

RIGA TECHNICAL UNIVERSITY
Faculty of Engineering Economics and Management
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“Management Science and Economics”

**KNOWLEDGE MANAGEMENT APPLICATION
FOR ENHANCEMENT OF ALUMNI LONG-TERM
ENGAGEMENT IN HIGHER EDUCATION
AND RESEARCH INSTITUTIONS**

Summary of the Doctoral Thesis

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DECLARATION OF ACADEMIC INTEGRITY

I hereby declare that the Doctoral Thesis submitted for the review to Riga Technical University for the promotion to the scientific degree of Doctor of Economic Sciences is my own. I confirm that this Doctoral Thesis had not been submitted to any other university for the promotion to a scientific degree.

Anita Straujuma

Date:

The Doctoral Thesis has been written in English. It consists of Introduction; 4 chapters; Conclusion; 57 figures; 48 tables; 7 appendices; the total number of pages is 201. The Bibliography contains 207 titles.

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INTRODUCTION

Higher education has a history of hundreds of years. Right now, because of rapid technology development and the globalization, the higher education market is radically changing. It is not a privilege only of elite circles, higher education nowadays is widely available. Universities are not only centres of knowledge, they are becoming generators of innovative companies and cornerstones of countries' future prosperity. The higher education market is quite uneven – university competition is moving to the government level where all self-respecting countries take part by generous funding of excellence initiatives. The USA and Western Europe dominate the rankings and continue to invest strategically in the higher education institutions. Worldwide the new life-cycle of a student is transformed to a life-long relationship with the university. After graduation begins a new phase of mutually beneficial relationship of alumni and universities. Alumni relations and fundraising is a large industry in the USA and Western Europe – it provides significant share of higher education financing and means for cooperation between industry and universities supporting common research, valorization, and career development. Alumni play a vital role in university support and development. Cooperation with alumni depends on the governance of the universities and dominant sources of power. Clark describes three main power sources: state authority, academic oligarchy and market (Clark, 1984). Latvia in the power triangle is in-between state authority and academic oligarchy close to Nordic Countries but far from the United Kingdom and USA, which are very close to the market. Being close to the market also means close cooperation with alumni. Thus, alumni as a research object are currently extremely important for Baltics. The history of centrally organized alumni relations is two centuries long in the USA, several decades in the United Kingdom, less than twenty years in Nordic countries and just starting in the Baltics. That reveals many challenges for the universities in the Baltics – building alumni relations means building a new culture and engaging alumni where majority until recently expected that their relationship with university ends after the graduation ceremony. In the Doctoral Thesis author researches higher education financing tendencies in the countries that are most actively promoting alumni relations. The research reveals clusters of countries that support the idea of Clark's model. Further research focuses on these clusters and the impact of higher education system on alumni relations and the chosen activities of universities in alumni engagement. That brings to a conclusion that in the Baltics expectations to get significant financial benefits from alumni in short term are premature – there is no tradition of supporting that, and the relationship culture must be changed sometimes even radically. In business it is common and convenient to apply monetary measures for success. However, intellectual capital of alumni-university relationship, knowledge, information and connection to the labour market are difficult to measure and

therefore underestimated and insufficiently applied as success metrics. The author for the doctoral thesis has chosen another, less researched way of mutually beneficial alumni-university relationship form – knowledge management. Most commonly knowledge management is associated with organizational efforts to manage its inner knowledge for better and sustainable business development. Customer knowledge management goes over organizational borders and involves three types of knowledge – to, from and about the customer. That precisely fits with alumni role in the university because the university cannot exist nowadays without the knowledge and experience of the industry because it is preparing the resources that will be the future driver of the labor market. At the same time it is important for the university to inform alumni and industry what is going on in the campus of the university – what skills students are acquiring, what are recent inventions, what equipment there is in the campus and how it all can be applied in the industry for mutual benefit. Until recently only foreign research has investigated different aspects of alumni relations, there is no research in the Baltic countries. Also, most of the research worldwide is dedicated to fundraising. The Doctoral Thesis is about alumni and their knowledge in all alumni-university intersection points. Implementation of alumni knowledge management model and systematic use of metrics will timely indicate strategic and knowledge gaps between the universities and industry. Cooperation with alumni has a multiplier effect because it increases the quality of higher education, provides technology and knowledge transfer, development of intellectual capital and increase of university brand value. The Doctoral Thesis reviews the main forms of cooperation of alumni and university, evaluates the strategic priorities and opportunities based on empirical research.

In the Doctoral Thesis, the following **research questions** are formulated.

1. What is alumni role in university?
2. How to enhance alumni long-term engagement in university?
3. How to measure the alumni knowledge management implementation results in the university?

The research object.

Alumni and alumni relations departments in higher education and research institutions.

The research subject.

Application of knowledge management instrument for the enhancement of alumni long-term engagement in higher education and research institutions.

The aim of the research.

To develop tools that assess the degree of alumni engagement and strengthen alumni long-term cooperation with higher education and research institutions.

In order to reach the formulated aim, the following research objectives are set.

1. To research the history of alumni relations, the environment influencing alumni relations management in the universities, and to research alumni relations nowadays – tendencies in different regions and how they relate to the situation in the Baltics, particularly in Latvia.
2. To investigate alumni roles, especially customer role, in relation to university by researching scientific and business literature, inquiring university management on attitudes and perceptions, and to ascertain the previous analysis by asking alumni themselves about their attitudes and perceptions about university.
3. To develop alumni segmenting that fosters alumni engagement with university.
4. To develop an alumni knowledge management model that involves all university-alumni activities and intersections and to develop alumni knowledge management metrics.
5. To do the approbation of the alumni knowledge management model.

Limitation of the research.

The Doctoral Thesis focuses on the alumni knowledge management specifically at higher education and research institutions, i.e. universities. Most of the knowledge management, customer knowledge management and key account management scientific research is based on business organizations. The results of research were adapted to the higher education environment and used in the design and implementation of alumni knowledge management model that is applicable particularly in universities. The period of empirical study is from 2014 until 2018. The research involves only the information and financial indicators that were publicly available.

Theoretical and methodological foundation of thesis.

The analysis of existing research on alumni relations, alumni segmentation, customer concept, knowledge management, customer knowledge management and key account management is limited to several research areas grouped as follows.

The first research group studied alumni concept, history, and alumni role in university (Shaw *et al.*, 1917; Sailor, 1930; Clark, 1984; Arceo, 2003; Balder,

2006; Dobbins, 2011; The Society of Alumni of Williams College, 2012; Council for Advancement and Support of Education, 2013; Appelqvist, 2014; Durango-Cohen and Balasubramanian, 2014; Ebert, Axelsson and Harbor, 2015), alumni segmentation (del Barrio-García and Luque-Martínez, 2009; Le Blanc and Rucks, 2009; Chi, Jones and Grandham, 2012; Durango-Cohen and Balasubramanian, 2014; Rattanamethawong, Sinthupinyo, and Chandrachai, 2017; Weerts and Cabrera, 2017; Windler *et al.*, 2017).

The second research group investigated customer concept, customer loyalty and lifetime value (Juran, 1988; Drucker, 1990; Kramer, 2001; Normann, 2001; Ross and Segal, 2002; John M. Bryson, 2004; Phills, 2005; Pickton and Broderick, 2005; Hill and Jones, 2007; Kaplan and Warren, 2007; Solomon, 2009; Bergman and Klefsjö, 2010; Rothschild, 2012), customer segmentation (Ross and Segal, 2002; Jonker, Piersma and Van Den Poel, 2004; Kim *et al.*, 2006; Hill and Jones, 2007; Kaplan and Warren, 2007; Böttcher *et al.*, 2009; Olsen, Prebensen, and Larsen, 2009; Hsu, Lu and Lin, 2012; Cuadros and Domínguez, 2014; Floh *et al.*, 2014), and key account management (Scott and Westbrook, 1991; Dunn and Thomas, 1994; Pardo, Salle, and Spencer, 1995; Millman, 1996; Pardo, 1997; Homburg, Workman, and Jensen, 2000; Ojasalo, 2001; McDonald and Woodburn, 2007; Zupancic, 2008; Laurin, 2017).

The third research group investigated knowledge management (Huber, 1991; Nonaka, 1994; Nonaka; Takeuchi, 1995; Galagan, 1997; Davenport, De Long, and Beers, 1998; Lang, 2001; Snowden, 2002; Hassard and Kelemen, 2002; Metaxiotis and Psarras, 2003; Jashapara, 2004; Dalkir, 2005; Surowiecki, 2005; Ohmukai, 2006; Liebowitz, 2012; Horaguchi, 2014; Milton and Lambe, 2016), knowledge management in universities (Davenport and Prusak, 1998; Pan L. and Scarbrough, 1998; Oosterlinck *et al.*, 2001; Metaxiotis and Psarras, 2003; Rowley, 2010; Hoq and Akter, 2012; Draghici *et al.*, 2015; Trivella and Dimitrios, 2015), and customer knowledge management (García-Murillo and Annabi, 2002; Grant and Anderson, 2002; Gebert *et al.*, 2003; Bueren *et al.*, 2005; Rollins and Halinen, 2005; Pavicic, Alfirevic, and Znidar, 2007; Zanjani, Rouzbehani, and Dabbagh, 2008; Sofianti *et al.*, 2010; Fan and Ku, 2010; Shieh, 2011; Chen, 2011; Sedighi, Mohamad Mohsen; Mokfi, Taha; Golrizgashti, 2012; Buchnowska, 2014; Khosravi, Razak and Hussin, 2016).

The fourth research group was dedicated to knowledge management metrics (Moreira, 1996; Sveiby, 1997; Skyrme and Amidon, 1998; Stewart and Ruckdeschel, 1998; Johan Roos, Goran Roos, Nicola Carlo Dragonetti, 1998; Bontis *et al.*, 1999; Bergeron, 2003; Bose, 2004; Faisst and Resatsch, 2004; Kankanhalli and Tan, 2004; Dalkir, 2005; Oliveira and Goldoni, 2006; Gupta, Mehrotra, and Sharma, 2015), incl. Balanced Scorecard application (Kaplan and Norton, 1992; Fairchild, 2002; Bergeron, 2003; Faisst and Resatsch, 2004; Dalkir, 2005; Gupta, Mehrotra, and Sharma, 2015).

Logics of the research.

Logical structure of the research is determined by the aim of the research and consistency of research objectives. Figure 1 shows the structure reflecting logics.

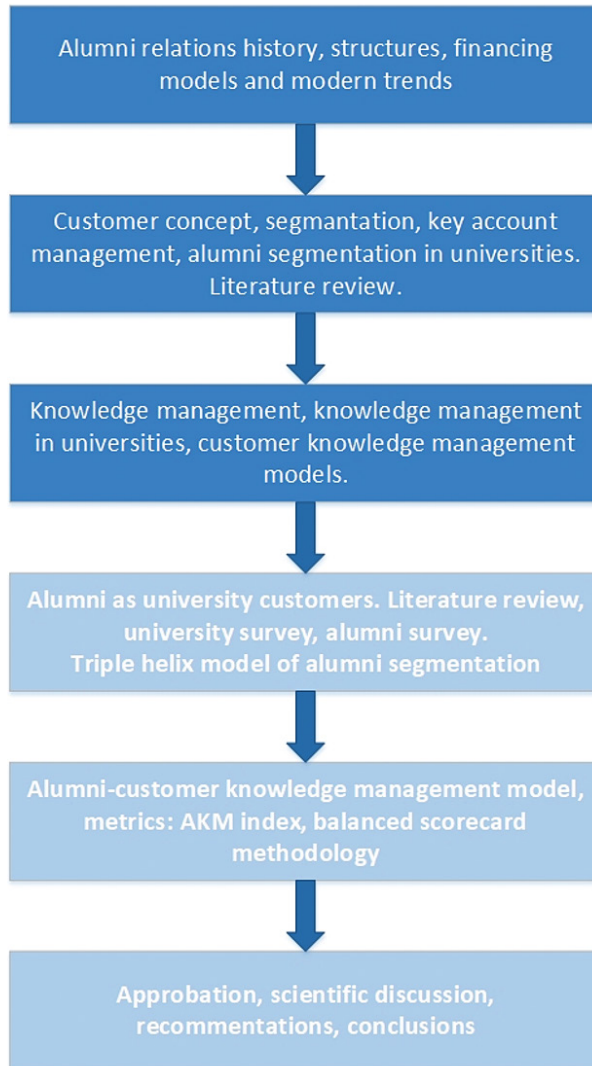


Fig. 1. Logic of the research (developed by author)

Research methodology

State of art literature review describes alumni relations, theory of knowledge management, key account management, customer knowledge management, customer notion and customer segmenting. It also reviews latest research and practices of knowledge management in the universities. Alumni relations and fundraising history and practices nowadays are derived by extensive literature research, systematic research of online resources and by expert interviews (Emma Johnes, KTH Royal Institute of Technology in Stockholm, Sweden; Sarah Havrén Schütz, Uppsala University, Sweden); Giedre Birzyte, Vilnius University, Lithuania; Rimante Hopeniene, Kaunas University of Technology, Lithuania; Elen Kirt, Tallinn University of Technology, Estonia; Teele Arak, University of Tartu, Estonia). There is literature review performed to substantiate the statement that alumni are university customers. With the same aim author performed an online survey inquiring universities about their services to and attitudes towards alumni as customers. As the research approved that one of alumni roles in university is being a customer, the author continued the research with state of art literature review on existing practices of universities in alumni segmenting, expert interviews (named above) supplemented the acquired knowledge. The author developed an alumni segmenting model (see Chapter “Triple helix model of alumni segmentation”) that was based on knowledge management integration with key account management and validated the model within a focus group (alumni relations office staff, volunteers, alumni association board members, ex board members). As (Griffin and Hauser, 1993) describes in “Voice of the customer”, for over 80 % credibility, it is enough to perform six one to one interviews backed up by focus groups. This methodology was applied to validate the alumni segmenting model. Based on this previous work, the author developed an alumni knowledge management model (AKMM) for the universities that is based on customer knowledge management theory integration with key account management (see Chapter “Alumni knowledge management model”). The author performed an online survey to gather information about alumni relations in the Baltic higher education (hereafter Universities). The target audience of the survey were alumni of Latvian, Estonian and Lithuanian universities and colleges. The survey was open for one month, engaging 579 respondents among them 76.6 % Latvian, 12.6 % Estonian and 10.9 % Lithuanian. The survey provided the view of alumni and supported the conclusion that customer is one of alumni roles in university. It also provided factors and priorities necessary for building alumni knowledge management model and developing alumni knowledge management index. Alumni knowledge management index (AKMI) is a method developed by author that measures the success of alumni knowledge management in the university (see Chapter “Alumni knowledge management index”). It involves all factors that are involved in AKMM and considers the importance of these factors in relation to university strategy and alumni perception at a given point of the time. Given the extent of factors involved in AKMI, it can be difficult to measure for small alumni relations offices operating

in universities, thus the author provides simpler way of measuring AKMI success and describes balanced scorecard methodology (see Chapter “Balanced scorecard as alumni knowledge management metrics”).

The findings are based on the author’s 7-year professional experience in the field, supplemented by surveys, expert interviews, focus group and case studies.

The main scientific contributions and novelty of the Doctoral Thesis.

1. Author performed a **research of alumni relations in the Baltics**. A study of this volume and of this particular topic was performed for the first time in the Baltics. It reveals overall attitudes of alumni towards long-term engagement with HERI as well as details of their priorities and readiness to engage. The results of the research will help HERIs to shape their alumni relations activities strategically fit to university and alumni needs.
2. **Alumni triple helix segmentation** developed by author is a new way to segment alumni according to the fields of engagement and level of activity. It provides an instrument for alumni relations practitioners and HERIs to communicate and involve alumni in a more meaningful and targeted way to ensure better engagement and mutual benefits.
3. **Alumni knowledge management model** (AKM) was developed based on customer knowledge management principles. It covers all intersections of alumni-HERI strategic activities and knowledge management supporting and enhancing alumni long-term engagement in HERI.
4. Alumni knowledge management model is described also mathematically as **alumni knowledge management index**. It covers all AKM aspects and can be used for the knowledge management system IT support development as well as for measurement of alumni and HERI strategic and knowledge management gap.
5. The author developed **alumni knowledge management metrics methodology on the basis of Balanced Scorecard** strategy performance management tool, which is also widely applied as knowledge management metrics. The Balanced Scorecard methodology application provides an overview of alumni relations performance and an opportunity to observe the tendencies in achievement of most important measureable targets.

The hypothesis of the Doctoral Thesis is stated as follows.

Accumulation and management of alumni knowledge enhances alumni engagement with HERI, which in turn leads towards increase of non-financial results and long-term sustainability.

The following theses are brought forward for the defence.

1. One of alumni roles in relation to HERI is lifetime customers. Such (customer) notion impacts attitudes and mutual relationship of both parties. Lifetime engagement changes student-alumni lifecycle and breaks the boundaries and perceptions by continuing meaningful and strategic HERI collaboration with alumni of all ages.
2. Customer knowledge management principles can be applied in alumni relations management, sustaining all strategic activities of HERI and alumni relations. Customer concept substantiates managing knowledge to, from and about alumni. Comprehensive model ensures management of these three knowledge directions in all strategic HERI and alumni activities.
3. It is possible to develop a quantitative alumni knowledge management model that provides a measurable description and analysis of alumni and HERI strategic activities and knowledge.

Practical contribution and key benefits of the Doctoral Thesis.

- The Results of the Baltic alumni survey describe situation in the Baltic universities regarding alumni relations. The survey reveals alumni attitudes, their knowledge segmentation, interests, priorities and ways to engage with universities. Practitioners can exploit the results by targeting activities to specific alumni segments that will provide most meaningful long-term results, by realizing activities that are of highest priority for alumni and university strategic targets.
- The triple helix alumni segmentation model is exploiting key account management principles and segments alumni according to 3 main fields of engagement and according to the level of their activity or engagement. This segmentation helps practitioners to target the communication and activities more precisely thus increasing alumni engagement and helping alumni to evolve in cooperation with their alma mater.
- Alumni knowledge management model describes all the alumni relations activities in all university strategic fields and respective knowledge management activities. Alumni relations practitioners can adapt the model according to their university strategic perspectives and structure alumni relations activities for a better fit of university and alumni relations strategic knowledge management targets.
- Balanced scorecard management methodology provides practical and easily adjustable and applicable tool for measuring alumni knowledge management results in universities.

Structure and volume of the dissertation.

The Doctoral Thesis consists of Introduction, 4 chapters, conclusions, and recommendations. The volume of the Thesis is 201 pages, excluding appendices. The content of the Doctoral Thesis has been illustrated by 57 figures and 48 tables. The Doctoral Thesis has 7 appendices. The bibliography contains 207 reference sources. The content of the Thesis covers both theoretical and empirical study. The author has published 11 articles about the topic of the study and its results. The results of the Doctoral Thesis have been presented in 12 international scientific conferences and approbated and presented in 8 international industry specific conferences.

Chapter 1 describes alumni relations concept, history and contemporary issues. It covers literature review, latest scientific research, and the statistics obtained by industry associations regarding alumni relations and fundraising. Financing of higher education in different countries is reviewed to set the background for different alumni relations cultures, patterns and models in order to derive which is the most realistic focus of alumni relations in Latvia and the Baltics.

Chapter 2 describes customer concept, paying particular attention to non-profit sector. It reviews latest research in customer segmentation and key account management, which is a discipline analysing organizations' relationships with most valuable customers. Latest research and practice of alumni segmentation is reviewed in greater detail.

Chapter 3 covers literature review and latest research on knowledge management and its metrics. Particular attention is paid to knowledge management in universities. Customer knowledge management encompasses acquiring, dissemination and usage of customer knowledge within the organization for mutual benefit. The concept is developed by merging knowledge management and customer relationship management. The chapter contains literature review, scientific research, and describes several models of customer knowledge management.

Chapter 4 describes authors' empirical research and application of the above mentioned theories and conclusions in developing alumni segmentation, alumni knowledge management model, metrics, metrics methodology, and approbation of these. Literature review and two surveys (one of higher education and research institutions (HERI), other of alumni themselves) approved that alumni are lifetime customers of HERI and theories and concepts related to customer management can be applied in alumni relations. The author developed a triple helix alumni segmentation based on key account management principles. Alumni knowledge management model is built on basis of customer knowledge management concept. The author developed a mathematical model for alumni knowledge management (alumni knowledge management index) and practical metrics methodology based on balanced scorecard principles. All developments were approbated at Riga Technical University.

Scientific publications on the theme of the Research

1. Straujuma, A., Gaile-Sarkane, E. Cross-Disciplinary Methodology for Development of Entrepreneurial Skills: the Case of Riga Technical University. Mathematics and Computers in Sciences and Industry: 2nd International Conference (MSCI 2015), Malta, Sliema, 17–19 August 2015. [S.l.]: 2015, 116–120, ISBN 978-1-61804-327-6.
2. Straujuma, A., Ozoliņš, M., Lapiņa, I., Gaile-Sarkane, E., Stensaker, B. The Role of Regulatory Compliance Governance in Strategic Management of Higher Education and Research Institutions. Proceedings of the 19th QMOD-ICQSS International Conference on Quality and Service Sciences, Italy, Rome, 21–23 September 2016. Lund: Lund University Library Press, 2016, 128–141., ISBN 978-91-7623-086-2.
3. Vaivode, I., Straujuma, A., Gaile-Sarkane, E. What Latvia Can Learn from Israel University-Industry Innovation Cooperation. Challenges and Solutions for Fostering Entrepreneurial Universities and Collaborative Innovation: University-Industry Interaction Conference, Netherlands, Amsterdam, 1–3 June 2016, Amsterdam: 2016, 13–28, ISBN 978-94-91901-21-8.
4. Straujuma, A., Gaile-Sarkane, E. Regulatory Compliance Governance as a Tool of Strategic Knowledge Management in Entrepreneurial Ecosystem. Riga Technical University 57th International Scientific Conference “Scientific Conference on Economics and Entrepreneurship”. SCEE ‘2016 : Proceedings, Latvia, Riga, 29–30 September 2016. Riga: Riga Technical University, 2016, 151–153. ISBN 978-9934-10-860-0. ISSN 2256-0866.
5. Straujuma, A., Ozoliņš, M., Lapiņa, I., Gaile-Sarkane, E. Legislation Impact, Regulatory Compliance and Strategic Management Process in Higher Education Institutions of Latvia. 75th Conference at the University of Latvia, Latvia, Riga, 27 Jan. – 3 Feb. 2017. Riga: University of Latvia, 2017.
6. Straujuma, A., Lapiņa, I., Gaile-Sarkane, E., Ozoliņš, M. Policies, Legislation and Regulatory Compliance Governance Impact on Strategic Management of Higher Education and Research Institutions in Latvia. Proceedings of the 21st World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2017). Vol. 2, USA, Orlando, 8–11 July 2017. Winter Garden, Florida: International Institute of Informatics and Systemics, 2017, 69–74. ISBN 978-1-941763-60-5
7. Ozoliņš, M., Straujuma, A., Gaile-Sarkane, E. What Latvia can Learn from Engaged University Concept Implementation Case. International Scientific Conference “Economics and Management, ICEM”, Latvia, Riga, 10–13 May 2017. Riga: 2017.
8. Straujuma, A., Gaile-Sarkane, E. Customer Knowledge Management Model Application in Alumni Relation Management. 58th International Riga Technical University Scientific Conference on Economics and Entrepreneurship (SCEE’2017), Latvia, Riga, 13–14 October 2017. Riga: 2017.

9. Ozoliņš, M., Stensaker, B., Gaile-Sarkane, E., Ivanova, L., Lapiņa, I., Ozoliņa-Ozola, I., Straujuma, A. Institutional Attention to European policy Agendas: Exploring the Relevance of Instrumental and Neo-Institutional Explanations. *Tertiary Education and Management*, 2018, Vol. 24, 1–13. ISSN 1358-3883. Available: doi:10.1080/13583883.2018.1459820
10. Straujuma, A., Gaile-Sarkane, E., Ozoliņš, M., Ozoliņa-Ozola, I., Alumni Knowledge Management Metrics for the Advancement of Industry University Collaboration. 2018. Proceedings of the 22nd World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2018).

Conferences

1. Riga Pedagogy and Educational Management Academy conference for young scientists, Riga, 28 November 2014.
2. Mathematics and Computers in Sciences and Industry: 2nd International Conference (MSCI 2015), Malta, Sliema, 17–19 August 2015.
3. CASE Europe annual conference, Council for advancement and support of education, Manchester, UK, September 2015.
4. Building Alumni Community: Creating Strong and Meaningful Alumni Programs at German Universities, Goettingen University, Goettingen, Germany, February 2016.
5. Alumni relations in Baltics: Is it possible to copy-paste American experience? The impact of cultural differences, Riga Technical University, Riga, Latvia, March 2016.
6. International Conference on Alumni Relations (iCARE), Porto, Portugal, May 2016.
7. International Conference on Quality and Service Sciences, Italy, Rome, 21–23 September 2016.
8. University-Industry Interaction Conference, Netherlands, Amsterdam, 1–3 June 2016.
9. 57th International Scientific Conference “Scientific Conference on Economics and Entrepreneurship”. SCEE ‘2016, Riga Technical University, 29–30 September 2016.
10. Conference «Alumni relations and fundraising», Vilnius University of Applied Sciences, Vilnius, Lithuania, September 2016.
11. 75th Conference at the University of Latvia, Latvia, Riga, 27 Jan. – 3 Feb. 2017.
12. 2nd International Conference on Alumni Relations (iCARE), Porto, Portugal, May 2017.
13. 21st World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2017). Vol.2, USA, Orlando, 8–11 July 2017.
14. International Scientific Conference “Economics and Management, ICEM”, Latvia, Riga, 10–13 May 2017.

15. Youth Role and Possibilities in the Development of Engineering, RTU Daugavpils Branch Scientific Conference, Daugavpils, Latvia, May 2017.
16. 58th International Riga Technical University Scientific Conference on Economics and Entrepreneurship (SCEE'2017), Latvia, Riga, 13–14 October 2017
17. 11th Annual Scientific Baltic Business Management Conference “Trends of Business and Funding Models in Contemporary World”. 15–17 March 2018, Riga, Latvia.
18. 3rd International Conference on Alumni Relations (iCARE), Elche, Spain, May 2017
19. 22nd World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2018). USA, Orlando, July 2018.
20. CASE Europe annual conference, Council for advancement and support of education, Edinburgh, UK, August 2018.

1 HERI ALUMNI RELATIONS DEFINITION, HISTORY, FINANCING MODELS AND CONTEMPORARY ISSUES

Chapter 1 of full Doctoral Thesis contains 5 subchapters, 27 pages, 8 tables and 9 figures.

The main focus of this Thesis is on alumni, thus it is important to define what this term comprises. The definition of the word *alumnus* (*masculine, feminine – alumna, plural – alumni, informal - alum*) in various dictionaries is as follows.

By Cambridge University Press, 2017a:

- 1) a person who has attended or graduated from a particular school, college, or university;
- 2) a person who is a former member, employee, contributor, or inmate.

By Oxford University Press, 2017a:

- 1) a former pupil or student, especially a male one, of a particular school, college, or university;
- 2) a former member of a group, company, or organization.

The origin of the word *alumnus* dates back to mid 17th century (from Latin ‘nursling, pupil’, from *alere* ‘nourish’).

All definitions are very similar. However, interpretations can vary. Universities sometimes redefine a wider or narrower scope of alumni. Wider definition comes by including in the concept all persons who have ever entered the organization, even if not formally graduated (e.g. students who are excluded because of academic debts). Narrower concept, on the contrary, deals only with those graduates who after graduation meaningfully reconnect to their alma mater and participate in university activities. (Medeisiene et al., 2017). This Thesis focuses on alumni in the classical understanding – a person who has graduated university, regardless of his/her activity and further connections with alma mater.

1.1 Alumni relations history

Universities in their lifetime always have had one sort or other of cooperation with their alumni. The written history registers that organized and deliberate alumni relations management started in the 18th century. The underlying reasons for organized alumni gatherings and university deliberate relationship building with alumni have been the same in the 18th century as they are nowadays – networking among alumni, alumni lobbying and knowledge support for improvements in the universities, and financial support by alumni to the university. The models and organizations have varied in different times and different regions. Alumni relations history started in 1792, when Yale University

started a system by organizing alumni by class (Sailor, 1930). Since then, class address lists and bibliographical records of alumni have been compiled regularly. In 1821, in Williams College a meeting took place “at the request of a number of gentlemen, educated at this institution, who are desirous that the true state of the college be known to the alumni, and that the influence and patronage of those it has educated may be united for its support, protection and improvement.” (The Society of Alumni of Williams College, 2012; Council for Advancement and Support of Education, 2013). In 1913, the first full time paid alumni secretary was appointed at the University of Michigan. In 1917, the first book about alumni administration “Handbook of Alumni Work” was published. It stated that already at that time practically every college or university had some sort of alumni publication designed to keep the graduates informed of the progress of their institution. All the larger institutions and many of the smaller ones also had a full or at least part time alumni relations officer. In 1931, the first comprehensive survey of alumni work was undertaken by John G. Olmstead and published as the Survey of Alumni Achievement. The report indicated that “there are 119 alumni secretaries in the field, the average salary is \$3,205, and the average tenure in the profession is 2.5 years.” (Shaw et al., 1917). Alumni relations are a major source of funding for American universities and colleges (E. J. Durango-Cohen & Balasubramanian, 2014) universities, and other nonprofit organizations-who have seen sharp declines in private contributions, endowment income, and government grants in the past few years, and face fierce competition for donor dollars (Wall Str J p. R1, 2011)

Alumni relations in Europe is a fairly new discipline. In the beginning of the 20th century, in Germany and France there were no organizations similar to American ones. Germany had a different type of loyal student and alumni organizations – *Corps* or *Burschenschaften*, where members usually were not from the same university but were advocating and supporting higher education, academic traditions, friendship, networking and patriotism (Balder, 2006; Shaw et al., 1917).

The situation was a little different in England and Scotland where alumni had considerable voice in the control of the university being part of the governing body. Though this situation still differs from American universities’ frequent alumni publications, homecomings and alumni relations secretaries’ classical functions (Shaw et al., 1917).

Nordic Countries have a relatively short history of formal alumni relations since all higher education is funded by government. In the UK and USA, investment in alumni relations is highly driven by expectations to get the money back as a result of fundraising. The Nordic Countries historically lacked this form of driver due to the financing structure of its tertiary education level. There has been an attitude that if there is a need for additional resources for a university in the Nordic Countries, the government should take care of it and finance the particular need. Universities always maintained an informal link with alumni – guest lectures, seminars, inspirational speeches have always been in place. However, a formal movement of organized alumni relations started in the late 20th century or even just in the beginning of the 21st as the universities realized that it is

worth investment. The main driver was governments encouraging universities to increase their interactions with society and build relationships with non-university stakeholders (Ebert et al., 2015).

In Latvia, Riga Polytechnical Institute (hereafter RPI, now Riga Technical University) Alumni Society was founded in 1910. The University archive contains protocols of this Society. According to the History Museum of the University of Latvia, there were separate attempts to start the alumni movement but none of them resulted in a solid organization. Meanwhile, in Latvia there were very active student organizations – fraternities that were similar to the German student organizations and sororities that gathered female students for a lifelong membership.

1.2 Alumni relations nowadays

Nowadays alumni relations (AR) and fundraising are large industries attracting interest of various business fields like IT (alumni data base, engagement applications, data mining on high net value individuals, etc.), consulting (strategies, etc.), marketing and communications services, etc. Most of colleges and universities in the USA and UK have alumni associations as their integral part of structure. According to author's research all top 100 US universities do have alumni associations (selection is based on QS University Rankings 2016/17 (QS World University Rankings®, 2016)). Situation in Europe is slightly different – out of 90 European universities mentioned in QS ranking as best (QS World University Rankings®, 2017), 87 % have alumni relations department or alumni association, 8 % have department based alumni clubs, for remaining 6 % there is no publicly available information about alumni movement connected with that particular university.¹ Alumni relations professionals have an opportunity to join the Council for Advancement and Support of Education (CASE) – an organization that originated in the USA, now having branches in Europe, Asia-Pacific and Latin America. It offers informal education for the industry participants, organizes regular conferences, performs regular surveys and benchmarking. In Europe, most active participants in conferences and benchmarking surveys are universities from the UK, followed by the Netherlands and Sweden. It reflects the overall activity in alumni relations industry in particular countries. According to expert interviews performed by author, most of the followers have founded formal alumni organizations hoping that alumni will be a self-organizing force without the need for financial investment in communication and data maintenance. However, in practice alumni organizations cannot ensure continuity without strong university support that provides basic administrative needs, alumni data base, marketing and communication, etc.

¹ Full lists of the USA and European universities can be seen in Appendix 1

The USA and UK, as described above, are the most active and successful countries in alumni relations investing lots of effort and finance in building solid life long relationship. As the analysis revealed the activities performed in alumni relations are identic and could shortly be described as “they do everything” that we know as related to alumni relations. Both countries actively organise events, there are mentoring and career services, strong loyalty programs, lots of networking opportunities including online alumni portals, very solid fundraising with history and traditions that dates centuries ago.

In the Nordic countries alumni relations appeared much later even though the activity was remarkably high. Probably the most important aspect that created difference was the financing model and mentality– in those countries taxes cover all study expenses, higher education is free and students and taxpayers are used to that. Thus fundraising and loyalty programs are least developed activities. Here extremes can be observed – many universities do not do fundraising at all, some already have solid history for fundraising for university equipment, buildings, important research. It must be noted that in the last decade universities are starting to pay more and more attention to fundraising. Mentoring is more common than career services. Main driver of the Nordic alumni relations seems to be networking and events that most probably are just another means to support the networking.

The Baltic countries reveal significantly less activities for simple reason – very short history of alumni relations. Many universities still do not have alumni relations department or have inactive and formal alumni associations. This formality reflects in the summary of alumni activities. Just like in the Nordic countries events and networking are the drivers, being simplest and most obvious way to start building the relationship with alumni. Fundraising has been around for a while but in a corporate form – not from individual alumni. Only few campaigns involving individual alumni have been appearing recently (e.g. RTU Inženierzinātņu vidusskola, LU absolventu taka Botāniskajā dārzā). Career services for alumni are close to zero. Mentoring randomly appears but often does not have systematic grounds.

In Latvia, the pioneers in formalizing alumni relations were business schools – first, Stockholm School of Economics in Riga (1996), followed by Riga Business School (2001). They developed alumni associations – separate legal bodies with the aim to unite alumni volunteers for mutual benefit, membership status was acquired by paying membership fees. Bigger universities hesitated investing in alumni relations. The first one to make the move was Rīga Stradiņš University (2009). It successfully cooperated with a sponsor and developed a series of alumni events “The Intelligence Academy” where alumni could receive informal education in arts, dancing and other disciplines.

Riga Technical University founded Alumni Association in 2012, for its 150 year anniversary. The founding of the Association was very much supported (also financially) by the University management seeking for meaningful ways of cooperation with alumni, entrepreneurs and society. Since the foundation RTU

Alumni Association has had paid employees to perform administrative tasks and coordinate activities of volunteers.

University of Latvia took a different approach – their Alumni club was founded solely by volunteers only with moral support of the University management. Later, as LU Alumni Club activities were growing, the University got more and more involved and provided support to the movement of alumni.

Many of the smaller and privately owned universities founded alumni societies with great expectations for volunteer self-sustainability and for instant payback in form of donations but that has never been the case and some of them have dissipated lacking investment from the university to support alumni movement.

1.3 Fundraising culture and its impact on alumni relations

Fundraising is one of the activities that is often related to alumni relations. There are different notions – some of them perceiving fundraising as one of primary tasks of alumni relations, other, on contrary, declaring that alumni relations and fundraising are separate but connected activities. Alumni relations involve alumni in university life in many different ways – as participants, as volunteers, inform them about life in university, involve them as lecturers, visit the companies of alumni etc. – the ultimate goal is to build the relationship (“friendrising”). Fundraisers can follow and harvest the fruits of this relationship – involve alumni as sponsors. In either of perceptions, it is quite clear that, separated or not, the ultimate goal is to build a relationship and later to ask money from those who are able and interested in supporting university also financially. USA is a shining example in higher education fundraising because of 200 years long history and culture. There are also economic incentives in place – donations taken from company profits are free of tax, same applies to private individuals and foundations provided that the organization receiving the donation has non-profit status (Appelqvist, 2014). In 2005, EU Commission initiated a major project with the aim to draw attention to the philanthropy in the field of higher education. The result were two reports (European Commission, 2008; European Foundation Centre, 2006) proposing possible measures at national and European levels to promote and increase donations for research. The impact of philanthropy on higher education sector in the UK is described by the results of yearly survey by the Council for Advancement and Support of Education in Europe². Total new funds secured in year 2015–2016 was EUR 1202 million. Median new funds secured per institution was 1 571 977 EUR, the mean was 10 837 404 EUR, in total 1 192 114 497 EUR (110 organizations participated in survey).

² www.rosscasesurvey.org.uk

Since the beginning of the 21st century, the Nordic universities more and more involve in fundraising and there are different drivers behind that. One of them is motivation by government (Ebert et al., 2015), which was also a case of Finnish universities which signed an agreement with the government saying that for every euro attracted by university fundraising the government will allocate to the university 2.5 bigger amount of euro. CAF World Giving Index (Charities Aid Foundation, 2017) describes giving patterns in the world and shows the place of the countries in the world. The pioneers of alumni relations and fundraising – the USA – are in the 5th place, the UK in the 11th. From the Nordic countries Island makes difference, being the 15th followed the rest – Norway (20th), Sweden (34th), and Finland (37th). The Baltic countries are at the end of the list, Estonia being the 100th, Latvia – the 131st, Lithuania – the 137th, with equally low rates in donating money and volunteering time. No doubt there are several economic, historic and cultural factors that impact the results and it is worth another research but for the scope of this research this just illustrates the environment in which Latvian universities work and the environment in which Universities in other parts of the world work.

All major universities in Latvia have founded separate entities for fundraising. They are called “development funds”. They have worked with varying degrees of success (see Table 1.1) – some have started activities only in 2011, some have ceased existing during recent years.

Table 1.1

Fundraising in Latvian Higher Education Institutions (EUR)³

	2013	2014	2015	2016
RSU fund	25 589	47 149	29 564	71 010
LLU development fund	25 497	12 493	20 049	19 850
RTU development fund	580 112	383 725	687 197	1 108 756
LU fund	2 441 725	1 627 003	2 270 279	2 820 166
VA fund	1961	3345	2300	4805
LiepU support society	0	0	0	0
BA fund	4306	13 422	7416	4725
SSE Riga foundation	1 965 322	1 007 404	251 628	78 290
RGSL fund	93 994	64 676	291 783	198 010

³ Data acquired from annual financial reports submitted to The Register of Enterprises of the Republic of Latvia published by Lursoft <https://www.lursoft.lv/lv/gada-parskati?setm=gp>

The biggest share in fundraising income is from large property donations, legacy and from companies. Companies are motivated by tax discounts for donations. They are also interested in students as prospective employees, and attract students by scholarships and paid internship. Thus, most active work in fundraising is with companies because it results in bigger donations with less investment.

1.4 Models of higher (tertiary) education financing and its impact on alumni relations

To compare financing of higher (further tertiary) education in different countries, two types of financial data will be reviewed – government expenditure on tertiary education as % of GDP and government expenditure on tertiary education as % of total expenditure. All data is derived from the UNESCO Institute for Statistics (<http://data.uis.unesco.org/>). Of all countries, special attention is paid to the USA and UK as leaders in alumni relations and fundraising. In the USA and UK most of tertiary education financing is private. Closer look is also taken at Sweden, Norway and Finland as the Nordic countries representing the financing model in which the government covers almost all university costs and to the Baltic countries, which are of particular interest in this research.

The Nordic countries cluster in same region of 1.5 to even 2.5 % of government expenditure on tertiary education as % of GDP ⁴. Meanwhile in the UK the spending fluctuates – rising from 1999 to 2005 and then constantly diminishing to its lowest of 0.74 % in 2009, influenced by economic crisis, to start rising again after 2010. Since then the expenditure is constantly rising and reaching the level of USA. The Baltic countries also stay in one cluster of 0.5 to 1.5 %, Estonia and Lithuania changing leading roles year by year, but Latvia always being the last with a sudden rise in 2012. If we look at clustering tendency, relatively the indicators of the USA and UK are close to the Baltic government expenditures. But then, it must be noted that in the USA and UK, government financing is only about 30 % of all tertiary education expenditure whereas in Latvia, it reaches 80 %. That is one of the indicators describing the underfinancing of higher education in Latvia.

As to the government expenditure on tertiary education as % of total expenditure, Estonia has been the leader among the Baltic states growing from 69.9 % in 2000 to 84.6 % in 2014, just missing 4.5 % to reach the level of Sweden. Latvia, with one exception of sudden jump in 2008, the percentage of tertiary education expenditures covered by government, is performing stable rise from 59 % in 2000 to 79 % in 2014. The USA and UK have the tradition of large private financing in tertiary education. In 2014, government share on tertiary

⁴ Here and further concerning expenditure on tertiary education, source is <http://data.uis.unesco.org/>

education financing in the UK has been dropping from relatively stable 57.3 % in previous years and reaching the level of 27.9 % in 2014 – being the country of least percentage of government financing share. That is reflected in the rising interest of universities in alternative sources of financing. In the Nordic countries government funding exceeds 80 %. That strongly reflects the fact that all these years higher education in the Nordic countries has been almost fully financed by government – traditionally having high taxes but almost fully covering all expenditures of tertiary education. The distribution of public and private financing in tertiary education influences alumni attitudes towards fundraising.

The funding of Latvian HERI sets up a challenging landscape. To compare with the closest neighbors, the total budget of the University of Tartu (Estonia) is EUR 142.6 million, Tallinn University of Technology – EUR 80.3 million, and Vilnius University – EUR 81.5 million. Average funding for universities in TOP600 of QS World University ratings is EUR 93.3 million, TOP 400 in the same rating have average EUR 228.6 million budgets⁵. Students are free to choose universities worldwide, and research and publishing requirements for researchers are the same worldwide. The financial gap adds to the challenges and in the long-term private financing (alumni being one of the sources) can help to reduce this gap and support tertiary education.

The previous analysis describes the overall situation in higher education financing in the world and more closely in the selected countries. There are similar tendencies in all indicators in the Nordic countries – the taxes are high, the government covers higher education almost fully and spends highest % of GDP on it showing that tertiary level of education is of utmost priority there. The UK and USA spend lower % of GDP on tertiary education and the proportion of public and private spending on higher education radically differs – most of the higher education financing is covered by private funding.

The extent of university investment in alumni relations and fundraising depends on many factors – the financing model of education in particular country or region; tax law concerning tax reductions for those entities who donate to nonprofit organizations; historic and other reasons. Just as it was described above the situation in the rest of Europe where Universities are funded by government, funding is decreasing and remaining stable (low in the case of Latvia) and it is not enough for the growth of universities. They look for other ways to remain competitive. Most typical strategic directions are attracting of foreign students who pay for their studies, participation in local or EU funded projects, new partnerships with entrepreneurs, valorization, alumni relations and fundraising.

⁵ Times Higher Education World University Rankings 2018

2 CUSTOMER CONCEPT, SEGMENTATION AND APPLICATION IN ALUMNI RELATIONS MANAGEMENT

Chapter 2 of full Doctoral Thesis contains 5 subchapters, 20 pages, 7 tables and 11 figures.

Customer is the reason of existence of organizations (Bergman & Klefsjö, 2010; Hill & Jones, 2007; J. M. Kaplan & Warren, 2007; Solomon, 2009), thus there is plentiful of theories and research on the topic. This chapter describes several definitions of the term *customer* and closely related terms, looks at the origins of the term, most popular ways to do customer segmentation and gives insight into customer loyalty. Since the subject of the Thesis is nonprofit organizations, there is a discussion on who the customer of nonprofit organizations is and how to determine customer groups there.

The definition of customer (plural customers) in various dictionaries is as follows:

- 1) “a person who buys goods or services” (Cambridge University Press, 2017b);
- 2) “a person of a specified kind with whom one has to deal” (Oxford University Press, 2017b).

Also persons who do not perform a direct transaction but intend to can be considered customers. Origin and etymology of term “customer” reasonably describes its current meaning: “*customs official* later *buyer* (early 15century), from Anglo-French *custumer*, from Medieval Latin *custumarius*, from Latin *consuetudinarius*. More generalized meaning – *a person with whom one has dealings* – emerged in 1540s; that of *a person to deal with* – in 1580s” (Harper, 2017). Juran extends the use of customer concept stating that customer is “anyone who is affected by the product or by the process used to produce the product” (Juran, 1988b). Normann emphasizes the significance of customer impact on the organization stating that in the future “we will see the customer more as a co-producer in a value creating network” (Normann, 2001).

Customer concept is more straightforward in business than in public sector. Especially in relation to HERI there are many reasons for discussions. Customer is the reason for organization’s activities, to whom the entity wants to create value (Bergman & Klefsjö, 2010). Especially in public services and nonprofit organization the transaction does not always include buying and that makes organization-customer relation borders blurred, also expectations and needs of various customers do not match (Drucker, 1990; John M. Bryson, 2004; Phills, 2005; Ross & Segal, 2002). Kramer (2001) suggests that nonprofit organizations have three customer groups simultaneously: volunteers working for the organization; sponsors ensuring the financial flow and customers (sometimes called *beneficiaries* in nonprofit terminology) who are identified in the mission statement and receive the services provided by volunteers and financed by sponsors. In order to

outperform the competitors (other nonprofit organizations striving for funding and solving similar issues), the organization must seek how to satisfy the need of all three groups simultaneously. Customer definition prioritizes the strategic use of resources (Rothschild, 2012). Many authors have researched and discussed on who HERI customers are and how to group them – according to the impact, roles, as primary, secondary, tertiary or as internal and external. Defining HERI customers is not a trivial task and there is a lot of scientific discussion about it (Conway, Mackay, & Yorke, 1994; del Barrio-García & Luque-Martínez, 2009; Juran, 1988a; Kotler & Fox, 1995; Pereira & Silva, 2003; Taiwo, 2010; Weaver, 1976). Alumni are HERI customers not only in direct meaning when they purchase HERI services but also continuously because the value of their diploma always depends on the HERI performance at that particular moment (Heckman & Guskey, 1998; Kotler & Fox, 1995; Taiwo, 2010). Kotler and Fox emphasize that “educational institutions have many customers: students, staff, faculty, alumni, donors and others” (Kotler & Fox, 1995). Taiwo (2010) describes three types of external customers of HERI, among them distinguishing alumni being HERI customers. He separates community as a customer group, expecting HERI to contribute to the development by training leaders, competent workforce and creating politically and socially active citizens. Conway et al. (1994) focus on strategic planning in HERI and in that context analyze the different types of customers of HERI. Authors refer to primary (students), secondary (employers, education authorities), and tertiary customers (parents, alumni) of HERI.

The author performed a survey to discover the extent to which universities consider alumni their customers. The respondents of the survey were employees of the European universities, 43.5 % of them being alumni relations experts, 16.1 % – fundraising experts, 12.9 % – marketing and communication experts and rest of them taking different university management positions. 42 organizations participated in the survey. 50 % of respondents fully agreed that alumni are customers of HERI, 40 % partly agreed, 5 % mostly disagreed, 1 % disagreed, and 1 % did not have an opinion.

The author also performed a survey inquiring alumni themselves. The target audience of the survey were alumni of Latvian, Estonian and Lithuanian universities and colleges. Online survey was open for one month, engaging 579 respondents among them 76.6 % in Latvia, 12.6 % in Estonia and 10.9 % in Lithuania. To the statement “alumni are customers of their University” 37.1 % agreed, 9 % strongly agreed, 22.4 % disagreed, 3.6 % strongly disagreed, and 27.9 % were neutral. This perception gap gives a serious signal to the universities about their attitudes towards alumni and requires reviewing of strategies of alumni engagement. However all research, business literature, scientific articles, survey of university management and survey of alumni, confirm that one of alumni roles in relation with university is customer, even though they are not buying goods or services at particular moment, thus further research and scientific novelties designed in the Doctoral Thesis perceive alumni as customers of HERI.

3 KNOWLEDGE MANAGEMENT, THEORETICAL MODELS, METRICS AND THEIR APPLICATION IN HERI

Chapter 3 of full Doctoral Thesis contains 4 subchapters, 32 pages, 5 tables and 17 figures.

Knowledge management is defined as a process of applying systematic approach to capturing, structuring, managing, and disseminating knowledge throughout an organization to work faster, reuse best practices, and reduce costly rework from project to project (I. Nonaka; H. Takeuchi, 1995). It is one of the newest field of management science (Horaguchi, 2014; Milton & Lambe, 2016) and with growing magnitude of data, capacities of processing and growing resources of knowledge it is getting more and more integral part in every organization's management practices.

Knowledge management most often is described as a cycle (Figure 3.1) that embodies the following:

- discovering knowledge – awareness of data, information and knowledge residing within the organization;
- generating knowledge – use of knowledge management tools and technologies to involve people, to encourage organizational learning;
- evaluating knowledge – deciding which knowledge is strategically most important and effective, assessing management processes;
- sharing knowledge – implementing knowledge management incentives, creating knowledge sharing supportive organizational culture, leadership and employee support;
- leveraging knowledge – generation of high level intellectual capital, measuring at an organizational level.

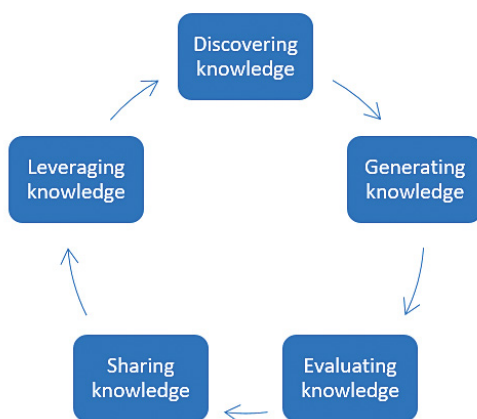


Fig 3.1. Knowledge management cycle (Jashapara, 2004).

Customers gain their own knowledge, experience and expertise by using organizations' services or products. They also have much wider market know-how than one organization can obtain. Organization needs this knowledge to improve its existing services and products as well as for its strategic planning to be in line with market needs. Customer knowledge management is a discipline that integrates customer relationship management and knowledge management (Chen, 2011; Gebert, Geib, Kolbe, & Brenner, 2003; Shieh, 2011). CKM encompasses acquiring, dissemination and usage of the customer knowledge within the organization for mutual benefit of the product/service provider and the customer (Khosravi et al., 2016). Knowledge flow can be split into three categories: knowledge for customers, knowledge from customers, knowledge about customers (Dorota Buchnowska, 2014; Bueren et al., 2005; Gebert, Geib, Kolbe, & Brenner, 2003; Gebert, Geib, Kolbe, & Riempp, 2003; Shieh, 2011). Managing these three knowledge flows is the main challenge of customer knowledge management – how to collect, store and distribute only strategically important knowledge and not to waste valuable time/human/storage resources on irrelevant knowledge (Chen, 2011; Gebert, Geib, Kolbe, & Brenner, 2003).

Universities shift from their traditional academic to a new entrepreneurial role as promoters of innovation to significantly contribute to their local economics. Moving away from universities' traditional two roles of creating knowledge (research) and disseminating knowledge (teaching), Draghici et al. (2015) describe three main roles for the universities: "education (smart people), research (new knowledge) and knowledge transfer to society (entrepreneurship, technology, expertise)". Oosterlinck (2001) discusses that universities are expected not only to be active in science and technology development but also to turn these developments into innovations and even further implement creation of new ventures. Thus universities are required to maintain bilateral knowledge flow to keep up with innovative learning and teaching (Metaxiotis & Psarras, 2003). Universities must foster creation and sharing of knowledge among most important stakeholders – teaching and non-teaching staff, students, alumni, sponsors, and other (Hoq & Akter, 2012b).

4 ALUMNI KNOWLEDGE MANAGEMENT MODEL FOR ENHANCEMENT OF ALUMNI LONG-TERM ENGAGEMENT IN HERI

Chapter 4 of this Doctoral Thesis contains 5 subchapters, 50 pages, 12 tables, 18 figures and 27 formulas

4.1 Triple helix model of alumni segmentation

Customer segmentation divides customers in groups that have similar needs, resources and interests in relation to a particular product or service. Segmentation is central concept within marketing and organizations use segmentation to better respond to customer needs in order to increase their satisfaction (Cuadros & Domínguez, 2014; Floh et al., 2014; Hsu et al., 2012; Jonker et al., 2004; Kim et al., 2006). Most typical and basic customer segmentation is based on demographics (also general attributes (Hsu et al., 2012)).

Key account management (KAM) is about the relationships with most valuable customers of the organizations. Those customers that are vital for the existence of this organization – losing them would mean getting into serious difficulties. Homburg et al. (2000) define KAM “as the designation of special personnel and/ or performance of special activities directed at an organization’s most important

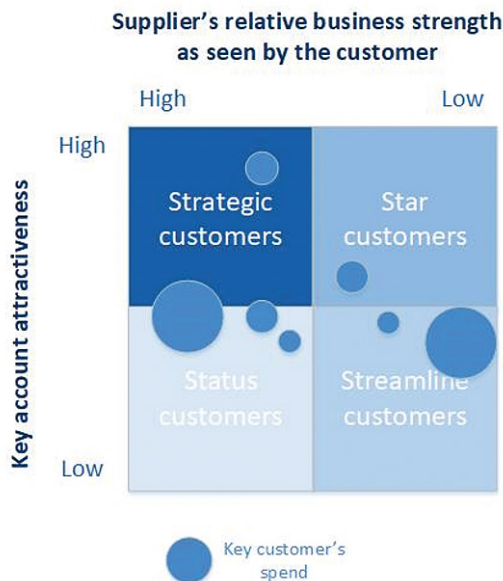


Fig. 4.1. The key account selection matrix (McDonald & Woodburn, 2007).

customers”. Zupancic (2008) enriches the definition by 3 main components of KAM and defines it as a “systematic selection, analysis and management of the most important current and potential customers of a company. In addition it also includes the systematic set up and maintenance of necessary infrastructure”. The foundation and core for KAM activities is selecting the right customers (Laurin, 2017b; McDonald & Woodburn, 2007; T. F. Millman, 1996; Pardo, 1997; Pardo et al., 1995). KAM is about strategic decisions – aligning choice of strategic customers to the strategy of the organization. And that is not always reflected directly in short term financial results (McDonald & Woodburn, 2007).

KAM requires clear customer segmenting rules that support the long-term strategic goals. It must be taken into account that the term *relationship* is by definition a two-way road, thus the selection of key customers also involves their perception of the organization. (Fig. 4.1) describes the selection of the key customer based on the customer attractiveness as seen by the organization (supplier) on the horizontal axis and supplier attractiveness as seen by the customer on the vertical axis. The size of the colored circles represent the volume of existing or potential relationship with particular customer.

The method proposed by author for alumni segmenting is based on KAM and involves three components, just like in the geometric concept and triple helix model of innovation. The proposed components are as follows:

- 1) finances;
- 2) knowledge;
- 3) cocreation capacity.

In each segmentation component four subgroups emerge – streamline, status, star and strategic (see Table 4.1). Such segmentation helps alumni relations practitioners to engage alumni meaningfully according to their interests, resources and level of activity. Alumni upgrade to the next level of activity must be one of alumni relations deliberate tasks that must be carried out by recognizing alumni potential and offering alumni development opportunities. The triple helix alumni segmentation will set up the basis for alumni knowledge management according to their engagement segment and level of activity.

Table 4.1

Triple Helix Alumni Segmentation in HERI (developed by author)

Segm. levels	Description	Examples
Finances		
Streamline	Alumni, who constantly query the price, negotiate on everything, want to see rapid return on investment. Manage for cash flow.	Alumni association member paying membership fees.

Segm. levels	Description	Examples
Status	Strategic alumni of the past. Mature relationship.	Alumni who have donated individually for university projects.
Star	Strategic alumni of the future. Relationship is just developing.	Alumni actively promoting university fundraising projects; owners of companies that are potential sponsors.
Strategic	High net worth alumni. The most innovative and important ones. Close relationship.	Owner/CEO of a large company regularly sponsoring strategic projects.
Knowledge		
Streamline	Alumni ready to cooperate on business basis, giving discounts or other favorable conditions.	Share experience in seminars, must be paid for that (give discount); owners of training companies; consultants; experts.
Status	Strategic alumni of the past. Mature relationship.	Mentors; guest lecturers
Star	Strategic alumni of the future. Relationship is just developing. Need expertise for common projects.	Publicly recognized opinion leaders from industry.
Strategic	The most innovative and important ones. Close relationship. Common projects.	Scientists working in large companies.
Cocreation capacity		
Streamline	Beneficiaries of alumni activities, interested in staying close with the university.	Active participants of alumni events.
Status	Strategic alumni of the past. Mature relationship.	Alumni association board members; lobbyists.
Star	Strategic alumni of the future. Relationship is just developing.	Publicly recognized opinion leaders with a potential to promote higher education.
Strategic	The most innovative and important ones initiating and managing common projects.	Advisory board; involved in valorization.

4.2 Alumni knowledge management model

Alumni as customer lifecycle is adapted to classical customer lifecycle and merged with triple helix model of alumni segmentation that is described above. The alumni lifetime engagement is cyclic and with each cycle it aims for deeper engagement and closer ties, more personal relationship and higher investment in the university. It consists of four consecutive stages.

1. **Identification** – finding alumni, discovering their knowledge, needs, interests and capacity, segmenting.
2. **Engagement** – meaningfully engaging new alumni in alumni and/or university activities.
3. **Retention** – building long term relationship with alumni, deepening loyalty, encouraging advocacy.
4. **Upgrade** – once higher level of engagement is reached and maintained for a certain period, upgrade alumni to next segment (see Triple helix model of alumni segmentation) to create new forms of engagement and to build more personalized relationship.

Once alumni are identified, they become engaged in university and alumni functions. Once they are engaged, the alumni relations task is to create for them opportunities to progress and upgrade to the next level in triple helix alumni segmentation.

Study process, research, valorization and smart digitalization are primary functions of the university (Riga Technical University, 2014).

The further model is derived by deconstructing these functions into relevant alumni relations functions. Synergies between main processes and alumni relations functions can appear in any place.

There are six most typical alumni relations processes (see Chapter “Alumni relations nowadays”): **event management, mentoring, career services, loyalty program, networking and fundraising activities.**

- **Events** – custom designed events targeted at alumni. They can be both entertaining or educational by nature. Examples: *seminars, company visits, inspirational speeches, trips to university labs, homecomings, etc.*
- **Mentoring** – alumni-student or alumni-alumni mentoring supported and organized by career or alumni relations office.
- **Career service** – career support also for alumni. Examples: *portal for job adverts, networking platform, career advice by university career center, etc.*
- **Loyalty program** – access to university infrastructure, products or services for alumni for a special price. It can involve university providing further education courses with special conditions (discounts, place reservation, etc.) Loyalty program can also involve alumni to alumni discounts where entrepreneurs offer discounts for their business products/services for fellow alumni. The program can be supported by alumni ID cards.

- **Networking** – events and services that support alumni networking. Examples: *online platform with alumni directory, integration with social networks, networking events – live library, vine tastings, fuckup nights, etc.*
- **Fundraising** – open fundraising projects that offer alumni opportunities to co-finance projects that are strategically important for the university, involves also student scholarships.

Knowledge management cycle (Jashapara, 2004) is present in all functions of the university and alumni relations.

- **Discovering knowledge** – involves alumni-employee personal interaction, knowledge identification; in other models – revealing (García-Murillo & Annabi, 2002).
- **Generating knowledge** – using existing knowledge to create new knowledge; in other models – knowledge levelling (García-Murillo & Annabi, 2002).
- **Evaluating knowledge** – valuation of knowledge, assigning values to knowledge assets, determining strategic value of the knowledge; in other models – knowledge sorting (García-Murillo & Annabi, 2002), valuing (Davenport et al., 1998; Rowley, 2010).
- **Sharing knowledge** – knowledge coding, storing, publishing, knowledge sharing in groups – training, experience sharing; in other models – knowledge

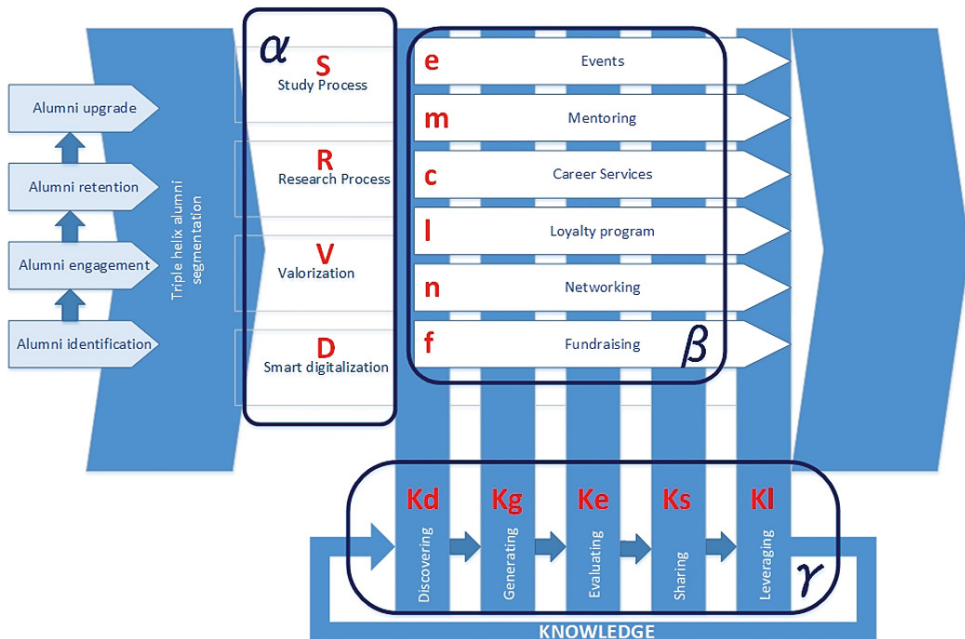


Fig. 4.2. Alumni knowledge management model inspired by the model of Gebert, Geib, Kolbe, & Brenner (2003).

externalization, socialization (Nonaka; Takeuchi, 1995), knowledge levelling (García-Murillo & Annabi, 2002); access (Davenport et al., 1998; Rowley, 2010).

- **Leveraging knowledge** – use of acquired knowledge to generate high-level intellectual capital. Term *leverage* means “to use something that you already have in order to achieve something new or better” (Cambridge, 2015).

This also applies to knowledge – ability to discover strategically important knowledge, to code and store it unequivocally and to retrieve, share and apply the right knowledge at the right moment sums up in leveraging knowledge.

Alumni knowledge management model exploits the concept of alumni being customer – that changes attitudes and perspectives towards the strategic activities and knowledge that HERI intends to manage in alumni matters. The model also discovers all possible combinations of HERI-alumni intersections by combining university strategic functions with typical alumni relations processes and implementing knowledge management cycle in each of these intersections. However, full implementation of such a model requires significant organizational and IT support as well as intrinsic interest and understanding in all HERI organizational structures to engage alumni.

4.3 Alumni knowledge management index

Alumni knowledge management index is based on alumni knowledge management model and measures performance in three blocks of the model - HERI strategic functions (α), Alumni relations processes (β) and knowledge management (γ) (see Fig. 4.2).

Alumni knowledge management index reflects how alumni relations reach strategic and knowledge management targets. University has certain strategic goals and alumni relations strategy must be in line with these goals, supplementing them. These goals are reflected in “university weight”, which signifies importance and priority of the particular strategic activity. “Alumni weight” reflects the importance and priority that alumni assign to particular strategic activity – this weight is obtained from alumni surveys in which alumni are asked to range alumni relations activities according to their importance. By applying these weights to the numeric results of certain activities and observing the difference (Δ), we can see where university strategy goes in line with alumni perceptions and where there is a gap that should be attended and decreased by communication or strategic actions. The first signal of necessity to review HERI and alumni relations strategy is when university and alumni weights for particular activity significantly differ. Then we can observe what are measurable results in particular activity and whether by multiplying them with weights, the results significantly differ. There might be cases where alumni assign importance to particular activities but their views are shifted or they want to look better and in real life their actions differ. That could result in a situation when HERI and alumni weights are different, but the final results when they are applied, are similar. Or vice versa – the other

extreme. Any of the cases helps alumni relations to identify the activities where particular attention and corrective actions should be applied. The closer the alumni knowledge management index is to zero the smaller is the gap between the university strategic needs for alumni knowledge and actual alumni relations performance.

AKMI – alumni knowledge management index can be written as follows:

$$AKMI = f(\alpha, \beta, \gamma), \quad (4.1.)$$

where

α – HERI strategy;

β – alumni relations;

γ – knowledge management.

$$AKMI = \Delta SAR \times \Delta CKM, \quad (4.2.)$$

$$AKMI \rightarrow 0, \quad (4.3.)$$

ΔSAR – strategic gap (see Strategy and alumni relations);

ΔCKM – knowledge gap (see Strategy and alumni knowledge management).

Strategy and alumni relations

The aim is for the university desired strategic alumni relations SAR_u to be as close as possible to alumni relations activities SAR_a . Alumni relations must either strategically plan their activities and improve their quality or improve alumni segmenting so that alumni perceptions and interests are in correlation with university strategic interests and gap ΔSAR is minimized and tends to zero.

In the following equations ΔSAR is strategic gap, SAR_u is strategic (study, research, valorization, digitalization) processes, university weight applied, and SAR_a is strategic (study, research, valorization, digitalization) processes, alumni weight applied.

$$\Delta SAR = SAR_{\alpha\beta u} - SAR_{\alpha\beta a} \quad (4.4.)$$

$$SAR_u = f(\alpha, \beta, u) = (S_u + R_u + V_u + D_u) \quad (4.5.)$$

$$SAR_a = f(\alpha, \beta, a) = (S_a + R_a + V_a + D_a) \quad (4.6.)$$

$$\alpha = (S \ R \ V \ D) \quad (4.7.)$$

$$\beta = \begin{pmatrix} e_1 & m_1 & c_1 & l_1 & n_1 & f_1 \\ e_2 & m_2 & c_2 & l_2 & n_2 & f_2 \\ e_3 & m_3 & c_3 & l_3 & n_3 & f_3 \\ e_4 & m_4 & c_4 & l_4 & n_4 & f_4 \end{pmatrix} \quad (4.8.)$$

where e_n, m_n, l_n, n_n and f_n represent alumni relations activities (see model in Fig 4.2). Each of them can have several factors according to HERI and alumni relations strategy and organizational capabilities. The illustrative factors are described in the next chapter.

Table 4.2

Alumni Relations Activity Factors (developed by author)

	Factor	Description	Data type
Event factors	e_1	Average amount of event attendants	Real number
	e_2	Events per year	Integer
	...		
	e_n	Average evaluation of events (from surveys after the events).	Real number (1 to 10)
Mentoring factors	m_1	Mentoring cases successful	Integer
	m_2	Total mentoring cases	Integer
	...		
	m_n	Mentee satisfaction (from surveys) Scale 1 to 10 Number from scale 1 to 10	Real number (1 to 10)
Career factors	c_1	Work adverts	Integer
	c_2	Real matching cases (alumni gets job from uni career portal)	Integer
	...		
	c_n	Alumni satisfaction with career services (from surveys) Number from scale 1 to 10	Real number (1 to 10)
Loyalty prog. Factors	l_1	Number of agreements	Integer
	l_2	Real transactions (alumni use discounts)	Integer
	...		
	l_n	Alumni satisfaction with loyalty program (from surveys) Number from scale 1 to 10	Real number (1 to 10)
Networking factors	n_1	Number of networking events	Integer
	n_2	Number of success stories	Integer
	...		
	n_n	Alumni satisfaction with networking events and services (survey) Number from scale 1 to 10	Real number (1 to 10)
Fundraising factors	f_1	Number of fundraising campaigns	Integer
	f_2	Number of participants (alumni donating)	Integer
	...		
	f_n	Target completion success Number from scale 1 to 10	Real number (1 to 10)

Alumni relations activity factors

Each institution can define the amount and values of factors for each alumni relations activity. The range of factors depends on HERI and alumni relations strategy, organizational capabilities and resources. The measuring data type must be assigned so that the results could be comparable.

The challenge in developing factors and assigning measurable targets is the scope of analysis. The more variables we want to include, the bigger is the challenge to gather data regularly. Alumni will not be enthusiastic to fill detailed surveys each year, data gathering for analysis must not be too expensive and must not take more resources than it brings economic profit from the conclusions. In organizations where IT support is strong and integrated in all sorts and levels of activities, data analysis can be automated and provide the desired results in seamless manner. Thus, it is important to invest in IT infrastructure. If there are not resources for solid IT infrastructure, alumni relations must choose a few measurable factors that are strategically important and easy to measure regularly. Further an example of the construction of formula (9) is provided that mathematically describes how alumni relations activity factors are applied to calculate the real (6) and desired (5) value of alumni relations activities and the gap between both (4).

The desired value of alumni relations activities in each university strategic directions

The desired value of alumni relations activities is calculated by adding all alumni activities that are related to strategic processes where each activity is multiplied by university weight. In each process, there one or more alumni relations activities can be measured – for example, alumni relations can organize many seminars for alumni and measure alumni participation rate or satisfaction rate. Then the resulting value will be a sum of result indicators of all these activities. The example of constructing formulas and variables is described further.

S_u – alumni relations activities related to study process, can be written as follows:

$$S_u = w_{ue} \sum_{i=1}^n es_i + w_{um} \sum_{i=1}^n ms_i + w_{uc} \sum_{i=1}^n cs_i + w_{ul} \sum_{i=1}^n ls_i + w_{un} \sum_{i=1}^n ns_i + w_{uf} \sum_{i=1}^n fs_i \quad (4.9.)$$

where

w_u – university weight (coefficient) of the importance of the activity applied (taken from university strategy);

es_i – study process related events factors;

ms_i – study process related mentoring factors;

etc.

Current (existing) value of alumni relations activities in each university strategic directions

The current value of alumni relations activities is calculated by adding all alumni activities that are related to strategic processes where each activity is multiplied by alumni weight – i. e. the importance that alumni assign to particular activity. As described above, alumni weight is taken from alumni survey in which they are asked to evaluate a range of activities. In each process there can be measured one or more alumni relations activities – for example, alumni relations can organize many mentoring events for alumni and measure the alumni participation rate or satisfaction rate. Then the resulting value will be a sum of the result indicators of all these activities.

The existing value of alumni relations activities in each university strategic directions can be calculated as follows (example of formula construction).

S_a – alumni relations activities related to study process, alumni weight (coefficient) for the importance of the activity applied can be calculated as follows:

$$S_a = w_{ae} \sum_{i=1}^n eS_i + w_{am} \sum_{i=1}^n mS_i + w_{ac} \sum_{i=1}^n cS_i + w_{al} \sum_{i=1}^n lS_i + w_{an} \sum_{i=1}^n nS_i + w_{af} \sum_{i=1}^n fS_i \quad (4.10.)$$

Where w_a is alumni weight (coefficient) for the importance of the activity applied (taken from alumni survey), etc.

Just like for “The desired value of alumni relations activities in each university strategic directions” in some cases, alumni relations can review just one factor and the difference of HERI strategic targets and alumni perception of activity importance. That will reveal gaps in particular activity segment and is applicable if the particular segment is of interest or if resources or IT support does not allow to make analysis of full scope.

Strategy and alumni knowledge management

The aim is for the university desired alumni knowledge CKM_u to be as close as possible to the results of alumni knowledge activities CKM_a . Alumni relations must plan activities so that gap ΔCKM is minimized and tends to zero.

Knowledge gap

ΔCKM – knowledge gap can be calculates as follows:

$$\Delta CKM = CKM_{\alpha\gamma u} - CKM_{\alpha\gamma a} \quad (4.11.)$$

$$CKM_u = f(\alpha, \gamma, w_u) \quad (4.12.)$$

$$CKM_a = f(\alpha, \gamma, w_a) \quad (4.13.)$$

where

α – strategic processes;

S – study process;

R – research process;

V – valorization process;
 D – digitalization process.

$$\alpha = f(S R V D) \quad (4.14.)$$

γ – customer knowledge management can be calculated as follows:

$$\gamma = f(Kd, Kg, Ke, Ks, Kl) \quad (4.15.)$$

where

Kd – knowledge discovering;

Kg – knowledge generating;

Ke – knowledge evaluating;

Ks – knowledge sharing;

Kl – knowledge leveraging;

WS – coefficient for science related knowledge;

WR – coefficient for research related knowledge;

WV – coefficient for valorization related knowledge;

WD – coefficient for digitalization related knowledge.

$$\alpha_i = (S R V D) \quad (4.16.)$$

$$\gamma_{ij} = \begin{pmatrix} Kd_1 & Kg_1 & Ke_1 & Ks_1 & Kl_1 \\ Kd_2 & Kg_2 & Ke_2 & Ks_2 & Kl_2 \\ Kd_3 & Kg_3 & Ke_3 & Ks_3 & Kl_3 \\ Kd_4 & Kg_4 & Ke_4 & Ks_4 & Kl_4 \end{pmatrix} \quad (4.17.)$$

$$w_j = \begin{pmatrix} WS \\ WR \\ WV \\ WD \end{pmatrix} \quad (4.18.)$$

$$CKM_{\alpha\gamma} = (S R V D) \begin{pmatrix} Kd_1 & Kg_1 & Ke_1 & Ks_1 & Kl_1 \\ Kd_2 & Kg_2 & Ke_2 & Ks_2 & Kl_2 \\ Kd_3 & Kg_3 & Ke_3 & Ks_3 & Kl_3 \\ Kd_4 & Kg_4 & Ke_4 & Ks_4 & Kl_4 \end{pmatrix} \begin{pmatrix} WS \\ WR \\ WV \\ WD \end{pmatrix} \quad (4.19.)$$

OR

alumni knowledge management desired value (university weight w_{ju})

$$CKM_{\alpha\gamma u} = \sum_{i=1}^4 \sum_{j=1}^4 \alpha_i \gamma_{ij} w_{ju}$$

The desired value of alumni knowledge management is calculated by adding all knowledge management factors that are related to strategic processes where each factor is multiplied by university weight (20). In each process there can be measured one or more alumni knowledge management factors.

customer knowledge management existing situation (alumni weight $w_{ja'}$)

$$CKM_{\alpha\gamma a} = \sum_{i=1}^4 \sum_{j=1}^4 \alpha_i \gamma_{ij} w_{ja}$$

The existing value of alumni knowledge management is calculated by adding all knowledge management factors that are related to strategic processes where each factor is multiplied by alumni weight (20). In each process there can be measured one or more alumni knowledge management factors.

The examples of alumni knowledge management factors are described in the next chapter and given in Table 4.3.

Alumni knowledge management factors

Each institution must define the amount and values of factors for each alumni knowledge management process. The range of factors depends on HERI and alumni relations strategy, organizational capabilities and resources. The measuring data type must be assigned so that the results could be comparable. Measuring knowledge is data intense and requires sophisticated IT support and analysis tools.

Table 4.3

Alumni Knowledge Management Factors (developed by author)

	Factor	Description	Units
knowledge discovering	kd_1	Quality of stored knowledge	Real number (1–10)
	kd_2	Level of knowledge updating	Real number
	kd_3	Quantity of useful suggestions incorporated in productive processes and/or products	Integer
	kd_4	Statistics of utilization of the search mechanism	Integer
knowledge generating	kg_1	Quantity of discussion groups on process or product innovation	Integer
	kg_2	Quantity of valid contributions for organizational memory /intranet	Integer
	kg_3	Number of ideas or patents	Integer
	kg_4	Evidence of best practice (countable amount)	Integer
knowledge evaluating	ke_1	Comparison of the number of hours planned for measurement and actual hours	Real number
	ke_2	Number of evaluations made in comparison with the plan	Integer
	ke_3	Experts evaluation to check quality	Real number (1–10)
	ke_4	User's feedback	Real number (1–10)

	Factor	Description	Units
knowledge sharing	ks_1	Quantity of messages or documents stored in the system	Integer
	ks_2	Number of registered users who use the system	Integer
	ks_3	Quantity of editions or updates	Integer
	ks_4	Average time to solve problems	Real number
knowledge leveraging	kl_1	Quantity of active communities of practice	Integer
	kl_2	Statistics on use of organizational memory / intranet	Integer
	kl_3	Perception of collaborators with available internal means of communication	Real number (1-10)
	kl_4	Cost of distribution	Real number

Alumni knowledge management index covers all spectrum of alumni relations activities, university strategic directions and knowledge management cycle. The main challenge for performing calculations is getting the data for all variables. The means, energy and finances spent for getting the data should not exceed the value that the calculated results give to our understanding of the current situation and actions on the future strategies. Especially the factors that require opinions and evaluations of the customers – nowadays there is such information richness and abundance that it is getting more and more difficult and thus expensive to get high quality data. In order to make valid comparison of attitudes, they should be measured regularly, e.g. yearly. That is a good practice but it is not always economically feasible for small alumni relations offices in the universities. Thus, another type of most typical knowledge management metrics described in Chapter “Balanced scorecard as alumni knowledge management metrics” can be applied. Balanced scorecard requires focusing on a few strategically important aims thus making performance evaluation more focused and easier to implement for organizations with less resources or insufficient IT support.

4.4 Balanced scorecard as alumni knowledge management metrics

Regardless of the method applied, the aim for measuring KM is one – to find out how well the organization converts human capital to organizational capital or knowledge, i.e. converted tacit knowledge to explicit knowledge and reduced the risk of losing valuable knowledge if people leave the organization. Kaplan and Norton (1992) searched for chain of cause and effect that would lead to strategic success. They distinguish financial, internal, customer, and learning and growth

perspectives that are essential to the strategy. Customer knowledge management clearly fits in as learning and growth and customer aspects being two cornerstones of the measurement metrics.

Figure 4.3 graphically describes how BSC can be applied in alumni knowledge management. Customer strategic perspective is replaced with alumni strategic perspective, and learning and growth is replaced with knowledge management perspective.

Implementing BSC means following the main steps.

1. Defining.
 - 1.1. Mission (why organization exists).
 - 1.2. Values (guiding principles).
 - 1.3. Vision (future described).
 - 1.4. Strategy (differentiating activities).

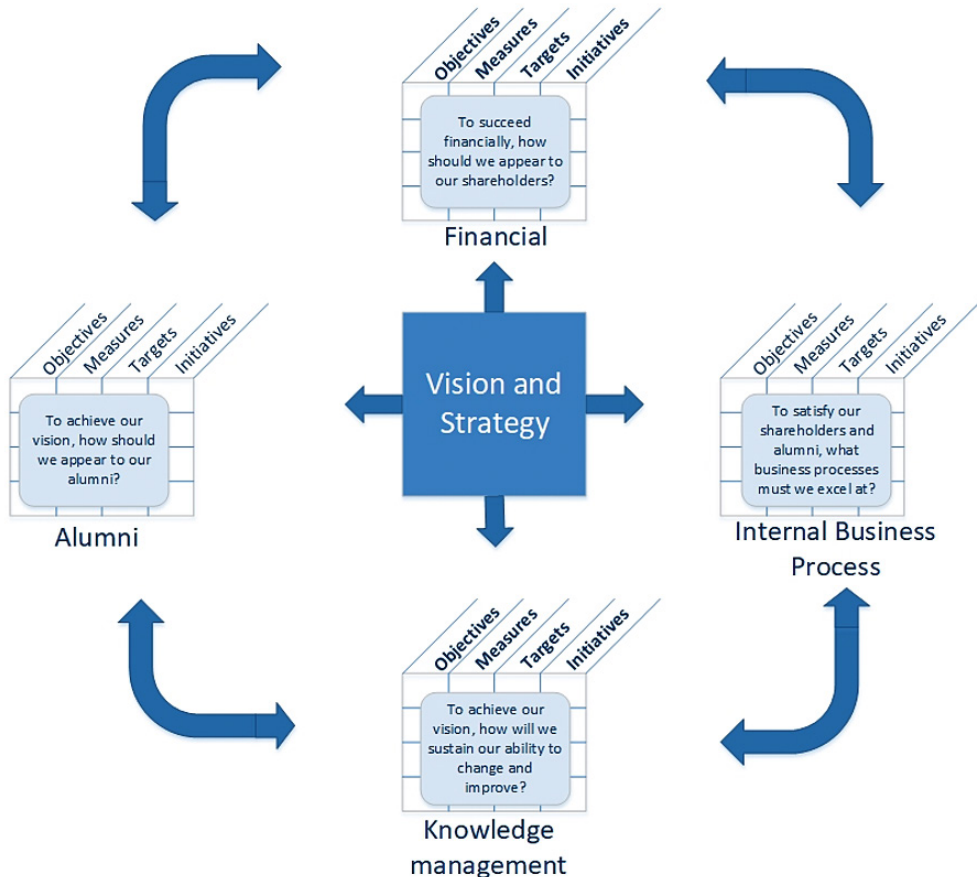


Fig. 4.3. Application of balanced scorecard in alumni knowledge management developed by author and based on main principles of Kaplan and Norton (1992).

2. Building a strategy map (putting objectives on the map according to the 4 strategic perspectives and linking the objectives according to their dependencies.
3. Creating performance measures.
4. Setting targets and prioritizing initiatives.

In order to follow the implementation of alumni customer knowledge management, performance measures must be assigned to each of the strategic objectives, targets must be set and appropriate initiatives must be assigned that ensures implementation of the assigned targets. Setting up realistic targets and choosing initiatives to implement them is one of the most important tasks. Each alumni relations department or association can define their own respective initiatives corresponding to the organizational structure, assigned resources and overall strategic priorities.

4.5 Approbation of alumni knowledge management model in HERI

The model was approbated in Riga Technical University during the time period from 2017–2018, based also on data, knowledge and measurements acquired since the founding of the organization in 2012.

As described in Chapter “Alumni relations nowadays” RTU has founded Alumni association in 2012 as a separate legal entity, nonprofit organization, with separate statutes and volunteer governance. However, it is not the only way the university cooperates with alumni. There are several formal and informal ways that existed even before establishing the Alumni association. The author has worked in RTU Alumni association since its foundation.

Alumni relations in RTU strategy

Alumni relations management is included in overall Riga Technical University strategy (Riga Technical University, 2017) in several points.

1. Organizational efficiency.
 - 1.1. To develop close co-operation with alumni. Measurable targets – yearly increasing number of alumni that become members of RTU Alumni Association.
 - 1.2. To develop advisory boards within all departments.
 - 1.3. To develop commercialization offers.
 - 1.3.1. To develop RTU services sales platform.
 - 1.3.2. To communicate with entrepreneurs about RTU services and commercialization opportunities.
2. Financial efficiency.
 - 2.1. To attract financial support and investment from organizations and alumni.
 - 2.1.1. Increase of total funds attracted.
 - 2.1.2. Increase of scholarship funding attracted.

RTU Alumni Association strategy

Riga Technical University Alumni Association strategy (RTU AA, 2013) was developed in 2013 and has been regularly updated within yearly strategic retreats. The strategy defines the vision, mission, values, aim and 5 strategic tasks that are further detailed with several activities per each task. Each activity has a measureable target, term and a responsible person.

Vision: Organization that unites RTU/RPI alumni, promotes implementation of alumni communication and common incentives and serves for RTU development.

Mission: To be the center for RTU/RPI alumni communication, personal growth and link with the university.

Values: Cooperation, growth, leadership.

Alumni relations management structure

Since the foundation, alumni management structure has changed during the years. During the first years, the Alumni association was strongly subsidized by the university which allowed the Association to employ executive director and staff taking care of project management and communication activities. Later, RTU established the alumni relations department as a structural unit within the university and hired employees who manage alumni relations, ensure cooperation with Alumni association, and promote and encourage alumni volunteer engagement. Alumni relations department has 3 employees – Head of the Department, Communications Manager and Project Manager. Alumni association remained on its self-contained budget and volunteer governance. The General Meeting of Members is the highest decision-making body of the Association (RTU AA, 2012). The General Meeting elects 9 board members in the annual meeting. The Board members in the Board Meeting elect the Chairperson of the Board. However, the strong link between university alumni relations department employees and alumni association volunteers cannot be underestimated – the ongoing engagement of professional alumni relations managers ensures continuous operation of Alumni Association, provides all administrative support, communication, cooperation with the university, infrastructure support and generation of new ideas. Historically the oldest instance where university collaborated with alumni was RTU Advisory Board. “RTU Advisory Board has been established to promote RTU growth, determining the course of its strategic development in accordance with the needs of the national economy. The Advisory Board meets four times a year. It consults the Senate and Rector on the issues concerning RTU development strategy, discusses structural reforms and development perspectives, as well as considers and offers advice on university budget planning. The Senate, Rector, or Faculty Councils can propose an expert in the field of research, education, culture, or national economy to become a member of the Board who then openly elected an Advisory Board member by RTU Senate for the period of three years by a simple majority vote” (RTU, 2014). RTU Advisory Board has 26 members and an elected Chairman of the board. It has a consultative role, thus there is no dependency link within the organizational chart. Gradually advisory boards were founded

in each RTU Faculty in accordance with the University strategy (Riga Technical University, 2017). The advisory boards of Faculties, just like the main Advisory Board, have a consultative role. Both types of advisory boards mostly consist of successful alumni – entrepreneurs, leaders of state enterprises and of government institutions.

Riga Technical University Alumni Association has been developing alumni association branches in three regions of Latvia where RTU Branches are located. The Branches do not have separate legal bodies or elected management boards. Instead, representatives from regions are volunteers in the central elected RTU AA Board. Coordination of alumni outside the capital city is a challenge since they are more dispersed, separated by longer distances, and less using social networks, therefore more difficult to reach. RTU Alumni Association has set membership fees for association members but is working with all alumni. The paying alumni have privileges of discounts for alumni events and enjoy loyalty program providing discounts for University infrastructure and services as well as discounts for services or products of fellow alumni companies. During 6 years of existence RTU Alumni Association has grown to more than 900 members, 13 000 unique email addresses receiving a regular newsletter, organizing more than 30 events (seminars, company visits) per year for alumni, implementing alumni loyalty program, sharing success stories in international alumni relations conferences and many more. All that is possible due to the generous support of the University and active participation of alumni volunteers.

IT support for RTU alumni knowledge management

As described above, IT management support is needed to implement knowledge management in HERI and to measure the success of it. In 2018, RTU made a decision to implement an alumni platform thus strategically deciding to strive for data quality and a sustainable link with alumni supported by sophisticated IT system integration. As the system is often mentioned later in the Thesis as a tool that supports knowledge management, it is necessary to describe the functionality in more detail. Alumni platform RTUConnect contains wide functionality that supports the alumni engagement and knowledge management comprising the following information:

- Alumni directory. During registration, alumni are required to indicate their study field, work place, location and also the ways they want to help other alumni or students. This sets the basis for segmented communication with alumni – according to their field of study, industry, and region. It makes possible the development of alumni chapters all around the world, it helps alumni without intermediate assistance to search for help in foreign countries. It also develops the ground for mentoring service, since other alumni in the directory can perform search based on industry and the remark “willing to be a mentor”. The platform also supports alumni relations with engaging functionality – easy registration with LinkedIn and Facebook, helping the platform users to find study mates from the same faculty and

year and offering these contacts on welcome screen interface as suggestions to connect. Link with Facebook and LinkedIn also ensures that alumni contact data is not obsolete – even if alumni prefer to update their career information in one place (e.g. LinkedIn), they can easily synchronize their data with the platform just by hitting one button.

- **Album.** Place for sharing photos, tagging friends, events, adding comments and timeline. This is an engaging feature working with users' sentiments and exploiting users' interest in visual materials.
- **Events.** Function similar to social networks, especially Facebook, allowing to create and publish events, and invite participants. This feature is working as the main engagement vehicle since from the very beginning when students become alumni – the registration for graduation ceremony will be in RTUConnect platform. Later all events related to alumni will be developed here which will ensure alumni registration and interest in the system. This also provides an easy way for the University Faculties to engage alumni and to obtain proper alumni data contrary to the situation when the Faculties do not have any data about their alumni or store them in Excel sheets.
- **News and updates** functionality provide an opportunity for the University to provide knowledge **to** alumni. It integrates the stream of social networks and chosen news topics from the University and Alumni Association home pages. It also generates a regular newsletter that is proven to be the most effective way to communicate with alumni.
- **Jobs.** Career advancement is one of the most important alumni relations activities and now there is an IT support allowing companies to publish job adverts that are targeted at alumni. There is also a possibility to email information to strictly defined alumni segments. There is also an option to integrate RSS feed of job adverts from the University Career Center. The platform also provides an effective search mechanism for alumni who are looking for job opportunities.
- **Groups.** Alumni engagement increases as they have a feeling of belonging to a certain group – department, sports team, student union, choir or any other organizational form where they have participated during their studies. Their closest friends are from this group, their memories, pride and loyalty is connected with this group. The platform supports the development of groups, each alumni can be attached to one or more groups. Within groups, members can post updates, organize events, share photos in an album and search for others who have similar interests. The groups are the basis for user generated content and are another strong driving force enabling alumni engagement.

RTU alumni relations management metrics

The overall results of alumni knowledge management metrics show that there has been a rapid progress and many activities implemented taking into account that the alumni relations culture in the biggest universities is not even 10 years

old. Still there are many ways to improve, especially in the fields where the set targets have not been reached. Overall, the Baltic alumni satisfaction with alumni relations activities is alarmingly low (5.9 out of 10). In Lithuania, on average alumni satisfaction is higher (Kaunas Technical University – 6.87, Vilnius University – 6.8), in Estonia it is the lowest (Tallinn University of Technology – 5.47, University of Tartu – 5). In Latvia, out of 3 biggest universities, Riga Technical University is having the highest score (6.1), Riga Stradiņš University following with (5.14) and University of Latvia (4.64). The data is taken from the Baltic alumni survey. The results show the necessity for organizing future research that would investigate in greater detail alumni preferences, their expectations, the public image of Alumni Association, connection of alumni satisfaction to the image of the university itself.

Implementation of triple helix alumni segmentation

Triple helix alumni segmentation is in its initial stage in RTU. To be implemented in full scale, it needs IT support in the form of alumni platform that has been implemented in 2018. That will add high quality data, it is especially important that knowledge about the activities in the Faculties is added. Presently the activities in the Faculties are dispersed and not registered. Thus most of the segmenting data are describing the situation from the centralized point of view and data sources.

Results of alumni knowledge management model approbation

The results of alumni knowledge management model approbation can be seen in Appendix 7 of the full text of the Doctoral Thesis. The results are collected in worksheets, two for each strategic BSC perspective (knowledge, internal business process, alumni, finance). The first worksheet describes measures, targets, department or position that is responsible for reaching the targets, results, data source from which the result data is obtained and the tendency (exceed ↑, lower than target ↓, exactly as planned =). The other worksheet describes initiatives that were assigned and corresponding implementation for all initiatives. Riga Technical University alumni relations experience proved that alumni knowledge management model is practically applicable in alumni knowledge management. The results prove that implementation substantially increases non-financial results and alumni engagement sustainability which confirms the stated hypothesis of this Doctoral Thesis.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

During preparation of the Doctoral Thesis, the topicality of alumni knowledge management in universities has been confirmed. Summarising the results of the Doctoral Thesis, the author has made the following conclusions.

1. Universities in their lifetime always have engaged in cooperation with their alumni. The underlying reasons for organized alumni gatherings and university deliberate relationship building with alumni have been the same in the 18th century as nowadays – networking among alumni, alumni lobbying and knowledge support for improvements in the universities, and financial support by alumni to the university. Nowadays, because of rapid technology development and globalization, higher education market is radically changing, thus it is important to research which activities exactly support alumni long-term engagement in universities.
2. Alumni relations history starts in 1792 in Yale University. In Europe, rapid development starts only in the end of the 20th century, main driver being government encouragement for the universities to increase their interactions with society and build relationships with non-university stakeholders. Alumni relations in the Baltics has its roots in the beginning of the 20th century, being interrupted by historical events and restarted from scratch just recently, following Western European countries and building new culture of engagement and philanthropy. Thus, it is crucially important to support building of a new alumni-university life cycle in the Baltics with solid research.
3. There are different notions – some of them perceiving fundraising as one of primary tasks of alumni relations, other, on the contrary, declaring that alumni relations and fundraising are separate but connected activities. However, the most common approach considers that alumni relations involve alumni in university life in many different ways: as participants, volunteers, lecturers, mentors, governors, etc. – the ultimate goal is to build relationships. Fundraisers can follow and harvest the fruits of this relationship and later involve alumni as sponsors.
4. Students are free to choose universities worldwide and research and publishing requirements for researchers are same worldwide. The insufficient funding of Latvian HERIs sets a challenging landscape. The overall financing of Latvian HERIs sometimes is two times smaller than in the neighboring Baltic countries or just 20 % of best universities in the world. In the long run strategic and purposeful investment and work of alumni relations will significantly support the HERIs.
5. Literature review reveals that alumni are HERI customers not only directly when they purchase HERI services but also continuously because the value of their diploma always depends on the HERI performance at that particular

moment. Alumni are a bridge between HERIs and the society at large. The real success of the HERI is often measured by the success of its alumni and how they represent its values in everyday lives and work. Strengthening this bridge involves a two way cooperation, including alumni in all possible life stages of HERI in a participatory way.

6. The survey that was performed in European universities shows that 50 % of respondents fully agree that alumni are customers of HERI and 40 % partly agree, thus affirming the conclusion of literature review that alumni are customers of HERI. The survey of the Baltic alumni supports it by 37.1 % of alumni agreeing, 9 % strongly agreeing, and 27.9 % remaining neutral.
7. Alumni segmentation is an important tool to reach the goals of alumni relations and there are different approaches according to the goals, richness of available data and resources. Grouping alumni into particular categories that share similar characteristics helps to gain greater mutual understanding and improve organization's needs to serve the alumni better and to foster their positive and accumulative engagement with the university.
8. The foundation and core for key account management activities (KAM) is selecting the right customers, aligning the choice of strategic customers to the strategy of the organization, and building sustainable relationship that corresponds to each chosen segment of customers. It also involves upgrading the transactional relationship from simple to complex, integrated engagement. Alumni are university customers, thus KAM principles are applicable in alumni relations.
9. Large university is not homogenous. It has complex structure and sometimes alumni have radically different interests and views. If alumni relations address all alumni without segmenting, those who are not interested in particular activities evaluate alumni relations operations as unsuccessful and stop engaging and following alumni relations communication channels. In addition, if there are active alumni who would like to dedicate their time and finance and alumni relations do not offer them appropriate opportunities, they will find other organizations where to invest their energy and resources. Segmentation helps alumni relations practitioners to engage alumni meaningfully according to their interests, resources and level of activity.
10. Traditional higher education institutions, where significant part of funding is public, are encumbered with excessive control by government institutions. The requirements of accountability dictate quality and governance practices and often negatively impact efficiency and ability to follow the pace of other players of knowledge intensive industries. Thus, Universities must foster creation and sharing of knowledge among most important stakeholders – teaching and non-teaching staff, students, alumni, sponsors and others. Universities are large, specific and complex organizations with many organizational branches and diverse functions and activities. Thus, the most important first step is to know which is strategic knowledge and sources of such knowledge.

11. Customer knowledge management is applicable in HERI alumni relations. Alumni knowledge management model developed by author exploits the concept of alumni being customer and is built on the basis of customer knowledge management. The model discovers all possible combinations of HERI-alumni intersections by combining university strategic functions with typical alumni relations processes and implementing knowledge management cycle in each of these intersections. However, full implementation of such a model requires significant organizational and IT support as well as intrinsic interest and understanding in all HERI organizational structures to engage alumni.
12. Alumni knowledge management index developed by author covers the whole spectrum of alumni relations activities, university strategic directions and knowledge management cycle. It reflects how alumni relations have reached strategic and knowledge management targets – where university strategy goes in line with alumni perceptions and where there is a gap that should be attended and decreased by communication or strategic actions
13. Balanced scorecard performance management tool is applicable as alumni knowledge management metrics. It requires focusing on a few strategically important aims thus making performance evaluation more focused and easier to implement for organizations with less resources or insufficient IT support. The metrics was approbated in RTU.
14. The model was successfully approbated in Riga Technical University. RTU alumni relations experience proved that the alumni knowledge management model is practically applicable in alumni knowledge management.
15. According to the survey, in alumni activities of the Baltics have the following priorities:
 - networking;
 - events;
 - career development.

Thus, maximum engagement can be reached by focusing alumni relations on these activities and knowledge management must be present in all intersections. During approbation, these considerations were implemented in RTU.
15. There is strong and purposeful alternative to a monetary assessment of alumni relations activities – alumni knowledge management and its metrics. It supports alumni relations management to implement long-term alumni-university relationship. The theses and hypothesis of the Doctoral Thesis were approved.

Recommendations

Based on the research results, the following recommendations have been made.

1. The Baltic universities must focus on alumni knowledge and gradually build the culture of fundraising since there is little chance to get high financial returns from alumni relations in short-term. Alumni relations must build a new culture of philanthropy and social responsibility. As historic examples prove, in the long-term private financing will help to reduce underfinancing of tertiary education. Since alumni are one of the sources, universities must build alumni engagement in a strategic and meaningful way.
2. The research proves that universities must invest in alumni relations to improve alumni engagement and views on continuous collaboration with HERI. University must acknowledge alumni as customer and treat them respectfully at the same time demonstrating challenges and possibilities of this role. It is very difficult to change attitudes of alumni thus alumni relations must start collaboration with students to form their mind-set for continuous collaboration with HERI that does not end with graduation.
3. Alumni upgrade to more and more engaging levels of activity must be one of alumni relations deliberate tasks that must be carried out by recognizing alumni potential and offering alumni development opportunities. It is recommended for HERIs to implement triple helix segmentation developed by author, which divides alumni into three strategically most important segments (knowledge, co-creation and financial) and additionally in each of these segments allows engaging alumni according to their level of activity.
4. HERIs in the Baltics should adapt to the new life cycle of alumni and see the collaboration with alumni as a long-term investment where all departments and faculties must get involved in a systematic way. It is recommended to assign significant organizational and IT support as well as intrinsic interest and understanding in all HERI organizational structures to engage alumni and fully implement alumni knowledge management model.
5. In alumni knowledge management metrics, the means, energy and finances spent for getting the data should not exceed the value that the calculated results give to our understanding of the current situation and actions on the future strategies.
6. Organizations should implement balanced scorecard for alumni knowledge management performance metrics by setting strategic goals, assigning objectives, measures and targets for each of them. Each alumni relations department or association can define their own respective initiatives corresponding to the organizational structure, assigned resources and overall strategic priorities.
7. According to the research it is recommended that the universities do the following:

- a. have alumni relations strategy that is in line with university strategy;
- b. have organizational support and culture that is aware of the value of HERI and alumni collaboration;
- c. choose a few strategic priorities per certain time period;
- d. focus on management of strategic knowledge for the chosen priorities;
- e. regularly research alumni opinions, interests and capabilities;
- f. segment alumni according to their interests and capacity, engage them accordingly and contribute to their upgrade to higher level of engagement;
- g. set targets and measure the results of knowledge management.

BIBLIOGRAPHY

1. Appelqvist, K. (2014) *Breakthroughs for Life. Fundraising at Karolinsk Institutet*. Karolinska Institutet University Press.
2. Arceo, A. (2003) 'The role of student and alumni associations in the democratization process in Spain', *Higher Education in Europe*, 28(4), pp. 523–528. doi: 10.1080/0379772032000170507.
3. Balder, H.-G. (2006) *Geschichte der Deutschen Burschenschaft*. Hilden.
4. del Barrio-García, S. and Luque-Martínez, T. (2009) 'The value of client perceptions in university strategic planning: an empirical research study', *Industry and Higher Education*, 23(6), pp. 423–436. doi: 10.5367/000000009790156391.
5. Bergeron, B. P. (2003) *Essentials of Knowledge Management*. New Jersey: John Wiley & Sons, Inc.
6. Bergman, B. and Klefsjö, B. (2010) *Quality from customer needs to customer satisfaction*. 3:5. Hungary.
7. Le Blanc, L. A. and Rucks, C. T. (2009) 'Data mining of university philanthropic giving: Cluster-discriminant analysis and Pareto effects', *International Journal of Educational Advancement*. Palgrave Macmillan, 9(2), pp. 64–82. doi: 10.1057/ijea.2009.28.
8. Bontis, N. et al. (1999) 'The Knowledge Toolbox: A Review of the Tools Available to Measure and Manage Intangible Resources', *European Management Journal*, 17(4), pp. 391–402. doi: 16/S0263-2373(99)00019-5.
9. Bose, R. (2004) *Knowledge management metrics*, *Industrial Management and Data Systems*. doi: 10.1108/02635570410543771.
10. Böttcher, M. et al. (2009) 'Mining changing customer segments in dynamic markets', *Expert Systems with Applications*, 36(1), pp. 155–164. doi: 10.1016/j.eswa.2007.09.006.
11. Buchnowska, D. (2014) 'Social Crm for Customer Knowledge Management', 5(4), pp. 65–80.
12. Bueren, A. et al. (2005) 'Improving performance of customer-processes with knowledge management', *Business Process Management Journal*, 11(5), pp. 573–588. doi: 10.1108/14637150510619894.
13. Chen, T. (2011) 'An integrated process-based customer knowledge management model', *Journal of Knowledge Management Practice*.
14. Chi, H., Jones, E. L. and Grandham, L. P. (2012) 'Enhancing mentoring between alumni and students via smart alumni system', *Procedia Computer Science*. Elsevier Masson SAS, 9, pp. 1390–1399. doi: 10.1016/j.procs.2012.04.153.
15. Clark, B. R. (1984) 'The Higher Education System: Academic Organization in Cross-National Perspective.', *Contemporary Sociology*, p. 462. doi: 10.2307/2069078.
16. Council for Advancement and Support of Education (2013) *History of Alumni Relations*. Available at: http://www.case.org/About_CASE/CASE_History/100AnniversaryA-AS/100AnniversaryExplore.html.
17. Cuadros, A. J. and Domínguez, V. E. (2014) 'Customer segmentation model based on value generation for marketing strategies formulation', *Estudios Gerenciales*. Universidad ICESI, 30(130), pp. 25–30. doi: 10.1016/j.estger.2014.02.005.
18. Dalkir, K. (2005) *Knowledge Management in Theory and Practice*, ButterworthHeinemann. doi: 10.1002/asi.21613.
19. Davenport, T. H., De Long, D. W. and Beers, M. C. (1998) 'Successful Knowledge Management Projects', *Sloan Management Review*, 39(2), pp. 43–57. doi: 10.1016/j.ygeno.2009.01.004.

20. Davenport, T. H. and Prusak, L. (1998) 'Working Knowledge: How Organizations Manage What They Know', *Knowledge Creation Diffusion Utilization*, p. 309. doi: 10.1109/EMR.2003.1267012.
21. Dobbins, M. (2011) 'Explaining different pathways in higher education policy in Romania and the Czech Republic', *Comparative Education*, 47(2), pp. 223–245. doi: 10.1080/03050068.2011.555116.
22. Draghici, A. et al. (2015) 'A Knowledge Management Approach for The University-industry Collaboration in Open Innovation', *Procedia Economics and Finance*. Elsevier B.V., 23(October 2014), pp. 23–32. doi: 10.1016/S2212-5671(15)00377-9.
23. Drucker, P. F. (1990) *Managing the Nonprofit Organization. Principles and Practices*. First. HarperCollins Publishers.
24. Dunn, D. T. and Thomas, C. A. (1994) 'Partnering with Customers', *Journal of Business & Industrial Marketing*, 9(1), pp. 34–40. doi: 10.1108/08858629410053461.
25. Durango-Cohen, E. J. and Balasubramanian, S. K. (2014) 'Effective Segmentation of University Alumni: Mining Contribution Data with Finite-Mixture Models', *Research in Higher Education*, 56(1), pp. 78–104. doi: 10.1007/s11162-014-9339-6.
26. Ebert, K., Axelsson, L. and Harbor, J. (2015) 'Opportunities and challenges for building alumni networks in Sweden: a case study of Stockholm University', *Journal of Higher Education Policy and Management*, 37(2), pp. 252–262. doi: 10.1080/1360080X.2015.1019117.
27. Fairchild, A. M. (2002) 'Knowledge management metrics via a balanced scorecard methodology', *Proceedings of the Annual Hawaii International Conference on System Sciences*, 2002–Janua(January 2002), pp. 3173–3180. doi: 10.1109/HICSS.2002.994356.
28. Faisst, U. and Resatsch, F. (2004) 'Measuring the Performance of Knowledge Management Initiatives', *Warwick University*. Available at: http://www2.warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/oklc5/papers/f-4_resatsch.pdf.
29. Fan, Y.-W. and Ku, E. (2010) 'Customer focus, service process fit and customer relationship management profitability: the effect of knowledge sharing', *The Service Industries Journal*, 30(2), pp. 203–223. doi: 10.1080/02642060802120141.
30. Floh, A. et al. (2014) 'Customer segmentation using unobserved heterogeneity in the perceived-value-loyalty-intentions link', *Journal of Business Research*. Elsevier Inc., 67(5), pp. 974–982. doi: 10.1016/j.jbusres.2013.08.003.
31. Galagan, P. A. (1997) 'Smart companies', *TRAINING & DEVELOPMENT*, 51(12), p. 20+.
32. García-Murillo, M. and Annabi, H. (2002) 'Customer knowledge management', *Journal of the Operational Research Society*, 53(8), pp. 875–884. doi: 10.1057/palgrave.jors.2601365.
33. Gebert, H. et al. (2003) 'Towards Customer Knowledge Management: Integrating Customer Relationship Management and Knowledge Management Concepts', *international conference on Electronic Business Taipei*, (September), pp. 1–12.
34. Grant, G. B. and Anderson, G. (2002) 'Customer relationship management: a vision for higher education', *Web Portals and Higher Education: Technologies to Make IT Personal*, pp. 23–32.
35. Griffin, A. and Hauser, J. R. (1993) 'The Voice of the Customer', *Marketing Science*, 12(1), pp. 1–27. doi: 10.1287/mksc.12.1.1.
36. Gupta, P., Mehrotra, D. and Sharma, T. K. (2015) 'Identifying knowledge indicators in Higher Education Organization', *Procedia Computer Science*. Elsevier Masson SAS, 46(Icict 2014), pp. 449–456. doi: 10.1016/j.procs.2015.02.043.

37. Hassard, J. and Kelemen, M. (2002) 'Production and consumption in organizational knowledge: The case of the "paradigms debate"', *Organization*, pp. 331–355. doi: 10.1177/1350508402009002911.
38. Hill, C. W. L. and Jones, G. R. (2007) *Strategic management: An integrated approach, Strategic Management An Integrated Approach*.
39. Homburg, C., Workman, J. P. and Jensen, O. (2000) 'Fundamental Changes in Marketing Organization: The Movement toward a Customer-Focused Organizational Structure', *Journal of the Academy of Marketing Science*, 28(4), pp. 459–478. doi: 10.1177/0092070300284001.
40. Hoq, K. M. G. and Akter, R. (2012) 'Knowledge Management in Universities: Role of Knowledge Workers', *Bangladesh Journal of Library and Information Science*, 2(1), pp. 92–102. doi: 10.3329/bjlis.v2i1.12925.
41. Horaguchi, H. H. (2014) *Collective knowledge management: Foundations of international business in the age of intellectual capitalism, Collective Knowledge Management: Foundations of International Business in the Age of Intellectual Capitalism*. Edward Elgar Publishing Ltd. Available at: <http://www.scopus.com/inward/record.url?eid=2-s2.0-84955689864&partnerID=40&md5=1ea02205a45d1f28349daf47accbbc6a>.
42. Hsu, F. M., Lu, L. P. and Lin, C. M. (2012) 'Segmenting customers by transaction data with concept hierarchy', *Expert Systems with Applications*. Elsevier Ltd, 39(6), pp. 6221–6228. doi: 10.1016/j.eswa.2011.12.005.
43. Huber, G. P. (1991) 'Organizational Learning: The Contributing Processes and the Literatures', *Organization Science*, 2(1), pp. 88–115. doi: 10.1287/orsc.2.1.88.
44. I. Nonaka; H. Takeuchi (1995) *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*.
45. Jashapara, A. (2004) *Knowledge Management: An Integrated Approach, Fisheries Research*. doi: 10.1016/S0165-7836(02)00158-3.
46. Johan Roos, Goran Roos, Nicola Carlo Dragonetti, L. E. (1998) *Intellectual Capital: Navigating in the New Business Landscape*. Lond: Macmillan.
47. John M. Bryson (2004) *Strategic planning for public and nonprofit organizations. A guide to strengthening and sustaining organizational achievement*. 3rd edn. San Francisco.
48. Jonker, J. J., Piersma, N. and Van Den Poel, D. (2004) 'Joint optimization of customer segmentation and marketing policy to maximize long-term profitability', *Expert Systems with Applications*, 27(2), pp. 159–168. doi: 10.1016/j.eswa.2004.01.010.
49. Juran, J. M. (1988) 'Juran on planning for quality', *New york: Free press*.
50. Kankanhalli, A. and Tan, B. C. Y. (2004) 'A Review of Metrics for Knowledge Management Systems and Knowledge Management Initiatives', 0(C), pp. 1–8.
51. Kaplan, J. M. and Warren, A. C. (2007) *Patterns of entrepreneurship*. second edi. John Wiley & Sons, Inc.
52. Kaplan, R. S. and Norton, D. P. (1992) 'The Balanced Scorecard - Measures That Drive Performance', *Harvard Business Review*, 70(1), pp. 71–79. doi: 00178012.
53. Khosravi, A., Razak, A. B. and Hussin, C. H. E. (2016) 'Customer Knowledge Management : Development Stages and Challenges', 91(2), pp. 264–274.
54. Kim, S.-Y. et al. (2006) 'Customer segmentation and strategy development based on customer lifetime value: A case study', *Expert Systems with Applications*, 31(1), pp. 101–107. doi: 10.1016/j.eswa.2005.09.004.
55. Kramer, M. (2001) 'Who, Exactly, Are the "Customers" of a Nonprofit Organization?', *The Chronicle of Philanthropy*, (May 31), p. 42.

56. Lang, J. C. (2001) 'Managerial concerns in knowledge management', *Journal of Knowledge Management*, 5(1), pp. 43–59. doi: 10.1108/13673270110384392.
57. Laurin, E. (2017) *Box Paradox*.
58. Liebowitz, J. (2012) *Knowledge Management Handbook: Collaboration and Social Networking*. 2nd edn. Edited by J. Liebowitz. Boca Raton: CRC Press.
59. McDonald, M. and Woodburn, D. (2007) *Key Account Management*. Second. Burlington, USA: Elsevier.
60. Metaxiotis, K. and Psarras, J. (2003) 'Applying knowledge management in higher education: The creation of a learning organisation', *Journal of Information and Knowledge Management*, 2(4), pp. 353–359. doi: 10.1109/ITHET.2006.339762.
61. Millman, T. F. (1996) 'Global key account management and systems selling', *International Business Review*, 5(6), pp. 631–645. doi: 10.1016/S0969-5931(96)00031-5.
62. Milton, N. and Lambe, P. (2016) *The knowledge manager's handbook. A step-by-step guide to embedding effective knowledge management in your organization*. London: Kogan Page Limited.
63. Moreira, D. A. (1996) *NoDimensões do desempenho em manufatura e serviços*. São Paulo.
64. Nonaka, I. (1994) 'A Dynamic Theory of Organizational Knowledge Creation', *Organization Science*, 5(1), pp. 14–37. doi: 10.1287/orsc.5.1.14.
65. Normann, R. (2001) *Reframing business when the map changes the landscape*. Chichester: Wiley & Sons.
66. Ohmukai, I. (2006) 'Collective intelligence and Web 2.0', *IPSJ Magazine*.
67. Ojasalo, J. (2001) 'Key account management at company and individual levels in business-to-business relationships', *Journal of Business & Industrial Marketing*, 16(3), pp. 199–220. doi: 10.1108/08858620110389803.
68. Oliveira, M. and Goldoni, V. (2006) 'Metrics for knowledge management process', (2003), pp. 1–8.
69. Olsen, S. O., Prebensen, N. and Larsen, T. a. (2009) 'Including ambivalence as a basis for benefit segmentation: A study of convenience food in Norway', *European Journal of Marketing*, 43(5/6), pp. 762–783. doi: 10.1108/03090560910947034.
70. Oosterlinck, A. et al. (2001) 'University/industry knowledge management: A university perspective', *Journal of Knowledge Management*, 2(1), pp. 92–102. doi: 10.3329/bjllis.v2i1.12925.
71. Pan L., S. and Scarbrough, H. (1998) 'A socio-technical view of knowledge-sharing at Buckman Laboratories', *Journal of Knowledge Management*, 2(1), p. 55. doi: 10.1108/EUM00000000004607.
72. Pardo, C. (1997) 'Key account management in the business to business field: The key account's point of view', *Journal of Personal Selling and Sales Management*, 17(4), pp. 17–26. doi: 10.1080/08853134.1997.10754107.
73. Pardo, C., Salle, R. and Spencer, R. (1995) 'The key accountization of the firm: A case study', *Industrial Marketing Management*, 24(2), pp. 123–134. doi: 10.1016/0019-8501(94)00039-Y.
74. Pavicic, J., Alfirevic, N. and Znidar, K. (2007) 'CUSToMER KNowLEDGE MANAGEMENT: TowARD SoCIAL CRM', *International Journal of Management Cases*, pp. 203–209.
75. Phills, J. A. (2005) 'Integrating mission and strategy for nonprofit organizations', *Management*. Oxford University Press, (10), pp. 1707–1725. doi: 10.1093/acprof:oso/9780195171280.001.0001.
76. Pickton, D. and Broderick, A. (2005) *Integrated Marketing Communications*. Second. Harlow: Prentice Hall.

77. Rattanamethawong, N., Sinthupinyo, S. and Chandrachai, A. (2017) 'An innovation model of alumni relationship management: Alumni segmentation analysis', *Kasetsart Journal of Social Sciences*. Elsevier Ltd. doi: 10.1016/j.kjss.2017.02.002.
78. Rollins, M. and Halinen, A. (2005) 'Customer knowledge management competence: towards a theoretical framework', *System Sciences, 2005. HICSS'05. Proceedings of the 38th Annual Hawaii International Conference on*, 0(0), p. 240a-240a. doi: 10.1109/HICSS.2005.180.
79. Ross, B. and Segal, C. (2002) *Breakthrough Thinking for Nonprofit Organizations. Creative strategies for extraordinary results*. San Francisco: Jossey-Bass Inc.
80. Rothschild, S. (2012) *The Non Nonprofit: For-Profit Thinking for Nonprofit Success*. San Francisco: Jossey-Bass Inc.
81. Rowley, J. (2010) 'Is higher education ready for knowledge management?', *The International Journal of Educational Management*, 14(7), pp. 325-333. doi: 10.1108/09513540010378978.
82. Sailor, R. W. (1930) 'The American Alumni Council', *The Journal of Higher Education*, 1(6), pp. 339-341. doi: 10.2307/1974320.
83. Scott, C. and Westbrook, R. (1991) 'New Strategic Tools for Supply Chain Management', *International Journal of Physical Distribution & Logistics Management*, 21(1), pp. 23-33. doi: 10.1108/09600039110002225.
84. Sedighi, Mohamad Mohsen; Mokfi, Taha; Golrizgashti, S. (2012) 'Proposing a customer knowledge management model for customer value augmentation: A home appliances case study', *Journal of Database Marketing & Customer Strategy Management*. doi: 10.1057/dbm.2012.32.
85. Shaw, W. B. et al. (1917) *Handbook of Alumni Work*. The Association of Alumni Secretaries.
86. Shieh, C.-J. (2011) 'Study on the relations among the customer knowledge management, learning organization, and organizational performance', *The Service Industries Journal*, 31(5), pp. 791-807. doi: 10.1080/02642060902960818.
87. Skyrme, D. J. and Amidon, D. M. (1998) 'NEW MEASURES OF SUCCESS', *Journal of Business Strategy*, 19(1), pp. 20-24. doi: 10.1108/eb039905.
88. Snowden, D. (2002) 'Complex acts of knowing: paradox and descriptive self-awareness', *Journal of Knowledge Management*, 6(2), pp. 100-111. doi: 10.1108/13673270210424639.
89. Sofianti, T. D. T. et al. (2010) 'Customer Knowledge Co-creation Process in New Product Development', *Proceedings of the World Congress on Engineering 2010 (WCE 2010)*, I, pp. 335-340. Available at: <http://www.doaj.org/doi?func=fulltext&aId=578910>.
90. Solsomon, M. R. (2009) *Consumer Behavior: International Version: Buying, Having, and Being, Consumer behavior*.
91. Stewart, T. and Ruckdeschel, C. (1998) 'Intellectual capital: The new wealth of organizations', *Performance Improvement*, 37(7), pp. 56-59. doi: 10.1002/pfi.4140370713.
92. Surowiecki, J. (2005) 'The Wisdom of Crowds', *American Journal of Physics*, 75(908), p. 336. doi: 10.1038/climate.2009.73.
93. Sveiby, K. E. (1997) *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets, Management*. doi: 10.5860/CHOICE.35-1000.
94. The Society of Alumni of Williams College (2012) *Constitution of the Society of Alumni of Williams College*. USA. Available at: <https://alumni.williams.edu/about/leadership/the-constitution-of-the-society-of-alumni-of-williams-college/>.

95. Trivella, L. and Dimitrios, N. K. (2015) 'Knowledge Management Strategy within the sHigher Education. The Case of Greece', *Procedia - Social and Behavioral Sciences*. Elsevier B.V., 175, pp. 488–495. doi: 10.1016/j.sbspro.2015.01.1227.
96. Weerts, D. J. and Cabrera, A. F. (2017) 'Segmenting university alumni using a person-centered methodology', *International Journal of Nonprofit and Voluntary Sector Marketing*, 22(3), pp. 1–10. doi: 10.1002/nvsm.1577.
97. Windler, K. *et al.* (2017) 'Identifying the right solution customers: A managerial methodology', *Industrial Marketing Management*. Elsevier Inc., 60, pp. 173–186. doi: 10.1016/j.indmarman.2016.03.004.
98. Zanjani, M. S., Rouzbehani, R. and Dabbagh, H. (2008) 'Proposing a Conceptual Model of Customer Knowledge Management: A Study of CKM Tools in British Dotcoms', *Proceedings of World Academy of Science: Engineering & Technology*.
99. Zupancic, D. (2008) 'Towards an Integrated Framework of Key Account Management', *Journal of Business & Industrial Marketing*, 23(5), pp. 323–331. doi: 10.1108/08858620810881593.

