



Systemic Products as a Source of Competitive Advantage on the Example of IT Sector (Part I)

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ABSTRACT

The purpose of this article is to identify the specific character of systemic IT product, created in synergistic relationships of IT entities in the area of the new approach to meeting customers' needs. As it is supposed, this is a new way of building competitive value by creation of systemic multi-products in synergistic relationships in IT sector, especially by the leaders. Critical analysis of literature in the area of studied category is conducted in the article; furthermore qualitative method of empirical studies (case study) is applied for practical illustration of described processes and phenomena. As it is shown by research results, the identified models of systemic IT products are wide-functional and offer many advantages, which can create a competitive value on market. In opinions of studied entities the net-cooperation is conducive to optimisation of activity, synergy of human resources, their competences and knowledge, as well as technology and financial resources.

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1. Systemic products and structures of their formation – identification of research category

Systemic products (multiproducts, multivalued, multibenefit) satisfy a specific group of needs and expectations of their buyers and not a single need or option / expectation associated with it; they also ought to solve several problems of the buyer / consumer simultaneously, or satisfy an aggregate of needs attributed to more than one level of needs in general terms.

Consumers indicate them as bundles / cluster of needs occurring simultaneously in a particular period of human life [18], for example an aggregate of housing needs, an aggregate of needs associated with recreation, an aggregate of needs related to entertainment, or in this case, an aggregate of needs in the sphere of IT. Systemic products are most frequently characterised by high degree of technological development while not all their components must be technologically highly engaged. Intersectoral systemic products comprising IT solutions – smart houses, smart arrangement of small architecture or smart household equipment can be examples here. Therefore they are usually products engaging significant knowledge potential of enterprises cooperants and customer / consumer creating them.

Systemic products occurred on the market as a result development of market economy that is highly globalised, based on knowledge of aware market participants, including information society of high level of consumption [18]. They are products of enterprises focussed on knowledge from customer and cooperant, about customer and cooperant, and for customer and cooperant. Therefore they are products that may possibly satisfy specific, complex and sophisticated customers' needs. However, they are more frequently found in the mid and high price segment. They enable to satisfy needs in the way that is different from the previous one, often in an innovative way. Depending on the level of innovativeness, systemic products can be targeted at customers expecting products of quality higher than before or at new target segments. Because of the tendency of further development of these products resulting for example from at least continued technological development, including IT technologies, customer' needs can be satisfied on increasingly more competent level. Because of its specific qualities, the product is most often labelled with the brand of promoter of network relationship of enterprises, or a new brand if it is a result of breakthrough innovation [12].

Systemic products occur as a result of cooperation between many entities; therefore they have a network nature. Their network character results from co-creating them by the network of entities, remaining in more or less formalised relationships with each other [2], [3]. These entities form various types of associations and create business eco-systems for the purpose of co-creation of systemic value, targeted at stakeholders.

The main features of the network enterprise include:

- voluntary character of joining the network,
- parallel (simultaneous) execution of various projects and economic ventures,

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- compatibility of competences of the integrator company and other cooperants,
- occurrence of islands of tacit knowledge,
- increasingly shorter lifecycles of products and services,
- permeating with other networks,
- application of computer networks in communication processes,
- significant potential of organisational learning.

Network structures created in this way are a group of more than two independent organisations that are connected with relationships of the following features:

- decisions concerning resources are made not only integrally by the parties in transactions, but also collectively by cooperating parties,
- transfer of resources between cooperating parties has a repetitive, and not temporary character; mutual expectations of cooperating partners include longer time horizon,
- information available to the parties in cooperation is considerably more extensive than in the case of market coordination,
- negotiations as well as agreement, and not competition are a form of coordination of activities between the parties.

The networks form together some additional value in against the value constituting the aggregate of individual activities [10]. Synergy is a factor generating mutual attractiveness of entities in cooperation, and as such, it constitutes inter-organisational network, both subsectoral and intersectoral, as it happens on the market of computer products.

The network entities function according to the principle of non-competitive relationships of a symmetrical or asymmetrical character (table 1). In the symmetrical structure the participants are co-creators of strategies, they coordinate and execute projects together. In this situation the interest and strategy of at least majority of engaged entities is accomplished on the principles of social networking and / or the so-called network of bureaucratic / contractual direct relationships, or on the basis of property rights, but without a coordinating entity. Coordination in the network can have a bilateral, mutual character or the character of trilateral coordination where separate entities representing the interest of the whole group are formed. They take coordinating and controlling function in the areas where consent is given by the network participants. While creating the so-called federated networks, the entities search together for the ways to satisfy a specific need, through cooperation and solidarity. Informal on-line communities of knowledge can be their expression. In asymmetrical relationships one or several entities have a considerable bargaining power against other partners and therefore assume the coordinating function. Asymmetrical network promoter formulates the network strategy. Within this form of network structure the following types can be distinguished [5]:

- asymmetrical social network – based on interpersonal relationships established by the participants in central organisation; a specific potential of entities, cooperating and ready to start acting if such a need occurs is created; this form is not accompanied by formal agreements and capital ties; the network of sector enterprises with consulting companies, groups of specialists in the sector and customers is the example here; it can take the form of direct relationships network that serve implementation of the strategy of penetration by communities of practitioners, most often on-line,
- symmetrical bureaucratic network consisting in participants' engagement that can be measured; agreements on cooperation are constructed; they determine exclusivity clause, forms of knowledge transfer, incentive systems, typical of network relationships between the promoter and suppliers of components and distributors on computer market among others; these networks are often referred to as contractual and qualified and they are a form of the strategy of growth on market through relationships with many partners,
- integrated asymmetrical network based on proprietary rights where groups search for the synergy in the system of cooperation of their own companies, particularly in risky sectors, for example in the period of economic crisis; this serves implementation of the strategy of presence and proximity.

Table 1. Examples of network structures by type and method of coordination on the example of IT sector

Network type	Character of relationships in the network	
	symmetrical	asymmetrical
Social networks, network of direct relationships	communities of specialists in technological parks, special economic zones	communities of knowledge of customers and cooperants, particularly potential network participants in open communities
Bureaucratic, contractual	communities of entities of complementary resources	qualified cooperation between promoter and entities of channels of distribution and suppliers of
Based on proprietary rights, integrated	non-competitive communities of branches, subsidiaries, SBU of a particular corporation / network	communities of branches, subsidiaries, SBU of diversified share in created size of turnover / profit in the company / network

2. Data and methodology

The purpose of this article is to identify the specific character of systemic IT product, created in synergistic relationships of IT entities in the area of a new approach to meeting customers' needs. As it is supposed, this is a new way of building competitive value by creation of systemic multi-products in synergistic relationships in IT sector, by the leaders. A brief critical analysis of literature in the field of studied category is conducted in the article and qualitative method of empirical studies (case study) is applied for practical illustration of researched systemic IT products. During the studies of the entities that form net business environment for the purpose of creation of systemic offer under the patronage of computer sector leaders, including HP, Intel, Microsoft, IBM and Apple, over 400 entities were identified. According to studied leaders, they were involved in direct network relationships. They are entities of various (narrow or broad) range of offer functioning within computer subsectors or telecommunication and / or media sectors, in the sphere of production, assembly and / or distribution. In-depth case study method was applied with reference to purposely selected group of enterprises representing the core of network relationship, the so-called extended core of network and entities of the circle of IT sector networks (table 2).

Table 2. Basic information about performed research

Specification	Characteristics of performed study
Research technique	analysis of Internet pages, analysis of sponsored interviews in IT journals, direct interview
Sample selection	purposeful selection
Sample size	5 promoters of network relationship
	9 entities of extended network core
	10 entities of network circle
Criteria of selection of sample group	purposeful selection by indications of promoters and / or position in the ranking of companies by turnover
Spatial range of research	Poland and global range
Time range of research	2000-2015

In-depth case study analysis method used in this research consists in a comprehensive presentation of a real situation occurring in a particular company or in regard to one of the functions realized within the company (e.g. systemic product creation), which is approached as an individual case. It involves seeking for all necessary data enabling its in-depth analysis, formulating possible choice options and making the best possible decision, accompanied by a proper justification. Application of this method seems well founded, considering the following:

- the research concerns contemporary, dynamic phenomena;
- the research concerns investigating actual contexts of these phenomena, concerning significant ambiguity of boundaries between the very phenomena and their contexts;
- the object of the research is too complicated, to explain cause and effect relationships with the help of methods such as a poll or experiment.

The unit of analysis/the subject of the studied case are „complex situations”, i. e. groups of economic subjects (particularly leaders of network structures and partners) and their market behaviour.

3. Theoretical models of systemic it products

Components of systemic IT products of subsectoral and intersectoral type can be presented with the use of theoretical product models known from the literature. They include the **concept of Levitt's product, Levitt's-Kotler product and structural model of value for customer.**

The possibility to store and process data in digital form (*the core of the product – according to Levitt's concept of product [7], [8], [9]*) is the essence of computer as electronic device and fundamental value (advantage) the consumer buys. As a result of technology development and consequently, information awareness, this fundamental value took the form of more precise functional qualities of the computer: data processing as text editing, graphic processing, image and sound processing (digital photography, synthesisers), distance data transfer, and database. To perform these functions the computer represents some specific technological solution, has a definite storage capacity, a particular processor of a particular clock speed, etc. The core of systemic IT sub(inter)sectoral product is formed by usability offered by creators of computer platform, software and services of components assembly services.

A real product, i.e. the sphere that determines the power of perception of the computer on market is its material form, price and quality determined by the origin of components used for assembly, style and design (mini, midi, and big tower), colouring, brand, certificates and safety mark. Specific attributes of this sphere are a domain of individual co-creators of systemic IT product, and some of them constitute a co-value.

Additional benefits offered to customers result from the conditions of technological progress because all innovations become a standard really quickly. Dynamics of changes has been so far determined mainly by the progress in the sphere of software. The sphere of *expanded computer product*, in traditional approach includes extended warranty period (2-3 years), free service after warranty expires, telephone (info line, hotline) or internet technical support, training in the sphere of operation, technical manuals of components translated into Polish, software (games and other multimedia programs), delivery and assembly at the customer's place as well as hire-purchase.

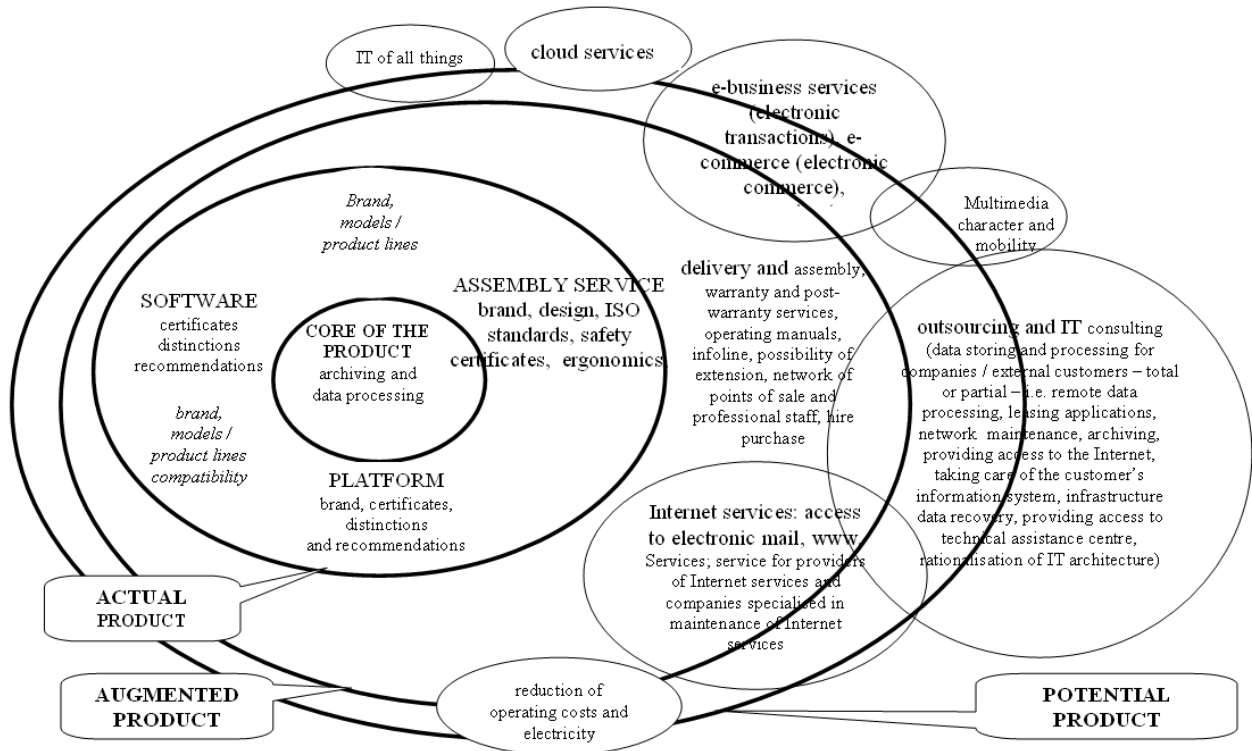


Fig. 1. Model I of IT, subsectoral product according to Levitt-Kotler's structure

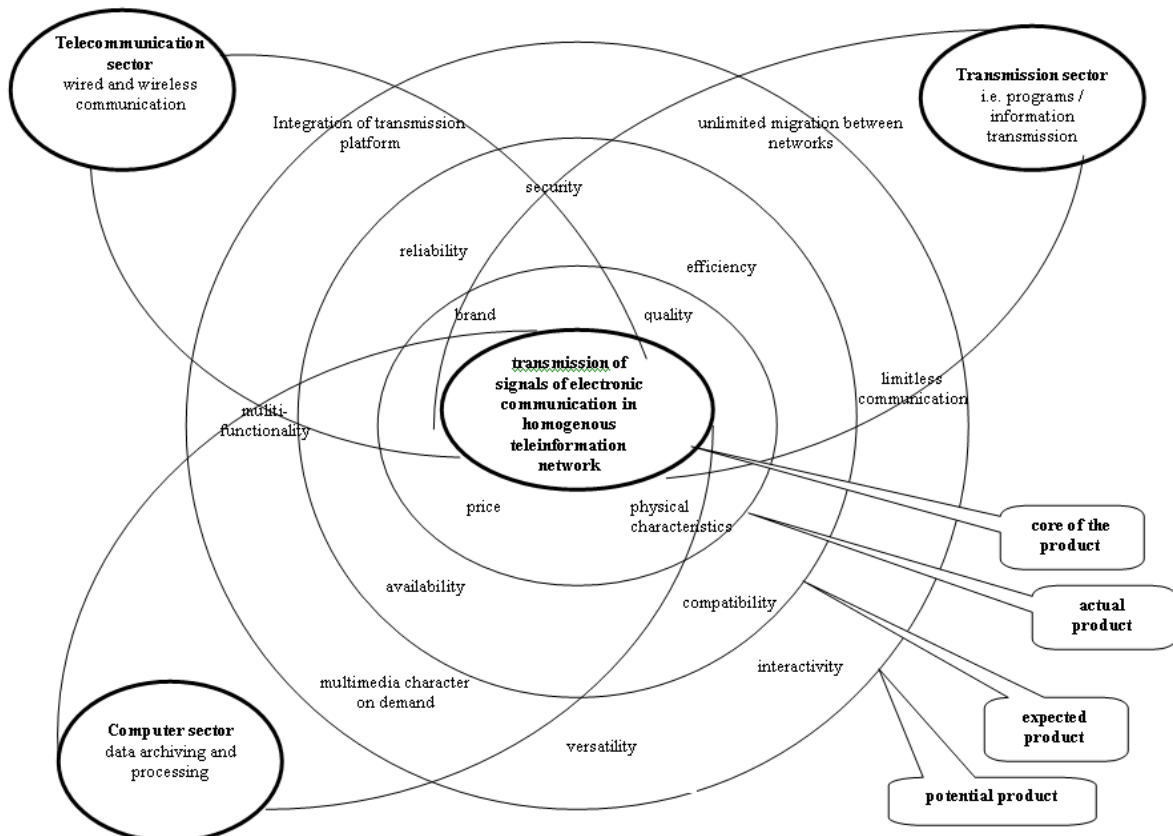


Fig. 2. Model II of multi-core inter-sectoral IT product according to Levitt-Kotler's structure

In Levitt-Kotler's modified concept of product, on the third level of the model, there is an *expected product*, i.e. a collection of qualities and conditions expected by the buyer making decision to buy a particular product, and on the next level, there is an *improved product* with the features distinguishing it against the competitors (fig. 1).

Potential product is a computer version expected in the future. With respect to technological solutions, so far the speed of operation execution, new shape and miniaturisation have been expected. Currently it is rather mobility and speed of data processing and possibility to operate Big Data that is searched for. Tying, e.g. the possibility to exchange or return the old or technologically exploited computer or its parts is perceived as a form of making the sales more attractive. Continuation of the product and service simultaneity processes as a demand of market attractiveness is a challenge for enterprises from computer sector. Some service-providing processes have already become a standard attribute of systemic IT product. *Sub-sectoral systemic character of IT products* in which further development, versatility and multi-media character are demanded is the consequence of such market demands.

Inter-sectoral, systemic IT product is the IT product of the new generation. It is a conglomerate of values offered by the entities of computer, tele-communication and transmitting sectors. Their common goal is to satisfy customer's needs in the sphere of interactive electronic communication. Pure solutions and / or together with complementary options are offered on market. Pure solutions are the absolute minimum of an IT product that constitutes a competitive alternative with respect to price, against solutions constituting carefully selected aggregate of multimedia options targeted at customers appreciating their value [1].

Model II of IT product structure takes the multi-core form [19] while exposing the values that are a domain of systemic, inter-sectoral products against mono-profits offered by sector entities in traditional approach. It is observed that expected and / or potential qualities of IT products in its sub-sectoral or even traditional approach constitute the core of systemic, intersectoral IT product (fig. 2).

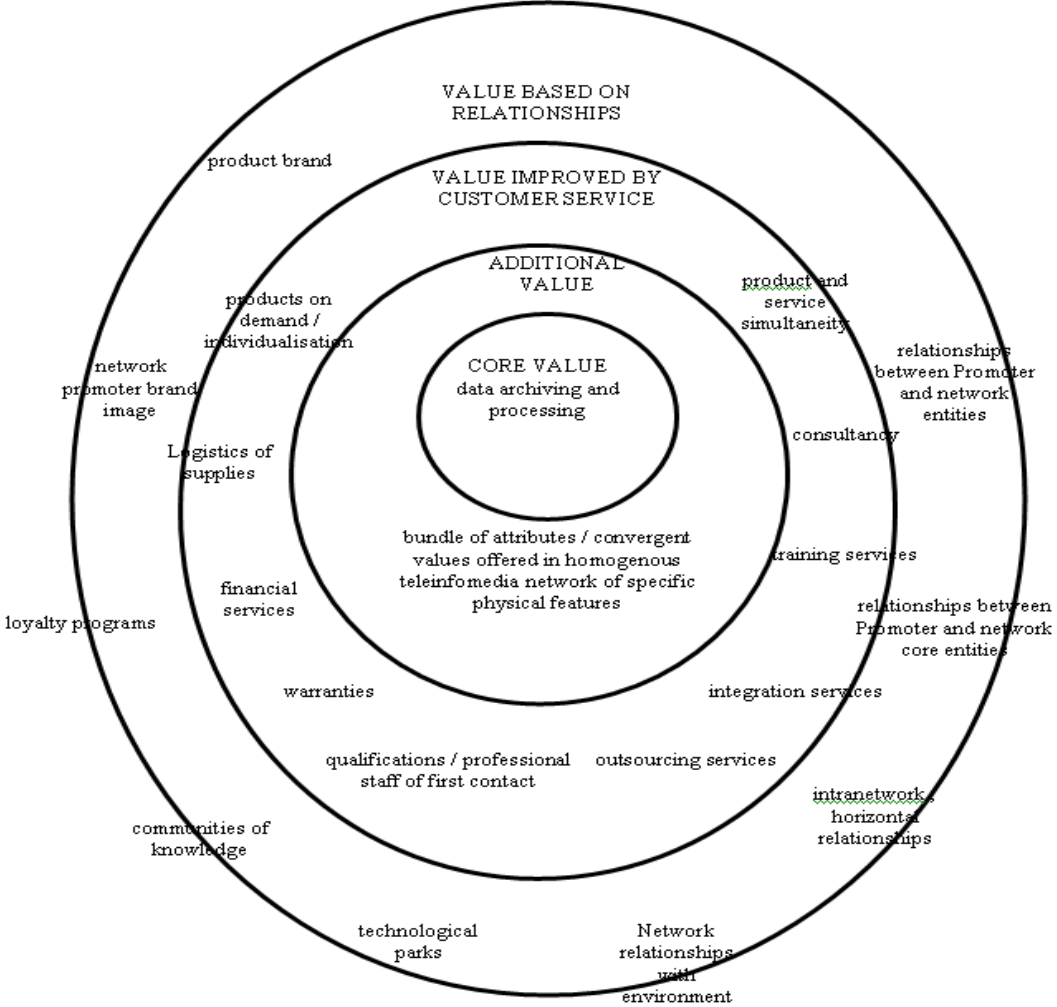


Fig.3. Model III – structural model of IT product value for customer

As it has been aforementioned, because of growing complexity of more aware and active customers of IT product meta-markets, competition between enterprises and networks created by them moves towards increasingly higher level of values or product qualities.

Structural model of value for customer (model III) that is a consequence of studies and compilations of traditional product structure model created by Levitt and developed by Ph. Kotler and the concept of brand four levels by L. de Chernatony and M. McDonald, shows not only product attributes but also customer service, relationships and customer's costs related to product purchase and use.

The core product value, in this case an IT product that is purchased by customer for a specific price is the first level in the model. However price is not the key attribute of competitiveness of enterprises in the market of IT products because in principle, these products are targeted at the customer from at least mid-market, who expects bundles of benefits at a relevant level of price [11]. On the other hand, price-oriented customers, forming the so-called lower market are rather recipients of monoproducts that are cheaper versions of IT product (computer in this case). This satisfaction of an aggregate of needs, and thereby provision of a bundle of benefits of product and service, or intersectoral character constitutes product value added in the model of value for customer.

On the metamarket of IT products that includes a group of markets of complementary products expected by customers as a complex bundle of satisfaction, beside traditional warranty, hire-purchase and operational support, etc., *value added* comprises multimedia character and interactivity: data and information archiving and processing, transmitting and communication which can only be a result of cooperation / technological and business convergence, and specific business ecosystems. Additional benefit can also be perceived in the possibility of purchase and use of equipment that performs functions of a few monoproducts. *Value improved by customer service* is associated with services accompanying sales, services before the sale, as well as after-sales services. Apart from designing a product for individual demands, hire-purchase and logistics of customer service, competitiveness of enterprises within the third sphere can be determined by skilful simultaneity of product and services of suppliers of IT products. Subsectoral cooperation of entities of the sphere of consultancy, training, integration and outsourcing services determines competitiveness of an IT product in this sphere. The fourth level of the model is formed by *relationships* between an enterprise with customer and network structure participants, either actual or potential.

The value of an IT product is a result of aware and competent relationships based on knowledge exchange, from and for the customer, network partner and its potential participant, in compliance with the principles of the concept of mass individualisation (mass customisation [6]). For this purpose, providers of IT products establish the so-called communities of knowledge that are platforms of interactive knowledge exchange for the purpose of co-creation of value, and specific technological parks based on relationships with specialists, research teams, scientific centres and customers.

4. Reasons for development of relationships in the light of systemic benefits of computer products

In the period of „New Economy”, in which information is becoming a fundamental value, according to Toffler, human history is mainly analysed in the context of third stage of its development. It is directly associated with the emergence of new technologies that allow for unlimited communication thanks to development of services and departure from mass production, occurrence of information society as well as service society, and thanks to technological revolution beside agricultural and industrial revolution [15]. Thus, new global economy is first of all based on [4]:

- global competition,
- megaconcentration of ownership and capital,
- cooperation between enterprises on global scale,
- new innovation policy,
- management based on knowledge and intellectual capital,
- development of advanced technologies in the sphere of information, telecommunication, including the Internet.

Therefore strategic perspective is rightly noticed in the definition of the network of enterprises, and the network is approached as a system that [16]:

- provides survival and enhancement of market position among competitors to an entity, thanks to relationships of multilateral cooperation,
- allows for focussing on key competences that are activated and used in a coordinated way while enabling smart and collective use of network resources and knowledge potential;
- is limited because of the necessity to offer the possibility to manage the network.

Certainly this is why, in opinions of studied entities, systemic solutions encourage adaptability of enterprises in changeable environment, bring work optimisation of people, processes and systems for the purpose of increase in effectiveness efficiency. They cause limitation of costs to customers and suppliers / participants in network relationship (in view of **HP, Intel and IBM** Managers). They contribute to acceleration of product development, enhance transparency of supply chain and allow for creation of offers compliant with the needs of metamarkets, particularly in the sphere of advanced business technologies. Systemic tools, including computer products, allow for adapting to changes occurring on market. Together with cooperants, the company offers solutions that enable customers to achieve business targets while

improving financial indices, minimising risk of application of the latest IT accomplishments, and also improvement in operational effectiveness. Combination of offers provides a specific product corresponding to customers' needs in the sphere of intersectoral products (the so-called cross-industry technology solutions) in the period of strong competition. Systemic relationships bring the effect in the form of a broad scope of solutions, created on the basis of best practices and standards and maximising flexibility. Complementary character of processes, methodology and tools integrated in an aggregate of benefits for customer constitute the power of solutions, thereby enhancing the offer competitiveness.

In opinions of these entities, systemic products of **HP and Microsoft** enable to work faster and more efficiently, react actively to changes, and provide high quality services. Besides, they help teams, departments and organisations to archive, order and share information and documents for the purpose of increase in productivity and cost reduction. They accelerate the process of decision-making. They improve systemic acting with partners and suppliers and also consumers thanks to efficient information flow in real time. Products of this category offer the feeling of security and flexibility on demanding market. **HP and Apple** products allow for synchronisation of business infrastructure, application, services and processes in the whole network of values created for the target customer, and thereby they reduce costs, simplify the demand of management complexity in the area of IT, while significantly accelerating implementation of innovations enhancing competitive advantage (tab. 3).

Table 3. Strengths of systemic solutions in opinions of respondents / providers

Acceleration of entrepreneurship development	S1. Adjustment to rapid changes while improving quality and reducing costs at the same time S2. Increase in flexibility thanks to combination of solutions that are significant on the market of systemic offers – synergy S3. Growth of profitability of key areas of activity and possibility to use new market opportunities – market penetration S4. Acceleration of technological cycle thanks to standardisation of procedures of network entities S5. Optimisation of application of valuable resources of network enterprises
Cost reduction	S6. Integration and management of diversified IT environment S7. Access to solutions of sector leaders S8. Application of compatible components
Risk avoidance	S9. Faster access to data in integrated environment, and thereby immediate adaptation S10. Improvement of quality thanks to effective and systemic system administration S11. Improvement of operational effectiveness thanks to involved technologies and best practices
Marketing knowledge management	S12. Establishment of close relationships between business and its environment thanks to modernised applications S13. Acceleration of information flow thanks to integrated systems S14. Access to knowledge about, and from customers and cooperants

In opinions of **HP** managers and their network partners an offer that is a result of network relationships brings benefits in the form of creation of improved values for target customer, which constitutes the major reason for development of this type of relationships beside advantages of economic dimension. In **Microsoft** managers' opinions financial results are mainly the measure of effectiveness of network relationships. On the other hand, managers of **Intel** Company approach systemic character of activity as a necessary condition of competitiveness on contemporary market.

Table 4. Value analysis of factors

	I totally agree			I agree	I rather agree	I have no opinion	I rather disagree	I disagree	I totally disagree	Σ
	Σ 125	% of total variance	Cumulated percent variance							
S5	19	15,2	15,2	1	1	-	1	1	1	24
S7	17	13,6	28,8	2	1	-	2	1	1	24
S14	17	13,6	42,4	1	2	-	1	1	2	24
S13	16	12,8	55,2	2	2	-	1	1	2	24
S2	9	7,2	62,4	2	1	-	1	1	-	14
S1	8	6,4	68,8	5	-	-	-	-	-	13
S9	7	5,6	74,4	6	-	-	-	-	-	13
S11	7	5,6	80	5	1	-	-	-	-	13
S3	6	4,8	84,8	6	1	-	-	-	-	13

	I totally agree			I agree	I rather agree	I have no opinion	I rather disagree	I disagree	I totally disagree	Σ
	Σ 125	% of total variance	Cumulated percent variance							
S12	5	4	88,8	4	-	2	-	-	-	11
S8	4	3,2	92	2	1	1	1	-	-	9
S6	4	3,2	95,2	1	1	-	-	-	1	7
S10	4	3,2	98,4	-	3	1	1	-	-	7
S4	2	1,6	100	1	1	-	-	-	-	4

It results from the information in the table above that four factors explain in total around 55.2% variances of initial collection of 14 variables. Participants in the research notice the necessity to enter network relationships. The key reason is the benefit resulting from the effect of optimisation and synergy of human resources, their competences and knowledge, technology as well as financial resources and acceleration of information flow, particularly from the leader of the relationship. Transformations on target markets and favouring social and economic determinants are causal factors, however studied entities do not notice limitations in joining network relationships; they sometimes only indicate the risk of change, particularly in the process of leaving the network.

5. Conclusions

Without any doubts in knowledge economy systemic solutions favour adaptability of enterprises to new conditions, optimisation of labour and processes, as well as efficiency and effectiveness. This is proved by results of research concerning relevance of network structures in opinions of IT sector entities. Systemic nature of IT products may have sub-sectoral and / or intersectoral character which was observed on the example of network of enterprises diagnosed in earlier research stages [13], [14]. Multifaceted convergence, including technological and business one, as well as inter and subsectoral one, is a factor favouring progressing systemic character. On the other hand multicore IT products that satisfy a bundle of customer's needs are its result.

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