Knowledge Sharing Barriers in the Educational Program Management Administrative Processes: A Case of a Bachelor Program in a Russian University

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Abstract: This article presents the results of the qualitative stage of the research of information technology based, organizational management based and organizational economics based knowledge sharing barriers in administrative subdivisions of higher education institutions. The objects of the qualitative research are the employees of the subdivisions taking part in the administrative processes of managing a particular Bachelor level educational program in one of the leading Russian universities. A research methodology of the qualitative research implies unstructured in-depth interviews with the employees of the involved subdivisions, from which interviews the constructs depicting the respondents' perception of knowledge sharing barriers the respondents face in their work activities are evaluated. On the basis of these constructs, practical recommendations of both managerial and technological nature regarding minimizing the effect of the revealed knowledge sharing barriers are developed; possible further research development directions are also suggested.

Keywords: knowledge sharing, knowledge sharing barriers, educational management, educational institutions' administrative processes.

1. Introduction

The notion of knowledge sharing barriers, i.e., the factors of a different nature hampering the processes of knowledge sharing, is a rather popular object of research in knowledge sharing studies, themselves being one of the most developed research areas in the wider knowledge management research sphere,

Among different industries researched in knowledge sharing barriers studies, the educational sphere, and higher education in particular, seem to be a specifically interesting research object due to their organizational culture being highly tolerant to knowledge sharing (Fullwood, Rowley and Delbridge, 2013), thus mitigating the influence of various knowledge sharing barriers typical for other industries.

However, evidence of higher educational institutions' organizational culture high tolerance to knowledge sharing is mainly based on researching the departments and employees involved in fundamental and applied research or teaching activities. Although for such departments and employees such high tolerance and resulting high levels of knowledge sharing activities are rather obvious, it can be different for those higher educational institutions' departments or specific employees involved not in research or teaching activities, but in purely administrative work that is not as knowledge intensive as scientific research or teaching the students, and thus can be associated with higher knowledge sharing barriers.

Thus, the aim of the study described in this paper is to study the knowledge sharing barriers in the administrative subdivisions of the higher educational institutions.

As the administrative subdivisions previously hadn't been a specific research object in the knowledge sharing barriers literature, the methodology of the study is qualitative, with the employees of administrative subdivisions of one of the leading Russian universities (later in the text, "University"), involved in the administrative processes of a particular Bachelor level educational program (later in the text, "Program"), giving unstructured interviews, the constructs of which are then compared for commonalities depicting the factors, perceived by respondents as significant knowledge sharing barriers. On the basis of these obtained barrier perceptions, recommendations regarding mitigating knowledge sharing barriers in the Program are developed, as well as suggestions for possible further research directions.

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2. Literature review

The knowledge sharing barriers notion itself is a rather widely discussed aspect of knowledge management, being a part of a wider "knowledge management barriers" category. Understanding of the fact that various factors of different origin can hamper the knowledge management practices in organizations has been obvious for knowledge management scholars since the earliest stages of development of knowledge management as a separate research field; e.g., in one of the most comprehensive literature reviews on the knowledge sharing barriers presented in Riege (2005), the earliest mentioned papers are dated back to the early 1980's (Katz and Allen, 1982).

Respectively, the research body developed throughout these years, in which such seminal and influential works can be specifically noted, as, e.g., Paulin and Suneson (2012) or Husted and Michailova (2002) has analyzed a great number of barriers, that in general can be classified into three major groups corresponding with three levels of subjects participating in the knowledge management process: individual (related to the psychological traits of individuals taking part in knowledge management processes), organizational (related to organizational structure peculiarities), and technological (related to characteristics of the information technology infrastructure supporting knowledge management processes) (Riege, 2005).

This classification is further developed in Blagov, Zhukova and Pleshkova (2016), where knowledge sharing barriers are classified into the categories of informational technology based, organizational management based, and organizational economics based. While the first two categories of this classification are similar to the technological and organizational categories of Riege (2005), the latter category is different and thus requiring specific explanation. This category is based on a fact that knowledge (as well as data and information) can be interpreted as an economic resource and a source of economic rents generation for the organization as a whole as well as for different organizational subdivisions and even for specific employees owning this knowledge, information or data. Indeed, if the ownership of rare, valuable, inimitable and non-substitutable resources can be a source of economic rent generation for an organization (Barney, 1991), then, for specific employees of this organization, ownership of resources with such attributes (and there is no doubt that the knowledge resources, related either to professional expertise area or to the political situation within the organization, can have these attributes) can be a reason for intra-organizational rent-seeking behaviour. The subsequences of such behaviour could be related, firstly, to raising the particular employee's position in the organization's informal organizational hierarchy, that is not always working in synergy with the formal hierarchy (Goduscheit and Knudsen, 2015), and secondly, to constraining the rent-generating resources sharing to an extent that can damage the organization's functioning as such (Knudsen 2007).

Considering the industry focus of the existing body of empirical research of knowledge sharing barriers, as the knowledge sharing barriers problem is understood as one of the most important in knowledge management, the scope of industries that have received the attention of knowledge sharing barriers scholars is considerably big; the educational sector as a whole and higher education in particular have also received considerable attention (Cranfield and Taylor, 2008; Chandra, Vashisth and Kumar, 2011; Kumaraswamy and Chitale, 2012).
However, the research focus in most of the works regarding knowledge sharing barriers or other aspects of knowledge sharing in higher education is on researching knowledge sharing between the academic personnel of higher educational institutions, i.e., researchers and professors involved in fundamental and applied research and in teaching. In those papers that include also the administrative personnel in their research object composition (Kumaraswamy and Chitale, 2012), still the knowledge sharing processes between the administrative and the academic personnel is analyzed, while research of barriers in knowledge sharing processes involving the administrative personnel of higher education institutions as part of administrative business processes is a gap in current state of knowledge sharing barriers research. Thus, this paper is oriented to filling this particular research gap.

3. Research design and methodology

Objects of empirical research presented in the paper are employees of administrative sub-departments of the University involved in managing the particular Bachelor level educational program. Namely, employees of such sub-departments participated in the study, as the Program directorate, Program study affairs office, Admissions office, Extra-curriculum affairs department, and the International contacts office.

The University itself is a "classical" type research university consisting of schools and faculties teaching a wide array of humanitarian, social and natural science disciplines, covering a comprehensive line of educational programs of Bachelor, Master, PhD and postgraduate (MBA et al.) levels; the educational program under scrutiny in this paper is provided by one of the schools of humanitarian and social studies.

Considering the University's organizational structure, the main feature of interest for the current study can be suggested to be a dual organizational subordination of the administrative subdivisions involved in managing the educational programs. Namely, such subdivisions are reporting both to the respective academic subdivision (e.g., the program of Bachelor in Physics is subordinate to the Faculty of Physics, the program of Bachelor in Chemistry – to the Faculty of Chemistry, etc.) and to the departments of the University's head office (e.g., the program directions are reporting to the department responsible for the programs content and study plans design, and the Program study affairs offices are reporting to the department responsible for the students support, etc.).

The research methodology can be to some extent assimilated to the principles of grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990), and to some extent – to the principles of case study research (Eisenhardt, 1989; Yin, 1984). Both of these methodological perspectives are oriented towards formulating theory (here, a classification and theoretical scrutiny of the knowledge sharing barriers in the educational program management administrative processes) from empirical data, and in using several stages of formulating generalized constructs from the collected data.

However, the research methodology cannot be called a grounded theory in its pure form, as it is not based on having no previously developed theory at all and developing the very idea about what the constructs would be about via the procedure of "open" or "initial coding", i.e., coding the text presenting the data line by line. Instead of it, the methodology used in the research presented in this paper is based on preconditioned understanding that we are searching for the knowledge sharing barriers, and the procedures of figuring out constructs from the empirically collected data are based on this understanding.

Thus, due to having a priori developed understanding of constructs, the methodology can be assimilated to the case study research as it is described in Eisenhardt (1989), with the exception of not using cross-case comparison highly recommended in Eisenhardt (1989), but considering the constructs for further formulation of variables for a quantitative stage of research suggesting econometric analysis of a sample of multiple higher education organizations.

An appropriate empirical material gathering technique for such methodology and research purpose can be suggested to be a minimally structured interview, guided by a possibly minimal number of interviewer's questions.

The interviews held for the current research can be even called "unstructured", as these interviews have been guided by only one question representing the above-described "preconditioned understanding of what the constructs would be about", asked by the interviewer in the beginning of the interview: "How do you think, what factors are hampering the transfer of necessary knowledge in the usual knowledge sharing processes you are engaged in when taking part in the Program's management?". (This is a translation from the original Russian text; for the original question formulation, as well as the full interview transcripts - both the Russian originals and the English translations - please contact the authors by the contact e-mails).

From the interview transcripts, the concrete formulations of answers to the interviewer's question (e.g., in our case, the "factors hampering the transfer of necessary knowledge", i.e., the knowledge sharing barriers, according to the respondents' subjective perceptions) are evaluated. These answer formulations are more concrete than the unstructured speech of the respondents, but are having individual formulations for each respondent, and thus these answer formulations can be called the "first-level constructs" (further in the text, for the sake of text brevity and ease of reading, also "FLC"), meaning that these formulations are constructed from unstructured interview texts, but can be further generalized by means of comparing commonalities and differences of these formulations between the respondents.

On the basis of the commonalities and differences' comparison, more generalized constructs are formulated, showing common factors perceived as knowledge sharing barriers by different respondents within the sample.

These formulations, that can be compared to the "categories" stage of analysis in the classical grounded theory framework in that they can be used to further generate a theory, can be generalized to a level beyond the specific sample of the current research; due to this qualitative difference from the first-level constructs, these generalized constructs can be called the "second-level constructs" (further in the text, respectively, "SLC").

Finally, the second-level constructs are analyzed with the help of the knowledge sharing barrier classification suggested in Blagov, Zhukova and Pleshkova (2016), allowing theoretical conclusions and practical implications to be made.

According to such research structure, the logic of presenting the interview results in the following Section 4 is designed in the following way.

As the interview texts are unstructured (and, moreover, are in Russian language), the first level of the results suitable for presenting in a text is the FLCs, presented in the table form (later in the text – Table 1, as this table is the first in the text) comparing these FLCs between the respondents.

After the table, the FLCs are compared between the respondents, and on the basis of commonalities between the FLCs, the second-level constructs (SLCs) are formulated and interpreted with the help of the above described knowledge sharing barrier classification. To make the understanding of the second-level constructs easier, a table (further in the text – Table 2) is introduced categorizing these constructs.

4. Results, analysis and discussion

As has been explained above, the presentation of the results begins with Table 1, describing the first-level constructs.

In total, 45 people were asked to undertake the interview. Out of these potential respondents, 9 people participated; the sub-departments in which these respondents are working are named in Table 1.

Table 1: First-level constructs

Respondent number	Administrative subdivision	First-level constructs
1	Program directorate	• 1.1. Hard to gather people from various subdivisions together for a personal meeting. Necessary to implement conference call systems for holding regular meetings involving employees working in geographically disconnected offices. Necessity of using Skype for off-campus show-up of the checked exam tests. • 1.2. When connecting via email, often those addressees to whom the email has to be forwarded are put as main addressees. Thus, it's often hard to find out, which emails are important and which are not. • 1.3. A possibility to edit documents simultaneously by different users would be convenient, for the document versions not to be sent via email. • 1.4. Ambiguous job instructions causing people to not always understand why they should do specific job tasks.
2	Admissions office	• 2.1. Problems with the all-University obligatory electronic document management system: frequent loss of documents due to imperfect documents assortment; no email notifications; processed documents are not deleted; no possibility to work with documents in hindsight. • 2.2. Hierarchical subordination problems: administrative employees don't know exactly whom they shall report to, as lots of functions are not described in University's organization chart and in the job instructions.
3	Program directorate	• 3.1. Problems with the all-University obligatory electronic document management system, in which the documents could be lost after the uploading. • 3.2. Necessity of common knowledge sharing environment on the basis of the Local Area Network or other solution. • 3.3. Implementing an electronic signature with its official recognition would be convenient. • 3.4. Conference calls equipment would be a convenient communication means for minimizing the time costs of travelling between geographically distributed offices.

Respondent number	Administrative subdivision	First-level constructs
4	Extra-curriculum affairs department	• 4.1. Social networks are used for communication with students more often than the University's corporate communication means, that is suboptimal because the communications are not united in one IT system. • 4.2 The all-University obligatory electronic document management system is rather uncomfortable (bad document assortment properties, possibility for the documents to be lost). • 4.3. The deadlines, even if being documentally supported, are badly followed by the employees. • 4.4. The superiors are also sometimes not following the agreements reached in insufficiently documented telephone negotiations.
5	Program study affairs office	• 5.1. The students are not always checking their corporate emails, and the communications via the social networks don't have the official documents status. • 5.2. The information entered into the all-University obligatory electronic document management system manually cannot be further used due to the lack of access.
6	Program study affairs office	• 6.1. The respondent is subordinate to a superior residing in a geographically disconnected facility, thus hard to communicate operatively; one of the solutions for this problem could be an introduction of an electronic signature system. • 6.2. It is hard to download the documents from the all-University obligatory electronic document management system.
7	International contacts office	• 7.1. Preparing the documents via the all-University obligatory electronic document management system is too time-consuming, thus the documents not requiring the senior management participation are prepared using the e-mail communication. • 7.2. International contacts office, the Bachelor program directorate and the Masters program directorate use different document management systems for the same processes (e.g., students enrolling to the elective courses), thus increasing time costs of these processes. • 7.3. Official recognition of electronic signatures would be a convenient thing for saving time. • 7.4. Also time could be saved by implementing any type of conference calls system.
8	Program study affairs office	• 8.1. Communications between different departments too often taking place between the department heads, thus significantly slowing the processes. • 8.2. While developing the supporting IT systems, the direct users' opinions are not taken into account, and thus the systems don't perform all the functions direct users need (e.g., hard to obtain necessary information from the systems).
9	Program directorate	• 9.1. The hierarchical subordination system (e.g., who does report to whom) changes rather often (e.g., from academic year to academic year or even from semester to semester) even within the same business processes. • 9.2. Unclear job instructions system (leading to the same problem of not knowing who does report to whom and what knowledge is necessary leading to the fact that employees often do the things they don't have to or don't do the things they have to). • 9.3. Nearly absent integration between document management systems used by different subdivisions. • 9.4. No possibility to edit the documents online by several users simultaneously, being able to see who is doing what in editing the document. • 9.5. Lack of documental proof of oral or telephone agreements, thus need to transfer most of the requests to the electronic system in which the requests can be saved.

Having been presented in a comparative table, the first-level constructs derived from the interviews need to be analyzed for formulating more generalized, "second-level" constructs. Interpreting the second-level constructs with the help of knowledge sharing barrier classification of Blagov, Zhukova and Pleshkova (2016), the following peculiarities of these constructs can be named.

Most of the constructs fall into two categories, namely, depicting barriers related to mainly technical aspects of the IT infrastructure supporting the business processes of the Program's management, and depicting the barriers related to its organizational and managerial aspects. According to the abovementioned knowledge sharing barrier classification, these two categories can be related to the, respectively, "information technology based" and "organizational management based" barrier categories (for the sake of formulations brevity, shorter forms "technological" and "organizational" would be further used in the text for these categories in relation to the constructs derived from the respondents' answers).

Already having mentioned technological barriers in the first place, and organizational barriers in the second, it is logical to begin analyzing the barriers depicted by the FLCs in the respective order.

4.1 Technological barriers

Comparing the number of first-level constructs dedicated to technological barriers, the most popular type of constructs (namely, 2.1, 3.1, 5.2, 6.2, 7.1 and 8.2) appear to mention the all-University obligatory electronic document management system, used by all the subdivisions in their communications with the University's head office. Looking for the commonalities between the constructs mentioning this system, such a main problem of this system can be interpreted as a knowledge sharing barrier as the **possibility of the loss of documents** that have been entered into the system by a user after editing.

Regarding other IT systems used by the respondents in the Program management processes, maybe the most important second-level construct could be based on such FLCs as 4.1, 5.1, 7.2 and 9.3; a common formulation for these constructs could be formulated as **low compatibility of document management systems used by different subdivisions**, hampering the knowledge sharing processes between these subdivisions or increasing time costs for these processes.

A considerably interesting common topic can be found comparing the FLCs 1.3, 3.2, 9.4, and 9.5: it can be said that these constructs reveal perceived necessity of introduction of a corporate intranet system with the possibility of simultaneous document editing by different users into the IT support of the Program's management. As such a system does not exist now, and as the second-level constructs are, according to the methodology of the research, formulated in this paper as (subjectively perceived) knowledge sharing barriers, the second-level construct on the basis of this common perception can be formulated as the **absence of possibility of simultaneous document editing by different users**.

In addition to this second-level construct, two more SLCs of technical nature can be inferred from the FLCs in Table 1.

One of such second-level constructs can be formulated on the basis of the FLCs 1.1, 3.4, and 7.4. A commonality between these FLCs formulated as a "barrier", i.e., as a negative factor hampering the knowledge sharing processes, is an **absence of conference calls equipment**, being a barrier due to hampering communication between employees in different buildings or geographically disconnected offices. This construct can be called probably the most organization-specific, as it reflects the comparatively recent changes in the geographical location of the particular Program that has moved to a new building relatively far from the administration of the University.
Another second-level construct depicting technological knowledge sharing barriers perceived by the respondents can be deduced from the FLCs 3.3, 6.1 and 7.3, depicting necessity of official electronic signatures recognition. Reformulating this necessity as a barrier, this SLC can be called **absence of official recognition of electronic signature**.

Comparing the resulting second-level constructs depicting technical knowledge sharing barriers, it can be noticed that none of these barriers are purely based on technical parameters of the IT systems supporting the Program's management, but are rather based on factors of organizational nature.

Indeed, the second-level constructs depicting the organizational knowledge sharing barriers, discussed in the subsection 4.2, can be interpreted as some of the causes of the technological barriers described above.

Such dependence of organizational barriers from the technological ones corresponds to a large portion of literature about knowledge sharing barriers, stating that the barriers of organizational and managerial nature occur prior to the barriers of a technological nature, meaning that purely technological barriers without organizational and managerial causes are rather a rare thing (Riege, 2005; Chandra, Vashisth and Kumar, 2011).

Thus, the order of presenting the suggested recommendations of mitigating the barriers' influence in Section 5 is different from the order of discussing the barriers themselves in Section 4, in that Section 5 begins with recommendations regarding the organizational barriers, because measures designed to lower the organizational barriers could, under such logic, be able to, respectively, lower the barriers of other types.

4.2 Organizational barriers

If beginning the organizational barrier second-level constructs formulation, analogously to subsection 4.1, from the most widespread commonalities between the FLCs, the first SLC could be uniting the first-level constructs 1.4, 4.3, 4.4, 6.1, 8.1, 9.1, and 9.2. The commonality between these constructs is that these are united by notions of **ambiguous subordination structure** and **ambiguous job instructions**, to a large extent interrelated and thus able to be treated as one second-level construct.

The main relationship between subordination and job instructions ambiguity is the following. As has been described in the beginning of Section 3, administrative personnel involved in the Program's management is subject to dual organizational subordination, firstly to the respective academic subdivision, and secondly, to the departments of the University's head office. Such dual subordination can generate necessity to reconcile mutually exclusive orders and instructions from both types of governing bodies leading to the job tasks content and priority ambiguity.

A related problem is the rather frequent rate of organizational changes in the University's organizational structure and the University's and the Program's business process architecture, with most of the processes experiencing change each academic year. Thus, when addressing the colleagues (or other employees in the same positions) who have been responsible for particular operations and thus had access to particular knowledge a year ago, the knowledge requesters can face answers that the respondents are not responsible for this operation and don't have access to this knowledge. Moreover, due to the organizational changes' frequency, sometimes there cannot be enough time to work out new job instructions on an appropriately detailed level, leading to ambiguity about what employee or even subdivision is responsible for what operations.

These problems are depicted in the FLCs 1.4, 2.2, 9.1, 9.2, on the basis of which the second-level construct of **lack of understanding of what employee has what knowledge** can be formulated.

Job tasks ambiguity has received considerable attention in management literature as a factor demotivating the employees, who in this case lack knowledge of what remuneration follows what activities (Husted and Michailova, 2002). Among the first-level constructs of Table 1, such an idea is depicted in the constructs 1.4, 2.2, 9.2; in the generalized second-level construct form, this idea can be formulated as a **lack of motivation to share knowledge as activities not included into the regular job duties**. Although these SLC are undoubtedly representing organizational barriers, it can also be suggested that the notion of reluctance to share knowledge due to absence of such tasks in regular job duties is relative to the organization economics based notion of reluctance to share knowledge due to perceiving it as personal resource increasing bargaining power within the organizational formal and informal hierarchy. It can be suggested, that the factor of absence of knowledge sharing tasks in regular job duties can be increasing negative influence of bargaining power logic related to reluctance to share knowledge on sharing activities. Vice versa, this reluctance can be increasing negative influence of lack of motivation to share due to absence of sharing in the regular job duties.

A specific problem of **excessive communication processes centralization** is described in one of the first-level constructs (FLC 8.1); according to Husted and Michailova (2002), such a problem can be a significant knowledge sharing barrier in organizations, so, although it was mentioned only by one respondent, this problem is worth being transferred into a specific second-level construct as needing attention in the organizational context under scrutiny.

Returning to the notion of organizational knowledge sharing barriers influence on the technological ones, this SLC can be connected to problems revealed in second-level constructs of **low compatibility of document management systems used by different subdivisions** and **possibility of loss of documents in the all-University obligatory document management system**. Indeed, there is evidence in literature of existing linkages between communications centralization and a low level of attention to compatibility between IT infrastructure of the specific subdivisions of big organizations, especially in functional organizational structures, that is a dominant organizational structuration logic in both vertical hierarchies (academic and administrative) of the Program management administrators' dual subordination (Knudsen, 2007).

Another direction of organizational factors' influence on technological barriers can be a probable positive dependence between the level of organizational structure centralization and the prevalence of attention to head office requests to specific requests of subdivisions in the supporting IT infrastructure design, that can be supposed to be one of the causes of such technological barriers, as **absence of possibility of simultaneous document editing by different users**, **absence of conference calls equipment** and the **absence of official recognition of electronic signature**.

To sum up, organizational barriers influence on technological ones (as well as the direct organizational barriers influence on the knowledge sharing processes) can be to a large extent traced to typical functional organizational structure traits both of the "academic" and the "administrative" vertical hierarchies, namely, the excessive predominance of vertical communications over horizontal and the lack of decision making delegation to the operative personnel level.

A more specific trait of the researched organization is excessive looseness of the administrative personnel regular job descriptions, that in combination with the abovementioned functional structure traits can decrease the employees' motivation toward proactive work activities, including knowledge sharing, due to lack of understanding of what activities would be followed by remuneration, and what activities could be punished for authority exceeding.

4.3 Organizational economics based barriers

Regarding the "organization economics based" knowledge sharing barriers category, none of either the first- or second-level constructs can be purely attributed to any of these categories without having close connection to either technological or organizational barriers. Thus, no new second-level constructs could be introduced in this subsection; however, elements of that category can be found in at least one of the SLCs discussed among the organizational barriers.

Namely, such second-level construct, that can be interpreted as analyzing not only organizational, but also individual or organizational economics based barriers, is **lack of motivation to share knowledge as activities not included into the regular job duties.** Indeed, if the knowledge is perceived by its holder as a resource with a rent generation potential, then the knowledge holder would have motivation to share this knowledge only if they are confident that the remuneration for this knowledge sharing would exceed the potential threats of jeopardizing it as a resource (Goduscheit and Knudsen, 2015). If the senior management of the organization does not demonstrate that knowledge sharing activities could be remunerated, or demonstrates remuneration for knowledge sharing irregularly, than the knowledge holder's expectation of remuneration can respectively decrease, thus lowering the knowledge sharing motivation.

To make the second-level constructs understanding easier, these constructs are summarized in Table 3, categorizing these constructs according to the knowledge sharing barriers classification of Blagov, Zhukova and Pleshkova (2016).

Table 2: Second-level constructs.

Barrier type	Second-level construct
Technological	• **possibility of loss of documents** in the obligatory all-University electronic document management system; • **low compatibility of document management systems used by different subdivisions**; • **absence of possibility of simultaneous document editing by different users**; • **absence of conference calls equipment**; • **absence of official recognition of electronic signature**
Organizational	• **ambiguous subordination structure**; • **ambiguous job instructions**; • **lack of understanding of what employee has what knowledge**; • **lack of motivation to share knowledge as activities not included into the regular job duties**; • **excessive communication processes centralization**
Organization economics based	• **lack of motivation to share knowledge as activities not included into the regular job duties**

5. Theoretical contributions and practical implications

Considering the contributions of the paper, it seems logical to discuss firstly the theoretical and methodological contributions to the existing research state, and then to continue with the practical recommendations.

5.1 Theoretical and methodological contributions

The main contributions of the paper to existing literature from theoretical and methodological viewpoints can be divided into two directions: contributions related to the research object novelty, and contributions related to the research methodology and the results interpretation.

Regarding the research object novelty, as it is shown in the literature review, although higher education industry receives considerable attention in literature on knowledge sharing as a whole and on knowledge sharing barriers in particular, the object of such research usually consists of higher education institutions academic personnel only or of academic personnel together with administrative personnel, but studies where the object of research consists of administrative personnel of higher educational institutions are absent in literature. However, as was pointed out in Section 1, such a research object is rather interesting due to the contradiction between the knowledge intensive and knowledge sharing friendly context of the whole higher education industry and the suggestions of such institutions' administrative personnel as being less friendly to knowledge sharing due to belonging to, usually, functional organizational structures; so, designing research around this specific object can be seen as an unique contribution of the current research to existing literature.

As the research object is unique due to the above described criteria, the research methodology is oriented on developing the constructs on which theory could be further built from the results of the unstructured interviews. As the research sample is rather small and thus the research findings need further testing on bigger and more varied samples, current research findings cannot yet be called a satisfactory theory construction basis; however, instruments used for deriving second-level constructs from first-level ones can be called a theoretical and methodological novelty and thus a contribution to the literature. Namely, the threefold knowledge sharing barriers classification suggested in Blagov, Zhukova and Pleshkova (2016) still hadn't been used in literature for empirical research results interpretation; thus, such analytical framework introduction can also be called a theoretical contribution to existing literature. Considering the results of the empirical research itself (i.e., the second-level constructs revealed from respondents' answers), as has been already stated, these results still need further testing on various samples.

5.2 Practical implications

As the paper presents results of a qualitative study involving one organization (or, more precisely, a part of a bigger organization, i.e., a Program within the University), most sound practical implications of the research results can be recommendations given to the organizational bodies under scrutiny, i.e., the administrative subdivisions involved in the Program's management.

However, we can suggest that the recommendations can be applied to higher education institutions other than the researched University, as such organizations often have a common organizational structure and business processes architecture peculiarities (e.g., functional organizational structure combination with dual subordination elements). In addition to the higher education organizations, the same organizational structure peculiarities can exist in various industries and markets, allowing further recommendations generalization.

As the organizational barriers have been found in Section 4 to be the most significant barriers according to the respondents' subjective perceptions, a description of suggested recommendations of overcoming such barriers can begin with the recommendations regarding the organizational barriers, then continued by the recommendations regarding the technological barriers, and finished by the recommendations regarding the individual/organizational economics based barriers, which is the less frequent category of barriers among the second-level constructs.

5.2.1 Recommendations regarding the organizational barriers

Among the recommendations regarding overcoming the organizational barriers, the first recommendation is the thorough analysis of the organizational structure of the University as a whole and its subdivisions engaged in the Program's management in particular, looking for actual and potential sources of unnecessary functions

duplication or job duties ambiguity, and developing methods of respective organizational structure fragments optimization with maximal outcome and minimal costs for the University, as well as minimal time waste and process complications for the Program.

This recommendation can lead to overcoming several barriers depicted by the second-level constructs. Namely, liquidating the potential job duties ambiguity sources can help mitigate the problem of lack of understanding of what employee has what knowledge. Another logical recommendation contributing to the same result, as well as to the possible overcoming of the barrier of lack of motivation to share knowledge as activity not included into regular job duties, consists in better job descriptions formalization, including not only generalized formulations of standard everyday duties, but also formulations of the knowledge sharing duties.

The recommendation of including knowledge sharing into job descriptions obviously calls for developing specific methods of motivation to participate in sharing activities. Such motivation methods could be based on the quantification of operational knowledge sharing quality assessment criteria allowing précising the material and non-material employee stimulation methods.

Such criteria could be based on the following parameters:

- Speed of knowledge holders' reaction to knowledge sharing requests;
- Shared knowledge adequacy to the request;
- Shared knowledge completeness.

Development of such criteria implies that knowledge sharing transactions should have enough formalization and codification level for allowing monitoring knowledge sharing transactions and assessing these transactions' quality with the above-described criteria.

This requirement makes necessary adjusting the IT infrastructure around the Program management business processes to the knowledge sharing transactions monitoring and assessing objectives; a deeper discussion of this recommendation is presented in subsection 5.2.2 dedicated to recommendations regarding overcoming technological barriers.

Considering the overcentralized communication construct, a recommendation could consist of increasing the authority delegation level (at least in sharing knowledge related to specific situations, but within the regular business processes) of the respective subdivisions operative personnel. Surely, such managerial recommendation requires improvement of the knowledge sharing environment technological infrastructure; however, detailed discussion of possible ways of such improvement lies within a realm of technological recommendations, to which subsection 5.2.2 is dedicated. Due to that, for the sake of paper continuality and readability, that subsection begins with recommendations regarding the improvement of technological infrastructure of knowledge sharing between subdivisions involved in the Program's management.

5.2.2 Recommendations regarding the technological barriers

As has been said at the end of subsection 5.2.1, the subsection dedicated to technological barrier related recommendations begins with recommendations to improve the means of knowledge sharing between subdivisions involved into the Program's management.

Such recommendations can be divided into two parts.

The first part considers deeper integration between document management systems used by different subdivisions, that can be performed either by switching at least the performance of the same or analogous operations in different subdivisions (e.g., enrolling the exchange students into the elective courses, requiring nearly analogous operations by the Program directorate, the Program Study affairs office, and the international contact office) to the same system (but still oriented on serving regular business processes, not being created deliberately for knowledge sharing), or by enabling maximally quick and lossless document transfer between document formats used by different systems.

The second part considers development and implementation of a system deliberately designed for knowledge sharing between employees involved in the Program's management disregarding the subdivisions to which

they belong. Such a system can contain profiles of each participating employee with maximally possibly distinct and detailed description of job duties and professional expertise. This measure can be suggested to help lower the transaction costs of searching the necessary knowledge sources, represented in the SLC of "lack of understanding of what employee has what knowledge". Another system feature mentioned in the first- and, respectively, second-level constructs and thus requiring inclusion into the system, is the possibility of simultaneous documents edition by different users; moreover, documents editing activity can be added to the knowledge sharing activity assessment criteria. It should be noted, however, that the knowledge sharing activity assessment system must not be based on criteria of quantitative estimation of sharing activity as such, but should be rather based on criteria assessing the shared knowledge quality (e.g., the abovementioned "adequacy" and "completeness" criteria), because in the opposite situation the knowledge sharing processes could be hampered by "handwaving" practices of employees seeking to get maximal remuneration regardless of real assessed practices' efficiency and effectiveness.

In addition to these recommendations dealing with organizational roots of technological barriers, several recommendations of purely technological nature can also be given.

Such recommendations can include:

- Regarding the all-University obligatory document management system:
  - Allowing access to all documents previously edited by a particular user with possibility of documents downloading disregard of their current legal status (i.e., a document already final and binding and signed by all the necessary signers, or a document still in preparation).
- Regarding the specific means of communication between subdivisions and the document management systems used by these subdivisions:
  - Implementation of conference calls equipment allowing time economies of communication between geographically distributed subdivisions;
  - Implementation of officially recognized electronic signatures, also allowing time economies of collecting necessary signatures on the documents.

5.2.3 Recommendations regarding the organizational economics based barriers.

As has been already mentioned in subsection 4.3, from the first-level constructs no second-level constructs can be revealed belonging to the organizational economics based barriers category according to the used classification; such elements are only traceable in the SLC of lack of motivation to share knowledge as activities not included into regular job duties, related mainly to the organizational type of knowledge sharing barriers. However, recommendations based on the organizational economics logic can still be given regarding the barrier depicted by this construct.

As has been described in subsection 4.3, deliberate reluctance to knowledge sharing caused by fear of personal knowledge resources being jeopardized and thus deprived of value as the personal resource and bargaining power generator, can be greater in situations when the knowledge sharing transactions have insufficient documental support, or when such transactions are not remunerated by the organization.

To avoid such influence, knowledge sharing transactions should be documented, with the documental records being a basis for remunerating the sharers, on the ground of mainly qualitative criteria (e.g., shared knowledge adequacy or completeness), complemented by such quantitative criteria as the speed of the sharer's reaction to the request for necessary knowledge, or the amount of knowledge shared. The remuneration system based on such criteria should be maximally transparent and straightforward, associating specific remuneration with specific result, allowing comparing knowledge sharing remuneration with possible knowledge uncovering costs. The detailed profiles of the employees' expertise in the sharing environment can also contribute to minimizing the effect of fear of jeopardizing valuable personal knowledge, as the formalization of the employee's status as an expert can act as an immaterial motivation factor, encouraging the acknowledged experts to share knowledge with the colleagues (Goduscheit and Knudsen, 2015).

6. Conclusion

To conclude the paper, firstly the research methodology, its findings, theoretical and methodological implications and practical recommendations are briefly summarized.

Finally, methodology and research results applicability limitations are discussed, and potential further research directions that can allow overcoming the discussed limitations are outlined.

6.1 Summary of the findings

The research presented in the paper is part of a research project intended to explore the knowledge sharing barriers in the educational programs management administrative processes.

The overall research design consists of several stages.

The first stage of the research, presented in this paper, is qualitative, based on in-depth interviews with administrative personnel involved in managing a particular educational program, from which constructs are revealed depicting main factors, perceived by these employees as significant knowledge sharing barriers hampering knowledge sharing within the business processes related to managing the program.

Such factors are found to be mainly related to the organizational and technological knowledge sharing barrier types from the classification of Blagov, Zhukova and Pleshkova (2016), with only one of the constructs depicting a barrier that can be treated as belonging not only to the "organizational", but also to the "individual" or "organizational economics based" types from these classifications.

The organizational barrier related factors are mainly resulting from such peculiarities of the researched university's organizational structure, as the combination of functional structure with dual subordination of several subdivisions involved in the program's management, excessive predominance of vertical communications over horizontal, lack of decision making delegation to the operative personnel level, and excessive looseness of the administrative personnel regular job descriptions.

The informational barrier related factors are mainly consequences of the University's centralization of communications, e.g., low compatibility of document management systems used by different subdivisions, absence of systems allowing simultaneous documents edition by users from different subdivisions, absence of conference calls equipment and of officially recognized electronic signatures, and, finally, imperfection of the all-University obligatory electronic document management system with a possibility of documents loss.

A set of recommendations is given regarding mitigating the effect of these factors as knowledge sharing barriers. Namely, recommendations include minimization of functions duplication in the University's organizational structure, better formalizing job descriptions of the administrative personnel with the inclusion of knowledge sharing into the job duties, development of a system of employee remuneration for knowledge sharing along with creating special knowledge sharing IT infrastructure, as well as implementing IT infrastructure elements the absence of which has been named by the respondents as knowledge sharing barriers. Although being given to the specific organization, the recommendations can be generalized to higher educational institutions in general and to organizations from other industries but with similar organizational structure features.

Regarding the theoretical and methodological contribution of the paper to existing literature, the main points are the focus on administrative personnel of a higher educational institution as a specific research object, and the introduction of the knowledge sharing barriers classification suggested in Blagov, Zhukova and Pleshkova (2016) as an instrument of analyzing the constructs of the interview.

6.2 Limitations of research

After summarizing the results of the research, several limitations of its scope and its results applicability should be noted.

A most obvious limitation is the small size of the research sample, consisting of only 9 people belonging to one organization. Thus, the results are very organization-specific, as the business processes in different organizations even within the same industry (e.g., in different universities) can be rather different. Moreover, a sample of 9 people is relatively small for making large-scale generalizations, that could be surely more valid and reliable if tested on larger and more diverse (e.g., cross-organizational) samples. In addition to the organizational specificity, national and industry specificity can also be named as research limitations, calling for possible further international and cross-industry sampling.

6.3 Further directions of research

Speaking from a methodological perspective, the research described in this paper can be further developed in two directions, based on both qualitative and quantitative research methods: an "extensive" direction of broadening the research scope, and an "intensive" direction of looking at the same research object (or a sample of objects very close to the initial one) with more elaborate, for example, quantitative research methods.

Basic further "extensive" research sub-directions can consider broadening the research scope to, firstly, samples of several universities or other educational organizations (including international comparisons also to reveal the influence of the national educational systems specificity), and secondly, to cross-industry comparisons of knowledge sharing barriers.

In addition to the "extensive" research scope broadening, an "intensive" direction of developing quantitative research methodology and design can be suggested, probably also following the logic of classifying the knowledge sharing barriers using the classifications of Riege (2005), Blagov, Zhukova and Pleshkova (2016) or similar ones.

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