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STRATEGIC PLANNING SOFTWARE AS A TOOL FOR IMPROVEMENT OF BUSINESS INFORMATION SPACE

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Abstract

In the 21st century, the idea of building single information space of a company has become popular. Integration of databases and data banks, technologies for their maintenance and use, information and telecommunication systems and networks, the search for common principles of their functioning, ensuring information interaction of users, satisfying their information needs become core drivers for the implementation of any business strategy. However, employing a purely technical approach often causes failures. A full-fledged attitude is needed to integrate the interdisciplinary character of the issue, namely, the search and benchmarking of integration points in cross-functional information exchanges that will improve business efficiency. The paper examines the ways of improving the quality of business information space, identifies and arranges the factors contributing to barriers in cross-functional information exchanges. Based on S. Star's concept, the author puts forward a hypothesis as to whether it is possible to use a software product designed for strategic planning as a boundary object – a means for integrating employees' efforts to remove barriers in information flows and mutually achieve goals established. The paper proposes strategies for managerial impacts to improve the quality of business information space based on the key aspects detected like accelerating information exchange in a company and raising culture of company staff.

Keywords: Information space, information technologies, strategic planning

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1. Introduction

In the late 20th – early 21st century, globalization-driven processes were underway in the economic sphere. There were global systems of financial relations highly sensitive to any external signal and expanded opportunities for sharing experience and knowledge. There was a growing need to combine efforts at the international level in addressing the challenges of civilization community, environmental contradictions with the environment. Globalization also affected information processes globally, thereby making new patterns come up to establish the "information economy" (Firth & Swanson, 2005). There are three challenges caused by these processes:

i. the volumes of diverse, qualitatively different information are rapidly increasing, which calls for new ways of storing, recording, processing it;
ii. a person is challenged to find, select truly relevant information from huge data arrays;
iii. a semantic layer and ambiguity of economy-related information is expanding, which requires interpretation of information.

Today, global large-scale transformations have a direct impact on the content and form of managerial professional activities. A new perspective on the role and place of information technology to be taken in the international economic community is gradually taking shape (Korhonen et al., 2021; Leotta et al., 2019). From an auxiliary technical tool, they can turn into a key strategic benefit of a company or, otherwise, an insurmountable obstacle to business development, destroying a once-successful team.

Current management approaches are innovative in that they turn to a knowledge-based form of business organization (Coveri & Zanfei, 2022; Werr & Stjernberg, 2003). The highest form of business organization – the knowledge type – is aimed at developing a knowledge base that provides key business competences. It is equally important for an organization not just to build a knowledge base, but also to create an environment enabling knowledge acquisition, accumulation, dissemination, coordination, and, moreover, acknowledgement as a source of core competence and competitive advantage. In this regard, in the 21st century, the idea of building a company single information space has become popular. Integration of databases and data banks, technologies for their maintenance and exploitation, information and telecommunication systems and networks, the search for common principles of their functioning, ensuring information interaction of users, satisfying their information needs become core drivers for the implementation of any business strategy. The information space is made up of the main components:

information resources containing data, information and knowledge,

i. organizational structures that ensure the collection, processing, storage, retrieval and transmission of information,
ii. means of information interaction (software and hardware, organizational and regulatory), providing IT-based access.

Continuous improvement in the quality of its information space is deemed important for competitiveness of a business.

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2. Problem Statement

A vast majority of businesses expanding or entering the international arena commonly face a great deal of technical, cultural, psychological challenges and contradictions to arise in their information systems. These phenomena entail barriers in the implementation of even standard business processes, not to mention new projects or innovations. The problem is a one-sided, mostly technical, approach to shaping business information space. An integrated approach is needed to allow for an interdisciplinary character of the problem, namely, the search and analysis of integration points in cross-functional information exchanges that will improve business efficiency (Campanale et al., 2021; Giaglis & Paul, 2012). It is necessary to encourage not only economists and IT-experts, but also psychologists, analysts, mathematicians, experts in intercultural communications to take part in scientific search in the target area.

Many scholars note that both theoretical and practical business research revolve around communication issues (Besharov & Smith, 2014; Borys & Jemison, 1989; Jakobsen, 2011; Mitchel, 2002). Researchers and top management of large international companies focus on cross-functional business processes (Brandsen & Van Hout, 2006). In these cases, special attention is paid to preventing barriers to arise at the crossroads of functions, which can often be overcome only by the joint efforts made by employees from different departments (Baldvinsdottir & Heidarson, 2017; Fincham, 1995; Van der Stede, 2014).

Assessment, analysis and removal of barriers therein are crucial in organizing activities to streamline cross-functional business processes. A barrier to emerge can be indicated by various kinds of signals (Aschhoff & Vogel, 2018). Most commonly, it can be a decrease in key financial indicators (KPI – Key Performance Indicators). Company management quite often calculates barrier-induced losses, however, it is most often not regular and is based on a particular manager's experience. In order to safeguard smooth performance, it is necessary to align continuous optimization of business processes. All activities should be aimed at reducing a number of barriers in information processes and preventing them in the future.

3. Research Questions

Barriers in company internal business processes result from many factors that can be detected through business process mining as soon as first attempts are made to formalize the company's business model. Further activities to improve the information space consist in constant monitoring of the relationship between the identified factors with key performance indicators and conscious managerial impacts on various dimensions of formal and informal information exchange between employees and departments.

3.1. Factors to affect the quality of information space

Let us dwell on the factors that lead to barriers in company internal business processes (Dougherty, 1992). One of the most important factors can be external impacts from the state and parent organizations. Let it be an administrative factor. In this case, new regulatory documents, changes in

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regulatory requirements (for example, in construction or food production), restrictions imposed due to changes in political or economic conditions (tourism, catering), etc. can lead to inconsistent actions between employees from separate departments.

Another factor to bring about barriers is organizational, due to errors in company hierarchy, inconsistency in the actions of various levels of management, unclear articulation of functions and responsibilities of managers in charge of business segments. Here is an example of organizational reasons for barriers when untimely informing of warehouse departments about new limits for material assets can lead to delayed delivery of production materials.

Barriers can arise directly in the production process. In this case, the reason is technological shortcomings or inconsistency between production capacities in various business segments, in the throughput of some divisions, responsibility centers, sections, departments, types of equipment, etc. Production barriers are associated with disruptions in technical and technological means and difficulties in handling them by employees. An example would be a barrier when the capacities of successively installed machines in a production shop mismatch or there is not enough space for storing manufactured products with a sharp increase in orders.

Particular attention should be paid to the factors that contribute to barriers in communications between employees: semantic (linguistic), psychological (individual), socio-cultural (racial, gender, age, etc.). At the end of the 20th century, scientists turned their attention to the behavioral (behavioristic) approach to respond to the problems of building information systems. Huge flows of information, new processing methods, strict requirements for work outputs have a specific impact on the mindsets of workers involved in the maintenance and use of software. Psychological barriers are those when an employee from one department (as well as within departments) misunderstands information transmitted by an employee from another department. A quite common barrier is caused by a certain “slang” used by IT department and accounting department, their commitment to professional language and unwillingness to accept tasks from other departments.

3.2. The role of strategic planning automation in improving information

In Western literature, the concept of *boundary objects* (points of intersection of interests) is proposed as a means to overcome barriers in internal business processes (Bowker & Star, 1999; Carlile, 2002; Fox, 2011; Star & Griesemer, 1989). These objects are designed to perform an integrating role in cross-functional business processes. In today’s environment, such objects that are clear and accessible to interact with employees of various departments can be an information base, a software product. What is more, it is important to charge a positive interaction between humans and software so that it becomes a means of integration endeavoring to mutually achieve goals established rather than a factor of barriers and conflicts.

It is customary to automate managerial functions with the following classes of tools, namely: horizontal software packages with analytical capabilities, custom-made software tools for creating an information data warehouse, and enterprise resource planning systems. A new trend in software in the early 21st century was the evolvement of BI (Business Intelligence) information systems. These are analytical systems that combine data from various sources of information, process them and provide an

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actionable interface for a comprehensive study and evaluation of information received. These systems are represented by Oracle BI, Microsoft Business Suit: Contour BI, SAP Business Object, SAP Business Planning and Consolidation.

Software of all four classes can be used for strategic planning. However, with MS Excel, it is apparent that it is not suitable for large-scale projects and large companies. Besides, integrated systems get much more expensive if a company expands its business dramatically and enters the international arena. In this situation, custom-made software can be offered for information support of strategic business planning.

Why did we choose the area of strategic planning for study? Strategic planning for management has taken a central position in the present economy. In a dynamically changing external environment and globalization of the economy, strategy is being more holistically referred to as creation of a variant future, as a search for compliance with external challenges and upcoming competitive advantages (Weske, 2012). Strategic management involves a long-term strategy designed to achieve the future sustainable development of a company and each of its business segments. The strategy is implemented through programs, budgets and procedures that can be considered as medium-term and short-term plans. Thus, strategic planning affects interests and functional responsibilities of the majority (if not all) of company employees. A clear understanding of strategic business goals, building priorities in operational decision-making in accordance with the adopted strategy raises the interest of employees in the outputs produced not only by their activities, but also by the entire company as a whole. A software product for strategic planning, which has a user-friendly interface, visual presentation of information, and simplicity of logical construction, can become a driver for improving the efficiency of all departments and each employee of the company (Burks, 2006).

4. Purpose of the Study

The paper aims to study whether it is possible to use software for strategic planning as a tool for improving the quality of company information space, a means of conscious managerial impacts on information exchange systems in organizations and raising employees' information culture.

5. Research Methods

The study was split in two stages. In the first stage, different-level managers were interviewed (top management, heads of departments and projects, sales managers, etc.). All of them were employed in a Russian consulting company, a subsidiary of an international corporation. In the paper, the company is codenamed WorkTeam. Interviewing was aimed at the key attributes of integrated business information space so as to construct its ideal model. Based on content analysis following a series of interviews, a number of statements was worked out signifying no administrative, organizational, technological and psychological barriers in the information space of the company (Table 01).

In the second stage, 35 employees were surveyed working in a company that implemented a project to launch an ANAPLAN strategic planning software product. The survey was conducted 2 weeks before the start of the project, as well as 2 months upon the completion. In both cases, the survey

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participants were offered to fill in the same Google form questionnaire of 16 positions. The participants were asked to measure the accuracy of statements about the information space of the company using the Likert scale from 1 (strongly disagree) to 5 (strongly agree). The average of the responses to each question was then calculated. The scores were further aggregated into an integral index for two blocks of statements: indices 1-8 were used to measure the rate of information exchange in the company, 9-16 – to measure the level of information culture in the team. Later, the results were compared before and after the implementation of the project to automate strategic planning of the company. The technique is quite simple and easy to apply, which is its advantage. The set of statements can be modified, subject to the emphases to be put on what to improve in the company's information space. Growing in size, the company will need to apply selective surveys.

Table 1. Attributes of ideal business information space

No.	Attribute	Type of barrier
	Block 1	
1	Company information system is fully consistent with the scope and scale of company activities	Administrative
2	External access to information resources is clearly authenticated	Administrative
3	Internal information interaction is organized based on the distribution of roles and user access rights	Organizational
4	Data between different information systems is reconciled automatically	Organizational
5	All information flows are integrated into a single system	Technological
6	Information for strategic planning is collected fully automatically	Technological
7	Employees have no difficulties in interacting with information systems	Psychological
8	Employees can easily get advice or help from the IT service	Psychological
	Block 2	
9	I am well aware of the strategic goals pursued by my company	Administrative
10	I have an idea of basic principles behind information management in my company	Administrative
11	My duties is a contribution to the company strategy	Organizational
12	I use corporate e-mail as my primary means of communication within the company	Organizational
13	I have no difficulty using the software at my workplace	Technological
14	I now and then improve my computer literacy	Technological
15	I have no fear of implementing a new software product (new version)	Psychological
16	I consider the information system as an assistant in my work	Psychological

6. Findings

The most important element constituting information space of organizations is their information field. The information field is a subspace in which information messages about activities performed by organizations are circulated, formed as a result of interaction, information exchange between personnel, accumulation of experience, knowledge, development of information culture and intellectual potential of organizations (Sidorova & Gulyaeva, 2016). Information messages in this subspace can be either arranged in a form of information flows or disarranged, but still affect information exchange and perception. Any strategic planning tool exploited in a modern organization can be successful due to the effective organization of information exchange processes. The information field can be positively or negatively charged. A positively charged information field fosters friendly atmosphere, trusting relationships

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between employees, fruitful exchanges of knowledge and expertise, and therefore updates both the process of collecting information for managerial analysis and the overall process of running a company.

It is very important for strategic management to constantly improve the quality of information space. The level of development is proposed to be measured using two indicators: rate of information exchange and level of employees' information culture. To assess the quality of information space and determine further strategies for its improvement, you can use the matrix shown in Figure 01.

The matrix is a square formed along two axes:

i. horizontal axis – level of information culture;
ii. vertical axis – level of information exchange capability.

Each axis is divided into two parts. One part corresponds to low values of indicators (low level of information culture, low level of information exchange), the other corresponds to high values (high level of information culture, high level of information exchange). As a result, four square sectors are formed, which represent the corresponding development strategies for information space. According to this matrix, each organization can determine the existing level of quality of the information space and choose an appropriate strategy for its improvement. For example, for the WorkTeam company, according to the survey, with a sufficiently high level of information culture (average – 4.2), a strategy was recommended to accelerate the rate of information exchange (Figure 02). The project to implement the ANAPLAN software product was launched as part of the company's strategic development.

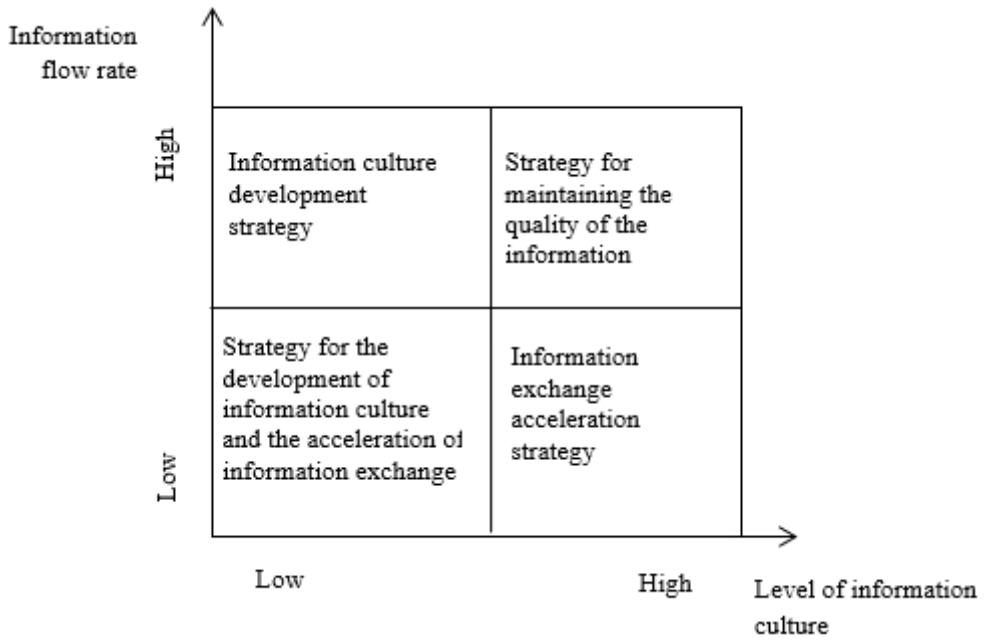

Figure 1. Matrix for measuring the level of information space and determining strategy for its improvement

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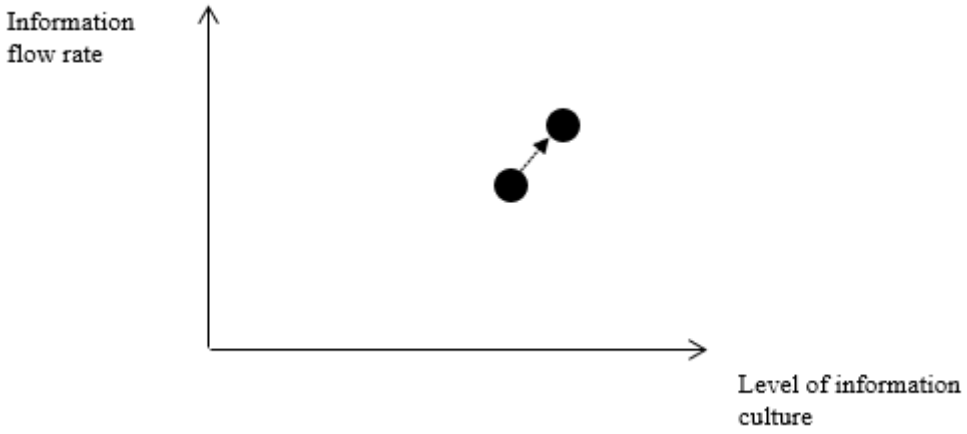

Figure 2. Changes in the quality of WorkTeam information space

ANAPLAN is an international cloud-based platform for financial and operational planning and modeling of business processes. Its heart is a single cloud-computing center where business users can create, deploy, use and share business models without special IT expertise. In 2006, ANAPLAN appeared in the business planning market that has long been dominated by the 'big four' – IBM, Oracle, SAP and Microsoft. Now, it is an international company headquartered in San Francisco with offices in the UK, France, Sweden, Benelux, Singapore and Russia. The CTO Michael Gould developed ANAPLAN as an alternative to existing conventional systems – Oracle Hyperion Planning, IBM Cognos TM1, SAP BPC. ANAPLAN's model is based on are directories, modules (sectors or activities) and dashboards (reporting forms). Domain employees should form a set of elements for a particular company. For example, a sales manager needs directories of prices, specifications of goods, sales regions, while an HR manager needs directories of positions, employees, types of payments, etc. The overall structure of business management models is comprehended as soon as various users' requests are discussed and can be changed and supplemented if need be. The survey results before and after ANAPLAN implementation in the WorkTeam company are presented in Table 02.

Table 2. WorkTeam survey results

Statement	Pre-implementation score	After-implementation score	Difference
Company information system is fully consistent with the scope and scale of company activities	2.6	3.8	+1.2
External access to information resources is clearly authenticated	3.0	3.1	+0.1
Internal information interaction is organized based on the distribution of roles and user access rights	2.8	4.2	+1.4
Data between different information systems is reconciled automatically	0.5	2.5	+2
All information flows are integrated into a single system	4	4.2	+0.2
Information for strategic planning is collected fully automatically	1	2.5	+1.5
Employees have no difficulties in interacting with information systems	3.5	3.8	+0.3

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Employees can easily get advice or help from the IT service	4.3	4.5	+0.2
Average for Block 1	**2.7**	**3.6**	**+0.9**
I am well aware of the strategic goals pursued by my company	4	4.5	+0.5
I have an idea of basic principles behind information management in my company	4.6	4.8	+0.2
My duties is a contribution to the company strategy	3	3.5	+0.5
I use corporate e-mail as my primary means of communication within the company	4.8	4.9	+0.1
I have no difficulty using the software at my workplace	3.8	4.2	+0.4
I now and then improve my computer literacy	4.6	4.8	+0.2
I have no fear of implementing a new software product (new version)	4.5	4.8	+0.3
I consider the information system as an assistant in my work	4.2	4.6	+0.4
Average for Block 2	**4.2**	**4.5**	**+0.3**

Based on Table 02, it is easy to notice an increase in the average indicators for each aspect of improving the information space, as well as the average indicator for each block of statements. This clearly indicates that an intuitive interface, similarity with Excel, ease of learning allowed the ANAPLAN platform to become a real boundary object for the WorkTeam company for implementing cross-functional strategic planning.

7. Conclusion

The findings confirm that it is possible to apply conscious managerial impacts with a view to improving the quality of business information space. Each economic entity can have some specific factors identified and streamlined that provoke barriers in cross-functional information exchanges. However, all of them can be combined into four groups: administrative, organizational, technological and psychological (communicative). The author defines the strategies of managerial impacts to improve the quality of business information space based on highlighting the key aspects of the problem: accelerating information exchanges in a company and raising employees' information culture. The results from using the software for strategic planning for these purposes demonstrate the effectiveness of the proposed tool.

It can be argued that in a consulting company employing a high proportion of qualified management and IT professionals, these results can be considered obvious. However, WorkTeam has accumulated sufficient experience in implementing this software product in trading, manufacturing and financial companies, where the level of information culture is much lower, and the mismatch of information flows is much higher. This learning kit for assessing the quality of information space and developing a strategy for its improvement is used by WorkTeam for consulting clients of the company when they implement projects to automate business processes on the ANAPLAN platform. It is not fortuitous that each project starts with training the customer's employees how to deal with the software product. This confirms a practical need for cross-functional performers (in this case, an automation project) to acquire an intersection point of interests and knowledge, which becomes an implemented software product. Acquiring common terminology, understanding the logic of business process modeling

embedded in the software product, discussing the results of the program with the customer at each stage of project implementation serves to accelerate both the rate of information exchange within the company and the level of information culture in the team.

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