INFORMATION VALUE AND SUSTAINABLE DEVELOPMENT OF IT-OUTSOURCING

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Information is an often used word in every part of our lives. Information age has already developed a lot of innovations. Social networks are indications for the new way of living. New businesses, like cloud services, have been occurring.

The present paper contributes to the perspective of the information value as main factor of sustainable development. The current Technology driven Information and Communication Systems are extended by Business driven Information and Communication Systems. Levels of importance on outsourcing price and outsourcing sales process are taken into account as features of information value, for the order income. The information value is considered as factor of production for penetrating markets and as service innovation for new perspectives of the outsourcing branch.

Keywords: information value, outsourcing, sustainable production.

1. Introduction

The information factor is used in many situations in everyday´s life and different fields of research.

The term *information* is an object within Business & Information Systems Engineering, BISE, as the German field of research and Information Systems Research, ISR, as the Anglo - American [1, p. 2]. BISE considers information as a combination of business and informatics.

The use of information, in general, could be considered in two directions. On one hand, the information shall be an input factor of production to create value. On the other hand, information as good or service shall be the output of a value-added process.

During the last decade, the action to implement sustainable development measures is a key point of discussion [2].

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High-tech industries are characterized by a sustained rhythm of innovation, the need for innovation being dictated by the markets for such industries, which are very dynamic and competitive, demanding of continuously higher performance at the same or even reduced price [3].

The traditional enterprise software used by all size organizations might require significant computational resources. A cloud service has the main advantage of a fast resource scaling, based on demand. Modern cloud applications usually involve a web-based interface, are able to answer to requests very fast, in several hundred milliseconds, and the number of requests received from customers is also high, can be tens of thousands per second [4].

The value of information has not been very much discussed from the input perspective, and the consequences of the company´s success have not been measured so far. The information and communication technology market has increased for a long time, but the IT-Outsourcing branch in Germany and Central Europe is struggling. The big deals are distributed and new potentials are missing. Service providers compete on a high level. The prices are under pressure by strong competition. The number of providers has been reduced and new opportunities for additional business opportunities are necessary.

2. Objective and method of research

The information shall demonstrate its value as an innovative factor of production and services to contribute to new perspectives for the struggling IT-Outsourcing business.

Information shall be discussed as a value driver. It shall be assessed as an influencing factor for the success of the order income.

The causal analysis of information value shall assess the relation between information as an input factor of production and the success of companies. Information as good or service shall contribute to digital markets like IT-Outsourcing. Innovative services shall give the outsourcing branch new perspectives in high wage countries.

A *Group* of 19 – 24 *Sales Managers* from leading outsourcing providers, GSM, participated in a complex survey for the determination of important factors influencing the success of order income. The findings of the considered survey give concrete data about the relationships between information value and order income.

An evaluation of researchers about the potential of the outsourcing market is revealed.

The present paper shall assess the information value as a factor of production for penetrating markets and as service innovation for new perspectives of the outsourcing branch.

3. A model for the extension of the outsourcing value levels

The IT-Outsourcing branch is technically focused so far. Infrastructure as a Service, IaaS, Platform as a Service, PaaS, or Software as a Service, SaaS, are in scope. IT-Outsourcing supports the customer by an increase of efficiency and cost reduction from the view of Technology driven Information and Communication Systems, TICS. The scope of business as enabling factor is almost missing.

The technical focus of the TICS shall be extended to the business enabling the impact of outsourcing for the customer. Software, for instance, reflects the business support for the Application as a Service, AaaS. This includes the support of the daily use and skills for the success of the outsourcing customer.

The Cloud Services shall be extended to Business Processes as a Service, BPaaS. This focuses on the primary processes as value chain, on marketing and sales, inbound and outbound logistics, operations and after sales services [5, p. 140]. These services shall gain a business impact by outsourcing. The highest level of service-providing from the BISE shall be the Business Model as a Service, BMaaS. This extends to the current thinking a lot of understanding and is creating direct value for the company. Business Model Outsourcing is the digital service to enable different fields of the company.

So, the BISE-Model has been developed to enlarge the technological view in level 1-3 by the business view in level 4-6 (Fig. 1).

Business driven Information and Communication Systems "BICS"	6	Business Model as a Service "BMaaS"
	5	Business Process as a Service "BPaaS"
	4	Application as a Service "AaaS"
Technology driven Information and Communication Systems "TICS"	3	Software as a Service "SaaS"
	2	Platform as a Service "PaaS"
	1	Infrastructure as a Service "IaaS"

Fig. 1. Extension of technical levels of outsourcing by business levels

By extension of the technical levels with the business levels, new opportunities for the Information Outsourcing Branch are being opened.

4. Information value for penetrating markets

The term information has no broadly accepted definition [6, pp. 6-7]. The basis is the knowledge of a company. It covers the pool of all data that are stored within electronic pools or even the people´s mind.

Information could be defined as the use of raw material of knowledge for special purposes. This raw material is utilized within the daily business to fulfill the tasks of the company. Information is based on the raw data used for special purposes to gain value for the company. The information is used for decisions, to analyse customers buying habits or even to advertise the new product. The influence of information value as contribution to the success of outsourcing service proposals is to be analyzed.

Based on the value of information for the technical levels of outsourcing services, the analysis shall assess the importance of outsourcing price and the importance of outsourcing sales process, as features of information value, for the orders' income (Fig. 2).

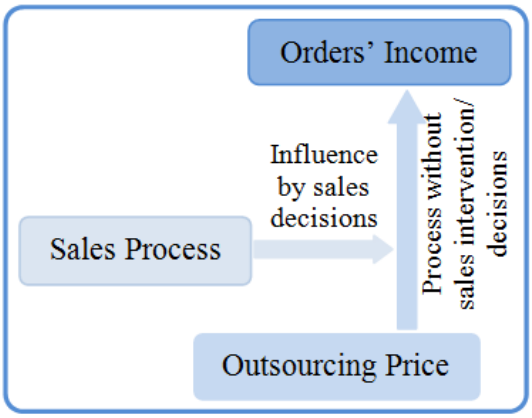


Fig. 2. Information value attributes influencing the orders' income

Importance of outsourcing price and sales process for order income

Let be IP, IS, AIP and AIS the assessment factors as follows: IP - *Importance* of Outsourcing *Price* for the Order Income; IS - *Importance* of Outsourcing *Sales* Process for the Order Income; AIP - Number of *Assessments* by Sales Managers revealing *IP*; AIS – Number of *Assessments* by Sales Managers revealing *IS*.

The main relationships of interest are:

$$IP = \Gamma_1(AIP) \tag{1}$$

$$IS = \Gamma_2(AIS) \tag{2}$$

where Γ_1 and Γ_2 represent the specific dependence relations.

Within the considered analysis, the quantitative data expressed by members of GSM, and the correspondent relevant graphic relations are presented in Fig. 3.

This shows that 100% assessments reveal the *Importance* of Outsourcing *Price* for the Order Income as being up to 70%, and the *Importance* of Outsourcing *Sales* Process for the Order Income - up to 40%. The considered results settle the dominating importance of the price vs. sales process on the success of the order income.

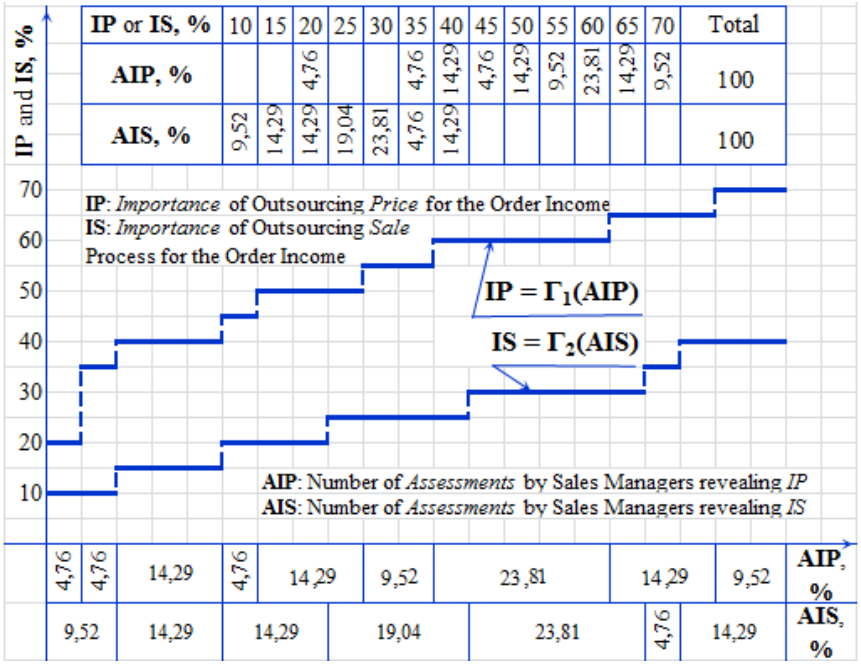


Fig. 3. IP as function of AIP, and IS as function of AIS

Importance of full availability and accessibility of information on outsourcing price for order income

Let be OII, IIP and AIIP the assessment factors as follows: OII - Order Income' Increase; IIP - *Importance* of Full *Information* on Outsourcing *Price* for Order Income' Increase; AIIP - Number of *Assessments* by Sales Managers revealing *IIP*.

The main relationship of interest is:

$$OII = \Gamma_3(AIIP) \tag{3}$$

where Γ_3 represents the specific dependence relation.

Within the considered analysis, the quantitative data expressed by members of GSM, and the correspondent relevant graphic relation are presented in Fig. 4.

As the analysis result, more than 85% of assessments reveal the *Importance* of Full *Information* on Outsourcing *Price* for the Order Income' Increase (IIP), as being at least 10% and by over 25%.

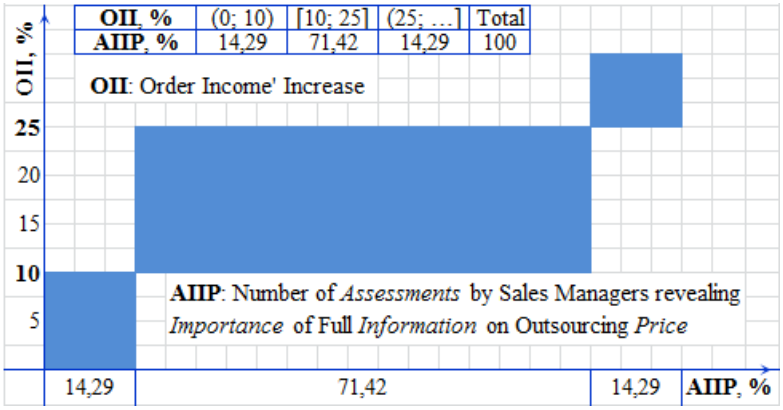


Fig. 4. OII as function of AIIP

At the beginning of the survey, the overall order income of the GSM members has been of 971 M €. If the full availability and accessibility of price information is able to increase the order income by at least 10%, this means an amount of over 97,1 M €.

The price shall be the dominating part, and the information about the price, as the basis, shall be the dominating instrument for significant increase value of the order income.

Importance of full availability and accessibility of information on outsourcing price and sales process for order income

Let be OII, IIP-nCS, IIPCS, AIIP-nCS and AIIP-CS the assessment factors as follows: OII - Order Income' Increase; IIP-nCS - *Importance* of Full *Information* on Outsourcing *Price* with *no* Full *Competence* of Outsourcing *Sales* Process for Order Income' Increase; IIP-CS - *Importance* of Full *Information* on Outsourcing *Price* with Full *Competence* of Outsourcing *Sales* Process for Order Income' Increase; AIIP-nCS - Number of *Assessments* by Sales Managers revealing *IIP-nCS*; AIIP-CS: Number of *Assessments* by Sales Managers revealing *IIP-CS*.

The main relationships of interest are:

$$OII = \Gamma_4(AIIP\text{-}nCS) \tag{4}$$

$$OII = \Gamma_5(AIIP\text{-}CS) \tag{5}$$

where Γ_4 and Γ_5 represent the specific dependence relations.

Within the considered analysis, the quantitative data expressed by members of GSM, and the correspondent relevant graphic relations are presented in Figs. 5a and 5b.

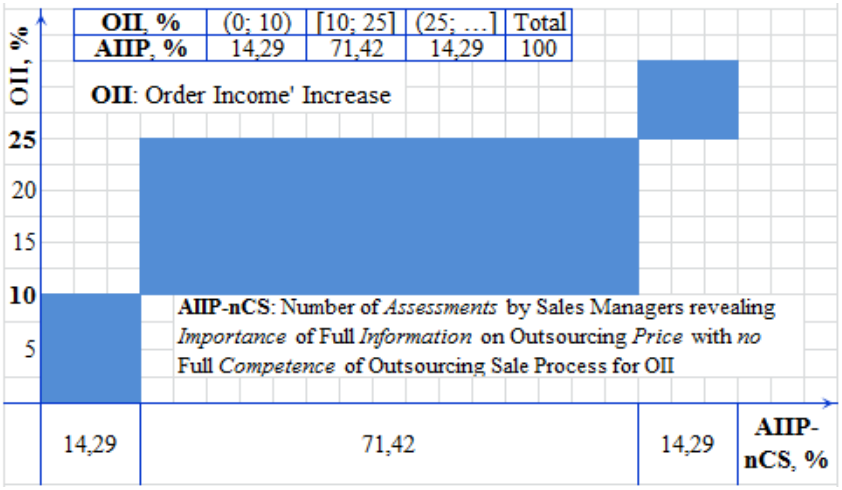


Fig. 5a. OII as function of AIIP-nCS

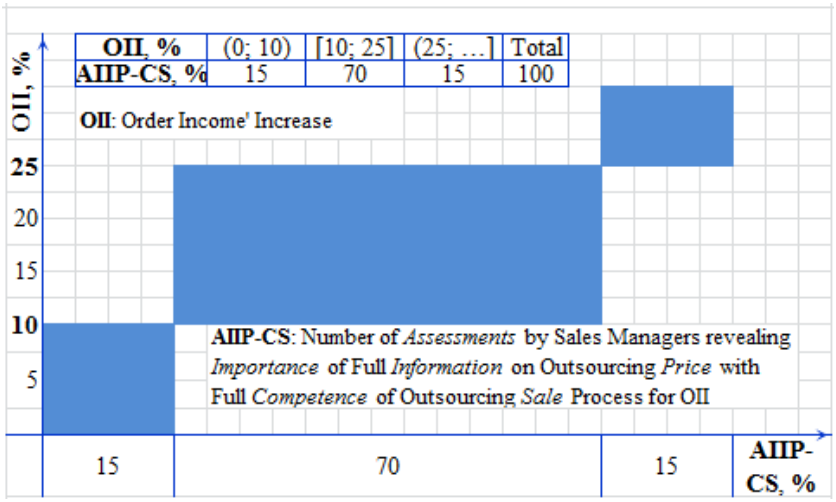


Fig. 5b. OII as function of AIIP-CS

As the analysis result, more than 85% of assessments reveal that, for the Order Income' Increase (OII), the *Importance* of Outsourcing *Price* (IP) is almost the same for both alternatives, i.e., without or with Full *Competence* of Outsourcing *Sales* Process, as being at least 10% and by over 25%.

Therefore, the availability of the full required sales competence to support the full availability of price information does not affect significantly the order income. There could be different causes for this: sales shall have no additional potential, because the sales performance is already very high; the importance of the price dominates all other factors and only price information shall have a competitive advantage for outsourcing providers.

5. Information value of developing innovative markets

The value of information as good shall be assessed as innovation for the progress of the IT-Outsourcing branch by business focus on SaaS, AaaS, BPaaS and BMaaS of the BISE-Model (Fig. 6). The answer shall be given about the potential for the turnaround of high-wage countries.

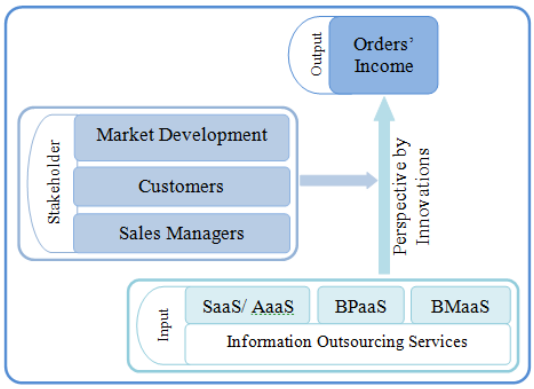
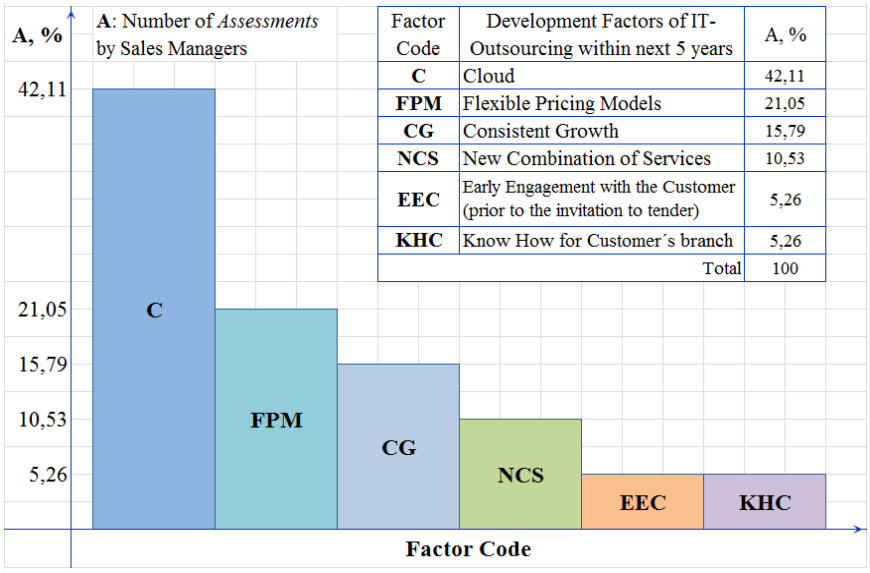


Fig. 6. Value of information services for IT-Outsourcing providers



Factor Code	Development Factors of IT-Outsourcing within next 5 years	A, %
C	Cloud	42,11
FPM	Flexible Pricing Models	21,05
CG	Consistent Growth	15,79
NCS	New Combination of Services	10,53
EEC	Early Engagement with the Customer (prior to the invitation to tender)	5,26
KHC	Know How for Customer´s branch	5,26
	Total	100

Fig. 7. Perspective of IT-Outsourcing services

The innovative information outsourcing services shall be analyzed: SaaS and AaaS - as the small extension of the current view; the progressive focus on the business impact by BPaaS and BMaaS. The view of IT - providers is not limited to the role of alignment. The business value of outsourcing shall be assessed as enabling factor.

The sales managers were asked by an open question about the development of IT-Outsourcing services within the next five years. Within the considered analysis, the quantitative data expressed by members of GSM, and the correspondent relevant graphic relation are presented in Fig. 7.

More than 42% of the answers were focusing on cloud as the potential of the future. Cloud services have already extended the current business by high flexibility of access and determination of services, the prices are transparent and the resources shall be individually booked by the customer. The opportunity for the IT-Outsourcing shall be driven by cloud in a short term, because the transparency shall give the customer the ability to compare the services and prices and the transparency shall reduce the prices from the high and global competition.

Case studies

Customer Relationship Management, CRM, is a very much discussed field of research, representing high expectations of the current market situation for the value of the company. Software and related business processes shall have a potential for outsourcing providers.

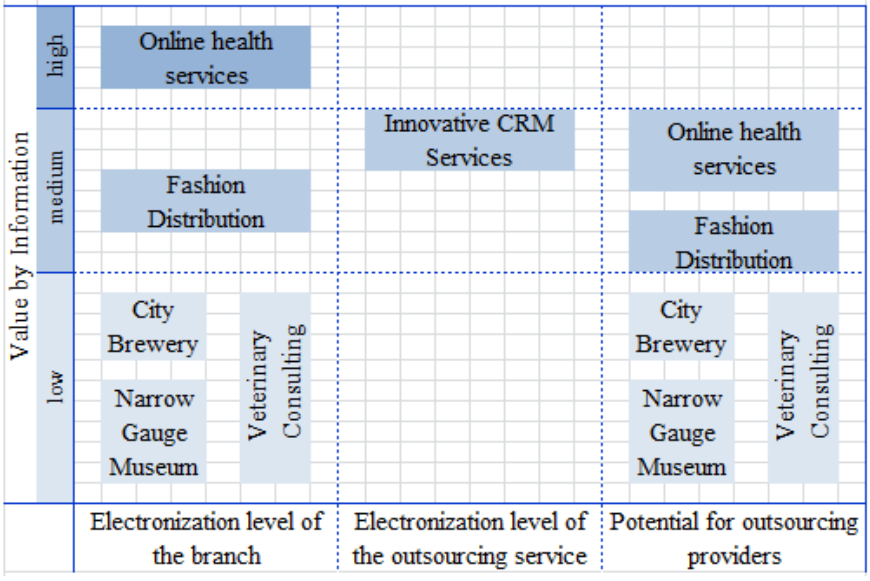


Fig. 8. Assessment of the outsourcing value by electronic CRM services

The innovative CRM-concept "Type-based Customer Management", TbCM, strictly focuses on the requirements of the customers as individuals [7, p. 106]. So far, the concept was developed and transformed into a current CRM software. The innovative concept TbCM shall be supported by a standardized software. Not all functions are digital to enable the customer´s business. Because of this, the level of digitalization is assessed as medium potential for the outsourcing providers (Fig. 8).

The potential of the innovative CRM concept TbCM shall be assessed for the value of different branches [8, p. 194]. Five branches - A, B, …, E - have been assessed by the level of digitization with low, medium or high level of value for the IT-Outsourcing providers, by case (Fig. 8). (A) Online Health Services, as a BMaaS supporting health activities for burnout prevention [9, p. IV], is 100% digital, supported by personal contact. (B) Fashion Distribution acts through local sites (offline, mostly) and online sales distribution channels. (C) Museum for historic trains, exposing items that were used in coal mines or other tasks to transport natural resources, only supported by the homepage [10]. (D) Local City Brewery, fully owned by the people of a city, is supported by particular digital activities. (E) Veterinary Consulting, as a business model to improve business tasks like strategy development, cost savings, marketing campaign and customer relation management [11, p. 18], presents a low level of the necessary personal contact.The level of electronization of the customer´s business shall be the basis for the potential of outsourcing services. Low level does not give the outsourcing provider significant potential for new services. Providers require a high level of electronization to enable the customer´s business by a huge impact of innovative services.

6. Perspectives by evaluation of researchers

All cloud levels of the BISE model were analyzed to give answers about the potential for the future of the outsourcing market (Fig. 9).

Artemis Industry Association is a private research company, that presents the interests of research and technology to public authorities. Cloud computing is assessed as a key trend for the Megatrend flexibility [12, p. 26]. It provides cloud services as technological challenge [12, p. 56]. Cloud, in general, is entitled as opportunity [12, p. 14]. Investments in software innovation are recommended to participate in the developments within Europe [12, p. 73].

The Federal Association of German Industry, BDI, predicts perspectives for the branch, based on a progress of the cloud services. Cloud follows the concept of outsourcing. Software is increasingly transforming from a technical focus to flexible service orientation [13, p. 24]. The new world of digital services shall be connected to the physical business [13, p. 57].

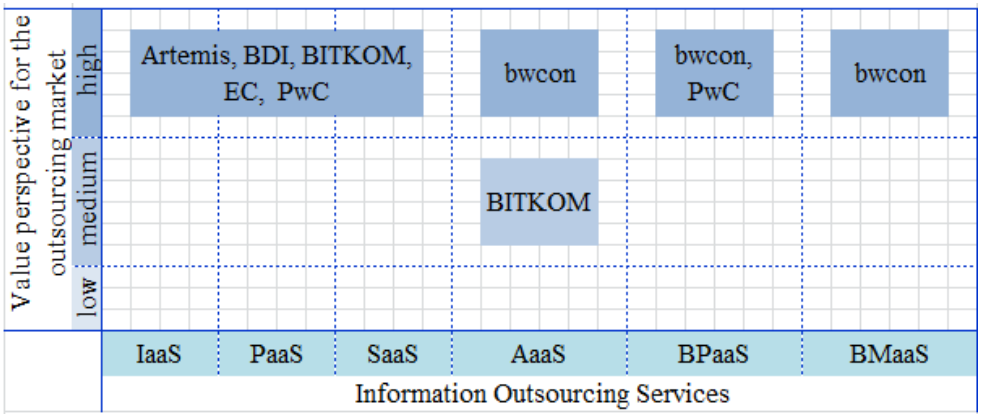


Fig. 9. Potential of the outsourcing market

The German Association for the Information Economy, BITKOM, publishes market research results for the future of the branch. It predicts a strong increase in the technical infrastructures of data centers [14, p. 31]. The competitiveness of the German IT-branch shall be improved by the development of service solutions [14, p. 9]. So far, Germany loses competitiveness [14, p. 6]. Service orientation, e.g. software services of the data centers, shall be a key factor for the success.

The European Commission, EC, shall develop Europe in the ”Digital Age” [15, p. 4]. Cloud computing shall provide new applications and services [15, p. 24]. Huge opportunities come from SaaS, network infrastructure and data centres [15, p. 102]. Digital technology is the basis for the strategy [15, p. 7]. Europe is not able to compete with Microsoft, Amazon or Google. It shall focus on integration, federation and interoperability [16, p. 66]. Europe shall participate in new and scalable services [16, p. 71].

PricewaterhouseCoopers, PwC, is a global research and consulting company that focusses on the development of companies: the potential of cloud within value added processes increases [17, p. 5]; IaaS, PaaS and SaaS have huge importance [17, p. 22]; the importance of BPaaS increases on lower level [17, p. 22].

Baden württemberg connected, bwcon, is an association for technology and innovation of the South-West region as a strong economy in Germany. It assesses that Germany is not participating on the digital developments [18, p. 3]. New business models are developing potential for outsourcing [18, p. 32]. Cloud solutions enable these business models, e.g. mobility services [18, p. 44].

The research companies assess the technically oriented cloud services (TICS), as the highest potential. This is the consensus. BITKOM, PwC and bwcon are focusing on the business view as the future development.

In the long term, outsourcers shall have huge potential with cloud services business driven services. This shall change the outsourcing business from the strong focus on Information Technology to the business impact of information within digital services, like cloud.

7. Perspective of the outsourcing business

Based on the results of the penetrating market and developing market, the overall perspective of the IT-Outsourcing business shall be derived (Fig. 10).

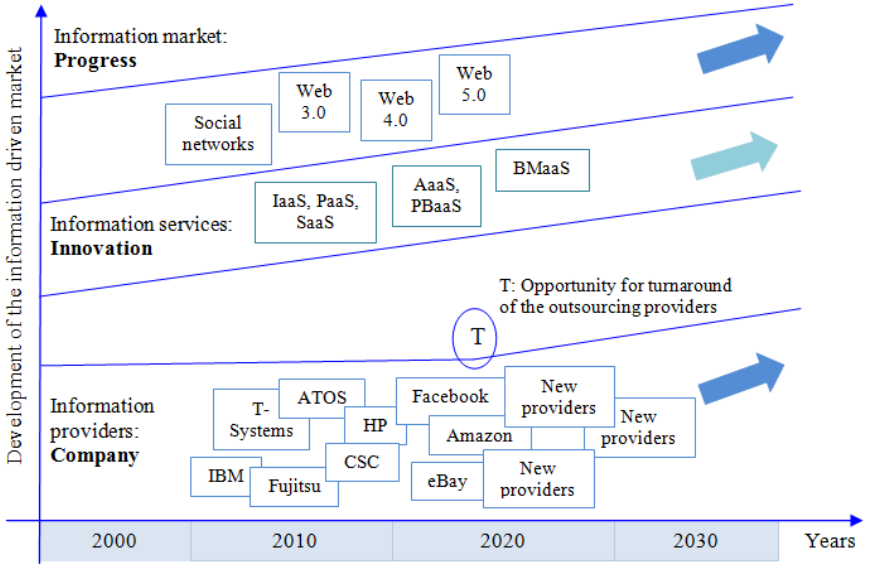


Fig. 10. Potential of innovative information services for IT-Outsourcing providers

The web-technologies will transform current services to the internet, develop current innovations, like eBay or Amazon, and create new business models like digital businesses. The web 5.0 shall support the digital inhabitants by nearly all services. This shall be the perspective of the Outsourcing Information Business as the next step from the Information Technology Outsourcing.

8. Conclusions

The term information was defined and differentiated from other factors of production. Information could be defined as the use of raw material of knowledge for special purposes.

The value of information depends on the impact of decisions on the proposed price from outsourcing providers for customers. The importance of information and the availability are the basis to assess the value of information.

The current view on Technology driven Information and Communication Systems (TICS) is extended by Business Information and Communication Systems (BICS). The extension is focusing on Application as a Service (AaaS), Business Process as a Service (BPaaS), and Business Model as a Service (BMaaS), based on the cloud concept.

Providers contribute to the value of the customer by enabling the business in a direct way. The business driven services cause direct value for the customer and shall cause new opportunities for the IT-Outsourcing branch. The current IT-Outsourcing Business is struggling. Information as a factor of production shall contribute to improve the order income of the providers. Sales managers assess that the full availability and accessibility of information shall increase the order income by at least 10%.

Price shall be the dominating part, and the information about the price, as the basis, shall be the dominating instrument for significant increase in value of the order income.

Sales managers assess the high potential of cloud that gives the opportunity to easier access, more transparency and higher flexibility. This seems to be a change of paradigm that starts with the technological oriented outsourcing services. The development of cloud services shall be a basis for the development of outsourcing services.

The problem of information as a factor of value requires a complex, continuous and profound research and development activity, for the development of the indicators and the confirmation of findings.

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