



KNOWLEDGE TRANSFER IN POLAND AND PORTUGAL (CLOSING PHASE) – SUMMARY OF COTRANS PROJECT

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ABSTRACT

The transfer of knowledge is a dynamic phenomenon. It creates knowledge in the organisation and can be considered as the basis for implementing the complex process of continuous learning. It constitutes a permanent relation between science and business and is a fundamental element which improves the latter's efficiency.

The aim of the paper is both to identify the enablers and barriers of knowledge transfer in selected EU countries and present a model of knowledge transfer elaborated during the two years of COTRANS project realisation.

A structured interview method and a comparative analysis method are used in the paper. The research was conducted in 2016, among 54 IT, medical and tourist enterprises from Portugal, Poland, Sweden, Denmark and Italy. The paper presents some of the results. The

additional part of the paper is a potential model presentation with a list of recommendations on how to make the knowledge transfer between academia and business effective, which was the main goal of the international COTRANS (Conditionings of Knowledge Transfers and Innovative Activity of Enterprises) project.

INTRODUCTION

Nowadays, the problem of an effective use of intellectual potential of academia as a support for developing and innovative-solution seeking for enterprises has become

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crucial (Mládková, 2014). Modern technologies and innovations are leading stars in the competitive market (Gupta & Barua, 2015; Maietta, 2015). The investment in R&D, self-development and new product development are the solutions to reach the so-called 'blue ocean', thus avoiding the 'red ocean of competition' (Bourletidis, 2014; Azar, 2008).

In these kinds of activities, a university seems to be a natural partner, where expertise and laboratory infrastructure is available to innovation and modern technology creation (Anatan, 2015; EU, 2007; Formica, Mets, & Varblane, 2008; Huang & Chen, 2015; OECD, 2012).

Meanwhile the current state of play in cooperation between academia and business is not satisfactory, since there are still barriers to this cooperation (Ankrah & AL-Tabbaa, 2015; D'Este, Guy, & Iammarino, 2013; Plewa et al., 2013). In most of the universities the level of intellectual potential use is low, despite knowledge as its basic product that is offered both didactically and in practice. The level of cooperation with enterprises is not sufficient either, which means that universities do not use the chance of knowledge transfer and, on the other hand, most of the companies do not derive any benefits from cooperation with R&D centres (Bjerregaard, 2010; Partha & David, 1994).

A closer analysis of this issue is crucial to identify the determinants that can create a common cooperation track not only at domestic level, but bearing in mind the globalisation and internationalisation as well. There is also a long list of barriers that make this cooperation difficult (Duarte et al., 2016). Among them, there are factors depending directly on universities or companies that can be individually dismissed to make knowledge transfer more efficient and profitable. When talking about efficiency and profits the word 'strategy' comes to mind. If companies are looking for new knowledge (regardless of whether from the inside or outside) it means that they are also looking for some kind of innovation – Product, Process, Marketing or Organisational (OECD, 2005). Although a product or process innovation as well as a marketing innovation are quite simple to understand, an organisational innovation is not so easy to identify. When a company is innovating, for instance the process innovation, it normally requires also some organisational changes. The organisational innovation may work as a pivot for an innovation strategy adopted by companies. In order to develop this strategy and to support our research, the paper presents a brief overview of the concept of design thinking. The main idea is to present a new approach to establishing the strategy that must be also innovative.

CONTRANS BACKGROUND

The aim of the project entitled "Conditionings of Knowledge Transfers and Innovative Activity of Enterprises" (acronym COTRANS) is the development of a knowledge transfer model and the identification and classification of the factors intensifying or inhibiting the knowledge and innovation transfer between enterprises and external sources of knowledge, e.g. universities and R&D institutions.

Primarily, three higher education institutions have participated in the project: the Faculty of Management at the University of Gdańsk, the Faculty of Finance and Management at the WSB University in Toruń and the School of Management and Technology at the Porto Polytechnic.

In order to develop the study on these concepts, a team of Portuguese and Polish researchers is cooperating with the following objectives:

- to identify enterprises' external knowledge sources
- to identify and enumerate the factors intensifying and inhibiting knowledge and innovation transfer between universities and enterprises
- to analyse the existing transfer models in Portugal and Poland – a comparative study
- to develop a reference model for innovation and knowledge transfer.

The final goal of this paper is to present a conceptual model based on the literature review, and then to assess the model by means of field research.

After two years, the research initiated in Poland and Portugal had been disseminated and, currently, there are other institutions testing the project results: Sweden (the Linnaeus University in Kalmar and Växjö), Poland (the University of Warmia and Mazury in Olsztyn), Italy (the University of Sannio in Benevento) as well as businesses in Poland and Denmark: NGOs and SMEs from tourism, medical and IT sectors.

DESIGN THINKING FOR COTRANS

For the past years the role of design management and doing business according to the concept of design thinking has become more and more significant. Identifying and using the design potential allows the companies to reach new markets and build innovative business models. The role of designers has also been changing. Their design work is not connected with art or fashion any more. Nowadays, they are more involved in strategy management. Rarely with art background, they are mostly graduates in management studies and economics. Some researchers find design to be an element of a change management process, where due to extraordinary designers' competencies a company adapts flexibly to turbulent and challenging market conditions. In organisation and management theory, design thinking forms part of the architecture, design and anthropology (A/D/A) paradigm, which characterises innovative, human-centred enterprises. This paradigm also focuses on a collaborative and iterative style of work and an abductive mode of thinking, compared to practices associated with the more traditional mathematics/economics/psychology (M/E/P) management paradigm (Jones, 2008). As Tim Brown, the author of a book "Change by design" said, it has two common interpretations in the business world (Brown, 2009):

- designers bringing their methods into business by either taking part in business process themselves, or training business people to use design methods
- designers achieving innovative outputs or products.

Utterback & Mälardalen (2006) suggested that designers have three types of knowledge: about technological facilities, users, products or service language. They also have skills to integrate this knowledge in innovative products. Lockwood (2010) stressed that "design thinking is a methodology, not exclusive for designers, that helps people understand and develop creative ways to solve a specific issue, generally business

oriented". Empathy, integrated-thinking, optimism and desire to experiment are the main design thinkers' features, valuable during searching for new solutions (Dziadkiewicz, 2015). And these are the reasons that COTRANS needed to create a solution for effective cooperation. Due to specific working style in design thinking method and its unique approach to solving a project issue, this method has been highlighted to fix a specific business issue such as the identification and classification of the factors intensifying or inhibiting knowledge and innovation transfer between enterprises and external academia sources.

According to the design thinking methodology the objective of COTRANS was to solve not only the stated problem at hand, but the real problems beyond the obvious ones. The best way to do so was to involve users, researchers and businesspeople from different cultures and backgrounds, with different points of view in an integrative process, which could be applied to cooperation design. The process was composed of three main phases (Brown, 2009):

- inspiration (issue identification and research),
- ideation (idea generation),
- implementation (prototyping, testing and market launching).

The first stage was based on empathy and deep understanding of users that was made by the main COTRANS executor in 2010 at the Laurea University of Applied Sciences in Helsinki.

This reciprocal relation takes us to the concept of knowledge exchange. Knowledge exchange presents a wider perspective for University-Industry Collaboration (UIC), as it implies a bi-directional exchange of knowledge. Under this perspective, the customer's role is no longer a passive recipient of value at the end of a transaction, but a co-creator of value with the supplier during an exchange (Canhoto, Quinton, Jackson & Dibb, 2016). Scholars have argued that both university and industry actors are motivated to build relationships with one another to take advantage of their complementary organisational strengths (Mueller, 2006; Siegel, Waldman, Atwater & Link, 2003). Normally, the factors used to measure knowledge exchange do not vary from those used to analyse knowledge transfer. Under the research for the COTRANS project, Duarte et al. (2016) presented a list of factors that might be used both for knowledge transfer and exchange. According to Bekkers & Freitas (2008) the process usually starts with a company defining its own strategy for interaction with a university, then, when a trust relation is built, the exchange is simpler (Plewa et al., 2013). The idea of trust is supported by issues of communication and understanding (Barnes, Pashby & Gibbons, 2002; Kim, 2009).

The Laurea University was a founder of knowledge management in Finland and its model of knowledge transfer has been successfully implemented in Finnish business (Nieżurawska & Śmiatacz, 2012).

It is worth mentioning that the issue of understanding, observation and definition that create an inspiration phase have been often ignored or considered incidentally. Since this was discovered, a proper elaboration of fundamentals can interfere with project success in the end. Summarising, the study of the Finnish knowledge transfer model connected with literature review (Dziadkiewicz & Nieżurawska, 2014; Duarte et al., 2016) allowed the Polish and Portuguese team to develop the framework of COTRANS and proceed to the second phase – ideating.

METHODOLOGY OF THE RESEARCH

The ideation stage was started in April 2015. There were a few work packages as virtual network organisation and participation in domestic and international scientific conferences and workshops (in Lisbon – Portugal, Rome – Italy, Sardinia – Italy, Benevento – Italy, Kalmar – Sweden) as well as interviews with SMEs and R&D entities. This undertaking was continued for one year until June 2016. It has been reflected on many possible ideas as how to create the most effective model of knowledge transfer. It is worth saying that ideation is a critical part of design thinking. All participants were challenged to brainstorm ideas and to suspend judgements. A team was asked to generate a hundred options in a single session both in Portugal and Poland (Dryl et al., 2015). As a result, a questionnaire of structured interview was created. Then, 18 IT enterprises from Sweden, Poland and Portugal were asked about enablers and barriers of knowledge transfer (see Figure 1) (Niezurawska et al., 2016). In the same year, further 18 medical enterprises from Poland, Denmark and Portugal (see Figure 2) and 18 tourist companies (from Poland, Sweden and Italy) were asked about the same issues depicted in Figure 3 presented below.

The model of knowledge transfer assumed the business diversity, thus the IT, medical and tourist sectors were selected. The respondents were asked to prioritise certain barriers and enablers of knowledge transfer following the rule:

- -2 – significant barrier
- -1 – barrier
- 0 – unimportant factor
- 1 – important but not crucial factor
- 2 – a crucial factor.

In order to hierarchize them, an importance index was used.

RESULTS

The companies for this research were micro-, small- and medium-sized businesses from Sweden (SWE), Poland (POL), Portugal (PRT), Denmark (DEK) and Italy (ITA). The bulk of them have believed that cooperation between enterprise and R&D units and institutions from the business environment is important, but not crucial (POL – 50%, PRT – 83.33%, ITA – 67%). Only Sweden and Denmark believed the factor to be vital (100%). Moreover, all of the businesses cooperate with R&D institutions and/or business angels associations, but this cooperation is mostly occasional (POL, ITA, PRT) and frequent only in Sweden and Denmark.

The respondents were asked to prioritise the selected stimulants of knowledge transfer (see Figures 1-3). Grants from the EU play a key role in the countries. The respondents also stated that ministerial grants are significant enablers in knowledge transfer. However, in Portugal and Italy there is no ministerial financial support. The similarities boil down to the fact that the most important factors of knowledge transfer are: knowledge of entrepreneurs considering cooperation, the level of trust of this kind of cooperation and efficient communication between entrepreneurs and R&D units. Access to Technological Centres/Parks was considered the least important.

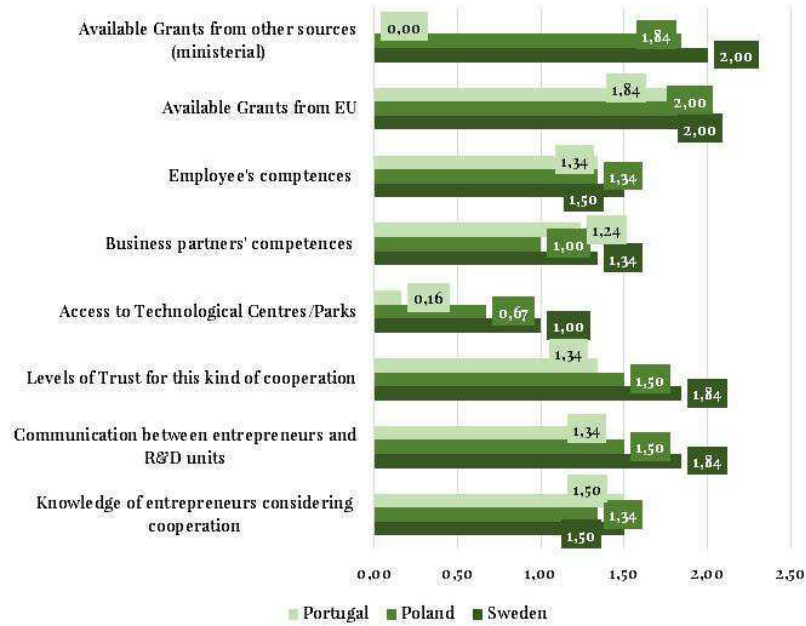


Figure 1. Enablers of knowledge transfer in Sweden, Poland and Portugal as viewed by IT enterprises (importance index)
Source: (Nieżurawska et al., 2016).

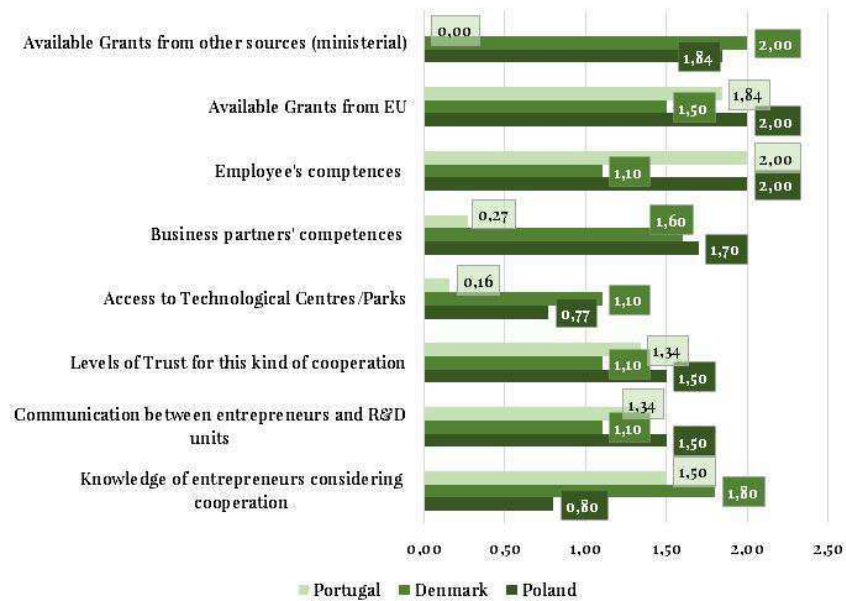


Figure 2. Enablers of knowledge transfer in Portugal, Poland and Denmark as viewed by medical enterprises (importance index)
Source: results of own research.

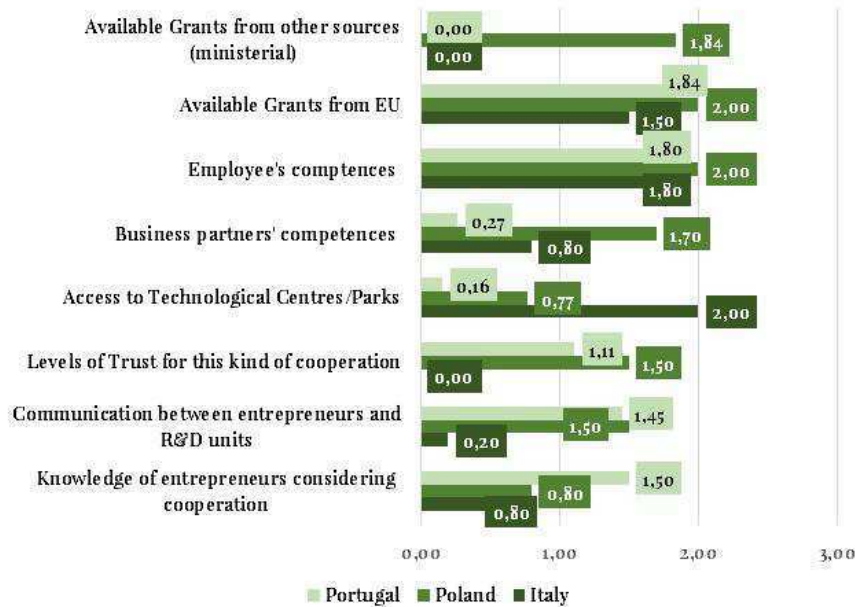


Figure 3. Enablers of knowledge transfer in Portugal, Poland and Italy as viewed by tourist enterprises (importance index)

Source: results of own research.

The respondents were also asked to prioritise the selected barriers of knowledge transfer (see Figure 4–6). That identification seemed to be crucial, as the elimination of dysfunctions and identification of the main barriers might make it possible to improve the knowledge transfer process and to develop its effectiveness.

According to our research the crucial factors which determine the knowledge transfer are financial resources/grants, knowledge of companies and businesspeople considering collaboration, as well as law/regulation. In Poland, Italy and Portugal bureaucracy hampers cooperation between universities and businesses.

The administration's and management's attitude towards cooperation constitutes the biggest barrier in Poland and it is of lesser significance in Sweden, Denmark, Italy and Portugal. Formal and law/regulation do not constitute a barrier for Portuguese entrepreneurs. The same is the case in Scandinavia and Italy, whereas it is a significant barrier in Poland.

To sum up, one cannot stop knowledge transfer, but a lot of changes, which were discussed in the paper, should be introduced in Poland, Italy, and Portugal, especially legal regulation aiding collaboration.

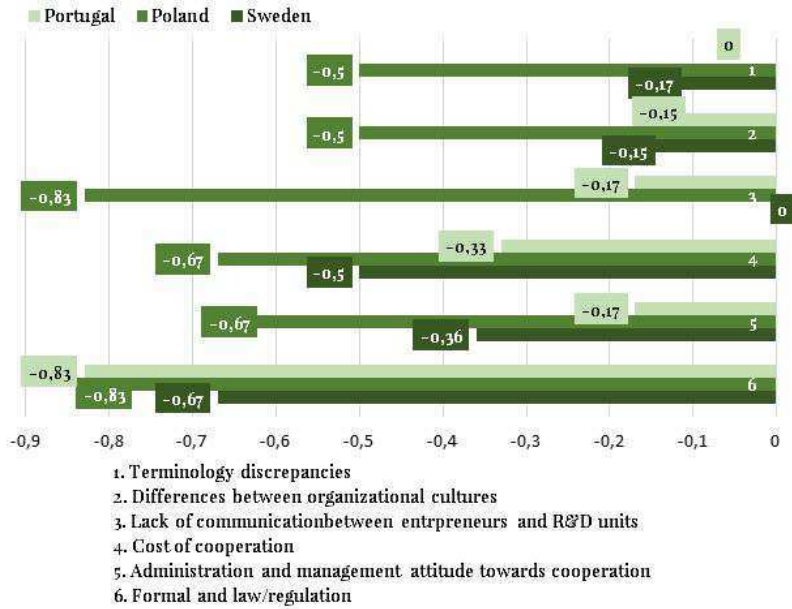


Figure 4. Barriers of knowledge transfer in Portugal, Poland and Sweden as viewed by IT enterprises (importance index)
Source: (Nieżurawska et al., 2016).

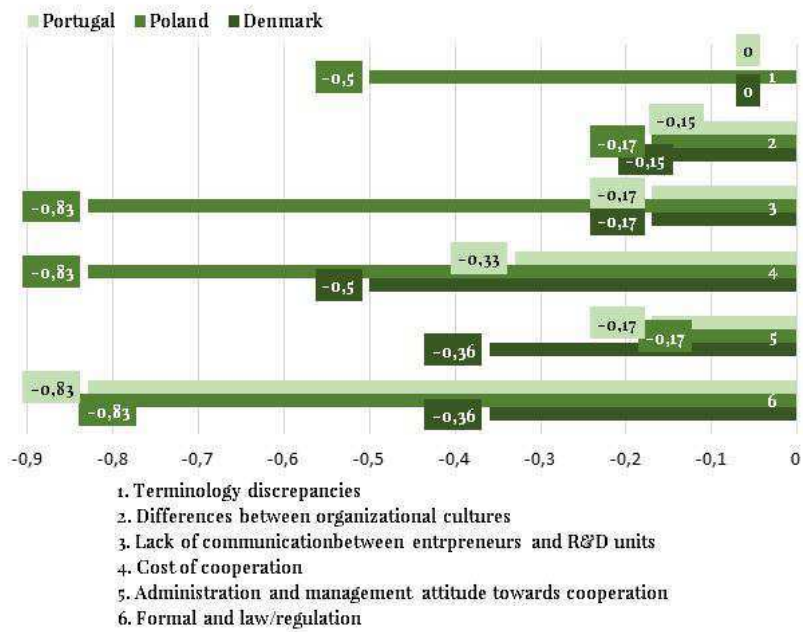


Figure 5. Barriers of knowledge transfer in Portugal, Poland and Denmark as viewed by medical enterprises (importance index)
Source: results of own research.

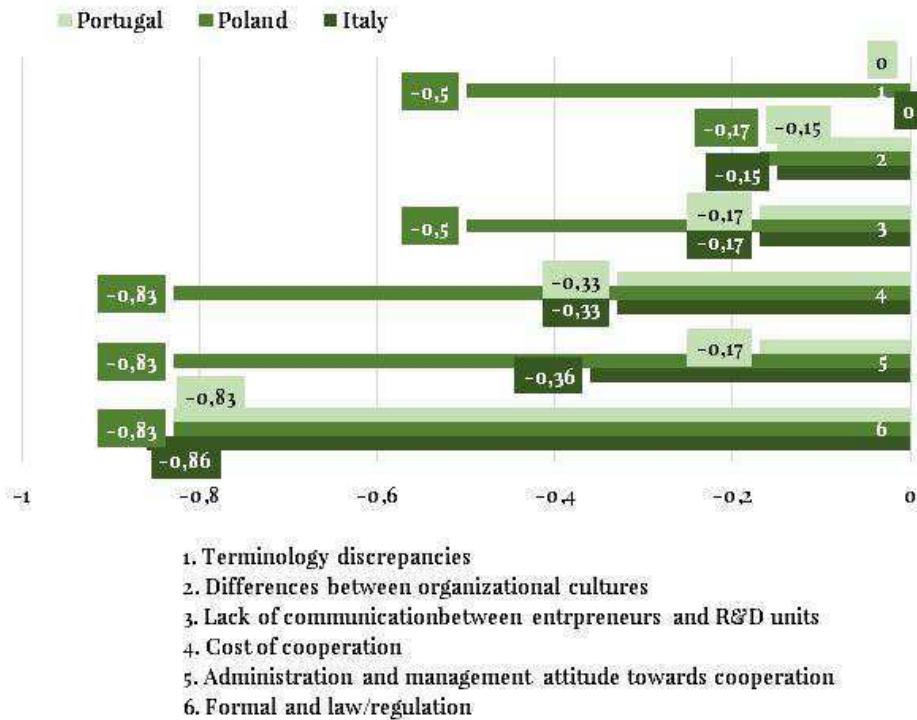


Figure 6. Barriers of knowledge transfer in Portugal, Poland and Italy as viewed by tourist enterprises (importance index)
 Source: results of own research.

The differences between the IT, medical and tourism sectors are insignificant and mostly related to the availability of EU grants, where the tourism sector has the smallest number, and the knowledge of enterprises about cooperation, which again, is the lowest in the tourism industry.

COTRANS MODEL OF KNOWLEDGE TRANSFER BASED ON DESIGN THINKING METHOD

As previously presented, the knowledge transfer might also be knowledge exchange, so during the research it was also possible to identify two sides of transfer: academia and business environment with a two-way process (to and from academia and business). This effect was due to the fact that each side is both a knowledge owner and taker. Students, graduates and lecturers/researchers are representatives of universities, with emphasis on the latter, who are also a 'knowledge source' in the transfer/exchange process. University authorities cannot be forgotten as a factor, which initiates joint cooperation of these two environments. Summarising, academia consists of students and graduates, lecturers/researchers, university administration and authorities, whereas

entrepreneurs with their employees and business practitioners are a part on the business side. The main reason of cooperation is a two-way need for knowledge that signals an education gap, both from academia (which provides theoretical background, reports, analysis, surveys, etc.) and business (which provides practical experience, skills and competences). This dual approach is composed of three main factors: knowledge (K), skills (S) and experience (E) and what must be emphasised is that all common activities are impossible without a strong network, in the form of Technology Transfer Centres (or other organisations such as partner's club, scientific league or creative lounge), which are a tool for building effective relationships (see Figure 7), where the independent knowledge centre plays an indisputable role.

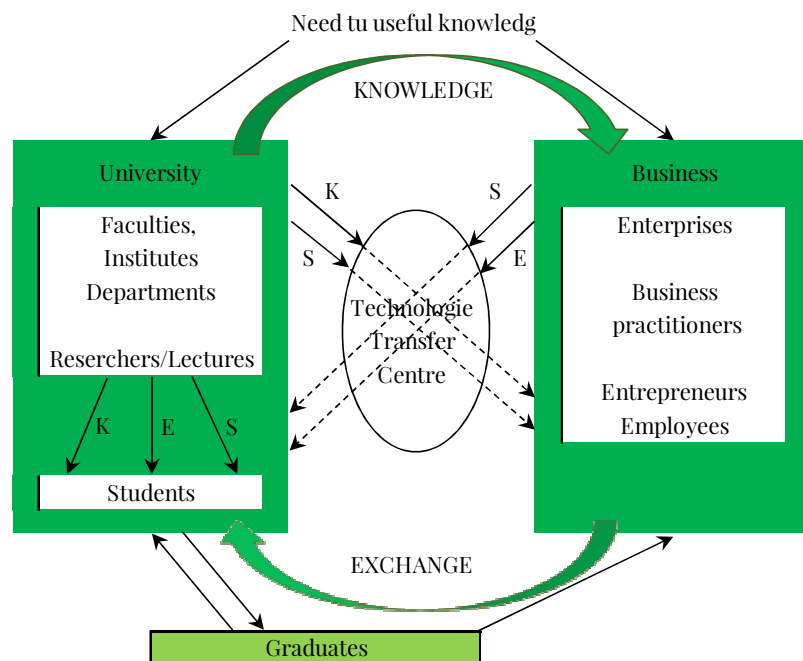


Figure 7. COTRANS model of knowledge transfer
Source: results of own research.

The next stage, based on the design thinking method, is the implementation consisting of two parts: prototyping and testing. Prototypes can be concept sketches, physical mock-ups, stories, role playing and story boards – anything which gets the ideas communicated to the team. It involves some form of visualisation of the concept. In the COTRANS project the prototype is a model of knowledge transfer elaborated during the two years of project duration. In practice, this kind of relations are not popular, thus the universities usually boot business cooperation without consultation with entrepreneurs. In the suggested model, business should be more involved in research activities. Another suggestion is the independence of these centres for cooperation. By being autonomous, those centres can be more effective. A total disjunction of university employees' duties (both administrative and researchers) is the

next significant change. The model provides for substantive support of business practitioners in the creation of cooperation centres.

CONCLUSION

The transfer between knowledge seekers and takers can be used when organising the academia-business cooperation. The knowledge centres employees have influence on this process management and try to combine both sides' expectations. It is possible thanks to assessment of the need for knowledge. The form of knowledge transfer is also monitored and fit: workshops and courses/classes are used mainly for transferring of theoretical knowledge, in contrast to skills and experience that are transferred via work shadowing and traineeship. When starting the project entitled "Conditionings of Knowledge Transfers and Innovative Activity of Enterprises" researchers assumed a model of knowledge transfer as the final added value. Meanwhile, it turned out there are many more possibilities that can be created and developed within the scientific cooperation. During the testing of the model, both beneficiaries at the University of Gdańsk and Felgueiras have assessed the model positively as one which transferred both the best practice and the useful state of knowledge.

The conclusion is that the transfer of knowledge is a dynamic phenomenon, which has been shown on COTRANS model of knowledge transfer. It creates knowledge in the organisation and can be considered as the basis for implementing a complex process of continuous learning.

The model may become a premise for further research in the field. However, one should remember that the model is dynamic and it may evolve in the future.

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