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Sustainability Development of Knowledge-Intensive Business Services: Strategic Actions and Business Performance

Veronika Bumberová and František Milichovský *

Faculty of Business and Management, Brno University of Technology, CZ-61200 Brno, Czech Republic; bumberova@fbm.vutbr.cz

* Correspondence: milichovsky@fbm.vutbr.cz; Tel.: +420-54-114-3782

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Abstract: The recognition of the relevance of knowledge-intensive business services (KIBS) is becoming especially acute in the European Union and even more important for many emerging economies. The objective of the present study is twofold: (1) to examine whether an empirically-based typology of sustainability development can be constructed for KIBS; (2) to identify whether different development patterns are associated with different business performance outcomes. The empirical evidence is based on quantitative and firm-level data gathered through an email questionnaire which yielded 128 qualified responses from KIBS in the Czech Republic. The analysis is based on exploratory factor and cluster analysis to identify the cluster membership and to assess the relationship with performance outcomes it has been used the parametric test one-way ANOVA. Data analysis revealed that three distinct patterns types of KIBS exist, which were associated with different performance outcomes. With regard to the level of sustainable development, we found the conservative KIBS following market extension through a repositioning of existing and revised services, innovating KIBS following a new service development strategy focusing mainly on complements or line extension to existing services based on changes in technology and middle-ranged KIBS focusing on traditional strategy of comprehensiveness of services or "more services under one roof". Innovating KIBS outperform other types of KIBS in all financial and non-financial parameters. The results have implications for practices involved in strategy development in services and useful for government efforts. The limitation of the research is done by focus on small companies, operating mainly in ICT and architectural and engineering services.

Keywords: sustainable development; strategy type; knowledge-intensive business services (KIBS), business performance; sustainable performance; patterns of behavior; Czech Republic

1. Introduction

Services are increasingly becoming the dominant activities in developed economies and their growth is not independent, but rather is closely linked to the other sectors of the economy [1]. The growing importance and focus on the services sector research is the result of significant manifestations of the current structural changes of the economically developed countries, which have been noted particularly over the past twenty years. In services, around 70% of added value is currently being generated in OECD countries, and the trend of this share continues to grow. It is not surprising that a majority of sustainability-related studies were conducted in a developed country context, global business organizations must promote research on sustainability assessment issues in the developing countries [2]. It is well known, that the knowledge-intensive business services (KIBS) as a small proportion of all services, is significant in terms of economic benefits and as the key part of

the growth in value-added, employment and labor productivity [3]. It also represents one of the major segments that is a facilitator of knowledge, external information, and an innovation facilitator for other client businesses [4].

The results clearly show that KIBS are very heterogeneous and there is great need to deepen our understanding of the types of business development they undertake [5–10]. The empirical studies in present days represent an attempt to investigate patterns, scenarios or modes of competitive, cognitive and innovation activities. For example, Corrocher et al. [6] explored the KIBS' 'black box' located in Italy, investigating sectoral variety and common patterns across different typologies, as well as heterogeneity, is driven by a firm and market-specific characteristics. The authors' results suggest, that there are four profiles of KIBS: interactive innovation mode, product innovation mode, conservative innovation mode, and techno-organizational innovation mode and each cluster membership was associated with strategy adoption as the most significant determinant. Miles, et al. [11] found six clusters of KIBS located in an emerging economy such as Russia: Non-innovators; organizational change innovators; marketing innovators; technology-oriented innovators; non-technological innovators and diversified innovators and distribution of companies across the clusters in terms of their size and the type of services.

Evidence from developed countries has outlines the positive effects of KIBS on sustainable development of the economy [12–15]. The recognition of the relevance of KIBS firms is becoming especially acute in the European Union and even more important for many emerging economies [11,16]. The Czech Republic is a small post-communist regime country located in Central Europe with rather short distances, good accessibility, an extremely strong economic position of the capital city Prague and a significant portion of manufacturing and R&D business employment located in non-metropolitan regions (Ženka et al. [17]). Considering the relatively small size of the Czech economy, the strong position of manufacturing industries and the lower share of KIBS in total employment [18]. The Czech Republic is in a situation where the main driver of the economy is industrial specialization, which is also linked to many commercial services. So far, less important in the domestic economy know intensive services. Employment of the Czech population in knowledge industries services grew at a faster rate (1.3%) in 2008–2017 compared to the EU-28 (0.9%), although convergence is only very slow. In the EU, knowledge-based industries make up 40% of total employment on average and 33% in the Czech Republic (2017 data). One of the positive examples of KIBS in the Czech Republic is IT and software services, where the importance in the economy and export performance is increasing. The export potential also shows architectural and engineering activities and creative sector such as design. However, the KIBS sector created less than 17% of the value-added of SMEs, compared to almost 22% in Europe [19]. The successful development of KIBS companies can be seen as a prerequisite for further sustainable development of the Czech economy in terms of increasing the value of exports and improving the position in global value chains.

Looking at this issue from situational or contingency theory perspective, one could surmise that the business performance is the output of alignment with the service, process innovation based on technology domain, market strategy and organizational changes of each KIBS, giving rise to the following empirical research questions:

(1) Is it possible to divide KIBS by the features of strategic actions and subsequent organizational changes into homogeneous areas?
(2) Are there dependencies between perceived strategic actions and business performance of KIBS?
(3) Which of the development activities contribute to considerable differences among business performance?

Drawing on a survey-based firm-level dataset, the aim of this paper is to test whether: (1) to examine whether an empirically-based typology of sustainability development can be constructed for KIBS; (2) to identify whether different development patterns are associated with different business performance outcomes, evaluating the heterogeneity driven by KIBS. The results could be useful for managers and owners in this sector and government efforts to support the development activities of

these companies. The next sections introduce the theoretical framework with the focus on KIBS sector and subsequent methodology provides the details of data collection and analytical methods, the fourth section presents the findings of the analyses and final section summarizes the conclusions of study results. The aim of this study is evaluating the heterogeneity driven by KIBS.

Defining of Knowledge-Intensive Business Services (KIBS)

There are different approaches to defining KIBS (see e.g., [9,20]). Generally, this sector is characterized by the private sector of small enterprises with a high level of knowledge and orientation of its services to other organizations (private and public sector) that are predominantly non-routine [20]. Over the last decade, the economic and business literature has been largely discussing competitive strategies and innovation patterns in KIBS, both from a theoretical perspective and, to a lesser extent, from an empirical point of view [6]. The empirical studies perform analyses and comparisons based on micro-level data from Community Innovation Survey (CIS), nomenclature classification (NACE) or on the prior distinction between professional KIBS (p-KIBS: business and management services, legal and accounting activities, market research, etc.) and technical KIBS (t-KIBS: IT related services, engineering, R&D consulting, etc.) as firstly proposed by [9].

In particular, it has been observed that traditional industrial classifications and economic nomenclatures, mainly based on the character of the goods and services produced, and on inputs, processes and technology of production—like for example those which refer to the NACE classification used in the European Community, can be inadequate when not misleading to differentiate the various types of firms that form the KIBS sector [8].

2. The Research Framework of Sustainable Development of KIBS

In this paper, we define sustainable development using the dominant definition established by the World Commission on Environment and Development (WCED), published by [2]: "Sustainable development means meeting the needs of the present without compromising the ability of future generations to meet their own needs. This definition means that firms engaged in sustainability need to seek strategies that simultaneously create economic value.

The sustainable development in terms of long-term growth and survival is driven by differentiation, its ability to provide unique and superior value in terms of quality, services, and special features or after-sales service. Therefore, research has begun to test whether strategic and other features configurations of actions and practices have a different impact on firm results [5,6,12–15]. The works by Tether [7] and Freel [3] provide important steps in the direction of exploring differences across KIBS. It seems that heterogeneity of KIBS sector concerns not many factors as the size of companies, or the kind of services provided, but rather strategy adopted, cognitive aspects of knowledge features [8].

These issues are defined by Scheuing and Johnson [21] according to Ansoff's product-market expansion matrix who identified four different development strategies for services that can be pursued using four different types ranging from new service/markets, through new service lines and service line extensions, to service improvements. However, the service/market development strategies should be supported by innovations and changes in organizing internal resources. Figure 1 shows the research framework of sustainable development of KIBS in this study.

In the middle is the alignment, which is based on the premise that simultaneously, many contingencies are embedded in the research model [22]. The goal is trying to find clusters of variables that collectively define a meaningful and coherent slice of organizational reality [23]. All individual determinants are described in the next sections.

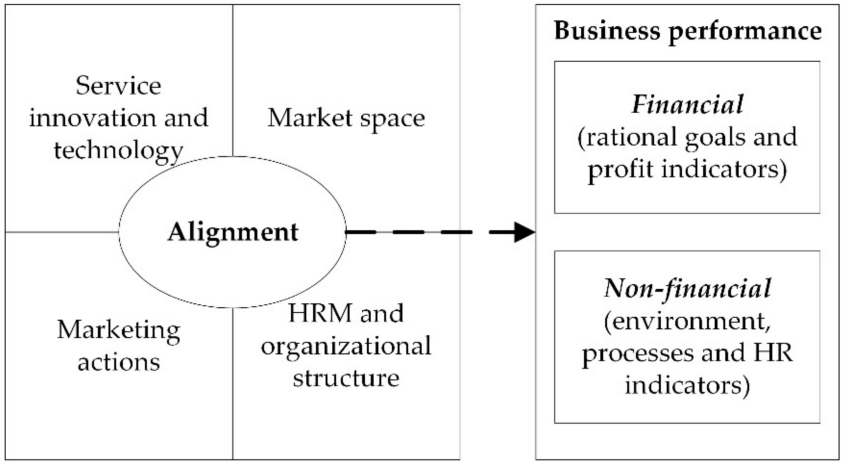

Figure 1. The research framework of sustainable development of KIBS.

2.1. Product (Service) and Process Innovation

The competitive advantage of KIBS firms primarily relies on the development, adaptation, and commercialization of knowledge-based services, product innovation plays a crucial role in KIBS' operations [24,25]. The new product development (NPD) literature classifies innovation into different types and captures the intensity of firms' innovation efforts within a technological domain. The emphasis on innovation in services is often placed on continuity rather than newness Voss et al., [26]. One of the key criteria which have been used as the basis for establishing the typologies is the degree of the radicalness of innovation.

Avlonitis et al. [27] offer a typology which classifies service innovation into six different types: new to-the-market services, new-to-the-company services, new delivery processes, service modifications, service line extensions, and service repositioning. Product and other innovations can give the company a competitive advantage to the extent that the technology underlying such innovations remains proprietary [27]. Lafuente et al. [24] are using commonly used scale proposed in the Oslo Manual for evaluating service innovations: (1) replacement of products being phased out; (2) extension of product range within main product field through technologically new products; (3) extension of product range within main product field through technologically improved products; and (4) extension of product range outside main product field. Others like [27–29] are using traditional data (e.g., CIS) with rather dichotomous (1-new or significant improved services, otherwise 0) variables. Product innovations are developed to meet or outstand the offerings of the company's competitors. Avlonitis et al. [27], suggest that this group of services is developed to meet or outstand the offerings of the company's competitors. Further, the KIBS implemented product (service) innovation is associated with how services are provided and organized, and in turn, affects the relation with users in terms of customer satisfaction [6].

Rodriguez and Camacho [30] and Miles et al. [11], identified technology, as a factor reflecting companies' orientation towards product innovation. According to Corrocher et al. [6] is technology adoption non-interactive source of knowledge explained by the (ICT) technologies used in service production/delivery process. The development of technology has implications, which concerns with the modes and timing of production and delivery of some types of services much more possible and easier. This process can introduce some distance between service development and utilization. It could create the geographical reach of KIBS and, accordingly, the perception of increasing international pressure on local firms [6]. This group of variables characterizes firms that are at the frontier in terms of adoption and use of new technologies but that are also likely to rely upon external drivers of innovation, such as specialized suppliers of tangible technological inputs.

Technology development emphasizes the newness of the service's operating/delivery process (i.e., hardware, software) to the company, the technological newness of the service's delivery process

and its subsequent newness to the customer, and the newness of the new service development and marketing process to the company [29]. However, KIBS firms specializing in a service like law or engineering may introduce a completely new service and many of them have developed consultancy offerings—without the use of any new technologies [11]. While professional KIBS are more keen to adopt new technologies, technical KIBS are more focused on moulding them [6]. This theoretical evidence suggests that technology development reflecting companies' orientation towards product innovation and improvement of service's operating/delivery process [6,30]. This theoretical evidence suggests that KIBS as a sector is conducive to greater service innovation level based on changes in technology.

2.2. Marketspace

Even established KIBS are on the lookout for new opportunities emerging in new markets to ensure future development in terms of growth and survival. Furthermore, being able to offer new or existing services or processes may improve a company's positioning in existing markets [31]. Market development strategies reflect the breadth of the geographic markets served and the firm's pursuit of new distribution channels [32] so they are closely interlinked with marketing actions. Branzei and Vertinsky [32] suggest that high-growth firms are twice as likely as low-growth firms to research and enter new markets. They found, that more intense market development strategies constrained exploitation while an increased focus on existing niches fostered the commercialization of incremental innovations. KIBS targeting to specific niche markets can offer distinct advantages and can avoid having to compete solely on cost against larger enterprises with greater economies of scale and deliver high-quality products, they can thrive in small volumes with high margins.

However, the service innovations (especially more radical) which are untested and bringing into the new markets are a very risky strategy Rodríguez and Nieto [33]. As a result of the interaction between service providers and their customers, some innovation activities are aimed at adapting the services to the users´ needs, which might in itself be considered a form of innovation Rodríguez and Nieto [33] which is often under the protection of the contract between the service provider and the customer. This may be a barrier to distributing and delivering service innovation to foreign markets as well.

2.3. Marketing Actions

Marketing development strategy involving significant changes in design, placement, promotion or pricing activities [34]. This strategy leads to tactical marketing actions such as changes in sales or distribution methods, advertising or permanent exhibitions. The objective is to increase the appeal for the firms' products in terms of market penetration and/or to enter new markets [6]. These actions focus on customer's needs, opening new markets, or repositioning a company's product with the intent to increase sales. Marketing strategies affect financial outcomes for small businesses and lead to the sustainable development of these companies. An effective marketing strategy increased sales and dominance in a targeted market [35]. KIBS managers/owners are tasked with using various communication levels to determine which consumer populations are most likely to talk about a company brand to help influence quantifiable ways to sales and profitability [36].

KIBS can use marketing communications to obtain information and advice, offer information about products, and persuade target customers on the merits of a particular product [37]. Product presentation is a very important marketing tool in terms of penetration or entering new markets and help to promote brands. Building a valuable brand increases customer value perception, gives the product a higher quality level, increases profitability [38] and lead to the sustainable development of these companies. Companies that have a strong brand name achieve better performance and marketing capabilities [39]. The KIBS focusing on marketing actions are likely to have a better ability to increase customer satisfaction, also to successfully adapt to changing market needs, to discover and

exploit business opportunities and to access new information and resources in order to develop new competitive products or processes [6,34].

2.4. Human Resources and Organizational Structure

A specific feature of KIBS, which affects the development activities, is their labor-intensive nature. It is especially in KIBS that highly qualified human capital represents a key strategic asset. Corrocher et al. [6] talking about the organizational changes and non-technological innovations, which is explained by human capital competencies and organizational structure, and reflects an innovative pattern which is oriented towards changing organizational variables such as the firm internal structure and personnel skills and profiles. Perhaps, one of the best arguments for sustainable development of SMEs is the potential to attract and retain employees [40,41]. Development of human resource management is a critical innovation strategy, particularly for high-tech or knowledge-intensive firms and consistently enables superior performance. Human development strategies reflected the strategic importance placed on recruiting knowledgeable employees, training existing employees, and developing functionally diverse teams [32]. Investments in human resources appear to increase, rather than decrease, with the introduction of product innovation and ICT, following the need for firms to improve their knowledge capacity [6]. Implementation more complex technology will increase the need for intensive learning.

2.5. Business Performance of Services

The impact of strategic and mainly innovation activities on the business performance of services is less directly observable compared to manufacturing [27,42]. In other words, because there is no physical product, it is often harder to convey the immediate benefit to consumers and any benefit may not be immediately linked by the customer to an innovation per se [42]. An increasing number of researchers have turned their attention to a specific aspect of the non-financial performance of service firms [29]. Effectiveness assessment of any strategy and its impact on the overall firm is an important issue that all firms need to assess after the implementation of any new strategy [2]. When measuring SMEs performance, the subjective sources of financial and non-financial performance are more useful [43].

All the mentioned strategic actions in terms of innovations and changes in selected areas of theoretical background have an impact on business performance. Researchers use many indicators, such as financial (turnover, sales, ROA, etc.) and non-financial (market share, customer satisfaction, image, etc.) using objective and/or subjective scales [2,27,42]. Many researchers (e.g., [27,42]) suggest that the service innovations have a positive relationship on firm (financial, non-financial) performance (depend on radicalness). According to Avlonitis et al. [27], service line extensions are concerned with non-financial performance, particularly the company's overall image. Having developed a good image in the eyes of the customer helps minimize the risk associated with the new offering and emphasizes its ability to (also) offer a particular service or its ability to offer improved services. Delivery processes have the most important contribution in terms of financial performance, particularly the profitability level. This type of action aims to take advantage of modern technologies in the delivery of the service and, thus, renders the delivery more cost-efficient and therefore, profitable. Service repositioning is merely an effort to shift the market's overall perception of the company's services relative to that of competitors. Further, Georgiadis, and Pitelis [44] find that more profitable services (SMEs) combine a highly skilled workforce with technological and know-how-based firm differentiation strategies, and/or product differentiation strategies, which are based on the quality of service and personal attention to customers, alongside generous compensation and attention to employee development. Thus, we hypothesize:

Hypothesis 1 (H1). *KIBS implemented more radical service (new to the market or firm) innovations have an association with non-financial performance, particularly company overall image.*

Hypothesis 2 (H2). *KIBS implemented marketing actions have an association with increasing customer satisfaction and flexibility to adjust to the changeable needs of the customers.*

Hypothesis 3 (H3). *KIBS implemented technology to introduce new or to improve existing delivery processes, have a close association with financial performance (profitability level).*

Hypothesis 4 (H4). *KIBS implemented changes focused on human resource management have a closed association with improvement of quality service offered.*

The firms often make decisions resulting in strategic configurations of one or several development actions. As Amara, Landry, and Doloreux [29] pointed out, there are strong complementarities between different types of innovations in services. From a system point of view, any action or change and innovation involves the development of other forms of actions in the system, organization. Hence, the introduction of new services often requires the introduction of new service processes, the adoption of new organizational practices, the availability of changes in service design, promotion and placement and so on [28]. Instead of exhibiting complementarities, the different forms of innovation might be independent of each other or even show substitution effects [29].

There is general agreement that KIBS sector have the highest mean score in innovation level within service industry as a whole and are expected to adopt a broad, complex portfolio of innovation initiatives [28,30]. Implementation of one of the four types of innovations and changes represents a simple strategy and any of their combinations a complex strategy [28]. The importance of the hybrid cluster is mentioned in the work of [15,28,45,46]. Coordination of innovation decisions can result in complex strategies. According to Martin-Rios et al., [28] a complex strategy is formed, for example, by combining one or more technology-derived innovations (product and process) and non-technological innovations (organizational and marketing). There is an expectation that internal variability of innovation types will lead to differences in the generation of organizational results. Service firms adopting complex innovation strategies could obtain high rates of firm turnover and alternatively, simple strategies could be associated with lower firm turnover rates [28]. However, even within the KIBS sector have been found differences and not all businesses are active innovators [11,27,47]. This type of non-innovatory KIBS probably rely upon established reputation and/or economic upturn in terms of growing customer demand to compete in the current market [6]. This cluster of conservative KIBS have been identified throughout European studies and studies from emerging economies (see [6,48]). In light of the above conclusions, we hypothesize:

Hypothesis 5 (H5). *The group of least or non-innovative KIBS are less successful in terms of both, financial and non-financial performance compared to the other type of KIBS.*

Hypothesis 6 (H6). *KIBS implemented more complex innovation strategy are more successful in terms of financial performance, particularly profit.*

3. Data, Variables Definitions, and Methods

3.1. Data

Drawing on the survey-based firm-level dataset, the aim of the paper is to test whether different types of KIBS could be associated with different development patterns and performance outcomes, evaluating the heterogeneity driven by KIBS. The empirical evidence is based on quantitative data through an email questionnaire from July to September 2017. The basic population gathered from university database Amadeus after selection criteria (headquarters in the Czech Republic, only private profit sector; services operating more than 5 years, should not be a presumption of bankruptcy or insolvency; the size determined by the total number of employees is 10–49; owner should be a senior

executive (CEO) and must be in the top management and has majority share 50.1%) included 1214 companies, operating in knowledge-intensive business service sector. The total return rate from the survey was 128 valid answers in completely and correctly filled form (return 10.5%). The resulting sample of respondents copies the theoretical database file structure (see Table 1).

Table 1. KIBS classification of industrial activities according to CZ-NACE Rev. 2.

		Theoretical Freq.		Research Freq.		KIBS *
		Absolute	Relative	Absolute	Relative	
Section J	62	300	24.71%	37	28.91%	t
	63	21	1.73%	3	2.34%	t
Section M	69	214	17.63%	19	14.84%	p
	70	64	5.27%	7	5.47%	p
	71	407	33.53%	40	31.25%	t
	72	17	1.40%	4	3.13%	t
	73	123	10.13%	11	8.59%	p
	74	68	5.60%	7	5.47%	p
Total		1214	100%	128	100%	

* t—high technological knowledge; p—professional services.

Looking at the geographic distribution, more than 60% of small KIBS in a sample are situated in the three, economically most important (metropolitan) regions in the Czech Republic. It means, 30.50% of KIBS is situated in the metropolitan region of Prague city, 22.70% are situated in South Moravian Region with the capital city of Brno and 8,7% are situated in Moravia-Silesia Region with the capital city of Ostrava (see next Figure 2). The rest of KIBS (40%) are situated in non-metropolitan regions. This is not a surprising result and it is consistent with the research results of authors Ženka et al. [17]. They found that KIBS in the Czech Republic is strongly spatially distributed according to the city size and employment potential.

Figure 2. Geographic distribution of the sampled business.

3.2. Variables Definition

3.2.1. Service-Market Development Strategies

Due to the continuous nature of product (service) innovation activities in services [5], rather use dichotomous yes/no response, we adopted existing ordinal scales [6,24,27]. The variable used to measure the service innovations is predominantly based on the scale proposed by Avlonitis et al. [27]: (1) the service was totally new to the company, (2) the service supplemented an existing company line, (3) the service created a new product line for the company, (4) the service was totally new to the market, (5) the service offered new features towards competition, (6) the service was in response to changing customer purchasing behavior, (7) the service was a modification of existing services, (8) the service was a revision of existing services. This typology reflects a continuum of the range of innovation from discontinuous (radical) innovation to continuous (incremental) innovation. Using a five-point scale (1: Strongly disagree, 5: Strongly agree), respondents were asked to indicate their degree of agreement with each service innovation items/statements implemented in the last five years.

Market development strategies indicated the strategic importance of market creation or expansion [32]. Respondents were asked to indicate their degree of agreement of four strategic objectives: (1) existing service targeted into new markets, (2) the company entered a new market for the first time, (3) the company extended the current market, (4) the searching for niche or specialized markets. Using a five-point scale (1: Strongly disagree, 5: Strongly agree), respondents were asked to indicate their degree of agreement with each market development items/statements implemented in the last five years.

3.2.2. Organizational Changes

Technology adoption explained by the ICT technologies is used predominantly with product (service) innovation, particularly delivery/operational processes [6,27,29]. Because empirical results suggest, that not all KIBS may introduce service innovations with the use of any (new or significantly improvement) technologies [11,49], we decided to take the technology variable as a separate item. We incorporated the technology adoption items such as software, hardware, and other ICT technology. These items were constructed on Likert-scale measure (1: Strongly disagree, 5: Strongly agree).

Marketing actions involving significant changes in design, placement, promotion, pricing activities [34]. We incorporated six items: (1) change in the current customer segments (2) change in company and product presentation, (3) introduction of a new distribution channels, (4) introduction of a new pricing policy of service offered, (5) change in communication with customers, (6) change in brand of services offered. Using a five-point scale, respondents were asked to indicate their degree of agreement with each service innovativeness items/statements (1: Strongly disagree, 5: Strongly agree).

Human development strategies reflected the strategic importance placed on recruiting knowledgeable employees, training existing employees, and developing functionally diverse teams [32]. However, we incorporated changes associate with HRM system: (1) change in the overall HRM system, (2) change in leadership style, (3) change in goal setting, (4) change in the reward and motivation system, (5) change in education and training system, (6) change in carrier growth and development of staff, (7) change in staff straining and satisfaction, (8) change in work flexibility, (9) work-load changes, (10) attract and retain new knowledge employees, (11) developing functionally diverse teams. All these items were constructed as the mean of questions on Likert-scale measure (1: Strongly disagree, 5: Strongly agree).

Driving on strategic change literature, changes in organizational structure include: (1) change in ownership, (2) change in decentralization level, (3) change in a functional area, department, or division, (4) change in managing staff number, (5) change of operational-level staff number, (6) change in step count in operation processes. All these items were constructed as the mean of questions on Likert-scale measure (1: Strongly disagree, 5: Strongly agree).

3.2.3. Business Performance

The business performance has been consistently reported as a multidimensional construct [2,27,42]. Further, many researchers in SMEs and service literature, recommend the use of a combination of both financial and non-financial parameters, based on the subjective opinion of respondents. Therefore, overall business performance of KIBS was measured through the construction of a Likert-type summated scale including twelve items drawing on modified complex organizational effectiveness model from Rubio and Aragón [43]. The performance construct is based on a subjective assessment of both, financial and non-financial construct measures.

These dimensions were operationalized using 12 items of the three for each dimension: Openness to environment: (1) customer satisfaction, (2) adjustment to the changeable needs of the customers and other stakeholders, (3) improved image of the company towards public/private sector, rational goals and profit: (1) profitability, (2) productivity, (3) staff team performance, the internal process model: (1) coordination of internal processes, (2) organization of the personnel´s task, (3) quality of service offered and human relation model: (1) internal communication, (2) employee´s motivation, (3) labour absenteeism. Using a five-point scale, respondents were asked to indicate their level of performance within each item/statements (1 = significant improvement, 5 = significant impairment).

3.3. Methods

Firstly, we used exploratory factor analysis with Varimax rotation. For each factor, the specific formula was created due calculation of loadings of variables, mentioned in the component matrix. These loadings were changed on a given proportion to reach sum equal to 1. In that case, all gained recalculated values represents the weight of the variable of the factor. Relevant variables, satiating observed factors were chosen for next steps. If any variables are not satiating, they were excluded. Also, there were excluded two variables, which saturate any factor but only a single item. Nine items with weak loading value (under 0.5) were excluded (see Table 2).

Table 2. Excluded items from the factor analysis.

	Item
A single item in factor	The service was a modification of existing services The company entered a new market for the first time
Not satiating	The service was totally new to the market Existing service targeted into new markets, Changes in flexible work Workload changes The service offered new features towards competition The service was in response to changing customer purchasing behavior Change in the brand of services offered Attract and retain new knowledge employees Developing functionally diverse teams

Secondly, to explore the possibility that different types of sustainable development strategies exist, a hierarchical cluster analysis was performed. Also, there is no referent pattern anchored to a criterion such as performance; from this perspective, different internally consistent patterns may thus be equally effective a priori.

Thirdly, numerical taxonomic methods such as the cluster analysis method employed in the present study are the appropriate statistical techniques for identifying gestalts [22]. One-way analysis of variance (ANOVA) was used to evaluate the equality of variable means across the clusters and thus assess the distinctiveness of each derived cluster to the original factors.

4. Results

An examination of the correlation matrix of the twenty-five items of development scenario suggested a considerable amount of interrelationship among them. Thus, it felt reasonable to expect that these items could be reduced to a more manageable set of development dimensions. We used exploratory factor analysis to reduce the number of variables for an explanation of sustainable development strategies adopted by KIBS. The examination of output variables in terms of development strategies is based on Sum Factors as the average score of multi-item scales.

In evaluating the exploratory factor analysis, several criteria are used the total variance explained (≥0.50), the factor loading (≥0.50) and the internal consistency was measured with Cronbach's alpha giving results above the critical limit of 0.60. As can be seen from Table 2, the pattern of loadings suggests that the five-factor resolution which together explained 70, 94% of the variance with eigenvalue. The result of the Kaiser–Meyer–Olkin (KMO) index of sampling adequacy is above the recommended cut-off point of 0.50 (0.766), corroborating that the sample is factorable. Significance of factor analysis is declared by Bartlett's test within 0.000 value, which confirm adequate usage. The results of the reliability test (Cronbach's alpha) confirming that the construct extracted from the factor analysis is internally consistent across items to measure the underlying concept under evaluation.

Table 3 shows the final result of factor analyses. The result shows four strategic actions in the form of service innovativeness divided into newness service to the company and more evolutionary nature in terms of reposition of existing services, delivery and marketing process, changes in HRM and features of organizing. The first factor (F1) represents a conceptualization of human resources that emphasize on adaptation, improvement, and change in management systems such as leadership style, reward and motivation system, education, or staff training. The second factor (F2) represents the technological newness of the service's delivery process and its subsequent newness to the customer and marketing process to the company. It includes such kinds of parameters, which support changes in specific marketing activities, which companies have to realize on the way to meets customers' requirements and flexibility to adjust to the changeable needs of the customers.

Table 3. Principal Component Analysis with VARIMAX Rotation.

	Item	Loading	Cronbach
Human resource management (F1)	The development requires a change in the overall HRM system	0.13945	0.902
	The development required the change in leadership style	0.14246	
	The development required the change in goal setting	0.13644	
	The development requires a change in the reward and motivation system	0.13429	
	The development required the change in education and training system	0.15986	
	The development required the change in carrier growth and development of staff	0.16158	
	The development required the change in staff straining and satisfaction	0.12591	
Delivery and marketing process (F2)	The development required the change in the customer segment	0.21597	0.791
	The development required the change in product presentation	0.01638	
	The development required the change in distribution channels	0.29887	
	The development required the change in communication with the customer	−0.22927	
	The development required the installation of new SW	0.20061	
	The development was supported by new IS/IT	−0.03889	
Service innovation (F3)	The service was totally new to the company	0.15915	0.789
	The service supplemented an existing company line	0.22944	
	The service created a new product line	0.24668	
	The service requires the installation of new HW	0.36472	
Service repositioning (F4)	The service was a revision of existing services	0.41129	0.698
	The company extended the current market	−0.34274	
	The development requires searching for niche or specialized markets	−0.24597	
Organizational structure (F5)	The development required the change in decentralization level	0.24148	0.780
	The development required the change in a functional area, department, or division	0.21241	
	The development required the change in managing staff number	0.16657	
	The development required the change of operational-level staff number	0.16210	
	The development required the change in step count in operation processes	0.21744	

The third factor represents (F3) service is focused on parameters, reflecting innovativeness of services to the firm involving more radical form in terms of supplements and new product line within existing services based on changes in HW technology. The fourth factor (F4) reflecting innovativeness of services involving the least innovative form in terms of revision i.e., slight renewal without incurring high costs. This helps to modify the evaluation of target market with present service offer. The fundamental of the factor is stabilized the market position in the current market instead of expanding to a new one. Last factor (F5) consists of parameters, which develop internal situations in company organization. These parameters support processes of decentralization of adequate competencies to individual managerial levels and employees, especially in operational management level. Parameters with negative values have a bad influence on the whole factor and decrease the total value for the company.

As most appropriate to examine alignment from a configurational perspective, the cluster analysis technique was used to test the research questions of the study [22]. This approach aims to group KIBS into clusters such that each cluster's membership is highly homogeneous concerning certain attributes. Here, the clustering variables are the five factors as components of alignment. To explore the possibility that different types of sustainable development adopted by KIBS exist, a hierarchical cluster analysis (Ward´s method) was performed in the 128 cases.

Three-cluster solution was found to be most parsimonious in identifying groups of firms that could be clearly distinguished from one another, based on a meaningful pattern of relationships among the clustering variables. The 3 solutions were considered as the most acceptable one based on maximum external isolation and internal cohesion, and parsimony of explanation. Clusters means were found significantly different on all SUM factors at the 0.000 level of significance based on one-way analysis variance (see Table 4).

Table 4. Factor´s mean and verification of observed factors in connection to clusters [1].

Factors	ANOVA		Means		
	Value	Sign.	Cluster 1	Cluster 2	Cluster 3
Human resource management (F1)	74,599	0,000	**4,470**	3,701	(2,804)
Delivery and marketing process (F2)	16,168	0,000	**1,983**	1,491	(1,417)
Service innovation (F3)	67,616	0,049	**3,808**	2,506	(2,042)
Service repositioning (F4)	3,096	0,000	(0,471)	0,622	**0,720**
Organizational structure (F5)	21,071	0,000	**2,932**	2,501	(2,290)

[1] Figures represent mean values in each cluster. Maximum values are in bold while minimum values are in parentheses.

As Table 3 shows, Cluster 1 is represented by KIBS preferring a repositioning of existing (revised) services to specialized niche markets (33,6%), cluster 2 includes KIBS combines elements of conservative items (service repositioning) and innovators (new service development) (42,2%) and finally, cluster 3 contains KIBS following a new service development strategy (24,2%) supported by changes in marketing and delivery process to customers and organizing resources and capabilities inside of the company.

There is also the question of ascertaining if certain strategic alignment, among the five factors, is associated with different business outcomes/performance. Thus, one-way ANOVAs were used to test for performance differences across the three groups of KIBS. As Table 5 shows, each type of identified types is associated with different performance outcomes. These findings answer the second research question pertaining to performance outcomes. In other words, strategic actions in terms of service innovation and organizational change and their alignment leading to firm performance in the KIBS sector. As [27] suggest, the analysis of the processes underlying the implementation of strategic actions is critical to understand the trade-offs between resource allocation and strategic actions, and the subsequent change in the organization's output portfolio. The results of ANOVA test in connection

to performance variables (Table 5) confirm hypotheses H1–H4 except particular junction of Labor absenteeism and defined clusters, where is hypothesis rejected.

Table 5. ANOVA test and descriptive for observed clusters and performance variables [1].

		Conservatives (33.6%)	Middle Range (42.2%)	Innovators (24.2%)	F	Sign.
Openness to Environment	Customer satisfaction	**2.53**	2.07	(1.94)	17.342	0.000
	Adjustment to the changeable needs of the customers and other stakeholders	**2.81**	2.24	(2.10)	14.176	0.000
	Improved image of the company towards public/private sector	**2.67**	2.09	(1.77)	19.342	0.000
Rational Goals and Profit	Profitability	**3.07**	2.65	(2.26)	9.549	0.000
	Productivity	**2.72**	(2.35)	(2.35)	5.485	0.005
	Staff teams performance	**2.77**	2.35	(2.16)	13.593	0.000
Internal Processes	Coordination of internal processes	**2.72**	2.30	(2.00)	18.121	0.000
	Organization of the personnel´s task	**2.67**	2.17	(1.84)	28.652	0.000
	Quality of service offered	**2.58**	1.91	(1.84)	30.070	0.000
Human Resources	Internal communication	**2.95**	2.65	(2.48)	7.544	0.001
	Employee´s motivation	**2.88**	2.56	(2.32)	8.341	0.000
	Labor absenteeism	**2.98**	**2.98**	(2.94)	0.120	0.887

[1] Figures represent mean values in each cluster. Maximum values are in bold while minimum values are in parentheses.

Firstly, ICT companies (J62, J63) are distributed in clusters with the greatest presence in cluster 2 and 3. As subsector, ICT services are realized by the most innovative companies according to KIBS sector. Secondly, professional companies such as accounting and management consulting companies (section M69, M70) are mainly found in Cluster 1. Surprising is, that architectural and engineering companies (M71) and R&D companies (M72) have the greatest presence in Cluster 1. These companies represent the largest share of conservative companies or non-innovators in KIBS sector. Finally, professional companies such as advertising and market research and other business activities (M73, M74) are distributed equally in clusters 2 and 3. It can be observed in Table 6, that companies of different subsectors are well distributed across the various clusters. In other words, no cluster can be identified on the basis of the sector to which companies typically belong. According to whole KIBS, companies in t-KIBS realised more innovations in comparisons to the p-KIBS companies in the sample.

Table 6. The cluster membership of KIBS across NACE Rev. 2 classification.

CZ-NACE		Total	Cluster Membership			KIBS
			Conservatives	Middle Range	Innovators	
Section J	62	37	2	18	17	t
	63	3	0	1	2	t
Section M	69	19	12	7	0	p
	70	7	4	2	1	p
	71	40	22	16	2	t
	72	4	2	1	1	t
	73	11	0	6	5	p
	74	7	1	3	3	p
TOTAL		128	43	54	31	

5. Discussion

In a current competitive and dynamic environment, implementation of strategic actions and subsequent organizational change to sustain future development and growth have become one of the most representative outcomes of the development efforts carried out by KIBS. However, the

nature of services outputs brings difficulties in identifying and measuring these actions and activities. The services are more immediately perishable, inseparable and tend to be more heterogeneous, than manufactured products; they are fundamentally different, and in ways that make them harder to identify and measure [43]. The KIBS have been generally intended as a homogeneous category and much attention has been paid to differentiating innovative approaches in the manufacturing sector and emphasizing the peculiarity of KIBS among tertiary activities, such a perspective neglects the remarkable heterogeneity within this same largely defined KIBS category [6].

The present study attempts to develop an empirically-based typology of strategic actions i.e., development patterns for small enterprises from the KIBS sector in the Czech Republic in the last five years. Based on five types of strategic actions such as product (service) innovation, market development, delivery, and marketing processes and changes in HRM and organizational structure, we found three clusters of KIBS which are associated with different performance outcomes. Grouping firms with the most conservative approach to innovation is taken as the base case, so the variables for other clusters should be interpreted with this benchmark. The following text describes the founded groups of small companies from the KIBS sector more in detail.

5.1. Conservative KIBS

The first cluster and the least innovative type of KIBS dominate, in comparison to other types, by extension of current markets through a repositioning of existing revised services. This type of service innovativeness is the least innovative one [27], including incremental innovations in terms of revision of existing services that do not require higher costs. This cluster of conservative KIBS have been identified throughout European studies (see [6,50]). Conservative KIBS in the present study, search for niche markets, where they can offer distinct advantages and can avoid having to compete solely on cost against larger enterprises. In terms of service repositioning strategy, this type of service does not implement more visible marketing efforts. The organizational changes inside the organization do not occur or remain at the same level in all areas. Compared to other types of KIBS, this group of companies has implemented many changes in the HRM in the last five years.

Conservative KIBS generally show a lower level of both financial and non-financial performance compared to the other types of KIBS identified in this study (supports H9). In the area of financial performance, they have shown a decrease in profitability in the last five years. This type of KIBS is in recent days probably rely upon established reputation and/or economic upturn [27].

5.2. Innovating KIBS

A product (service) innovations in this cluster focusing mainly on complements or line extension of existing services to current markets to improve a company's positioning. This is the second most innovative type of new services (after the newness of services to market), namely, "new-to-the-company services" [27]. Further, the results appear consistent with those of [11,30], who identified technology as a factor reflecting companies' orientation towards product and process innovations. These companies have implemented more (radical) changes in technology and the organization's internal environment. Innovating KIBS implemented changes in organizing of resources and internal processes. The supplementary services and line extension have created a need for changes in the breakdown of functional areas or teams specializing in the area, including changes in senior and operational staff. However, they implemented rather moderate changes in marketing actions such as distribution channels and presentation of products. The KIBS in this cluster compared to other types of KIBS are more capable of making changes in HRM (particularly in the field of reward and motivation systems) reflected in higher employee motivation and staff team performance.

They show improvement in two parameters of internal processes such as the organization of the personals tasks and quality of service offered. This cluster contains KIBS dominating, in comparison to other types, change efforts in delivery and marketing processes. Implementation of new or improvement delivery process based on technology aims to either decrease unit costs of delivery or to

increase the quality of the service [6]. This third, the most innovative type, have the most important contribution in terms of financial performance, and particularly the profitability [27].

Generally, innovating KIBS outperform other types of KIBS in all financial and non-financial parameters. The KIBS implemented service innovations, are associated with how services are provided and organized, and in turn affects the relation with users in terms of customer satisfaction [6]. In our study, the innovative KIBS make the strongest contribution to non-financial performance, particularly company image (rejects H10). This is in line with research results of Avlonitis et al. [27] suggested that the most important contribution of this kind of services is the impact that it can bear on the company's overall image. The intangibility inherent in most services entails considerable uncertainties and risk to customers. Having developed a good image in the eyes of the customer helps minimize the risk associated with the new offering and emphasizes its ability to offer a particular service or its ability to offer an improved service. Innovating KIBS combining innovation strategies and subsequent organizational changes associated with higher levels of performance compared to other types. The research study of Martin-Rios et al., [28] confirm that service firms adopting more complex strategies could obtain higher rates of firm performance.

5.3. Middle Range KIBS

The third cluster has a specific middle-range position because this type of KIBS is a combination of factor parameters from cluster 1 and cluster 3 in equal size. They show a growth improvement particular in two parameters and that is customer satisfaction and improved quality of services offered. This type of KIBS implemented complementary services to the existing one as a product offering of the company to improve the quality of services. This is a traditional strategy of services in current time in terms of comprehensiveness of services or "more services under one roof". The customer is not forced to search for other services, but they are offered comprehensive services to solve their existing needs. This stops customers from looking for, or even buying competitive offerings [27].

The middle range position of KIBS extended current markets by searching for special niche markets also. This is very similar to cluster 1 (conservative KIBS). They focus on existing niches fostered the commercialization of incremental innovations [32]. They can offer new services in existing markets to improve a company's positioning [31], so they can deliver high-quality products to improve customer satisfaction. They also show efforts to improve the service delivery process. However, they implemented rather moderate changes in the organization's internal environment, mainly hired staff at the operational level and implemented slightly improvements in internal processes.

Middle range KIBS outperform conservative KIBS, however, they exhibit lower performance compare to innovating KIBS, excepting productivity, which has the same level. The biggest difference is in the level of profitability. Both middle-range and innovative KIBS are highly customer-oriented.

6. Conclusions

Sustainability assessment of service sector cannot be ignored due to the increasing contribution of the service sector to the global economy. This research study lends insights into the use of subjective financial and non-financial business performance as the ability measure of KIBS's sustainable development. This study shows the potential strategy development of KIBS that is heterogeneous across firms, similarly to other studies [6,27,48]. Also, cluster membership is found to be associated with different performance outcomes [27].

Generally, we didn't identify the most radical form of service innovativeness in terms "newness of services to the market" [27] in the KIBS sector operating in the Czech Republic. One reason may be the fact that KIBS in our sample is rather small in size (10–49 employees). This is not surprising, because this radical form of product innovation is typical for medium and large-scale (foreign-owned) companies. None of the companies entered a brand new market or change the focus on the customer segment. They extended the current markets through service repositioning of existing or revised services to the niche markets or penetrate current markets through line extension and supplements to

create a stronger position to the market. One possible explanation may be that the more radical service innovations, which are untested and bringing into the new markets are a very risky strategy [33]. Some innovation activities are aimed at innovations are created in adapting the services to the users' needs, which might in itself be considered a form of innovation, which is often under the protection of the contract between the service provider and the customer. This may be a barrier to distributing and delivering service innovation to foreign markets as well.

The new or improved delivery process efforts exist in all type of analyzed KIBS. User participation in the process of production and delivery, often overlapping with consumption itself, generally, the most debated and distinguishing characteristic of services and appears all the more relevant in the case of knowledge-intensive services [6]. There exists a tension between the pressure to reduce the production costs of services, which leads firms to look for increasing standardization, and the need to meet specific user requirements, which, on the contrary, force firms to seek a high degree of customization in their products.

Most of KIBS firms have both science and engineering and other graduates on their payrolls. Some firms are highly specialized, while others that are nominally in the same sector are much more broadly focused [50]. It is therefore very surprising to find that the knowledge capital embodied in the human resources of small KIBS in the Czech Republic has not undergone more pronounced changes in the last five years. This is a similar result with Corrocher et al. [6], who found a rather conservative attitude of KIBS not inclined to hire new personnel and more stimulated human resources to engage in training programs to update their competencies with focusing on product innovation.

Finally, this study suggests that the most innovative KIBS make the strongest contribution to non-financial performance, i.e., company image, building customer satisfaction, increasing quality of services and so on. Although this conclusion is somehow tentative, as its deeper investigation was beyond the scope of this study, it provides the management of companies in the service sector with an initial basis for achieving a match between financial performance objectives and new services development strategy.

6.1. Practical Implications

Apart from academic use, the classification and positioning of the growing number of studies in this field will help practitioners develop a comprehensive understanding of the strategic importance of sustainability issues in different ways [2,51,52]. At a public policy level, the results of this study give ideas for encouraging strategy development of KIBS. This study suggests, that there is a different development scenario within the KIBS sector. It should be acknowledged that small enterprises comprise several divergent target groups, and the diversity of development patterns suggests that diversity should also direct the policies aiming at supporting development in these small enterprises (e.g., Mol, Brandl [53] or Desmarchelier, Djellal, Gallouj [54]). Based on the evidence of this study, the smallest companies operating under sector "KIBS" do not develop radical innovations and it is necessary to make greater efforts to foster the development of incremental innovations.

A second contribution for practitioners lies in the relationship between the degree of innovativeness of the new service and its performance. That is, the least innovative new services (revision or repositioning existing services) are relatively less successful in terms of financial performance compared to the moderately innovative types of new delivery processes and service line extension.

6.2. Limitations and Further Research

Further in-depth research is required with control variables such as age of company or localization characteristics. We also didn't incorporate other important dimensions of development activities such as relational or network activities as a part of learning and knowledge process as well as other organizational innovations (see [6,11]). External relationship development and innovations, the establishment of relationships with partners and a subset of organizational innovation, has been developed especially for services [47]. Service firms are more likely to engage in collaborations with

customers and suppliers as part of their innovation process [7]. Customers, suppliers, and competitors are major sources, while partners such as franchises or professional associations are another [11]. Customer and supplier relationship development allows SMEs to maximize the use of their limited resources [4,55]. Developing such partnerships can provide them with opportunities to acquire new skills and improve existing ones. This also allows them to pursue cooperative joint ventures as a means of sharing the risk [50,56].

The research carried out on a sample that is rather small in size or the range corresponding to the lower limit of usability of some suitable tools. From this point of view, the theoretical possibility is to be increased by another KIBS category sample research or at least to obtain a uniform representation of each of the sections, which was distorted by the representation of the two largest sample groups (ICT and architectural and engineering services) to validate the results. All obtained results could not be generalized to wider population of KIBS companies in the Czech Republic. The study has been conducted in a specific national context of the Czech Republic. It would be interesting to extend the analysis to other countries to identify the patterns of KIBS which are either country-specific or generalizable.

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