

Online Visibility and Knowledge-Intensive Business Services Performance: The Scope of Interrelatedness

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Abstract

The aim of this paper is to gain a deeper insight into the interrelatedness between online visibility indicators (which are the spheres of digital marketing) and business services performance parameters. A conceptual framework was developed to analyse the online visibility of knowledge-intensive business services (KIBS) using data triangulation on the service industries. The data were analyzed using both netnographic and correlation analysis, and a classification and regression tree. The research adopted an analytic approach on the business services (industry) level. The results reveal that services with the highest level of competition on search engines and strong growth in requests were also those KIBS with the highest profits per employee. Business services with a high monthly search volume range also had the highest salaries per employee in the industry, while those with a low average search volume and stable or rising average monthly search volume dynamics also had low employment levels. This study provides insight into the interrelatedness of the business and digital marketing spheres of the contemporary service economy. We proved that business services that are most competitive on search engines and have the highest level of online visibility indicators are among those who achieve the highest profits.

Keywords: Digital marketing, Search Engine Optimization, online visibility indicators, knowledge-intensive business services.

JEL classification: M30, L80, L86.

1. Introduction

The development of the Internet has led companies, especially business services, to adopt digital marketing (DM) to reach potential clients, both among customers (B2C) and other businesses (B2B). This is of particular importance for knowledge-intensive business services (KIBS), which while supporting the processes of other small and medium enterprises that lack internal resources (Miles *et al.*, 1995; Muller & Zenker, 2001; Muller & Doloreux, 2009) must be visible on the Internet to ensure good business results. DM offers them a precise tool for target prospective customers (Pandey & Gudipudi, 2019). As the researchers note, this helps B2B executives (e.g. KIBS managers) optimize their sales productivity, as well as track B2B

consumer engagement and sales conversions in real-time and allows the dynamic creation of content that suits a prospective customer's viewing habits (Pandey, Nayal & Rathore, 2020).

The literature indicates that potential customers prefer to search for information through search engine platforms rather than going directly to company websites (Kannan & Li, 2017; Cluley, Green & Owen, 2020). Thus, developing a successful search engine optimization (SEO) strategy can help attract new customers (Matta, Gupta & Agarwal 2020). SEO has been an important tool in enabling KIBS to achieve a DM strategy. SEO is defined as a mechanism which allows the searcher to get the most appropriate results during an online search. It has the potential to alter multiple marketing variables and improves online visibility (Berman & Katona, 2013). It has been shown that 93% of Internet traffic is managed by search engines. Search engines are so significant that search trends can be used to predict sales volumes. (Chaffey & Ellis-Chadwick, 2016.) It is said that 3.5 billion Google searches are executed daily (Djuraskovic, 2021).

In fact, until recently, many organizations only perceived online visibility and DM as useful in B2C relations (Lacka & Chong, 2016). However, the successes of selected KIBS such as Cisco or IBM (Venkatesh *et al.*, 2019) are gradually changing this perception. KIBS companies are slowly realizing that DM improves the flow of information between their clients (Krishna & Singh, 2018). Moreover, the demand for research in the field of online visibility is still one of the main issues of DM (Pandey, Nayal & Rathore, 2020) due to the continuous influx of new technologies (Shaltoni, 2017). This research addresses this gap.

Therefore, in this study, the authors focused on the online visibility of KIBS, which, as the literature shows, have a significant economic impact among other service industries (Huang & Ji, 2013; Brenner *et al.*, 2018; Mustak, 2019) and are at the forefront in the use of new technological solutions, including DM (Miles *et al.*, 2017; Bumberova & Milichovsky, 2019; Chichkanov *et al.*, 2019). KIBS issues are widely covered in the literature, but these studies often examine the impact of selected KIBS and rarely look at industry-level analyses covering all services classified as KIBS. Furthermore, Santos-Vijande *et al.* (2013) noticed that since the dynamism of KIBS has an impact on the whole economy, optimum management practices for fostering new technological solutions, including DM spheres and improved performance in KIBS, are also vital, though relatively few studies have tackled this issue. In this context, KIBS online visibility seems to be of particular importance. Implementation of DM practices enables firms to reach new clients and offer them radically new value creation more efficiently (Markides & Anderson, 2006), and it can increase company efficiency and effectiveness (Neirotti & Pesce, 2019). No such research has been conducted to date, so this article is an attempt to fill that gap.

This study aims to gain deeper insight into the interrelatedness between online visibility indicators and KIBS performance parameters. To research this gap authors applied exploratory method by implementing the classification and regression trees with research questions instead of the hypothesis (that can't be used for that dataset). In view of the significance of online visibility, the authors performed a netnographic analysis of the Internet presence of KIBS and an analysis of KIBS performance parameters.

This article has five sections, including this introduction. The second presents a review of the literature on the topic of DM and online visibility, service industry performance parameters and the conceptual research framework, with particular emphasis on the online visibility of service industries. In the third section, the methodology used to achieve the proposed goal is described. The fourth section outlines the results of the research. Finally, the fifth section comprises a discussion, conclusions, and an examination of the limitations of the study and directions for future research.

2. Literature review

2.1. Digital marketing and online visibility

Use of the Internet has been systematically increasing across the world with digital becoming a crucial source of competitive advantage in both B2C and B2B marketing (Leefflang, Verhoef, Dahlström, & Freundt, 2014). The importance of digital marketing (DM) has been growing and the tools used, including digital technologies, have been improved (Bakker, 2018; Herhausen, Miočević, Morgan, & Kleijnen, 2020; Drivas, Sakas, Giannakopoulos, & Kyriaki-Manessi, 2020;). Saura, Palos-Sánchez, & Cerdá Suárez (2017) stress that DM is not just a transactional tool, but also generates change at the commercial and microeconomic level, which in turn demands changes in marketing practice and theory. Thus the relationship between the digital environment and business performance is noticeable. Digital technologies reduce information asymmetries between market participants (Kannan & Li, 2017). The rise in the practical importance of DM has led to more research. An extensive review of the literature from the years 2005-2012 was performed by Pomirleanu, Schibrowsky, Peltier, & Nill (2013). They predicted that one of the three most explored research areas would be Internet analytics. A review of contemporary literature proves the validity of their conclusion. The number of such publications has been increasing systematically (Lambin, 2013; Stone & Woodcock, 2014; Wang & Vaughan, 2014; Barger, Peltier, & Schultz, 2016; Bala & Verma, 2018;).

Competition in the digital environment for the provision of relevant information, encouraging users to stay on a given website, buy something, or submit a query, means that search engines play a major role in this process (Palamarova, 2018). Stone & Woodcock (2014) emphasize that companies should pay close attention to search engines as they allow customers to acquire free information on products and services and identify firms and brands that fit their search criteria. Kannan & Li (2017) stress that firms have to contend with search engines as both collaborators and platforms on which they must compete with other firms in acquiring clients. Kannan & Li (2017) highlight that search engines provide organic (natural) listings of websites as well as paid search listings in response to the keywords that users type, which is connected to governance of business intelligence and allows companies to obtain client insights.

Being present on the Internet at the right time with a relevant search term can represent a business opportunity. Search engines permit the almost instant generation of millions of search results for every user query. According to the study by Jansen and Spink (2006), as many as 73% of search engine users never see the second or subsequent pages of results, so the ranking is crucial. In the competition for the highest positions in the search engine, the key factor is SEO (Search Engine Optimization), which is the process of improving the visibility of a page to search engines in the rankings – as Saura *et al.* (2017) put it – and increasing the number of visitors to a website by seeking strong positioning for specific keywords in the search results (Evans, 2007; Visser and Weideman, 2011; Moreno and Martinez, 2013; Park, 2018).

There are a few research studies concerning the efficiency of search engines. Berman & Katona (2013) examined the impact of SEO on the competition between advertisers for organic and sponsored search results. Yang & Ghose (2010) investigated the synergy between organic search and sponsored search ads. Many research projects have focused on answering these questions, identifying the factors that make search engines successful (Bifet, *et al.*, 2005; Moreno and Martinez, 2013) and analyzing the dynamics underlying search engine operation (Khaki-Sedigh and Roudaki, 2003; Fortunato *et al.*, 2006). There are several factors that influence the difficulty of achieving high positions in search engine rankings. This is known as the ‘keyword search difficulty’ (KSD) or ‘keyword difficulty level’ indicator and is frequently

used (Drivas, Sarlis, Sakas, & Varveris, 2017). Many studies on SEO algorithms give some idea of the process, but only a few studies examined search engine results in the context of business performance (Wei and Lai, 2006; Wang and Xu, 2017).

The above-mentioned studies focused mainly on the effectiveness and efficiency of DM tools. A comprehensive model of the relationship of company marketing strategies, including DM and their business environment, is presented by Kannan & Li (2017). Their framework with respect to outcomes achieved through marketing actions and strategies points to: creating value for customers (through value equity, brand equity, relationship equity and customer satisfaction), creating customer equity (through strategies for acquisition, retention and higher margins) and creating firm value (as a function of sales, profits and growth rate).

In this article, the authors consider two issues: **online visibility** and **business services performance**.

Extensive use of the Internet and new technologies have produced the already mentioned problem of visibility on the Internet (Dreze and Zufryden, 2004; Wolk and Theysohn, 2007; Cioppi *et al.* 2019;). Usually, researchers, such as Wang & Vaughan (2014), understood this term as the visibility of individual company websites. In this paper, the authors intend to adapt and extend this term to online visibility throughout the B2B industry (taking KIBS into consideration), adding in some parameters describing this issue in terms of search engine optimization analytics. Visibility in the services industry is determined by parameters related to interest in a given service on web search engines, both through organic search and in results that constitute sponsored search ads (Bala & Verma, 2018). These parameters can be evaluated on the basis of data available in the public domain from search engines, using appropriate analytical tools. The visibility of the services industry is a composite variable that can be used to describe and explain the classification of services on the basis of their characteristics. The authors selected a number of parameters to define it, first and foremost: Average Search Volume (monthly) in the last 12 months (ASV) (*original variable*); Monthly Search Volume (MSV) (*original variable*); Keyword Search Engine Optimization Difficulty (SEO DIFF / KSD) (*original variable*); Mean ASV (*derived variable*); Average MSV variance (*derived variable*) and Mean MSV range (*derived variable*). Visibility of industries in the digital environment has not been explored to date as a research area, and the present study may prove to be a contribution to the development of analyses of this type.

2.2. Service industry performance indicators

Four variables were taken into consideration in our investigation: number of businesses, number of employees, net profit, and remuneration at particular KIBS.

The first two variables characterize the supply side of the market. Number of businesses describes market size and, obviously, is dependent on demand (Ding and Niu, 2019). The relationship is not a direct one, due to various moderating factors (entrance barriers, life cycle, size of the target market), but in general the significance of the industry may be assessed on the basis of the number of companies and employees. The bigger the industry, the more complex the relationships between market participants. In order to understand them, we need to examine and identify the similarities and homogeneity of businesses and the inter- and intra-relationships of cooperation and competition between them.

Net profits is the most frequently used category to analyse the performance of both individual companies (Wall *et al.*, 2004; Ordanini and Parasuraman, 2011; Ndlovu, Mutambara and Assensoh-Kodua, 2017) and the industry as a whole (Gunarathne, 2015). Profits are a very good synthetic measure of economic results (Savic, 2016). Remuneration at companies, especially of their executive members, is closely related to their performance (Achtenhagen *et al.*, 2010; Ndlovu, Mutambara and Assensoh-Kodua, 2017; Gao, 2019), and thus may be

treated as a proxy indicator of the quality of their human capital, which is one of a company's most valuable assets (Zhuo *et al.*, 2016). Examples can be observed in the whole industry (Namasivayam and Denizci, 2006; Wojtczuk-Turek, 2017).

2.3. Conceptual framework for research into KIBS' online visibility

Despite the importance of online visibility for business performance, research on these relationships is relatively limited. Sonnier, McAlister, & Rutz (2011) focused on the sales effect of online customer interaction volume. McAlister, Sonnier, & Shively (2012) extended this analysis to firm value. Stephen & Toubia (2010) investigated the economic value implications of social commerce in online social networks where sellers are individuals. One of the important aspects of the above research that links the digital environment and company activities is the rigor in ensuring that alternative explanations are ruled out (Kannan & Li, 2017).

There were also research attempts that involved the use of data generated in the digital environment to create metrics related to firm performance. Tirunillai & Tellis (2012) showed that user generated content (UGC) is related to the stock market performance of a firm. Tirunillai & Tellis (2014) showed that UGC data can be mined to create dynamic mapping of competitive brand positions on dimensions deemed important through the analysis of data over time. Nam & Kannan (2014) used social tagging data and developed tag-based metrics that worked as proxy measures for customer-based brand equity and explained abnormal returns. This stream of research shows that digital environment data can contain very useful information for tracking a firm's performance.

Literature review leads to the conclusion that some outcomes in the digital environment have been examined, but mainly in reference to the company, at a micro level. Until now – to the authors' best knowledge – there has been no industry-wide research. Moreover, there has been no attempt to examine the relationship between: 1) online visibility obtained through a client search for a given type of services and the competitiveness of this segment in the digital environment as a result of digital marketing and 2) the business performance of a particular service industry. Having identified this research gap, set out to fill it.

The authors have developed a conceptual framework for research into the online visibility of KIBS, on the basis of data from multiple sources and CART analysis. To describe this framework, the researchers identified the specific attributes of KIBS providers, focusing above all on their digital and technology advancement.

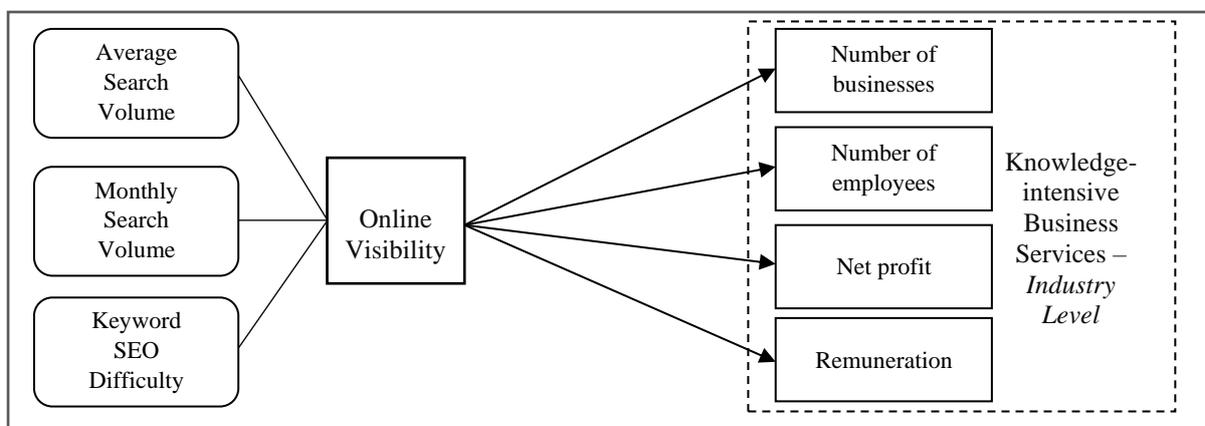


Figure 1. Conceptual research framework.

The conceptual model is shown on Figure 1. The parameters used for analysis are described in the following subsections.

3. Material and methods

3.1. Data collection

The Internet is the key channel for KIBS in acquiring new business clients (Borodako *et al.*, 2015). In order to extrapolate this result, the authors of this study used a modified version of the netnography method (Borodako *et al.*, 2018) originally employed to research online communities (Kozinets, 2010) and consumer behavior, needs, and trends (Belk, 2017). In this instance, it was used to research key words specific to particular services, as a measure of interest in those services in the online environment. The relevant data was collected from the online tools that companies typically use in their Internet marketing activities, above all Google Trends (GT), Google Adwords (GA), and KeyWords Finder (KF). In the first step, the authors collected data from the period 2009 to 2017 for all types of KIBS using GT. Then, we used GA to find the keywords most frequently entered by Internet users looking for particular types of services. In this second step, GT and KF were used (for data from the preceding 12 months). These two data sets were compared to confirm that the changes they showed were similar. Finally, the KF tool was used alone for further study because it offers more detailed, absolute data on Internet inquiries for analysis. This study employs the data gathered using these tools (ASV – Average Search Volume, MSV – Monthly Search Volume, and SEO DIFF/KSD – Keyword SEO Difficulty) as a measure of the industry's online visibility. Used together, all these tools enabled the authors to analyze the activities of companies for which online visibility is important. The data on characteristics of the KIBS industry manifested in particular types of services in the real economy were purchased from public statistics, which provided the data for the whole population (thus eliminating the need to take samples to introduce any generalization at a later stage).

3.2. Methods of analysis

In this article, the researchers present the results of research based on a data set containing information on 20 types of KIBS. Classification and regression trees (CART) were used to study the relationship between service providers' real economy characteristics and their online industry visibility. Parameters of the digital environment were assumed as the explanatory variables. Finally, three regression tree models were built for the three dependent variables: Y1 (employee number), Y2 (average remuneration), and Y3 (profit per employee).

The first algorithm for the regression trees was AID (automatic interaction detection), which was developed in 1963 (Morgan and Sonquist, 1963). In this approach, the data set was recursively divided into subsets in a way that minimized the variance of the dependent variable in the child nodes. In 1984, a new algorithm for the construction of regression trees was developed, called CART (Breiman *et al.*, 1984). What distinguished this approach from the AID algorithm was above all the notion of pruning, the lack of restrictions on the number of values of the analyzed variables, the use of surrogate variables in case of missing data, and the construction of rankings of the importance of given variables. In this approach, the parent node is split on the basis of the independent variable which most minimizes the weighted variance in the child nodes. The weights are determined by the proportion of cases that go into the left and right nodes respectively. The purpose of building a model is to predict a target variable or – as in this article – to understand the structure of the relationships between a dependent variable and independent ones. The authors of the algorithm emphasize its advantage over linear regression, but only when the relationships between the variables are not linear (as in this research).

Regression tree models are an interesting alternative to the parametric approach and give a different view of the data under analysis. Their use when building a regression model is especially justified in data sets where the assumptions of multiple regression are not met. The assumptions concern, among others homoscedasticity, normally distributed residuals, and linear relationships between the dependent variable and independent variables. In this study, all assumptions were violated.

Regression trees have been used, for example, to predict willingness to pay for organic dairy products (Liu et al., 2013) in order to examine whether declared spending on products in this category depends on the demographic profile of potential buyers. Other studies in which the CART algorithm has been used are related to factors affecting subjective well-being (Galletta, 2016), to predict willingness to pay for ecotourism (Meleddu and Pulina, 2016), and to examine the relationship between production export levels and per capita GDP increase (Sheridan, 2014).

4. Results

The empirical data connected with the Internet activity of business services companies gathered for this study were collated with secondary data from public statistics. The purpose of this research approach was a deeper insight into the interrelatedness between online visibility indicators and KIBS performance parameters. This is important because the literature review revealed that digital marketing (online visibility, SEO) is significant for companies' development – their image, development, and sales (Dreze and Zufryden, 2004; Kannan and Li, 2017; Pandey, Noyal and Rathore, 2020). The number of observations is quite small, but the results concern only the correlation which is significant at the level of 0.05.

4.1. Relationships between numbers of employees and online visibility

The first step of the analysis was to examine the relationships between the number of employees in companies offering given types of business services (the dependent variable linked by subject with keywords) and three independent variables. These three variables are as follows: the mean keyword search indicator for a given type of service, the average MSV variance, and the mean MSV range. For example, analysis was carried out on the relationship between employment levels in companies offering accounting and bookkeeping services, and numbers of keyword searches connected with those services (“accountant’s office”, “bookkeeper”, and “bookkeeping services”). The values of the correlation coefficients for these three relationships were relatively high, in the range 0.58-0.61 ($p < .05$).

The strength of the relationship between these variables may be characterized as moderate. In empirical terms, it is possible to conclude that a high value of the mean keyword search indicator for a given type of business service correlates with a large number of people working in this group of services. This would seem to be justified, since large numbers of employees generate high turnover for companies, and companies need orders. Variables such as mean keyword search indicator, but also average MSV variance and mean MSV range, are also a reflection of online visibility.

As emphasized earlier, the relationships between the dependent variable Y and the independent variables X1, X2, ..., Xn were non-linear and therefore a decision was made to replace multiple regression with CART regression trees. It is the non-parametric alternative analytical tool most commonly used to analyse large data sets. Because the purpose of the study was to describe the relationship between variables, the authors believed this tool would be appropriate.

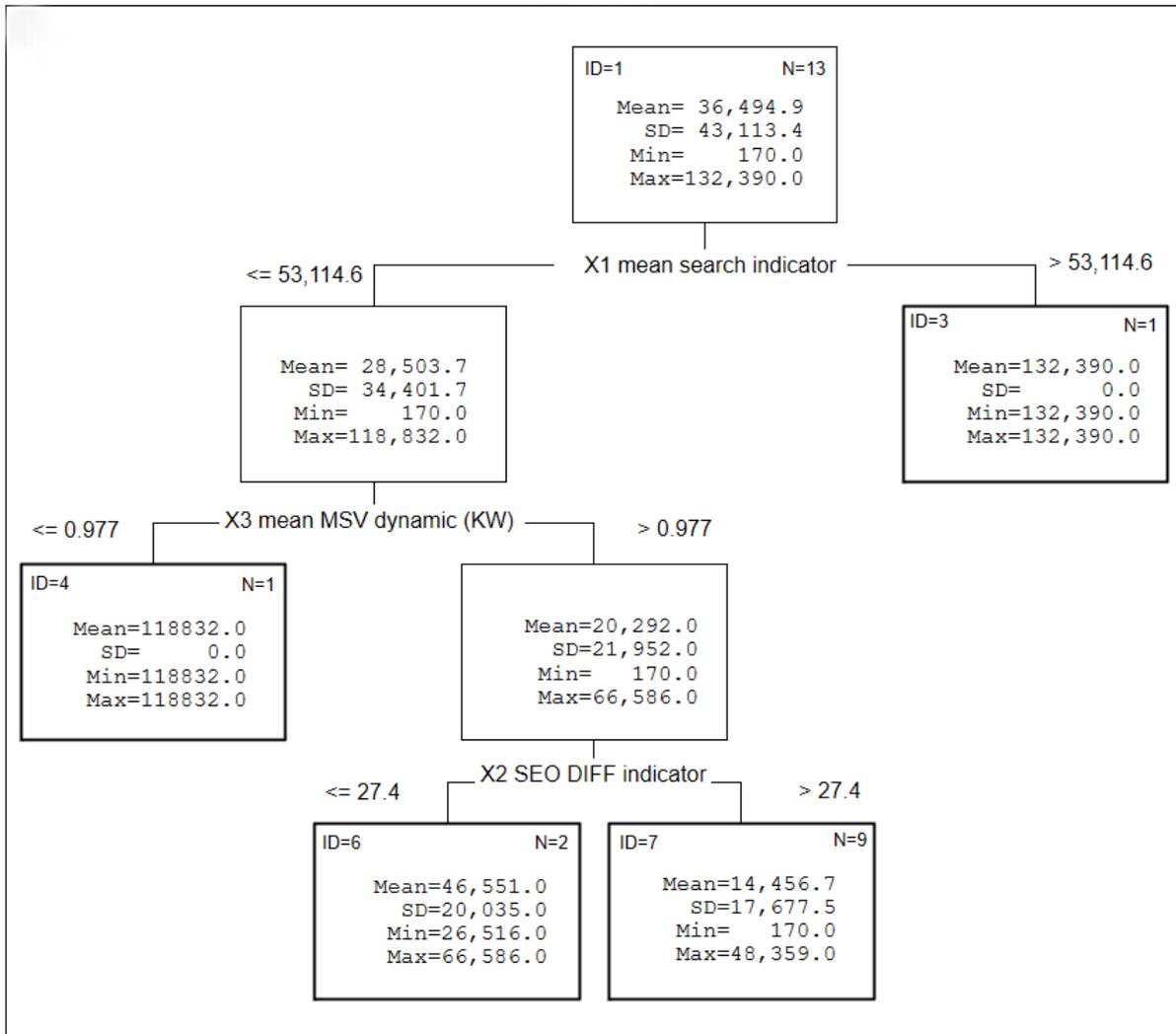


Figure 2. Regression tree for employee numbers in each KIBS industry.

A regression tree analysis was also carried out (Fig. 2). A small number of cases in the leaves of a regression tree usually indicate overfitting in the predictive model. In this case (description of dependencies), it allows us to indicate outliers. Where the mean search indicator was below 53,114, the mean MSV dynamic stable or rising, and the SEO DIFF indicator high (at over 27.4), mean employment in companies providing business services was 14,000 (ID7). In companies with a low SEO DIFF indicator (below 27.4), and where the other variables were identical, mean average employment was 46,500 – ID6 (Architectural and engineering services). This level was double that of the average employment level across the KIBS industry nationwide, and the fifth-highest employment level in the KIBS economy overall. Thus constructed, the tree shows that the business services with the highest average MSV also have high employment levels. Services with a low mean search volume indicator and stable or rising average MSV growth have a low level of employment. Of these, services that face strong competition for positioning (i.e. a high SEO DIFF) tend to be characterized by low employment levels (on average around 14,000 employees, which is half of the average employment level for the KIBS industry as a whole). The model adopted for analysis should be considered appropriate in view of the relatively high variance it explains – around 85% for the strongest relationship between the three main independent variables (predictors): average MSV growth

(100), mean MSV variance (76), and the SEO DIFF indicator (74). The numbers in brackets represent the number of points from variable importance ranging of the regression tree.

4.2. Model of correlation between remuneration (per employee) and online visibility

The next two research models examined the relationship of certain financial values to the online visibility of given services. The first model focused on the relationships between independent variables connected with Internet activity and mean remuneration per employee in various types of business services, while the second explored the relationship of the same independent variables to mean average profits per employee in various types of business services. Regression trees were employed in both models.

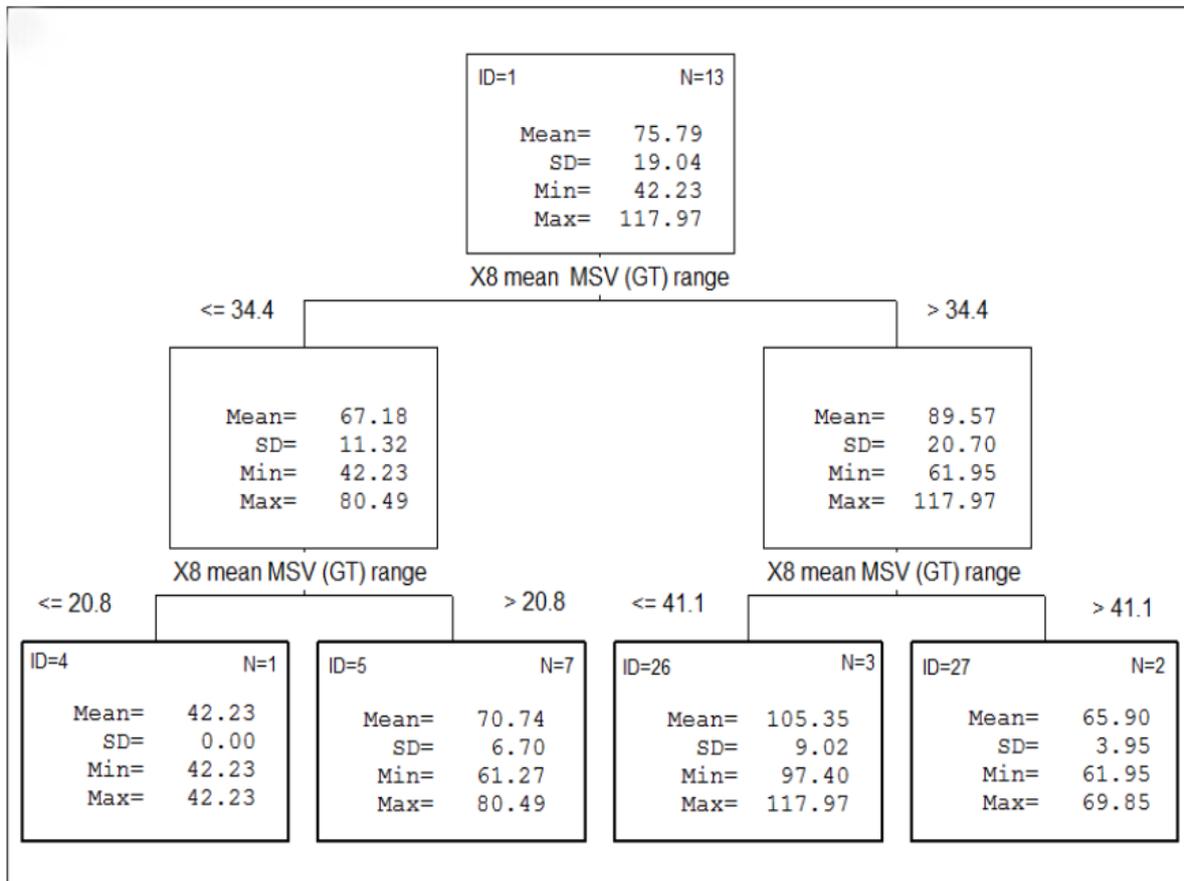


Figure 3. Regression trees for average remuneration per employee.

Use of the regression tree method enabled us to calculate the mean average annual remuneration per employee for all KIBS as PLN 75,790 (US \$18,051) – the exchange rate according to the National Bank of Poland as of 1/12/2016: USD 1=PLN 4.1987. However, the values of this indicator were differentiated by the mean MSV (GT) range, because services with a higher MSV(GT) level (over 34) also had higher remuneration levels per employee (on average PLN 89,570, or US \$21,333). Analysis of the regression tree revealed that the statement “the higher the MSV(GT), the higher the remuneration per employee” did not hold true in all the business service types analyzed. Services with average MSV(GT) levels (in the range 34–41) had the highest remuneration (per employee), with a mean of PLN 105,350, or US \$25,091. The services with the highest remuneration per employee were Advertising, Market research, and IT services. One finding worthy of note is that the lowest mean average remuneration per employee was recorded in the services with the lowest MSV(GT) level (employment agency services – see Fig. 3). The model adopted for analysis should be

considered appropriate in view of the relatively high variance it explains – 87.5% for the most strongly correlated independent variable (predictor), i.e. averaged MSV(GT) range (100).

4.3. Correlation model between profit (per employee) and online visibility

The second model examining financial values looks at the correlation of profits per employee in a given services industry with the Internet visibility levels of that service type. The mean average profit in the business services studied was PLN 29,350 (US \$6,990) for a broad spread ranging from a low of PLN 1,740 (US \$414) to a high of PLN 99,020 (US \$23,583). Services with an average MSV(KF) growth rate of over 1.028 saw higher profit-per-employee levels (PLN 63,300 or US \$15,075), and within this group the highest profits were generated by groups with the highest SEO DIFF indicator, of over 33.8 (mean profit per employee: PLN 86,130 (US \$20,514 – see Fig. 4)). The group of services with the highest profits per employee comprised Advertising services and Legal services (ID23).

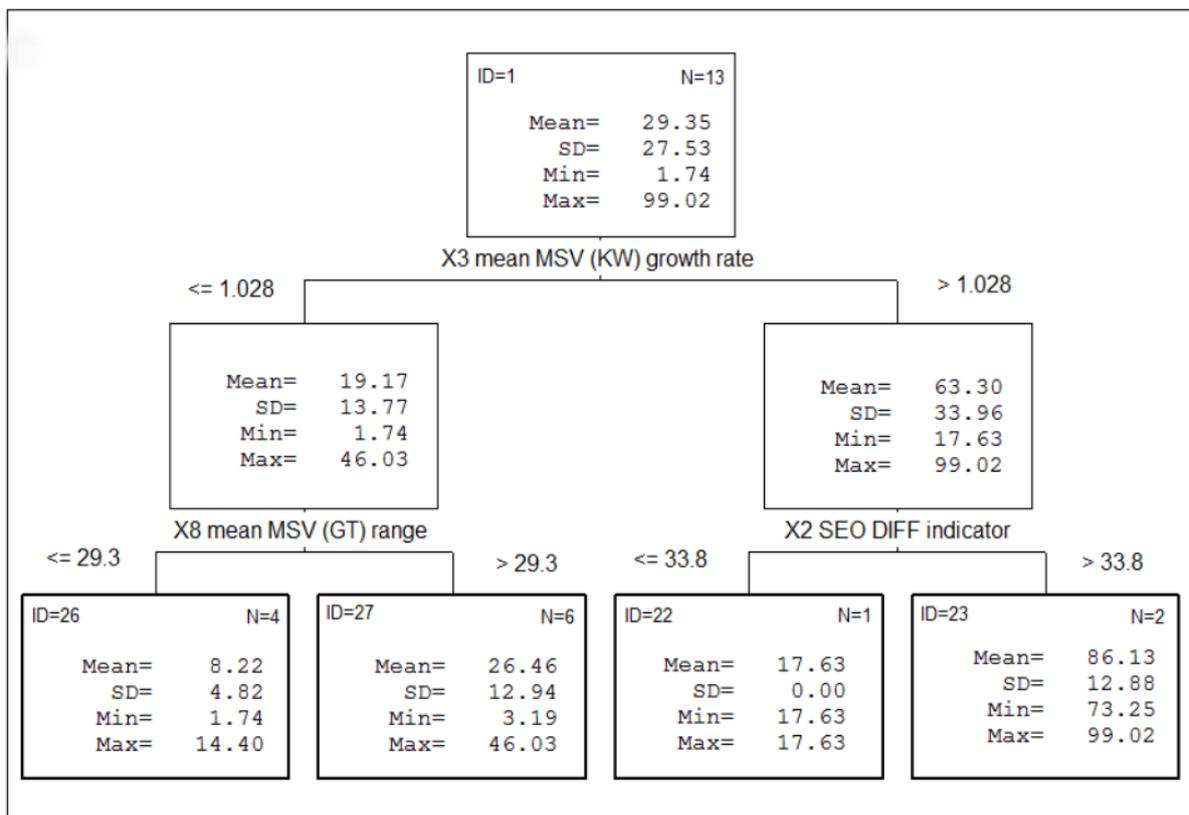


Figure 4. Regression trees for profit per employee.

Services with high growth in Internet searches for industry-specific keywords and very strong competition for positioning (high SEO DIFF) have high profits per employee. Although the accessible data are insufficient to verify this thesis unequivocally, the analyses confirmed that business services which use the latest in IT enjoy better financial health (if authors take profit per employee in a given services as a measure of that health). The model adopted for analysis should be considered appropriate in view of the relatively high variance it explains – 85.5% for the most strongly correlated independent variable (predictor), i.e. average MSV(GT) variance (100).

5. Discussion

5.1. Contribution of the research

KIBS providers are an atypical industry in most economies the world over. They are knowledge advanced, they create and disseminate new solutions, and they enhance their clients' competitiveness. The literature review did not reveal any research into ICT in KIBS. Any studies focusing on the DM were carried out on other types of companies – usually large corporations (e.g. Lin, *et al.*, 2011).

This study could be treated as an extension of the conceptual framework by Kannan and Li (2016), who proposed the inclusion of the company and environment perspective of digital marketing research on the micro (firm) level in the model. The results presented in this paper connect the digital marketing sphere with the business sphere on the business services industry level. Using this approach, the differences among services were indicated in digital marketing, giving deeper insight into the specific online visibility of service providers.

After careful review of the literature, some similarities to this research were discovered in studies of company online marketing. These findings confirmed that service industries with high numbers of requests in search engines also had large numbers of employees. More precisely, services characterized by low levels of requests on search engines and stable or sluggish MSV (monthly search volume) dynamics also tend to be service industries with low employment levels. These study results are in line with those of Lin *et al.* (2011), who claimed that small and medium-sized enterprises (SMEs) have a poor understanding of the significance of websites and the Internet in general. This study also supports the results of recent work by Ritz, Wolf, & McQuitty (2019), who claimed that small business owners invest time and effort into fostering customer loyalty by implementing different online marketing tools. For managers of SMEs, the scale of digital marketing is fragmentary, but it helps to improve customer satisfaction. The authors studied companies providing knowledge-intensive business services in considerable depth; for the most part these are very familiar with ICT. The explanation of this phenomenon is that strong competition on the Internet is an indication of a highly developed and competitive market, which is reflected in high employment levels in companies.

Analysis make it possible to better understand the nature of the relationship between strong Internet competition in the service industries (measured as ASV – average search volume) and industry attributes and performance. The highest ASV scores are achieved by KIBS with high average profits. According to our analysis, the highest remuneration (per employee) was paid out in services with high (but not the highest) MSV: Advertising, Market research, and Information technologies. The evidence showed that services which reported strong growth in requests via search engines and a high level of competition for positioning of those keywords on search engines (high SEO DIFF score) – advertisement services and legal services – also had high profits (per employee). These results could be treated as an extension of the study by Berman & Katona, (2013), which studied the competition between advertisers for organic and sponsored research results. These companies can benefit from websites which are positively evaluated by customers and at the same time lead to better search engine rankings.

The results also bear some similarity to research by Vaughan and Romero-Frias (2010), who reported the correlation between a company's online information visibility and its revenues or net income. Similar conclusions were proposed by Vaughan and Yang (2012), who identified a correlation between inlink counts and company revenues and profits in the case of top US and Chinese companies. Wang and Vaughan (2014) found a positive relationship between web visibility and company advertising efficiency. These results shed light on KIBS service industries, which, as mentioned at the beginning of the paper, transfer, create, and implement new solutions.

5.2. Limitations and directions for future research

The foremost limitation of this study is the geographic scope of the data gathered, which were available only on the national level and thus gave a picture of only one country's market. This approach can be treated as a case study for this conceptual model. The second limitation was the availability of the variables, and even certain restraints on researcher access to the variables in question. Moreover, the analysis was conducted according to the Polish Classification of Business Activity, which, though compatible with the European Classification of Activities, may not be entirely comparable to classifications used by authors from other continents.

The original variables regarding online information visibility were chosen with due diligence, but nonetheless other authors might suggest variables that give an even better picture of the online visibility of the KIBS industry. Tools for netnography analysis will likely continue to be developed, which will increase research precision, creating further incentive to repeat this study in the future.

Acknowledgments

Funding: Project financed from National Science Centre (Poland) grant no. 2016/23/B/HS4/03011.

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