

The Strategy of the Innovation Alliance in Higher Education

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Abstract—The purpose of this study is to visualize the strategic network of higher education institutions and its strategic directions. The strategy map of the balanced scorecard approach is developed to describe the strategic objectives and their causal relationships in higher education. The empirical part of the study presents the survey results of the desired strategic directions of the network obtained from the teachers and other staff of the member institutions. Research and development projects are the most important form of activity in the network, but education and many other forms also turn out to be important. The results of this study support the argument that a strategic innovation alliance is a suitable and useful way to promote collaboration among European higher education institutions. The results of the study can be used by those who wish to promote such international collaboration among higher education institutions.

Keywords—Balanced scorecard, higher education, social networking, strategic planning.

I. INTRODUCTION

THE traditional model of research has evolved so that the classification of the mode 1 and mode 2 research by Gibbons et al. [1] is no longer sufficient to describe the characteristics of research and development in higher education. Higher education institutions apply for funding from the European Union and many other funding sources. The projects presume new kinds of internal and external mechanisms. One such internal mechanism is that research and development are integrated into education so that students are involved in the projects [2]. In this way, capabilities are created for students to participate in development work after graduation.

Another evolutionary feature of research and development is that the importance of networks increases when partners are sought for these research and development projects. It is believed that innovations are created in projects when teachers and other staff interact with external partners. A typical example can be found in the research and development programs of the European Union, which presume collaboration among several European countries. Higher education institutions need trustworthy partners and look for collaboration according to their interests and strategic plans.

Higher education institutions need open strategic innovation alliances through which trustworthy partners actively build partnerships in projects and promote student and staff exchange to share knowledge and skills to serve business companies and other organizations and strengthen the economic and social

cohesion of Europe [3], [4]. The social networks of teachers and other staff create benefits and value and raise the ability of partners in networks to participate and interact when they resolve their shared problems [5].

The purpose of this study is to develop tools for visualizing the strategic network of higher education institutions. The strategy map of the balanced scorecard approach is developed for the Consortium on Applied Research and Professional Education (CARPE). The strategy map was originally developed for business entities by Kaplan and Norton [6], [7]. The network is an open innovation alliance of six European higher education institutions established in 2011. The study also presents an empirical survey in which the network partners presented their opinions about the future outlines of the network.

The Turku University of Applied Sciences and the HU University of Applied Sciences began planning the CARPE network in 2008. The criteria of inviting members to the network included similar fields of education that enable student and staff exchange. The criteria also included applied research and development that enable joint research and development projects. All the network members have strong roots in their respective regions and a substantial role in the economic, social, and cultural life of their environment.

The traditional research model in which a single scholar in a university internally and singularly generates new knowledge and publishes the results has changed and taken new forms, especially at universities of applied sciences. Applied research and development have increased and become essential in today's quickly changing and complex economy. The closed innovation environment is simply too slow, costly and inefficient to produce useful results for external organizations and improve their competitive advantage. This study challenges the traditional approach of closed research, because the funding sources and innovation networks have changed the traditional research model.

The remainder of this paper is set up as follows. Section II includes the literature review, which introduces the importance of strategic objectives viewed from the perspectives of the balanced scorecard. Section III describes the data and methodology and presents the collaborative higher education institutions and the data collected for the study. The results and discussion in Section IV present the strategy map of the CARPE network. It also presents the empirical results of the survey about the future directions of the network. The final section,

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Section VI, offers closing comments.

II. LITERATURE REVIEW

Carefully selected European higher education institutions established a strategic network which can be characterized as an open innovation alliance. An open innovation alliance is a network among several parties to promote innovations and secure common interests. Open innovation alliances evolve over time, because partners are free to enter and leave the alliance [8]. The member institutions and other partners are free to join the research and development projects and initiate student and staff exchanges with the member institutions of the strategic alliance.

The strategic networks offer several benefits including 1) pooling complementary skills, 2) accessing external knowledge, 3) accelerating product development [9], and 4) earlier and closer customer interaction in product development [10]. The strategic alliances are expected to generate competitive advantage [11]. Indeed, examples from business literature show that strategic alliances yield positive returns [12]. There is also extensive literature on the positive contributions of networks to innovation [13]–[15].

Strategic networks provide access to new knowledge, skills, technologies and markets by integrating complementary competencies and sharing risks [16]. Therefore, partnerships in strategic networks have potential as drivers of co-innovation and new funding sources. An open strategic network provides opportunities for external actor involvement in research and development, wherein partners from a diversity of backgrounds collectively solve complex problems in the network [17], [18]. The higher education institution is able to utilize the discoveries of others and is also able to pass on internally developed knowledge to others.

Strategic plans have typically been created for an organization and their strategic business units, which are independent of other organizational units. It is, however, important to create networked strategies for clusters, strategic alliances, and other networks that share knowledge and skills and collaborate to promote the competitiveness and create benefits and other advantages for network participants. The network strategies are not binding, but they can be used in partner organizations to guide their strategic planning and management. The tools of strategic management can also be applied to collaborating networks.

The balanced scorecard approach was developed by Kaplan and Norton [6], [7] to provide a framework for the communication and implementation of the strategic plan. The approach translates the strategic plan into strategic objectives, and the achievement of objectives is described by the measures. The strategic objectives are typically placed in four different perspectives which extend the traditional accounting to activities, organizational knowledge, and customer relationships. The strategy map also includes causal linkages between the perspectives and objectives which are performance drivers and desired outcomes.

The perspectives of the balanced scorecard approach are 1) customer, 2) finance, 3) internal processes and structures, and

4) learning and growth. The learning and growth perspective and the financial perspective are the drivers of internal processes in higher education while the core processes are research and education. The results of research and development are used in education, which describes the causal sequence of the core processes. The processes have effects on service quality that is described by student and employer satisfaction and the external impact of the institution on the region and society.

Generally, the objectives are derived during the strategy process and included in the strategic plan. The strategic objectives are not always clear in strategic plans, but in some cases they have been clearly written in the text of the strategic plan. The achievement of the strategic objectives has typically two types of measures: 1) indicators, and 2) development projects. The indicators have target values for the planning period, and the achievement of these target values is left for the different organizational units and regularly monitored. The development projects are typically set by the responsible managers. Sufficient funding is allocated, a timetable is set, and people in charge are set for the projects to achieve the strategic objectives.

The balanced scorecard approach is a safeguard that all the necessary elements are included in the strategic plan and that they are balanced with each other. The approach balances the drivers and outcomes, short- and long-term achievements, and financial and other measures, among other things. The balanced scorecard approach is not only an approach to plan, implement, and communicate the strategic plan, but it can also be used to evaluate strategic plans and activities [19]. In this study, the approach is used to evaluate the objectives of the strategic network.

The strategy map was developed to illustrate the main elements of the strategic plan, much like a road map. It describes the main routes to the desired destinations but leaves the less important elements out in order to focus attention on the most important challenges and achievements. The strategy map describes the chain of causal relationships between the driving forces and desired final strategic outcomes. The best strategy maps indicate the strategic plan so well that the main elements of the strategic plan can be described by one figure. The strategy can be inferred from the collection of strategic objectives and causal relationships among them.

III. DATA AND METHODOLOGY

The general agreement of the CARPE network was signed in November 2011. The following higher education institutions are members: 1) the HU University of Applied Sciences Utrecht (Hogeschool Utrecht), 2) the Turku University of Applied Sciences (Turun ammattikorkeakoulu), 3) the Polytechnic University of Valencia (Universitat Politècnica de València), 4) the Hamburg University of Applied Sciences (Hochschule für Angewandte Wissenschaften Hamburg), and the Manchester Metropolitan University. The Steering Committee of CARPE accepted the University of Debrecen as an associate member in November 2014.

The CARPE network has organized biennale conferences to

promote the collaboration of the higher education institutions. An innovative feature of the CARPE conferences is that they do not include only the presentations of research papers but also parallel sessions that include the presentations of research ideas and that invite partners to join the projects. The first biennale conference was arranged in Utrecht in 2011. The second conference was in Manchester in 2013 and the third CARPE Conference was arranged in Turku in May 2015.

The session themes of the CARPE conference in Turku were 1) sustainability and technology, 2) inclusive, innovative, and reflective societies, 3) health and wellbeing, 4) European entrepreneurship, 5) excellent management and governance in higher education, 6) applied research methods, and 7) teaching and learning excellence and innovation. The sessions included more than 60 presentations and workshops. In addition, many research and development workshops and administrative meetings were arranged during the conference.

Conference participants were asked about the desired future directions of the network via an online survey. Feedback was also collected from conference participants via a questionnaire that was sent to all 222 participants. The survey was open for 23 days and a reminder e-mail was sent one week after the first call. In total 66 people returned the questionnaire. The response rate of 30% can be considered satisfactory. The share of responses from the Turku University of Applied Sciences was 33%; HU University of Applied Sciences Utrecht, 28%; Manchester Metropolitan University, 18%; Polytechnic University of Valencia, 7%; and University of Debrecen, 2%.

The overall methodological approach to research design in this study is to connect the theoretical concepts of strategic management to empirical survey data and select relevant tools and procedures as the coherent whole, following the outlines presented by Bryman and Bell [20] and Punch [21]. This study follows the methodology of a case study presented by Yin [22]. The study involves a survey about respondents' perceptions about the desired future directions of the network. An interpretative survey investigates a subjective understanding and opinions about the strategic outlines of the respondents.

IV. RESULTS AND DISCUSSION

A. The Strategy Map of CARPE

The objectives of the CARPE network are exchange and collaboration in the European research programs, the development of joint study programs, the exchange of students and staff, and the establishment of a strong European reputation. The research and development programs of the European Union presume collaboration among several European countries. Funding these programs was the motivation to establish the strategic network. Another motivation was to support European companies and other organizations, because Europe is the major export area of the countries where the institutions are located. These business and other activities strengthen the economic and social cohesion of Europe as outlined by the European Union.

Fig. 1 describes the strategy map of the CARPE network. The cause-and-effect relationships can be described so that the

processes require two prerequisites in higher education. The achievement of strategic objectives in the funding perspective is necessary to finance the objectives of the processes and structures perspective. The network also needs the achievement of the strategic objectives in the learning and growth perspective. On the other hand, successful internal processes are necessary in order to secure funding. The processes also have effects on the learning and growth perspectives, because the personnel of higher education institutions learn by doing. Finally, the processes have desired outcomes in the customer perspective.

The learning and growth perspective of the balanced scorecard generally includes strategic objectives that are related to the knowledge and skills required in the processes. The learning and growth perspective includes the "exchange of students and staff" in the case of the CARPE network. Both of these improve the international skills that staff and graduates need in their working lives. Teachers and other staff also share knowledge and good practices among various higher education institutions and enable the planning and conducting of research and development projects.

The financial perspective of the balanced scorecard typically includes the objectives of revenue and cost efficiency. In private business companies, the financial perspective is placed at the top of the hierarchy of the strategy map and includes the strategic objectives of profitability obtained through customer satisfaction. In the case of the CARPE network, it includes the strategic objective "funding from European Union", which was one of the most important motivations to establish the European strategic network, because many funding programs of the European Union require partners from several countries. The requirement of several countries is based on an assumption that innovations can be increased in collaborative projects.

The processes and structures perspective typically includes the objectives of the value chain and structural changes. In the case of the CARPE network, it includes the objectives "exchange and collaboration in the European research programs" and the "development of joint study programs". They are the core processes in higher education and form the value chain common in higher education and described in legislation and regulations of higher education institutions. The core processes can be broken down into detailed process descriptions when deemed necessary.

The customer perspective of the balanced scorecard typically includes customer satisfaction or the external impact of an organization. In the case of the CARPE network, the customer perspective includes the strategic objective "establishment of strong European reputation" and the "economic and social cohesion of Europe", because a key motivation of the collaborative higher education institutions was to support the businesses and other organizations in the European common market.

The strategy map is a simple tool for the illustration and evaluation of the strategic network. Each member institution of CARPE can use the strategy map in communication and as a foundation in their strategic plans when they define their own strategic themes, objectives, and measures. On the other hand,

each higher education institution can see how they contribute to the achievement of the objectives of the strategic network. The network's strategy map can be used to achieve commitment to the common objectives and synergy across autonomous institutions.

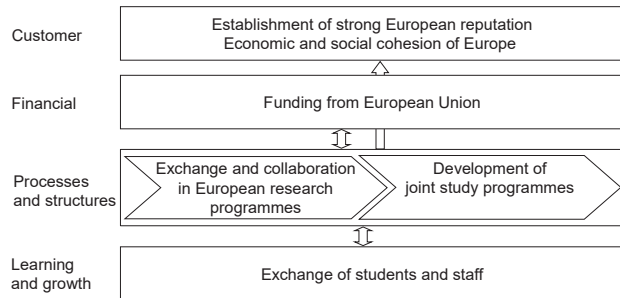


Fig. 1 The strategy map of the CARPE network

B. Results of the Survey

Table I depicts the survey results of the strategic themes of the CARPE network. The results show that research and development projects are clearly the most important element for the member institutions. Nearly 64% of the respondents were of the opinion that research and development projects are highly important. One of the facts of the research programs of the European Union is that there are also partners from other European countries in research and development projects. Only a few of the respondents were of the opinion that research and development were of only minor importance.

Education is another mission of the network's member

institutions. Educational programs were given the second-highest average value with staff mobility. The development of the joint educational programs was one of the workshops in the CARPE Conference. Educational systems and regulations differ greatly among European countries. Therefore, the objectives, contents, methods, and regulations of degree programs must be compared with other institutions to plan joint degrees.

Student mobility was ranked of slightly lower importance than staff mobility. Student mobility is primarily related to education and therefore the result is consistent with the fact that research and development were considered more important than education in the network. Thematic workshops are smaller meetings than conferences and they are arranged by research and development projects. The conferences mainly plan research and development projects and present the results of projects, but some of the parallel sessions discuss education and learning.

Personnel training was clearly ranked as of the lowest importance in the survey. The sharing of knowledge and good practices takes place in the thematic workshops, conferences, and student and staff exchange. That is most likely the reason why personnel training was ranked lowest. Publications also had rather high importance, but their importance was clearly lower than the average of the research and development projects. Generally, all the averages of responses showed relatively high values. Therefore, these results support the argument that respondents highly value the importance of networking.

TABLE I

RESULTS OF THE SURVEY QUESTIONS: CONCERNING THE DEVELOPMENT OF CARPE, HOW IMPORTANT DO YOU FIND THE FOLLOWING JOINT ACTIVITIES WITHIN THE NETWORK? 1=NOT IMPORTANT AT ALL, 6=HIGHLY IMPORTANT

	1	2	3	4	5	6	Average
Research and development projects	0	3.0	3.0	9.1	21.2	63.6	5.4
Educational programmes	0	1.5	4.6	27.3	34.9	31.8	4.9
Thematic workshops	0	1.5	9.1	34.9	40.9	13.6	4.6
Conferences	0	1.5	9.1	30.3	42.2	16.7	4.6
Student mobility	1.5	3.0	6.1	27.3	34.9	27.3	4.7
Staff mobility	3.0	0	7.6	16.7	37.9	34.9	4.9
Personnel training	1.5	13.6	24.2	19.7	21.2	19.7	4.1
Publications	1.5	9.1	9.1	36.4	22.7	21.2	4.3

The motivation to establish a strategic network emerged among higher education institutions when the European Union provided project funding for networked international research and development projects. The motivation of these institutions to apply for funding from the European Union increased when they experienced budget cuts by central governments. In addition, the performance-based funding schemes and performance indicators of higher education institutions have increased incentives to apply for external funding for research and development in some countries.

The strategic network of higher education institutions is formed and maintained based on several governing principles, such as open project membership, student and staff exchange, the regulation of funding bodies, and self-monitoring and

evaluation of institutions in quality assurance. The network evolves dynamically over time because the partner composition of research and development projects changes along with changes of the focal area of the research and development programs of the European Union. The changes in the politically directed focal areas of funding favor open strategic networks.

One implication of the CARPE network is that Turku University of Applied Sciences developed innovation pedagogy which extends the traditional lecture-based education to collaborative learning in research and development groups and networked learning outside the institute in strategic and other networks [2]. These new modes of delivering education improve the problem-solving skills of students to achieve practical learning goals [23]. The networks raise the ability of

students to participate and interact when they solve shared problems [5]. Learning takes place as learners interact [24].

Innovation pedagogy also means that the higher education institution responds to the development needs of businesses and other organizations with applied research and development projects which typically are multidisciplinary and do not follow the structure of subjects or degree programs in higher education. The projects are integrated with education so that students, teachers, and other staff participate in the projects that develop innovations. The incremental innovations improve processes, services or products, but radical innovations create new ones [25]. This kind of activity also improves the entrepreneurship and innovations, because the international projects bring many new ideas from other countries.

V.CONCLUSIONS

The purpose of this study was to describe the strategic network of European higher education institutions using the concepts of strategic management. The CARPE network was established in 2011, and there are five members and one associate member that represent the different countries of the continent. The network was established to promote research, education, exchange, and funding from the European Union and to create a strong European reputation.

The objectives of the strategic network were analyzed using the balanced scorecard approach, which was originally planned for the implementation and communication of the strategic plan. It turns out that the balanced scorecard approach can also be used to evaluate the activities of the network. It further emerged that the objectives of the strategic network were balanced so that there were essential strategic objectives in every perspective of the approach.

A survey was conducted after the third biennale CARPE Conference held in Turku. The purpose of the survey was not only to collect feedback from the conference but also to gather the opinions of conference participants about future collaboration in the network. The results of the survey show that research and the development projects are the most important activity for participants. The institutions use the network to apply for funding and to collaborate in research and development projects to better serve customers in their region and society. Also, the joint educational programs were considered important with staff mobility. Thematic workshops, conferences, student mobility, personnel training and publications were also considered important even though they were rated as less important in the survey.

The limitation of this study is that the results cannot be generalized to other networks. The results have been obtained mainly from the European universities of applied sciences, which have applied research and development and orientation to promote regional development. The results cannot therefore be generalized to the traditional research universities. A challenging and a fruitful topic for further study would be to analyze other networks and the international collaboration of traditional research universities.

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