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PERSPECTIVES OF BUSINESS AND ENTREPRENEURSHIP DEVELOPMENT

Development of E-recruitment as E-business Model Based on Business Model Ontology

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Abstract

Purpose of the article Modern e-commerce businesses are developing rapidly as new modern enterprises, e-business management performance is an important topic across contemporary management and modern information technology. This paper creates e-recruitment evaluation system framework based on Business Model Ontology. More objective evaluation recommendations on e-recruitment evaluation that provide useful implication of e-business models for e-recruitment development are presented. E-recruitment evaluation development could be expanded through knowledge creation process in the context of Business Model Ontology.

Methodology/methods Exploratory research, synthesis and categorizing.

Scientific aim Create new e-recruitment evaluation categories through knowledge creation process in the context of Business Model Ontology.

Findings More objective evaluation recommendations on e-recruitment evaluation that provide useful implication of e-business models for e-recruitment development. Authors see e-recruitment business model advantages in e-recruitment methods, transferring knowledge for job seeker through automated processes creating the ability to accomplish these processes in a shorter time. These advantages are the main technical feature of the e-recruitment business. Particularly it is interaction with job seeker in e-environment, thus reducing cost associated with e-recruitment evaluation.

Conclusions E-recruitment business model should be based on indicators providing effective information content required to affect job seekers' positive decision. Advantages offering high quality information interaction for e-recruitment business should be developed. To contribute to this process, authors present indicators to evaluate important issues associated with information interaction in order to develop effective e-recruitment business model. E-recruitment focus only on outcomes such as job acceptance decisions or application attractiveness should be carefully evaluated. Thus e-recruitment's effect on initial job-seeker interest is limited, decreasing the potential possibility to attract a job-seeker and receive positive feedback. Information interaction playing a certain role for a job seeker's attitude and job acceptance decisions, but the motivation enhancing possibilities are likely to be less effective than traditional ones.

Keywords: e-recruitment, e-business, Business Model Ontology, value creation, information and communication technology, ICT

JEL Classification: G14, L21, M1, M10, M21

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Introduction

Under conditions of globalisation the boundaries of labour market continue to expand generating new opportunities and challenges. Workforce became more geographically mobile searching for well-paid job and better life circumstances. The increasing migration of workforce creates a surplus of available labour in developed countries, and the shortages of labour in less prosperous countries. Also, organisations look for developmental possibilities expanding their market. These organisations' activities include the expansion or relocation of business abroad, the utilisation of cost efficient forms of labour (e.g. flexible types of employment) etc. In majority of cases, organisations encounter the matter of personnel recruitment. As Deloitte's survey "Global Human Capital Trends 2015" demonstrates, the organisations' need for talent and contingent workers will continue to grow (Deloitte, 2015), thereby recruitment process must be extensive and high-calibrated simultaneously. The Boston Consulting Group's survey "Creating people advantage 2014-2015" reveals that the future importance, urgency and invested effort of recruiting processes and strategy are higher in high performance organisations than in low performance organisations (Boston Consulting Group, WFPMA, 2014).

The rapid electronic environment development over the last decade has fostered the e-recruitment growth and has provided companies with opportunities that they previously did not have. By employing advantages offered by the e-recruitment, entrepreneurs can ensure expedient and effective communication with the target audience, by promoting their services on the global market. The performed scientific studies show that proper and skilful use of modern technologies can contribute to significant development of companies. Up to now, no unequivocal studies have been performed about the use of the electronic environment in ensuring development of micro, small, and medium enterprises. Ph. Kotler, D. Tapscott, P. Drucker, and J. A. Pearce (Sculovs, 2013) maintain that two parallel markets exist and are developing – the traditional and the electronic environment. The electronic environment is used for various needs – for trade, marketing, advertisement, studies, communication, training, etc. Simultaneously, there is an opinion claiming that in future, the majority of businesses will be performed on the electronic market, hence advancing the dominant position of the e-environment in achieving entrepreneurship competitiveness. In recent years, companies' intellectual capital (IC) has gained increased attention due to globalisation and integration of capital markets, greater mobility of monetary and actual goods, tougher competition, new dominating industries, and developments in information and communication technology (ICT).

Scientists (e.g. Beattie and Pratt, 2001; Eustace, 2000; Lev, 2000; Upton, 2001) have argued that demand for information (external communication) on knowledge-based resources is growing as companies increasingly base their competitive strength in the value of know-how, patents, skilled employees and other intangibles. The electronic environment already now offers companies practically all the necessary marketing and communication tools for ensuring company development by creating competitive advantages, nevertheless, not all companies can employ the opportunities rendered by the e-environment, in order to increase company competitiveness and productivity. These trends promotes e-recruitment as a new form of business that has changed conventional recruiting to a more efficient "continuous mode" (Lee, 2005) and has reduced hiring costs compared to traditional recruiting through newspapers and magazines (Gill, 2001). Competitive advantages provided by e-recruitment methods and value creation process principles should be better explained in order to create effective business model. Recent findings stated that more than 20% of job seekers have rejected job opportunities simply based on poorly designed websites (Pastore, 2000) and that company-designed websites are so complicated that about three-quarters of all job seekers are unable to use them successfully (Brown, 2004). Conventional management studies of employee e-recruitment methods have failed to provide managers with a theory-based understanding of how e-recruitment contribute to recruiting success (Allen, Van Scotter and Otundo, 2004; Breugh and Starke, 2000) or explain "not only what happens, but why it happens" (Barber, 1998).

Considering challenges coming from using e-recruitment methods, this article develops an e-recruitment evaluation system framework based on Business Model Ontology (BMO). New model is created to identify crucial e-recruitment factors. This model is based on statement that conventional evaluation system is not suitable for the recruiting process and should be developed. From this perspective, the model presents e-recruitment as an e-business and evaluates in BMO context. The model is aimed to create sustainable e-business by identifying value creation process and significant factors.

1 E - recruiting as a business

In general, e-recruitment (or online recruitment, internet recruitment, web-based recruitment) is the process of human resource (HR) recruitment exploiting electronic resources. The majority of the definitions of e-recruitment are derived from view of human resource management theory and practice, so focused to e-recruitment as instrument or process by which organisation's needs for workforce is ensured. For example, Armstrong defines e-recruitment as the use of the internet to advertise or 'post' vacancies, provide information about jobs and the organization and enable e-mail communication to take place between employers and candidates; the latter can apply for jobs online and can e-mail application forms and their CVs to employers or agencies (Armstrong, 2009). Some HR specialists interpret e-recruitment not only as the using internet for hiring, but also emphasize the application of HR software (HRZone, 2015). The academic works examining e-recruitment are increasing, but many studies analyse this subject from human resource management, psychological or information and communication technology perspectives. Searching relevant articles in database Scopus,

applying keywords “e-recruitment”, or “e-recruiting”, “online recruitment”, “internet recruitment”, and “business” and “model” for document’s title, abstract or keywords, only fifteen results were obtained. Approximately half of this search results could be referred to the theme of e-business.

The typical forms of e-recruitment are corporate websites, commercial job boards and recruitment agencies’ sites (Armstrong, 2009). The last two represent e-business. According to usual sequences of staffing process, commercial job board is relatively narrow form of e-business, where main source of revenue is advertisement of vacancies. In contrast, recruitment agencies offer much more services and its completions – from investigation of pool of potential candidates to support for hired employee. The vacancies market handled by job boards and recruitment agencies is divided by location, economy sector, job types and level (Barber, 2006).

There are different types of recruitment agencies that provide external recruiting services for organisations including retained search, contingency search, full-scale recruitment process outsourcing (RPO), on-demand RPO, and staff augmentation/placing consultants (Greenberg, 2013). Retained search agencies, or executive search firms, provide search services for senior, executive, or other highly compensated positions. Retained search agencies work exclusively with clients, require an upfront retainer, and typically charge 30 to 35 percent of the salary of the position. Payments are made according to milestones in the recruitment process, so at least some fees will be paid regardless of whether a hire is actually made. Contingency search agencies search for candidates for their clients and get paid when a candidate they present is hired. Their search fees are typically 20 percent of the candidate salary when hired. Full-scale RPO agencies acts as a company’s internal recruitment function for a portion or all of its jobs. RPO is utilized when a company experiences high volume staffing needs that internal HR can’t cost-effectively handle along with their core responsibilities, or when there is no HR function in the company. On-demand RPO agencies provides recruiting, sourcing, and coordination on an as-requested basis rather than with long-term contracts. The agencies can also provide companies with own consultants for project or high-demand business objective.

To provide effective and efficient services, all types of recruitment agencies have to use e-recruitment advantages, which are associated with wider access, faster processes, reduced costs, corporate image promotion and reinforcement (Barber, 2006). As Kelly Outsourcing and Consulting Group’s survey “Global Trends in RPO and Talent Recruitment 2014” demonstrates, organisations are very interested in recruitment service outsourcing (Berklich, 2014), so there are favourable conditions to develop commercial side of e-recruitment.

2 E - recruiting as value creation process

The most important aspect of value creation process is e-recruitment revenue streams that the source for business model. (e.g., advantages over other products, website design, attitude-relevant information, user friendly interface and etc.). In practice, these main advantages in e-recruitment environment are promoting intensive knowledge (information) interactions between employers and applicants (i.e., its interactive characteristics), and the degree to which it provides necessary information. The goal of e-recruitment business is to influence job seeker attitudes toward job application and that the ability to accomplish this goal is affected by ability to manage key indicators. Management decisions should promote these key indicators that affecting job seeker decisions.

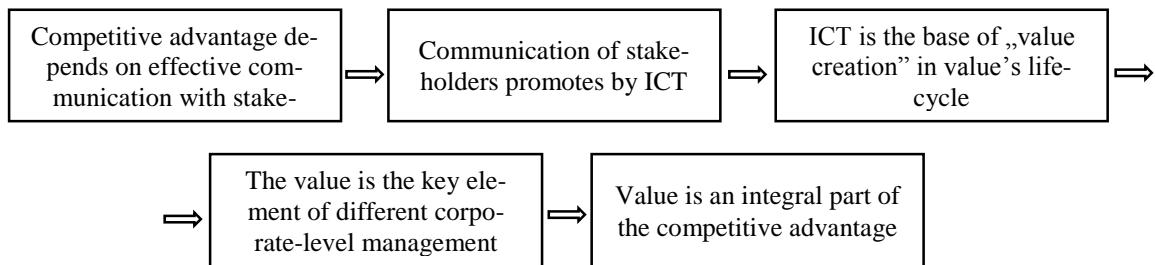
Various theories were developed many years ago, when the electronic market was not yet developed, and hence are suitable for the conventional market. Due to this reason, the authors of the article suggest that companies use the Alexander Osterwalder’s value proposition concept or the approach that is a constituent element of the author’s developed business model canvas. (Osterwalder, 2003, see Figure 2). The Osterwalder’s business model was formed based on Freeman’s stakeholder theory (Freeman, 1984). The model is adapted to today’s market needs and conditions, and the importance of the electronic environment, i.e. of the electronic market, in entrepreneurship is taken into account. Osterwalder distinguishes between “value proposition” and “elementary value proposition”, which is an element of value proposition. The authors wish to draw attention to Osterwalder’s “value life cycle” consisting of five stages: value creation, appropriation, consumption, renewal, and transfer (Osterwalder, 2003).

All life cycle stages are linked to value consumption, using the electronic environment: value creation process (based on ICT) – adaptation of various products for the needs of an individual consumer. Value appropriation – “a one click purchase” at an internet shop. Value consumption – listening to music, watching a movie and etc. Value renewal – various software updates, value transfer – disposal of old computers and other machinery, giving away unnecessary books and equipment for further use, etc.

Upon combining analysed models, it can be seen that the information and communication technologies (in the Osterwalder’s model) or the information communication technology bear great importance in creating value for consumers and that they undoubtedly affect the company’s image. The value concept is broadly used in various business models, including e-business models. The value forms the basis of several business models. The e-business model is based on mutual integration of key flows and values and implementation thereof between e-market participants, through the use of the e-environment. Three main e-business model elements can be distinguished: flows, participants, value. The term e-business model describes a broad spectrum of informal and formal models, which may be used in companies to depict various

business aspects, such as operational processes, organisational structures, and financial forecasts (Laudon and Traver, 2010).

The conceptual business models enable companies to analyse the current condition more broadly and to evaluate the already existing business. By employing this analysis, companies can develop new business development directions or improve the existing ones, because a modern market demands that companies change and are aware of their global condition. Entering the global market allows companies to reduce their dependency on local market fluctuations. The use of ICT promotes communication (Figure 1); moreover, ICT is at the basis of the first stage “value creation” of the value life cycle.



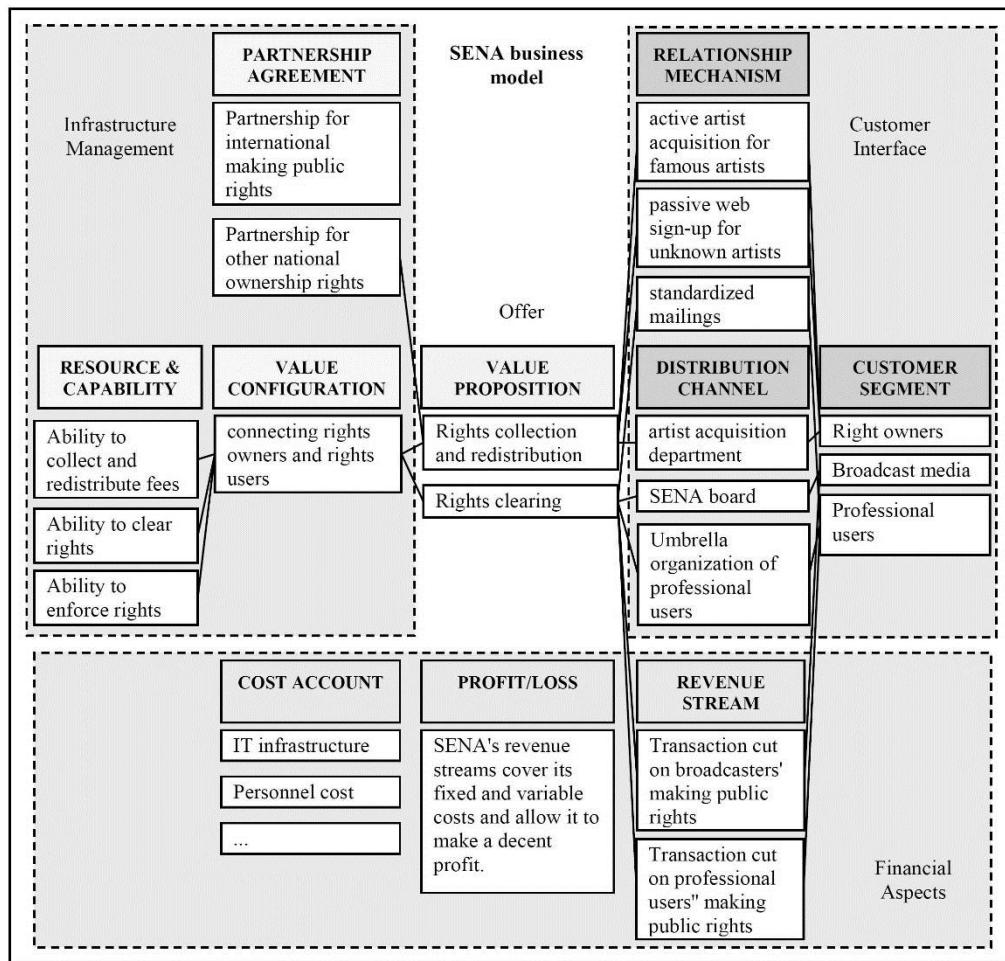
Source: Shatrevich and Sceulovs, 2014

Figure 1 Competitive advantage, ICT and value intermediation

Based on the authors' performed study about the use of e-environment in e-business companies (Sceulovs and Gaile-Sarkane, 2010), having studied value formation theories, having analysed the types and theories of business models, the authors have drawn a conclusion that the most suitable course of action would be to base further development on the Osterwalder's Business Model Canvas (Business Model Foundry, 2014). Forbes has referred to this business model canvas as a simple instrument for creating innovative business models (Sceulovs, 2013). The model is based on active use of the e-environment in entrepreneurship. There are nine stakeholder groups at the basis of the model. Meanwhile, reciprocal and effective interaction and communication between the stakeholders promotes a company's competitiveness (Osterwalder, 2009).

At the same time, value is an intrinsic part of a competitive advantage. It can be concluded that a competitive advantage depends on effective communication with stakeholders and customers. The previous study done by the authors about competitiveness of companies' shows that it is the use of communications networks, being a constituent element of competitiveness of companies, that the companies are using the least (Sceulovs, 2013). Thus, the authors of the paper assume that by increasing e-environment element as part of IC system, the competitiveness companies will also increase.

For the practical use of the quantitative evaluation model in e-business authors of the paper develop BMO (Osterwalder, 2003). The BMO's roots are found in management science and information systems research. Its four basic areas of preoccupation of a business model, the value proposition, the customer interface, the infrastructure management and the financial aspects stem from management literature (Hagel III and Singer, 2000; Kaplan and Norton, 1992; Markides, 1999). The proposed business model elements providing practical contribution for business users. Its scientific roots originate in so-called design science (Owen, 1997) and its recent upsurge in Information Systems research (Au, 2001; Ball, 2001; Hevner *et al.*, 2004; March and Smith, 1995).



Source: Gordijn, Osterwalder and Pigneur, 2005

Figure 2 SENA business model

Authors of the paper see business model as a conceptual tool that contains a set of elements and their relationships that allows expressing the business logic of a company. It is a description of the what, the who, the how and the how much in a company (Hagel III and Singer 2000; Kaplan and Norton 1992; Markides 1999). In other words it describes the value a company offers (what?) to one or several segments of customers (who?) and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital (how?), in order to generate profitable and sustainable revenue streams (how much?). This business model has a good visualization, allowing understanding value creation logic.

In human resource management sources, many indicators for recruitment evaluation can be found which allow to measure some quantitative and qualitative aspects of this process (Table 1).

Table 1 Examples of traditional indicators for recruitment

| Quantitative indicators | Qualitative indicators |
|---|---|
| Number of applicants attracted per method | Ratio of qualified to unqualified applicants attracted |
| Number of candidates interviewed | Job performance of employee attracted by method |
| Costs per applicant attracted | Tenure of employee attracted by method |
| Total recruiting cost per employee hired | Proportion of those interviewed who receive invitations to visit |
| Time from start to hiring of applicant | Organisation's or Applicants' satisfaction with recruitment process |

Source: based on Phillips, 1996

Obviously, the traditional indicators for recruitment are not sufficient to evaluate e-recruitment as business. Using discussed above approach authors propose an additional set of indicators to evaluate e-recruitment (Table 2).

Table 2 Non-financial indicators for e-recruitment company's development determination

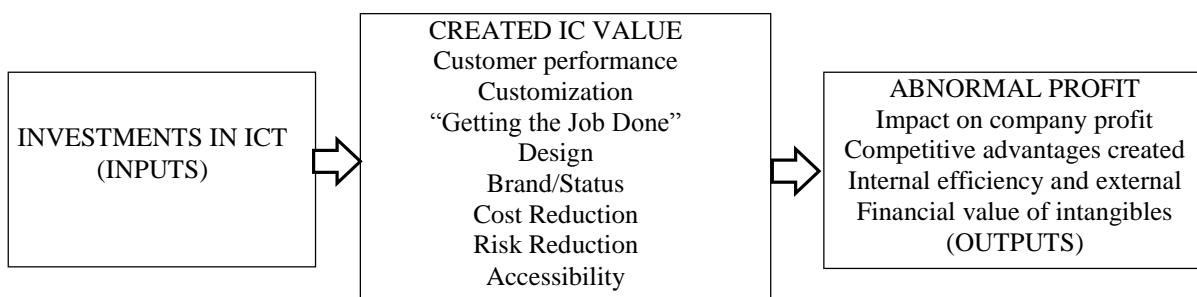
| Indicator name | Explanation |
|--|--|
| Market share by purchased units | Market share by purchased units (%) = (Purchased units (%)) / (Total units of Purchased units (%)) |
| Market share by revenue | Market share by revenue (%) = (Revenue from sales) / (Total revenue from market sales) x 100% |
| Relative market share | Relative market share (%) = (Brand market share) / (Biggest competitors market share) x 100% |
| Market concentration | Shows which a relatively small number of companies account for a large market share. |
| Brand development index | Brand development index = ((Brand sales for a group)/(Household in a group)) / ((Total brand sales)/(Total household)) |
| Penetration (market or brand) | Market penetration (%) = (Customers who bought product) / (Total population) x 100% |
| Penetration share | Penetration share (%) = (Brand penetration) / (Market penetration) x 100% |
| The total number of active consumers | Percentage of consumers who at least once certain periods of time have bought a brand or product. |
| Awareness | Awareness scale with point grading system. |
| Desire to search | Percentage of the number of consumers who want to postpone purchase, changes stores or reduce purchases volume, focuses on other brands |
| Trial rate | Trial rate (%) = (Applied first time in period t) / (Total population (number of customers)) x 100% |
| Penetration t | Penetration = (Penetration t x Replicates rate (%)) x first purchased in period t |
| Sales forecast | Sales forecast = Penetration x The average purchase frequency x Average number of sold units |
| Repeated purchases | Number of repeated number of buyers = Trial number x Repetitions rate (%) |
| Trial volume | Trial volume = Trial number x Number of appliances |
| Repeated purchases volume | Repeated appliances volume = Repeated buyers number x Number of appliances made by one customer x Repeat times |
| Numerical distribution | Numerical distribution (%) = (Number of brand banners) / (Total number of banners) x 100% |
| All products distribution | All products distribution (%) = (Total sales volume of all brand's sales places) / (Total sales volume of sales places (banners)) x 100% |
| Distribution of particular type of product (PTP) | Distribution of PTP (%) = (Total PTP brand's sales places sales volume) / (Total sales volume of sales places (banners)) x 100% |
| Premium price | Premium price (%) = (Revenue market share) / (Product market share) x 100% |
| Impressions, Opportunities-to-See, Exposures | Impressions = Network Reach x Frequency Network Reach – the percentage of reach of the certain audience through the media; Frequency – certain ad or others activity views number, which done by one user. |
| Clickthrough Rate | Clickthrough rate = Clicks / Effect |
| Visits indicators | Visits, Sessions – a particular company's website first-time attendance of users. Visitors, Unique Visitors – the number of users who visit a particular website of the company for a given period. Clickstream – the way, how user find website. Abandonment Rate – the percentage of abandoned number of websites. Cookie – the small visitor's file, which recorded by website and helps identify user next on visiting time. |
| Website traffic statistics dynamics | How many internet users visited a given site during a given period. |
| Web site visit duration | Average time which users spent on the site. |
| Site visitors characterization | Behaviour: new and repeated visitors, frequency etc. Demographic data: language, location, gender, etc. |
| Technologies | Technologies used in site attendance: device, from which the attendance made; browser and operating system, with which help made attendance; provider used for site visiting; visitors flow (what content were visited on the site); in what way was visited site - directly or via link and/or divert from other sites. |

Source: based on Sceulovs, 2013

Business Model focuses on the design of a company's value creation model, visualization of value creation in BMO is highly relevant, and such visualisations are used to explain a model to stakeholders. Additionally, it proposes specific diagrams, for instance for distribution channel strategies or activity configurations.

3 Knowledge as successful e-recruitment element

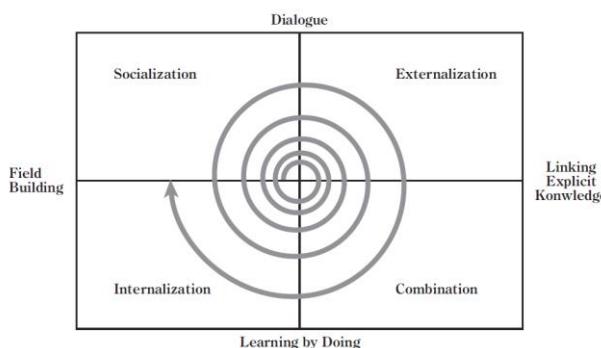
In the context of knowledge, since knowledge itself is invisible, its creation and use are hardly measurable. Nonetheless investing in ICT many valuable outputs are generated (brand, know-how, patents etc.). Value generated by knowledge will probably have time lag (long-term) and not always have instant impact on profit (short-term). Using this model authors can describe the methodology of evaluation model (Figure 3). Promoting investments to ICT and specifically to e-environment, it is possible to evaluate company value. Comparing the investment made by company to ICT and abnormal revenue flow generated by ICT will reveal the intangible value created. Reliance on productive tangible assets such as raw materials and fixed capital no longer account for investments made and wealth created by new and prospering companies. As the primary input to organizations 'value creation processes is internal resources, classic economic laws are hardly applicable for knowledge and other intangible resources. These resources traditionally seen as external could make an important contribution to the value creation process of the company.



Source: based on Pullic, 2000

Figure 3 Model of ICT, e-recruitment and value creation process

There are two types of knowledge: explicit knowledge and tacit knowledge. Explicit knowledge can be expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals etc. It can be processed, transmitted and stored relatively easily. In contrast, tacit knowledge is highly personal and hard to formalize (Figure 4).



Source: Nonaka, 1995

Figure 4 Knowledge spiral

Nonaka's conceptualization of the relationship between tacit and explicit knowledge has also been criticized. While Nonaka treats tacit and explicit knowledge as separable, other theorists regard tacit knowledge as always necessary for explicit knowledge to be understood (Adler, 1995; Stacey, 2001; Tsoukas, 2003).

Knowledge is transferred beyond organisational boundaries, and knowledge from different organisations interacts to create new knowledge. (Badaracco, 1991; Inkpen, 1996) Through dynamic interaction, knowledge created by the organisation can trigger the mobilisation of knowledge held by outside environment such as consumers, affiliated companies, suppliers or distributors. A product/service works as the trigger to elicit tacit knowledge when customers give meaning to the product by purchasing, adapting, using, or not purchasing it.

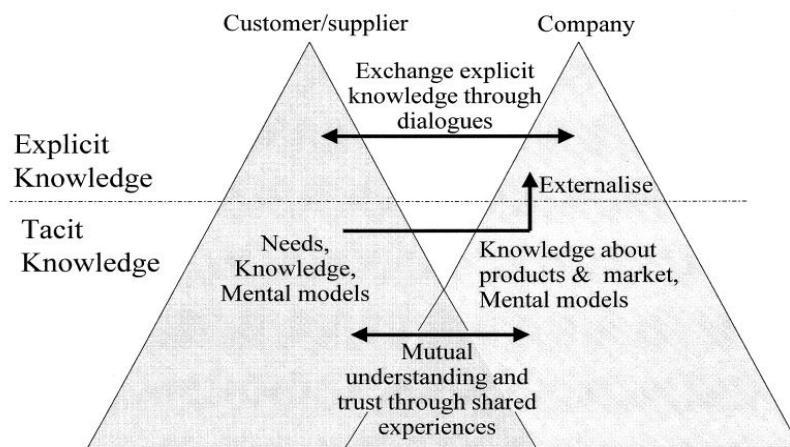


Figure 5 Creating knowledge with outside environment

Figure 5 shows how the organisation interacts with outside constituents to create knowledge. It is evident that ICT tools, methodologies and practices play a critical role in understanding the applicability of the SECI model. (Cayaba, 2012; Kodama, 2008; Sian and Kelkar, 2013)

Authors see e-recruitment as a modern and powerful tool in creation of IC that helps to transfer company knowledge to customers and build product/service value. The IC literature draws on aspects of the practical applications, providing a framework for explaining the value creation process as the link, between resources and shareholder value.

The paper goal is dedicated to evaluating e-recruitment company development, as the e-recruitment dominance in the market increases, as well as to interaction of both fields. The paper question is “how to evaluate e-recruitment using ICT”? Its deals with the sector of ICT as a result of e-recruitment development. This paper analyses and describes the role of the ICT sector in modern entrepreneurship and e-recruitment processes as a part of knowledge management and IC processes. The e-recruitment is analysed in this context as a factor affecting entrepreneurship development and competitiveness.

The theoretical and methodological ground-work of the study using literature exploratory approach, in the research generally accepted qualitative and quantitative data analysis methods of the economic science were employed, among them, statistical data processing, data grouping, and inductive-deductive data analysis methods. The scientific study employs surveying, observation study method, as well as comparative, and analytical methods, which are used by the authors to compare and analyse facts and assess solutions to specific issues. Based on the IC approach, the paper start's the research that explores the effect of intangible resource in creation of shareholder value.

4 The concept of e-recruitment business model

Authors see e-recruitment business model advantages in e-recruitment methods, transferring knowledge for job seeker through automated processes creating the ability to accomplish these processes in a shorter time. These advantages are the main technical feature of the e-recruitment business. Particularly it is interaction with job seeker in e-environment, thus reducing cost associated with first phase (Socialisation, Figure 6).

The impact of information was noted long ago by Behling, Labovitz, and Gainer (1968), who observed that job choice decisions are based on thoughtful assessment of key information concerning objectively measurable job attributes such as pay and working conditions.

Information interaction is suggested by authors to be central point as soon as job seeker's interaction process is very important. The importance of knowledge is found in information processing studies, which have demonstrated that prior knowledge of product characteristics greatly affects the way in which consumers investigate, process, and organize product-related information (Alba and Hutchinson, 1987).

This phase (Externalisation, Figure 6) is analysed in management studies showing interaction experience create substantially different variations in the ways that job seekers gather and use labour market information (Rynes, Orlitzky and Bretz, 1997). Experienced customers are better able to extract and analyse important central information (Meglino, DeNisi and Ravlin, 1993).

Traditional recruiting advantages
 P2P knowledge creation

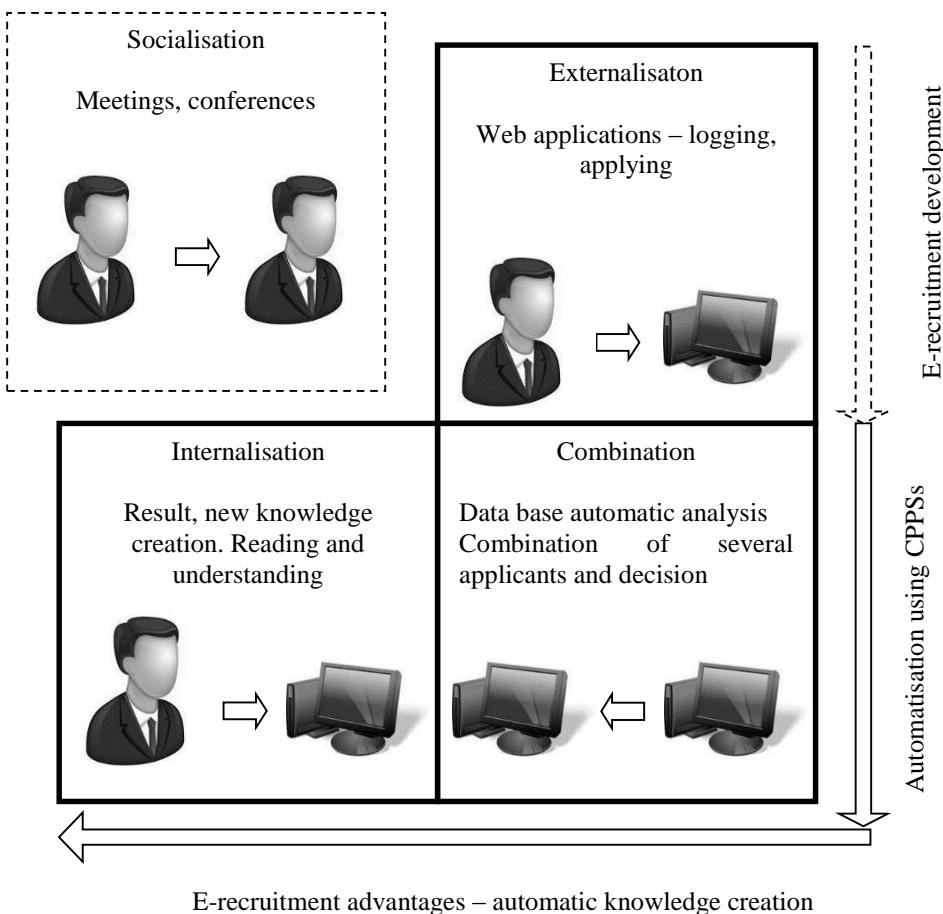
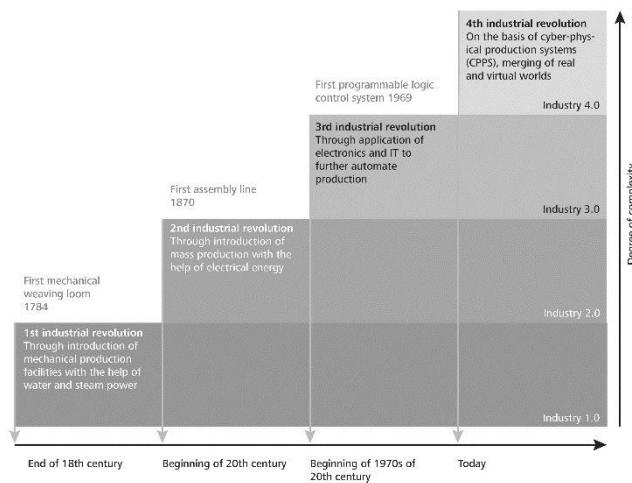


Figure 6 E-recruitment business model

The implication of these findings for e-recruitment is that e-recruitment business model potentially could neglect these shortcomings by using only last two phases (Combination and Internalisation). The advance of modern ICT has launched the Industry 4.0, to take up a leader role in industrial IT which is currently revolutionizing the manufacturing engineering sector (Germany Trade and Invest, 2014).

Technology breakthrough is allowing to increase the level of automation for interaction with job-seekers and labour cost decreased. These trends will be more focused on intangible assets (associated with IC) managing company data flow, plant-specific software and the “hardware” of manufacturing technology.

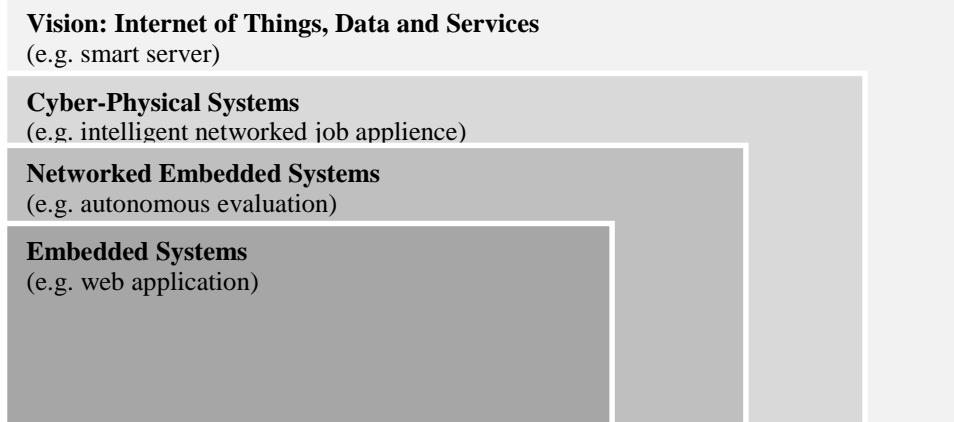
Since ICT is only one part of the Industry 4.0, the other is its use in the industrial sector and the utilization of the benefits that it brings to the value chain (Figure 7).



Source: Schlick, Stephan and Zühlke, 2012

Figure 7 The evolution of embedded systems into the internet of things, data and services

“Industry 4.0” (sometime referred as Smart industry) advantages are coming from the technological evolution - from embedded systems to cyber-physical systems. Industry 4.0 connects embedded system production technologies and smart production processes associated with the new technological age advantages (Figure 7). Decentralized intelligence helps create intelligent object networking and independent process management, with the interaction of the real and virtual worlds representing a significant new aspect of the manufacturing and production process. Industry 4.0 creates the vision (Figure 7) of an entirely networked production, in which orders managed automatically throughout entire value chains, order processing machines and material and organize their delivery to the customer. (Berger, 2014) Using these data efficiently provides a considerable competitive advantage (reducing downtimes, accurate planning, reducing unit costs and etc.).



Source: Federal Ministry of Education and Research, 2012

Figure 8 The evolution of embedded systems into the internet of things, data and services

New Industrial revolution (Industry 4.0) is also called Internet of Things, Data and Services (Figure 8). Cyber-physical systems provide the basis for the creation of an Internet of Things, which combines with the Internet of Services to make Industry 4.0 possible.

The widespread adoption by e-recruitment automatic operations of ICT is increasingly blurring the boundaries between the real world and the virtual world in what are known as cyber-physical production systems (CPPSs) (Federal Ministry of Education and Research, 2013).

In contrary to e-recruitment, studies of interviewers as recruiting sources have found that such factors as interviewer personableness, competence, empathy, interest in the applicant, communication skills, and enthusiasm often play significant roles in applicant interest in a job and intention to accept a job offer (Harris and Fink, 1987; Maurer and Howe,

1995; Powell, 1991). E-recruitment lacks these advantages and these findings show that motivation of job seeker will be affected (Petty, Cacioppo and Schumann, 1983) and decreasing their motivation (MacKenzie and Spreng, 1992). These findings emphasize that search motivation is a key element of a job-seeker, and that e-recruitment must carefully consider negative effects.

Conclusion

The cornerstone advantage of e-recruitment methods lies in labour cost. E-recruitment methods represent a growing and high-potential opportunity for business to reduce recruiting costs (Cappelli, 2001). Hence the goal of e-recruitment is to satisfy job-seekers needs by providing competitive virtual environment to traditional one. The ability to manage value creation process as interaction effect's efficiency is of the main goals, meeting job-seeker needs and web applications capabilities.

Controversially the problems discussed here about Socialisation affect toward motivation and the effort needed to attract a job offer should be taken in consideration. E-recruitment focus only on outcomes such as job acceptance decisions or application attractiveness should be carefully evaluated. Thus e-recruitment's effect on initial job-seeker interest is limited, decreasing the potential possibility to attract a job-seeker and receive positive feedback. Information interaction playing a certain role for a job seeker's attitude and job acceptance decisions, but the motivation enhancing possibilities are likely to be less effective than traditional ones.

Nonetheless such our findings provides e-recruitment with a new approach in value creation. Firstly, an effective information interaction development process, that requires careful and specific attention to certain indicators. Secondly, the effective management of information provided by job-seeker.

Based on this approach, e-recruitment should create a virtual recruiting environment that effectively interacts with job-seeker partially motivating his decision process.

E-recruitment business model should be based on indicators providing effective (user friendly) information content required to affect job seekers' positive decision. Advantages offering high quality information interaction for e-recruitment business should be developed.

To contribute to this process, authors present indicators to evaluate important issues associated with information interaction in order to develop effective e-recruitment business model.

However, the field of research is very wide and this paper presents just an in-sight into the large scope of questions that should be analyzed in the future researches.

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