using the degree of point definition.

However, control and independence can be more useful definitions. As we have mentioned above, a person who controls information flows is more important than one who is on the topic position or may have more friends in the network. Such person may have better information to eliminate the risk of common business activities. But the importance of this position is not as high as it should be. Holder of the position is often responsible for finding out such points and their relationships - it's the key to a successful business deal.

Therefore in the next we calculate - for analysed network`s nodes - such properties as local measures of degrees and distance centralities. It helps us to decide better about centralities of such network.

Degree centrality is defined as the number of links incident upon a node (i.e. the number of ties that a node has). In an enterprise network this means counting the number of informed people it has in a social network. The more people are connected to a given node, the more important the node is.

Degree centrality can also indicate which members are the most useful or well connected and therefore the best information resources. It is often interpreted in terms of the immediate risk of node for catching whatever is flowing through the network. The greater a person's degree, the greater the chance that he will catch whatever is flowing through the network, whether it is good or bad. Nodes with degree centrality are not only more viewable and controllable but the network better obtains any information which may effectively exploit in the competition process. In a better way they gather new innovation and knowledge. In general, the greater a person's degree, the more potential influence the network has and vice-versa. For example, in the enterprise network, a person who has more connections can spread information more quickly, and is also be more likely to hear more information. It is so in our enterprise where marketing manager (node Y3) has always better information about sales promotion so he can better plane purchase orders than his chief who prepares plans for firm`s stock--in-trade. Also a lot of research points say that organisations gather better more information incidentally or through fellowship dialogs than through official reports.

Next we will also analyse distance centralities to obtain better information about weaknesses as well as about opportunities of a communication network. We outline the betweennes centrality based on a counting rate of information ties as well as distance and density centralities computing. There we use a graph-analysis methodology combined with a correlation matrix analysis [1] to optimize such network properties.

5.1 Setting of Local Measures of Centralities by Using a Graph-Analysis Methodology

If we constructed a social network diagram we could analyse point's properties, set hierarchy levels of communication network as well as its density. To do it correctly we configured a matrix model which corresponds with a communication network diagram (Fig. 2). That correlation matrix corresponds with information flow's relations of the analysed network's subjects described above.

Let this matrix be a compact model of information graph. In the social network there is a time delay of information flows between input and output data according to their background pro-

cessing in the analysed social network. Let these elements of social network mark as subjects of that system - Yi. Some relations between these subjects described as oriented paths are variable $X_{i,j}$ those can be even 1, if there is a relation from node Yi to Yj node, and $X_{i,j}$ can be even zero, if this relation does not occur. We get an information matrix (matrix of relations between a manager and his employees - see Tab. 1).

summarized the values of the columns answered to particular nodes. We repeated that process until we obtained a zero-matrix. [1]

The number of exponentiation corresponded with the number of hierarchy levels. We must exponent our matrix 5-times to obtain a zero-matrix - so our network has five hierarchy levels. Gradually we determined distribution of nodes to several levels and assigned to nodes relevant

Tab. 1: Correlation matrix of information relation network

|		Y1	Y2	Y3	Y4	Y5	Y6
	Y1	0	1	1	1	0	1
	Y2	0	0	1	0	0	0
M 1=	Y3	0	0	0	1	1	1
	Y4	0	0	0	0	1	0
	Y5	0	0	0	0	0	0
	Y6	0	0	0	0	0	0
	Σ	0	1	2	2	2	2

Source: own

In the next step we summarized the values in the columns to set hierarchy levels of communication network. If the sum in the columns is zero, these points are integrated to the same hierarchy levels. As we can see from the Fig. 3, the node Y1 has the highest degree position. It corresponded to the chief position of analysed enterprise network.

To obtain next levels we calculated series of matrix n-exponentiation and consequently we again

information flows to the nodes according to existing ties of communication system. So we obtained a new graph model of information network corresponding to existing information hierarchy levels (Fig. 3).

This model monitors an analysed network more transparently because of more visible hierarchy levels and ties and it simplifies the above mentioned graph diagram (Fig. 2). Our network was simpler, but if we could analyse a bigger social

Fig. 3: Graph presentation of hierarchy model
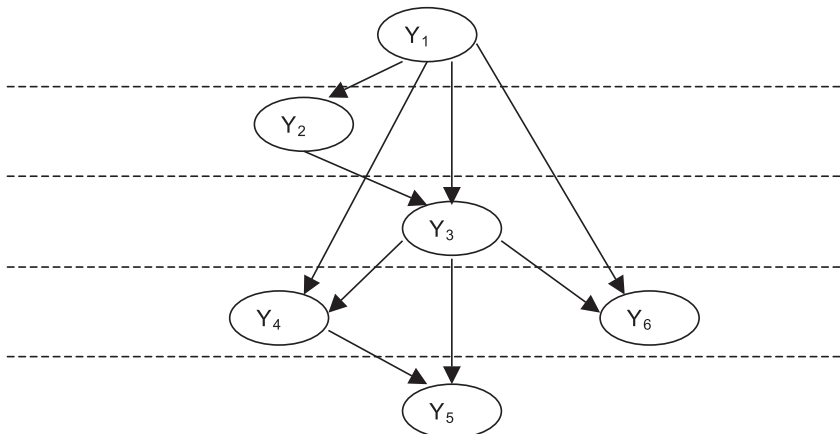
Source: own

network we could obtain a structure of hierarchy levels more transparently - even it seemed to be complicated at the first sight in the first graph diagram of such network.

Next, if the network is directed (meaning that ties have their direction), then we must usually define two separate measures of degree centrality, namely indegree and outdegree. An indegree is the number of ties directed to the node, and outdegree is the number of ties that the node directs to the others. For positive relations such as friendship or consultancy, we normally interpreted indegree as a form of popularity, and outdegree can be seen as indicating gregariousness [5].

Next we could decide who has a better control in the communication network. We can use graph-analysis method that also gives information about control centrality. The **control** refers to the extent to which nodes depend on one specific node to communicate with other ones. For example, if more employees are connected to each other only when that node serves as the bridge connecting them, then its centrality is high. It is the node that controls the communication flows. There it is a node Y_3. If such a worker absents information flows from Y_2 to Y_4, Y_5 and Y_6 absent. The worst situation is when Y_1 also doesn't work.

We can calculate such centrality in our network as a degree centrality.

- **degree** centrality has the node Y3 because the most outstar and instar paths connect other nodes to it (Fig. 3).

We calculate degree centrality as:

$$C_E(v) = \sum \omega(e) \qquad (1)$$

where e is a count of all instars and outstars paths. As we have counted a degree centrality of network by Fig.3.

$C_E(v)$ for node Y_3 is even 5.

Next we want to set local measures of centralities. We compute

- **outdegree** centrality as:

$$C_E(v) = \sum_{e \in outstar(v)} \omega(e). \qquad (2)$$

We can say the node Y_1 has the highest outdegree centrality because its $C_E(v)$ is equal to 4. Next

it is Y_3, but not Y_2 as we could gather from hierarchy model (wife of chief) of enterprise structure.

Next centrality is

- **independence** centrality:

means that a node is closely related to all the nodes considered - so that it is minimally dependent on any single node and it isn't a subject to control. This means it can reach the maximum number of people through the shortest number of links, without being dependent on a few particular nodes (Y_1). It is normal because the boss of the firm has such position in the firm. Vice-versa the point Y3 is strongly dependent on other nodes so its activities are more visible. It can put stress to its work duty beneath criticism.

On the other side we can decide which of all nodes is well informed - it has relatively the highest level of control in such network. We can compute it from a graph theory as a:

- **closeness** centrality is a centrality measure of a node within a graph.

Nodes that are „shallow" to other nodes (it means, the nodes that tend to have short distances to other nodes with in the graph) have higher closeness. In the network theory, closeness is a sophisticated measure of centrality. It is defined as the mean shortest path between a node and all other nodes reachable from it.

If we computed this centrality for all nodes as:

$$C_E(v) = \cfrac{1}{\sum\limits_{t \in V(G)} \delta(v, t)} \qquad (3)$$

We obtained that closeness centrality **has** the node Y_3.

We deduced that in such network node Y_3 is the most important one, it means such employee is more important person in the enterprise even if it does not seem like that at first sight. So a successful business deal of all firms will depend on his activities.

5.2 Analysis Measures of Distance Centralities and Redundancy

Furthermore we can decide about the position of Y3 when we compute measure of distance centrality:

- **betweenness** centrality

It is a distant measure of nodes within a graph. The nodes that occur on many shortest paths

between the other nodes have higher betweenness than those that do not.

The highest betweenness centrality has Y_3 and it serves as the bridge between the most nodes and controls the information flows.

The betweenness centrality for node v is:

$$C_E(v) = \sum_{s \neq v \neq t \in V(G)} \frac{\delta st\,(v)}{\delta st} \qquad (4)$$

where:

$\delta st\,(v)$ - is the number of the shortest paths from the node s to t that pass through v,

δst - is the total number of the shortest paths from the node s to t.

Betweenness centrality has node Y_3. Its measure is equal to 1/4. The distance measure is the shortest for the node Y_3, where a path to the node Y_5 is the shortest of all through the node Y_3 (but not through the node Y_4). As we can see the analysis through a network graph in the Fig.2 is more frosted than one in the Fig.3, because we can't set the shortest way so exactly because were not aware of hierarchy levels distribution of all nodes. It confirmed our findings that Y_3 is the well important node in such communication network. It is necessary to pay attention to such point because we have to be aware of information security violation.

Tab.2: Matrix of counting rate information ties

	Y1	Y2	Y3	Y4	Y5	Y6
Y1	0	1	**2**	**2**	**2**	**2**
Y2	0	0	1	1	**2**	1
Y3	0	0	0	1	**2**	1
Y4	0	0	0	0	1	0
Y5	0	0	0	0	0	0
Y6	0	0	0	0	0	0

Source: own

Fig. 4 Visone model analysis
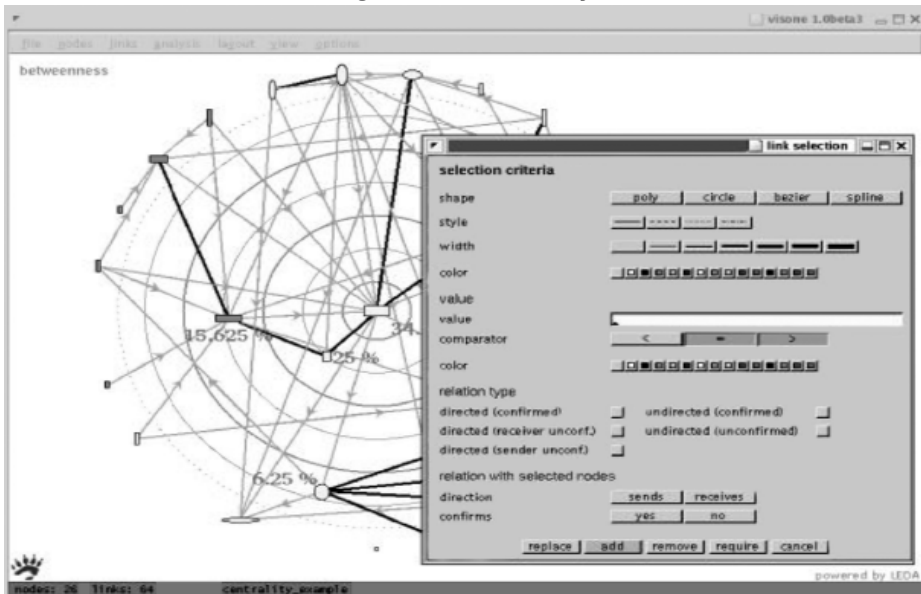
Source: BRANDES, U., WAGNER, D. Visone - Analysis and Visualization of Social Networks [online]. [cit. 2007-1-12]
<http://i11www.iti.uni-karlsruhe.de/algo/people/dwagner/papers/bw-vavsn-03.pdf>.

On the other hand, when we analyse an existing network it is necessary **to decide** about **information redundancy**, if it is needful or needless. It is necessary to balance the positives and negatives of size and communication activity.

If we would analyze redundancy we can also use a correlation-matrix model. There we must configure matrix of ties counting rate. The number of ties indicates the number of information redundancies of network nodes (Tab. 2).

As we can see the information redundancy have the nodes Y_3, Y_4, Y_5 and Y_6. If we summarize rather obtained findings (chapter 5.1) we can say the information redundancy for node Y_3 is needful but the other nodes redundancy is needles.

5.3 Network Analysis by Using Visone

Nowadays we can use an analysis tool that facilitates the visual exploration of social networks by using Visone programme. It may be used if we have a large network with many nodes and ties, where it is more simply to research its properties through models and build algorithms which integrate and advance the analysis and visualization of social networks. [2]

It includes counting of many above described centralities.

Such tool enables a social network analysis by using graph-theoretic concepts - to describe, understand and explain social structure. The Visone software is an attempt to integrate analysis and visualization of social networks and is intended to be used in research of complicated social networks. It attempts to make complicated types of analysis and data handling transparent, intuitive and more readily accessible. Nevertheless we recommend using such tools for SME enterprises if they need to analyse their network. Software Visone is free for research purposes. It can be downloaded on http://visone.info/download/.

6. Conclusion

Searching and setting of centralities in the social network gives more possibilities to manage the network, supports data management, etc. It is executed by implementation of social network analysis. Social network in enterprises has unique properties and due to them it is a socio-technical system that is created by people with their specific characters but not only by exploitation of technical components and other communication tools.

Separation of weaknesses and some limitations of managed network provide better utilization of communication network in business processes, in negotiations or in decision - making processes. It is possible to eliminate treatments of network nodes that may evoke some failures by more important dealings or statements. Setting of their centralities may eliminate constraints and threats which may occur by using such network to predict partner behaviour and identify new business opportunities mostly when doing business on foreign markets. Definitely, they need enough proper information about possible ways and available support when they carry out business activities with their partners.

Applications of such theory in different ways described in this paper provide variable tools to analyse various networks. We presented an extension of graph-analysing theory combined with density matrix which simplifies these problems in the small enterprise. The correlation matrix modelling is described by a functional analysis which includes the graph-analysis of our network. The computing of centralities offers a precise tool to determine centralities of such network. In this way, the discontinuity or darkness points can be eliminated. In the tests of the method in a simple system we assigned the advantages of such analysis that helps us to determinate seclusions, menaces as well as opportunities of analysed enterprise system occurred in such business segment.

If we optimise a network by using such tools we can precisely analyse also the network which seemed to be complicated at the first side. It is due to necessity of the top subject matter experts - SME - they must search information, use both direct and indirect links - hierarchical as well as informal communication paths. Therefore SME can apply the above described network measure metrics of centralities as well as distance centralities. According to them they can better decide about the size of investment which company needs to improve its management through higher quality communication processes. It is especially necessary for SME due to incorrect leverage that could weaken or even end all their business activities.

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ABSTRACT

OPTIMIZING OF COMMUNICATION PROCESSES MANAGEMENT

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This article is focused on analysis of the importance of business communication in SME and its role to support and increase their business efficiency. It is necessary to communicate effectively and collaborate with teams and partners. Simplified ways of information sharing between people are very important for doing business and so it is possible to integrate communication with business processes. Unified communications help to solve a lot of problems, because companies as well as their partners have limited resources - so they must look for simple solutions to manage common communication processes more effectively. It is required to create an opened and optimized communication structure that supports on-line exchange of information necessary to make and operative decision-making and managing processes more flexible. The final result is that a business is run faster and smoother.

To make a communication process more effective it is essential to decide where closed areas or risky points of information processing are and evaluate what to do to optimize such communication process. Communication network in any enterprises has unique properties since it is a socio-technical system that is created by people with their specific characters, but not only by exploitation of technical components but also through other communication tools. We implemented a concept of social network methodology where we used a graph diagram-method combined with matrix correlation analysis based on mathematics modelling of such network.

We present methods and tools designed to detection and computing of centralities (closeness, degree and betweenness centralities) as well as network density. By setting these centralities we can visualize a social network structure of common businesses communication systems. Business efficiency could be increased due to better information about properties and closed appointments of an analyzed enterprise structure.

Key Words: efficiency, management by information and communication, correlation analysis

JEL Classification: M15, M21, C02, C46.