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Strategic Planning of the Integrated Business and Information System – A Precondition for Successful Higher Education Management

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Abstract. *This paper brings about the primary purpose of a research directed towards probing the insight into the presence of strategic planning at higher education institutions in the Republic of Croatia. The main conclusion of this paper sublimates the contribution to science and to the profession, and makes a new premise, that strategic planning of an integrated business-information system depends significantly upon long-term alignment of the management, which is in turn directly affected by common knowledge about the domain and funding. It therefore requires further in-depth research that needs to be conducted longitudinally, using an international sample, which would be as extensive as possible.*

Keywords: strategic planning, integrated business-information system, higher education, short-term and long-term alignment.

1. Introduction

In times when we witness new business trends, ever growing global knowledge based on information is implied, as well as vigorous interfusion of all information society elements with the activities of higher education as a whole. Analysts of these relationships more and more stress the development of the theory of *academic capitalism,* by which they explain the process of integrating higher education institutions into the new economy. Ever larger demands that are placed before university management in terms of overall management of all business segments, aiming at managing the complete business in the most efficient manner, assume utilisation of modern ICT technology and solutions that enable integrated monitoring of all business information being utilised for reaching operative, tactical, strategic and financial decisions.

Viewed from the aspect of scientific research, the study of information system strategic planning is by no means simpler, especially if the fact that the discipline is as yet insufficiently researched within information science is taken into account, as well as that it is quite young, since the initial works date from the 80s of the preceding century.

With the introduction of the Bologna process in the higher education of the Republic of Croatia, optimization of the use of available resources has become an acute issue: budget funds, own revenue, personnel, space and equipment, and especially the optimization of the distribution of funds by introducing financing based on overall amount. Therefore, it is necessary, in order to develop and manage such a complex system as the single business and information system of the university, to conceive a single information strategy as the link between academic strategy and information system strategy. The complexity of the process requires specific forms of strategic conception, planning and management of activities, and, finally – strategic profiling of the university. Each new contribution to advancing knowledge, financing, attitude and planning aiming at improving the success of university becoming information enabled, which in turn makes possible more efficient use of budget funds, surely does have full social justification as well.

2. Background

Based on the study of stated sources, it can tentatively be concluded that there is significantly more research of methods and algorithms important for the issues of strategic planning of information systems in scientific research centres and institutes and higher education institutions, and can be proclaimed with sufficient certainty there are quite few

published scientific papers on the topic, especially those dealing with the issues of strategic planning of information systems in higher education.

For the purposes of writing the dissertation and for its acceptance, upon which this paper is based, the priority was the research of higher education organization management perception on the issues of planning, constructing and utilizing integrated business and information systems at the level of top management of academic and administrative profile, elective and permanent members, using a wide range of public universities and colleges in the Republic of Croatia. The research was therefore primarily directed at studying the attitudes and common knowledge as the results of academic and business experience of individuals in the domain of higher education.

2.1. Research Goals

The fundamental research goal was directed at advancing the paradigm of the information system based on the integration between two scientific fields, the social and the technical, at the study of management factors affecting strategic planning of higher education institutions' business and information systems, at the research of the factors impacting upon short-term and long-term alignment by using comparative testing of the application of the current research results, at identifying the interaction between constructs of the model design, at determining the weight factor of each model construct, and identifying the variables that could envision the degree of alignment based on the degree of concurrence. [3]

2.2. Hypotheses

The research question was posed in a threefold manner: (1) how to analyze business and information strategies in the university environment, (2) what is the actual practice in higher education institutions and especially (3) identifying key factors for the implementation and application of the strategic plan of the integrated business and information system, aiming at as efficient management of higher education as possible. The principal dissertation hypothesis is unequivocally used for the topic, claiming strategic planning of the integrated business and information system (SP-IBIS) significantly hinges upon long-term alignment of higher education institution management, which can be directly influenced by the constructs of KNOWLEDGE and FINANCING. [3]

3. Result and Discussion

3.1. Model Particles and Variables

As already stated, based on undertaken descriptive analysis of all questions and answers in the questionnaire, particles have been selected for defining the four constructs, which serve for describing the principal variables of the SP-IBIS model, these being the following: knowledge, planning, attitude, financing.

3.1.1. Knowledge

Common knowledge on domain in research by Reich and Benbasat is defined as the 'ability of IT and business leaders to understand, on a deeper level, and be able to participate in key processes of the other, and to respect the other's unique contribution as well as challenges surfacing from the relationship.'[5] Nelson's and Cooprider's construct of common knowledge on domain is quite similar even though its implementation differs, and includes 'mutual understanding and acceptance between IT and business managers in matters of technology and processes that impact their joint work effects.' [4]

Common knowledge on domain in this paper strikingly differs from the stated authors' definitions, as seen from the aspect of common knowledge participants. That is, it does not include the knowledge of IT managers/IT leaders. It focuses merely on common knowledge of the management, managers in permanent and managers in elective positions, regarding the important elements of information technology implementation in business that is essential for their joint work on strategic planning of the integrated business and information system. [3]

3.1.2. Planning

Most authors, either implicitly or explicitly, presume the process of IT planning represents a decisive moment for joint, synergic work by IT leader and business managers. Partial support for such a presumption does exist in the study indicating IT leaders that are more involved in business planning think they understand

management goals better than those participating less.[2] Supporting their involvement in planning is also emphasized by Zmud, who claims structural mechanisms that would be connected to management communication systems are required, in order to build partnership between the IT and business management and successfully implement new technologies in business. [7]

In this work, planning in the context of SP-IBIS model design represents the connection between IS and PS processes of strategic planning, that include planning IT equipment investments and user training, as viewed from the degree of the synergic action by managers in permanent and managers in elective positions. [3]

3.1.3. Attitude

There is extensive proof to be cited substantiating the fact that communication leads to mutual understanding between IT and business managers, thereby impacting their attitudes on the application of IT in business. Thus Boynton considers efficient application of IT depends on interaction and the exchange of information between the managers stated. [1] The exchange of information in time leads to individuals agreeing or disagreeing on mutual understanding of a particular topic, and on their positive or negative attitude towards the same. Rockart claims good communication between IT and business managers ensures efficient integration of their abilities into business. [6]

In this work, attitude in the context of SP-IBIS model design represents agreement or disagreement, positive or negative perception of the importance of strategic planning for the integrated business and information system, as seen from the dual perspective of managers in permanent and managers in elective positions. [3]

3.1.4. Financing

In literature studied, analyses of IT investments in the context of impact on the success of information system strategic planning have not been discerned. In this work, financing in the context of SP-IBIS model design represents the representation degree of IS/IT investment planning mechanisms, and the knowledge of the type and size of investment, as seen from the dual perspective of managers in permanent and managers in elective positions. [3]

3.2. Construct Differences as per Gender and Position

Possible hypotheses on the equality of construct averages as per gender, age categories and the positions of those surveyed have been tested by the t-test and single factor analysis of variance.

Figure 1 states the coefficients of Pearson's correlations between construct pairs, while these are all statistically significantly connected ($p<0.01$). The constructs, given their division and mutual connection, create an acceptable measuring instrument for determining the perception of the importance of those surveyed regarding the SP-IBIS for their institution, i.e. Cronbach's α coefficient amounts to 0.65, which implies the instrument measures 65% of the content of perception regarding SP-IBIS. The coefficient is lesser that the 80% usually required, but since this is an unchartered research territory while the sample is limited, this can be considered as a satisfactory indicator.

	KNOWLEDGE	PLANNING	ATTITUDE	FINANCING
KNOWLEDGE	---	0.363	0.191	0.273
PLANNING	0.363	---	0.452	0.430
ATTITUDE	0.191	0.452	---	0.336
FINANCING	0.273	0.430	0.336	---

Key: $p < 0,05$ $p < 0,01$

Figure 1. Spearman's construct correlations (N = 218)

4. Important Insights of the SP-IBIS Research Undertaken with Management of Higher Education Institutions in the Republic of Croatia

The dilemma on who constitutes top management level, as viewed from the aspect of elective positions, was non-existent, so chancellors, vice-chancellors, deans and vice-deans were defined with no additional analysis as the primary respondent cluster. Taking into account the fact that the business and information system is primarily based on financial processes, and by and large relies on organization and human potential that make an important segment of strategic envisioning, it was estimated that research must also include management members in permanent positions;

i.e. general secretaries and heads of finance and accounting.

The final sample based on previously stated stratification was composed using the Sumsion typology and was seen dually, through the prism of legal entities, 73 public institutions in the higher education system of university character, and 365 natural persons from stated institutions, aiming at the creation of a representative i.e. statistically significant sample. Out of 73 institutions, 45 of them accepted to participate in research. Out of 7 rectorate, 6 participated in research and out of 66 faculties, 38 participated in research.

The first insight from the research conducted points to the fact that the management of higher education institutions, when it comes to strategic planning of the integrated business and information system, exhibits the greatest interest for the topic of aligning the business and academic information systems, followed by use of information and communication technology, while their interest is least directed at planning the development of the integrated information system. Even if not the highest, a significant part of management hold the influence of applying the ICT does not impact the success of their institution's current work, but that it is critical for their work and business in future. Furthermore, most of management actually recognise ICT as a necessity for the integration with European higher education and as a necessity for implementing the Bologna process, while they recognise themselves as leaders of future projects of implementing information technology in their institutions.

The second principal insight confirms that management occupying elective positions give significantly greater importance to systematic approach to constructing IS, which includes project planning and is primarily based on getting existing processes and information flows in order, when contrasted with management occupying permanent posts who all but do not register these activities, which points to the fact that management occupying elective posts primarily see themselves and state officials from the relevant ministry in defining strategic goals of new IS is justified.

The following insight points to the fact that the planning mechanism for investments into IS/IT in larger universities is represented more than in smaller universities. As viewed from the aspect of financing source, it can be said most money from the state budget is spent on IT equipment, followed by system and application programmes and training IS/IT users. Speaking of own revenue as financing source, means are equally distributed to all parts necessary for the construction of the information system. Also, results received point to the fact managers' opinion, in case of those occupying elective posts, is significantly more represented in decisions connected to the issues of implementing information technology in their institutions, when contrasted to those managers occupying permanent posts, the reason for which should be sought in their disproportionate representation (2/3 in contrast to 1/3), but in sufficient levels of required knowledge as well, for which it was established they do not possess.

Speaking of the perception of expected results, elective management significantly recognise shortening the time intervals for reaching business decisions as one of the results of implementing information technology. Also, they are more skilled in computer use in comparison to permanent management. The frequency of computer use in everyday work in both respondent groups is at an enviable level, even though it is still mostly at an operative level according to the opinion of a decisive majority.

Analysing the previous insights in a complete manner, it can be said strategic conceptions of the utilisation of information sources are significantly more present on larger universities than in smaller ones, which implies the assumption that management of larger universities are more inclined to strategic planning of integrated business and information systems.

4.1. Results of the PATH Analysis for the Proposed Model SP-IPIS

This work studies the social dimension of alignment in two different groups of respondents – managers in permanent and elective positions, as viewed from the temporal dimension, and directed at measuring the state in which different manager groups within the same business field understand and are dedicated to strategic planning of the integrated business and information system. The research was focused on the approach affording best possibilities for interpretation, in order to determine how certain key factors interact, as defined through four principal constructs, with the goal of creating conditions for enabling or disabling short-term

and long-term alignment. The approach used in designing the model is based on the use of statistical methods in a limited sample, aiming at measuring the relation between independent variables in the context of short-term and long-term alignment.

Even though initially identified principal factors, with potential effects on alignment, are in the form of the constructs of KNOWLEDGE – PLANNING – ATTITUDE – FINANCING, taking into account the fact that there is no universally accepted theory of the social aspects of alignment, this work is of research character. Since research goals have been directed at defining alignment and developing measures for measuring the impact of individual constructs on short-term and long-term alignment in terms of perception of the importance of SP-IPIS, these must be defined. [3]

Short-term alignment, in the context of this work, is defined as the state in which managers in permanent and elective positions understand and are dedicated to current, short-term plans and goals. *Long-term alignment,* in the context of this work, is defined as the state in which managers in permanent and elective positions share a common vision on how strategic planning of the integrated business and information system can contribute to the success of their institution

4.2. SP-IBIS Model Design

By relying on previous settings and explanations of the same given in the process of designing the SP-IBIS, it was necessary to determine the cause and effect structure of constructs selected. Starting with their mutual correlation, it was discerned that PLANNING provides largest correlations with the remaining three constructs – largest with the ATTITUDE construct, followed by the FINANCING construct, while the KNOWLEDGE construct comes last. Because of this, PLANNING was selected as the dependent variable for the SP-**IB**IS model, which is appraised on the first level depending on ATTITUDE, and FINANCING and KNOWLEDGE on the second level. Such order of constructs also represents a presupposition of the logical sequence of getting insight of the importance of strategic planning and the construction of the integrated business and information system. In order to determine the level of influence of independent model constructs, the most favourable model is the PATH analysis, with the help of which direct and indirect impacts on the dependent variable can be appraised (PLANNING). The PATH analysis undertaken on the total number of respondents is displayed on the PATH graph of permanent and elective position respondents' constructs, given in Figure 2 that follows. [3]

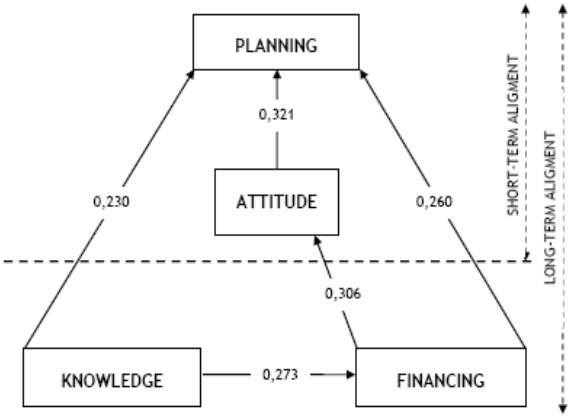

Figure 2. PATH graph of permanent and elective position respondents' constructs

The application of the model is possible at both macro and micro levels of higher education institutions, at the university, faculty, individual scientific branch or individual managerial function level. Moreover, the application of the model is sustainable in any institution where there are different management groups that constitute management, and which is by its vocation in charge of its strategic profiling – within which it is in charge of strategic planning of the integrated business and information system as well.

5. Conclusion

The principal insights point to the fact that higher education institution management, speaking of strategic planning of the integrated business and information system, exhibit the greatest interest for the topic of aligning the business and academic information systems. They hold that the impact of implementing ICT is critical for their work and business in future and necessary for integrating with European higher education. Further, gained results point to the fact that elective post managers' opinion is significantly more represented in decisions connected to the issues of implementing information technology in their institutions, in contrast to those managers occupying permanent positions.

The conclusion abstracts the contribution to science and profession and expresses a new premise that strategic planning of the integrated business and information system significantly depends on the long-term management alignment, directly influenced by the COMMON KNOWLEDGE ON DOMAIN AND FINANCING, which surely requires further research.

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