WP1: Preparation – Research and state of the art

D1.3 EU Best practices database

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INNOLEA: Innovation for the Leather Industry in Jordan and Egypt
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1 INTRODUCTION

The important roles of Higher Education Institutes/Universities in creating and disseminating knowledge to the society research have been widely acknowledged and in many cases directly embodied in research collaborations between universities and industry partners. Depending on the environment, i.e. government's policies/regulations/supports and the existing research culture in different countries, different collaboration mechanisms exist [1].

These collaborations sponsored by the governments of countries [2, 3] interested in promoting this kind of activity, eventually became individual relationships between companies and universities throughout the rest of the world. Current literature [4] indicates that such relationships became more of the norm in the late 1990's and in the last decade commonplace in various forms.

There were a number of different forms of industry-academia collaborative efforts, and some of these major forms were [4]:

- Large, multi-university/multi-company collaborations;
- Single university collaboration with multiple companies;
- Single university collaborations with individual companies;
- Collaborations of individual companies with multiple universities.

In the case of collaboration of tanneries in Jordan and Egypt with universities, the preferred form of collaboration, probably, should be the mentioned above as second: single university collaboration with multiple companies due to specificity of leather science and prevailing existence of small and medium enterprises in the industry.

Universities, however, are not ideally working independently in creating knowledge and technologies that are immediately useful and practically applicable. Collaboration between university and industry is needed to bring together insights, practical knowledge and applicable technologies into industries in addressing issues and challenges faced by the industry.

As propose Pecas and Henriques [5] the collaboration between universities and SME companies should be based on a small projects base. These projects must be focus in localized and specific problematic areas in the industrial companies, where the potential of improvement and innovation is large, must diagnose the problematic situation and propose new and efficient solutions supported by technical/scientific methodologies.

The models, how they can work, describe Tjia and Sutrisna [1]. They present_transfer technology and knowledge mechanisms in United Kingdom, Unite States, Japan and Singapore.

Figure 1 describes the model of university-industry (henceforth U/I) collaborations in the UK. Government body such as Engineering and Physical Sciences Research Council (EPSRC) distributes funds to encourage universities engaging partnership with industries or other beneficiaries of research. Este and Patel [6] stated that about 45% of EPSRC budget was directed to the projects involving partnership with industries and other organisations. The types of U/I interactions in the UK were dominated by meetings and conferences, consultancy and contract research, joint research and training. It is observed that UK academic staff was less productive in releasing patenting-licensing due to the Research Assessment Exercise (RAE) and teaching quality assessment [7]. As a result, university researchers put more focus on paper publications or stressed on information, which in contrast to the research focus in USA, i.e. more invention [8]. The relatively more recent funding model of Knowledge Transfer Partnership (KTP) by the Technology Strategy Board may help with the

'lack of invention" perception but not with the low commercialisation as the focus on ERA can still be considered dominant [1].

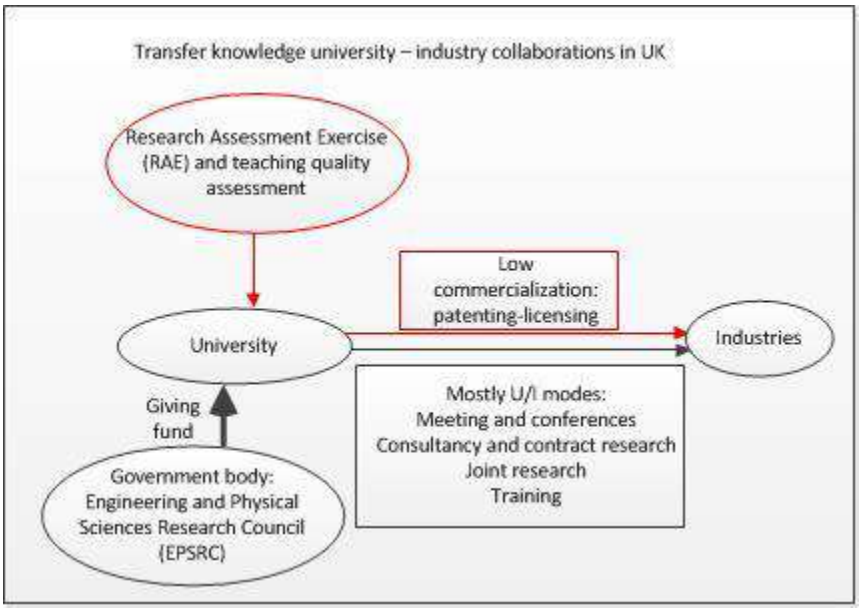

Figure 1. Transfer knowledge mechanism between university and industries in UK [1]

Figure 2 depicts the U/I interaction mechanisms in the USA. These mechanisms were adopted from Hall [9]. Four interactions are highlighted, i.e. University-Industry Research Centres (UIRC) and Engineering Centres, individual supports, large laboratories and one-off projects. The research centres are typically funded partially by Federal Government. One-off projects typically include a university as a partner, and some of the projects received funding from Advanced Technology Program (ATP) and some were funded from Federal Government. Meanwhile, laboratories were built from consortia funds collected from several (commercial) firms. The other type of collaboration is patenting and licensing which became popular since Bayh-Dole Act (1980) [10] was introduced. This act allows universities to keep their intellectual properties on the research funded by the government.

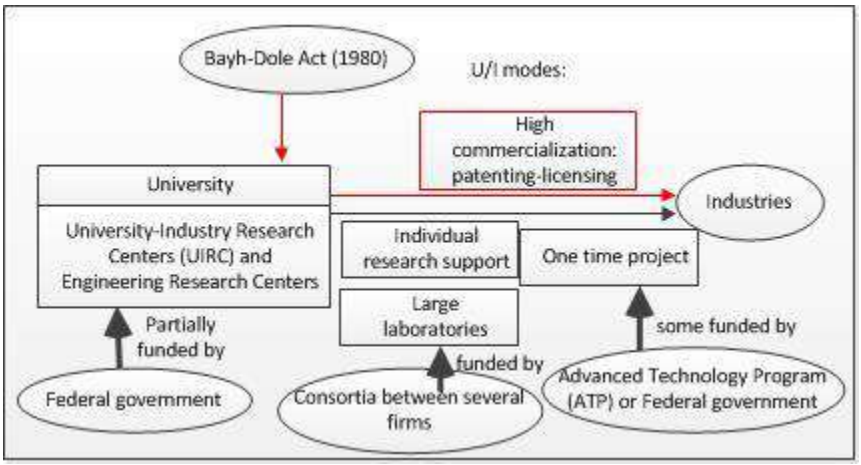

Figure 2. Transfer knowledge mechanism between university and industries in USA [1]

Figure 3 illustrates the research collaboration model in Japan. In contrast to models in the UK and the USA, the technology transfer mechanisms in Japan were proactively performed by the receiver of the technology [11]. Kodama and Suzuki [11] introduces receiver-active role in U/I linkage paradigm. Several formats of this I/U interactions include co-authorship of paper publications as well as co-application of filing patents or combinations between them. The uniqueness of I/U in terms of I/U transfer technology in Japan is the arrangement that intellectual properties do not belong to university but they are owned by the inventors. The inventors commonly do not file the patents and transfer the invention to the companies with little or no fees and they are registered as joint applicants or only as inventors [11]. The main reason was believed to be the high cost of transaction for inventors. The use of university resources with less apparent benefits back to the universities have triggered a conflict in 1960 where students protested against I/U collaborations. Since then the Japanese government, i.e. Ministry of Economy, Trade and Industry (METI) and Minister of Education, Sport, Science and Technology (MEXT) have increased the budget for U/I linkages and initiated to build a technology licensing organisations (TLOs) to promote research outcomes to industries [11].

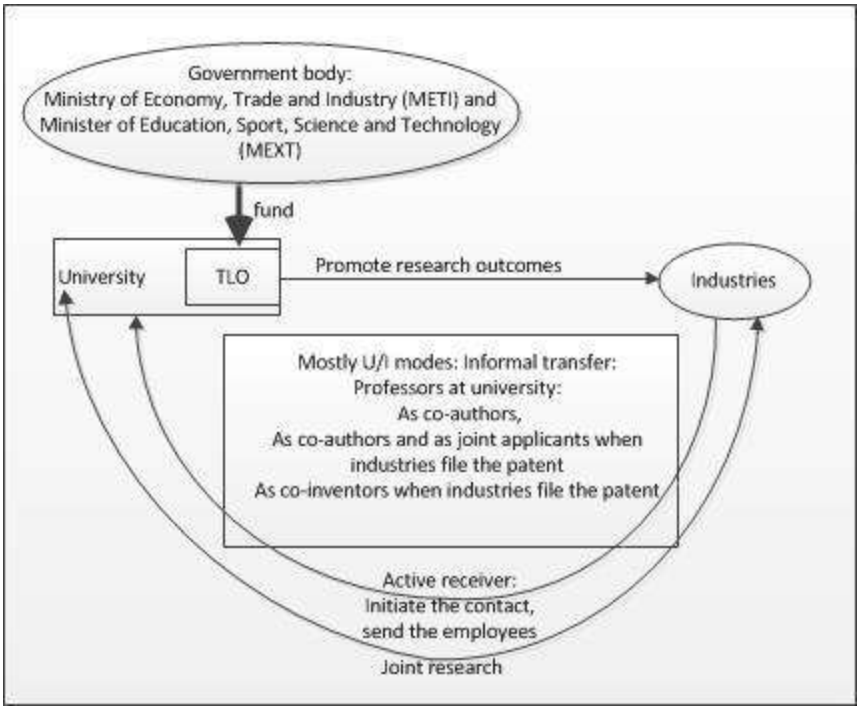

Figure 3. Research U/I collaboration in Japan [1]

The scheme of transfer knowledge in Singapore was adopted from Lee and Win [12] and presented in Figure 4. Three types of research funding mechanisms are highlighted here. Firstly, through Kent Ridge Digital Labs who are responsible for development of information and networking technology (IT). Secondly, through GINTIC Institute of Manufacturing who plays in development of technology mostly in manufacturing and finally, the Centre for Advanced Construction Studies. All research centres received government funding. The first two centres were supported by National Science Technology Board (NSTB) and the construction study centre obtained supports from the Construction Industry Development Board (CIDB).

The types of U/I collaboration in Singapore can be generally divided into two groups: two way and one way interaction. Two way interaction encourages university to be involved in R&D which includes sharing the cost and facilities. In one way interaction, research centres are responsible for the managing the cost and providing

facilities. Most of U/I interactions using this model is in IT and manufacturing centres (i.e. the first two mechanisms) doing joint ventures, joint research, patenting-licensing and technical provision as one way transfer knowledge flow. In construction study centre, the typical modes are mostly seminar and conference for two way interaction and provision of technical service and training as one way flow. In order to have high credibility, CACS consists of academic staff and well-known local professional engineers. CACS also invites professors of eminent overseas universities [12].

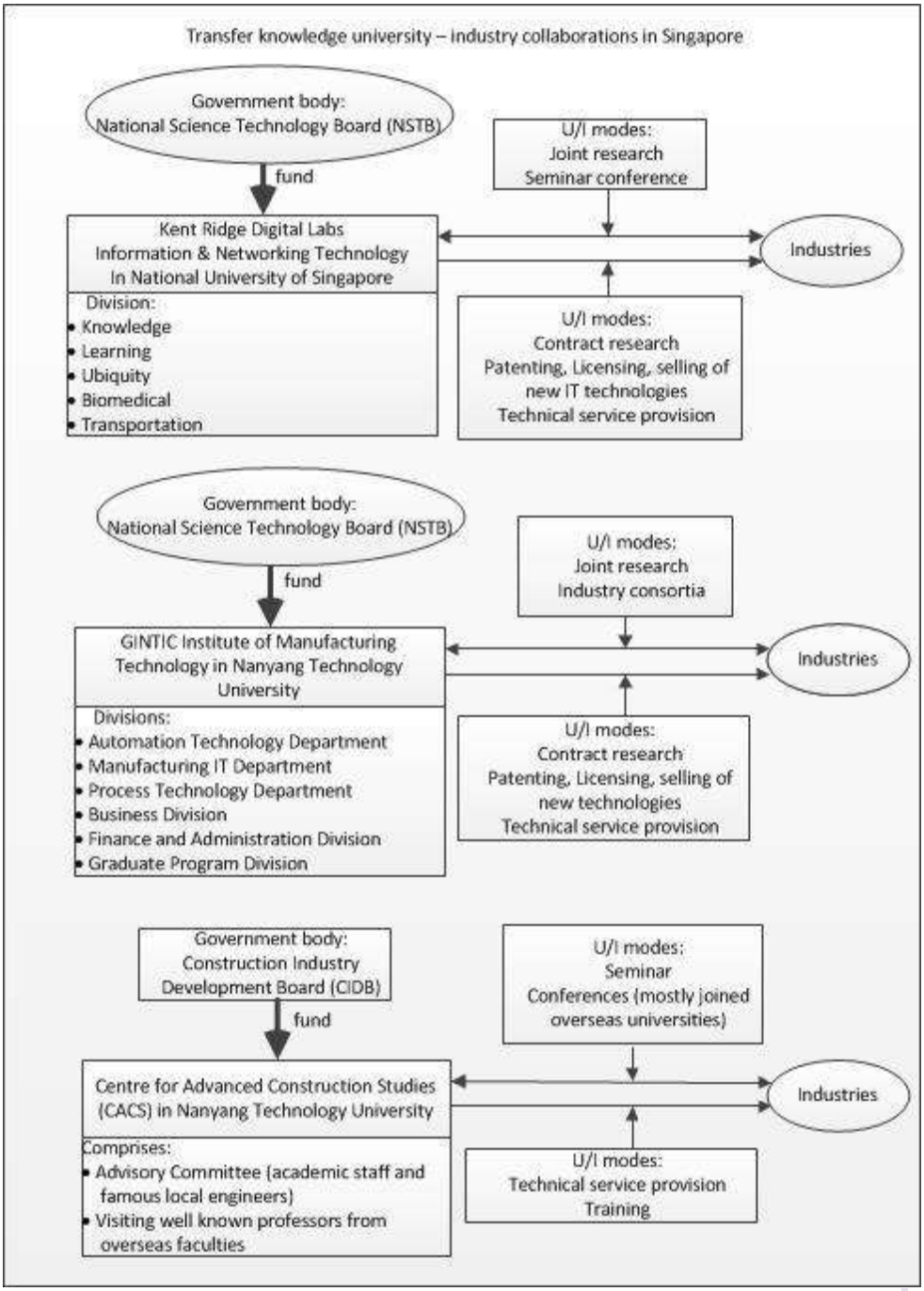

Figure 4. Transfer technology mechanisms of Singapore's I/U collaboration [12]

The presented models exploration has been set to review existing U/I research collaboration and to develop a best practice model suitable for facilitating research collaboration [1]. On the other hand, authors (who are from Australia) state [1] that „Whilst the population and therefore the context is Western Australia, the final outcome of the research is expected to provide an empirical insight on how to develop best practice model for a specific sector". Therefore, it can be conclude that „the population" and „context of country" are the main factors determining form and model of the interaction between universities and industry.

The leather sectors in Egypt and Jordan consist of companies that have limited access to services like testing, training, research, studies, fashion, and financial funding instruments, and there are not any focal points in these two countries that fulfil the knowledge triangle, bringing together enterprises, universities and research centres, especially as far as the leather production is concerned.

Since INNOLEA project aims to fill an apparent gap in the area of specialized services for the leather sector with the establishment of leather centres in local Universities, the experience and expertise of EU partners in the area of services for the leather or similar (textile, food etc.) sector should be thoroughly analysed seeking to prepare and implement capacity building programme to enhance the skills of Jordanian and Egyptian experts in running and managing leather centres, followed by the actual setup and operational organization of the Leather Centres.

1.1 References

1. Tjia, D., Sutrisna, M. A review of research collaboration models between university and industry – an exploratory study. Proceedings of The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors, 20 - 22 September 2016, Toronto, Canada, http://www.rics.org/Global/A%20Review%20of%20Research%20Collaboration%20Models%20between%20University%20and%20Industry%20-%20An%20Exploratory%20Study.pdf]
2. Abramo, G., D'Angelo, C. A., Di Costa, F. University-industry research collaboration: a model to assess university capability. *Higher Education*, 2010, 62, 163-181.
3. Motohashi, K. & Muramatsu, S. Examining the university industry collaboration policy in Japan: Patent analysis. *Technology in Society, 2012,* 34, 149-162.
4. Peters, D.L., Lucietto, A.M. A Survey of Types of Industry-Academia Collaboration. 2016 ASEE Annual Conference & Exposition. New Orlean, June 26-29, Paper ID #14634 https://www.asee.org/public/conferences/64/papers/14634/view
5. Pecas P., Henriques. E. Best practices of collaboration between university and industrial SMEs. *Benchmarking: An International Journal*, 2006, 13, 54-67.
6. Este, P.D., Patel, P. University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry?, *Research Policy*, 2007, 36, 1295—1313.
7. Gann, D. Putting academic ideas into practice: technological progress and the absorptive capacity of construction organizations, *Construction Management and Economic*s, 2001, 19, 321-330.
8. Decter, M., Bennet, D., Leseure, M. University to business technology transfer-UK and USA comparisons, *Technovation*, 2007, 27, 145-155.
9. Hall, B. H. University-industry research partnership in the United States. Kansai Conference Paper, February 2004, http://cadmus.eui.eu/bitstream/id/1735/ECO2004-14.pdf/;jsessionid=94C31E6F77E81ED60BF37E9C3C4ED38F

10. The Bayh-Dole Act of 1980 (Patent Rights in Inventions Made with Federal Assistance), http://counsel.cua.edu/fedlaw/bayh.cfm

11. Kodama, F., Suzuki, J. How Japanese companies have used scientific advances to restructure their business: the receiver-active national system of innovation. *World Development*, 2007, **35**, 976-990.

12. Lee, J., Win, H. N., Technology transfer between university research centers and industry in Singapore, *Technovation*, 2004, 24, 433-442.

2 CASES OF EU BEST PRACTICES

To select the objects to be included in the review, a broad definition of the term “practice” is adopted. It encompasses a process or a methodology that represents an effective way of achieving a specific objective, the one that has been proven to work well and produce expected results, and is therefore recommended as a model or as a useful example.

Objects included in this report should not be compared with each other, as they are different in terms of scope, activities, budget and duration of existence. They should rather be seen as distinct examples of good practice.

2.1 Igualada Leather Cluster (Spain)

General information	**Year Established**: 18 November, 2015. **Number of employees in the cluster organisation**: 1-5. **Legal form of organisation**: Registered Association. The Igualada Leather Cluster is currently formed by 28 tanning companies grouped at the Tanners Guild, the A3 Chair and the new UPC Campus as centres that provide research, innovation and training to the sector, the IDR tanners' treatment plant, pioneering plant in Europe in the treatment of industrial waste water, the Leather Museum and "Cal Granotes" Museum illustrating the history of tanning in Igualada since the fourteenth century, the J. BELLA CLUSTER CLUB, headquarters of the Igualada Leather Cluster and European Leather Interpretation Centre for Quality Leather, the Municipal Gaspar Camps School of Art in Igualada, the only school in Catalonia that teaches a middle grade course in Leather Crafts, and the Innovation Park for Leather and Leather Goods, one of the 10 strategic projects of the Government of Catalonia to promote economic development in Catalonia
Members (protagonists)	• **Igualada Guild of Tanners** (the Igualada Guild of Tanners comprises **28 tanning companies** employing about **800 workers);** • **A3 Chair in Leather Innovation at the Polytechnic University of Catalonia (UPC)**: A3 Chair develops projects by promoting innovation, research and the application of new technologies in the leather sector; • **UPC's Igualada School of Engineering (EEI):** The new University offers very specialized leather studies, like the Master's Degree in Leather Engineering or the Postgraduate Course in Tanning Techniques; • **J. Bella Cluster Club**: it is a meeting point for the leather sector, and a cultural space open to the city that recalls 700 years of tanning in Igualada; • **Tanners' Treatment Plan**t: currently purifies wastewater from 28 tanning companies in Igualada, as well as part of the domestic wastewater of the city and wastewater from other industries. • **The Innovation Park for Leather and Leather Goods**: tt will allow tanners to relocate from the old town of Igualada and attract investment from companies related to leather and leather goods. • **Cal Granotes and the Leather Museum**. With 50,000 visitors a year, Cal Granotes and the leather museum of Igualada are one of the town's principal cultural attractions; • **Gaspar Camps School of Art**: offers workshops and art studies in leather, and it is the only school in Catalonia that teaches a middle grade course in Leather Crafts, with the official title of Plastic Arts Technique and Leather Craft Design.
Operational Areas	• **Environmental Responsibility**: Clean technologies, treatment of waste water, and the minimization and reuse of waste, has reduced of 50% in water and a 40% to 50% in pollution load; • **Industry**: Igualada is a strategic enclave for developing economic activity around the areas of quality leather and leather goods;

	• **Research, Development and Innovation**: R&D Centre A3 Chair is key in the search for new products, the modernization of the sector and in the environmental sustainability of products; • **The Leather University**: UPC's Igualada School of Engineering (EEI) is an example of educational cooperation between the University and the business sector; • **Social Responsibility**: Igualada Leather Cluster Barcelona has been one of the economic engine of the city since 1340 and is involved in the development of its workers; • **Training**: The Igualada Leather Cluster's activity in the field of education is based on training programs from the world of leather to companies; • **Internationalization**: Is a strategic area of Igualada Leather Cluster. More than 80% of the production of leather goods made in Igualada is for export; • **History**: Seven centuries of tanning industry in Igualada explain the great role of the Cluster in the leather sector and why is an important element of the city.
Activities	• **International cooperation;** • **Trans-national cooperation.**
Services	• **Facilitation of collaboration between members;** • **Promotion of activities (marketing/ visibility);** • **Support of knowledge transfer;** • **Support of technology transfer.**
Link to website	http://igualadaleather.com/en/igualada-leather-cluster-eng/

2.2 Institute of Leather Industry (Poland)

General information	**Year Registered**: 16 November, 1986. **Number of employees in the organisation**: not declared. **Legal form of organisation**: Research and Development Units. Self-presentation: "Knowledge and reliability. Experience and innovation. Open minds and tradition. We can enumerate a long time our advantages developed and rooted in the ethics of our business since 1951. The history of our activity is very rich. As a result, employees who are associated with the Institute since its inception, pass their expertise to young, full of enthusiasm for work personnel. By choice of scientific career, young people can grow with us. Doctorates, internships (for which we are always open), laboratory, research or scientific work allow them to combine the adventure of learning with scientific trips to our friendly foreign centres. Research are conducted under the themes of our own topics or in cooperation with other research institutes and with universities. This enables for solving problems in multi-and interdisciplinary way. We also cooperate with entrepreneurs and we lead many laboratory works for them. Thematic diversity and number of our projects, clearly illustrates our growth and commitment to Polish science. We encourage you to familiarize yourself with our offer as well as offer our branch in Krakow. We are open to every call or email and we invite you to cooperate with us and benefit from our expertise."
Structure of institute	**Laboratories:** • Footwear Laboratory • Tannery Laboratory • Environment Laboratory • Colorimetric Laboratory **Research Departments** • Department of Tannery • Department of Experimental Application • Department of Optical Spectroscopy • Department of Footwear • Department of Innovative Polymer Technology • Department of Biotechnology and Environmental Protection **Centre of certification** • Accreditation AC 055
Activities	**Services** • **Projects:** preparation and realization of joint projects with country and foreign enterprises; • **Research:** achieving of the progress of scientific knowledge, to preparation of new theses; • **Conferences**: organization of conference; • **Training**.

	Commercial offer • **Own production**: special adhesives, chemical substances, insoles for shoes, colour patterns; • **Auxiliaries**: for tannery, textile and household chemicals by following companies "ICAP", "TENSIS", "EXOL"
Link to website	http://www.ips.lodz.pl/en/szkolenia

2.3 National Research and Development Institute for Textiles and Leather (INCDTP) – Division: Leather and Footwear Research Institute (ICPI) (Romania)*

General information	**Year Registered**: 1951 **Number of employees in the organisation**: INCDTP - 164 / ICPI – 77 **Turnover**: INCDTP - 2,93 M Euro / ICPI - 1,48 M Euro (2016) **Legal form of organisation**: National Research Institute (Public) Leather and Footwear Research Institute (ICPI) is the Division of the National Research and Development Institute for Textiles and Leather (INCDTP) established in Bucharest since 1951. In Romania INCDTP-ICPI possesses unique expertise and R&D facilities in the field of leather processing, shoe manufacturing and allied fields. ICPI took various organizational forms and different names, before merging with Textile Research Institute for the foundation in 1996 of INCDTP - The National Research and Development Institute for Textiles and Leather. Despite this long evolution history ICPI has succeeded in consistently maintaining the domain of its activities "*research and development in natural science and engineering*" (NACE: 7219) and managed to sustain a strong relationship with the leather and footwear sectors in Romania and worldwide. In recent years, the Institute's dynamic and comprehensive presence at a National and European level made possible the development and promotion of interdisciplinary applied research in the fields of leather, footwear, collagen, rubber goods and cultural heritage. In order to accomplish its active role ICPI collaborates with SMEs, other R&D centres, universities, associations, public bodies etc. from Romania and abroad. INCDTP-ICPI has a portfolio of over. 75 international projects (FP5, FP7, EUREKA, EUROSTARS, PHARE, LEONARDO da VINCI, IEE, ERA.NET, ERASMUS+, BILATERAL COOPERATION, SD grants etc.). In the last 5 years, INCDTP-ICPI participated in LLP/ERASMUS Training Programs as Host organisation for professors and students from Romania, Greece, Turkey, Lithuania, Czech Republic and China. All these outstanding performances of ICPI were and are possible due to: - the multidisciplinary skills of its personnel (total **77** of which **52** are working in RDI; **31** accredited researchers and **25** with PhD degree); - a modern RDI infrastructure (high-tech equipment for instrumental analysis, accredited laboratory, modern pilot stations); - national and international recognition and visibility by: national/international partnerships, active participation in national, EU and international associations, networks, ICAMS International Conference organization every 2 years (www.icams.ro), Leather and Footwear Journal - open access - quarterly publication (www. http://revistapielarieincaltaminte.ro) etc. INCDTP obtained in 2013 the **A+ certification level**, according to the Romanian Gov. Decision 1062/2011. In 2015 INCDTP-ICPI was authorized, by Romanian National Authority for Qualifications, to organize 3 qualification and 1 refresher training courses.

Organisational structure (ICPI)	**RESEARCH DEPARTMENTS:** • Department for Leather Research • Department for Footwear Research and Design • Department for Collagen Research • Department for Rubber Research • Department for Biotechnologies & Environment Protection Research • Research Department for Tests and Quality Control • Compartment for Information Dissemination **TECHNOLOGICAL TRANSFER & SERVICES:** • DEPARTMENT for EXPERIMENTAL PRODUCTION & SERVICES; • LABORATORY for TESTS and QUALITY CONTROL - Accredited by RENAR – Romanian Accreditation Association – according to ISO 17025 for 31 tests (physical- chemical, physical-mechanical and chromatographic methods for leather, footwear, chemical auxiliaries, rubber and waste-waters); • Training Centre; • Support services.
Activities	• **Research and development in natural sciences and engineering –** trans- and interdisciplinary applied research in the fields of leather, footwear, collagen, rubber goods, cultural heritage and allied fields; • **Activities for technology transfer and valorisation of research results** through our Experimental Pilot Unit; • **Consultancy, technical assistance and services** (quality control, investigation & laboratory testing) in our accredited laboratory; • **Professional training activities** – the institute was authorized as professional training provider since 2011 and in 2015 was reauthorized; • **Editing & publishing of technical journal (Leather and Footwear Journal), books,** through INCDTP own Publishing House named CERTEX; • **Standardization activity –** through Romanian Technical Committees; • **Development of private – public partnerships and attracting SMEs in new projects consortia**, at national and international level, in order to increase and support sectorial competitiveness.
R&D directions:	**INCDTP-ICPI develops and promotes interdisciplinary applied research in the following R&D direction**s: • Eco-innovative technologies & advanced materials for leather, rubber and footwear industries; • Recycling / valorisation of wastes in leather and footwear sectors for added value by-products generation; • Collagen advanced biomaterials and drug delivery systems with applications in medicine, pharmacy and cosmetics;

	• Medical footwear used in the conservative treatment of the lower limb pathomechanics; • Studies regarding environmental factors and degradation degree assessment, conservation and treatment procedures/materials for restoration of collagen based historical or cultural objects; • Lifelong learning and retraining for new skills and competences development, studies and strategies for increasing leather& footwear sectoral competitiveness and RDI capacity; • Improving leather & footwear sector sustainability by circular economy principles, integrated quality control and environmental impact monitoring towards eco-efficiency.
Main objectives for the future	• To remain and to consolidate our position of dynamic and representative actor in the field of leather, footwear and allied domains of scientific research; • Increasing the degree of implementation & exploitation of RDI results; • Development of private – public partnerships and attracting SMEs in new project consortia, at national and international level, in order to increase and support sectorial competitiveness; • The increase of INCDTP-ICPI's involvement in the professional / vocational training of employees from our industrial sectors, including new and flexible types of courses; • Increased involvement of INCDTP-ICPI in the practical training of students and good practices exchanges with universities and other research centres etc.
Link to website	www.icpi.ro http://pisie.it/site/sites/default/files/Romania_ICPI.pdf http://www.certex.ro/en/

* Despite the fact that Leather and Footwear Research Institute is the Division of the National Research and Development Institute for Textiles and Leather, it is described and analysed in the Best Practices cases study as separate Body.

2.4 The Portuguese Technological Centre for the Leather Industry – CTIC (Portugal)

General information	CTIC is a **non-profit private organisation**, which was **created in 1992**, under the initiative of leather companies, the sector's Association and with the participation of the Portuguese State. It has modern premises, in an area of 1.800 m^2, and it is located at Alcanena, where 90% of the leather industry is concentrated. The Centre has a **technical staff of 24 people**, specialized in different areas: Leather Technology, Chemical Engineering, Environment, Safety at Work, Food Safety and Management areas. CTIC provides scientific and technological support to the sector, assuming a predominant role in the implementation of new technologies and processes, in the research and development, and in the environment preservation, which leads the sector to the technical sophistication, innovation, process rationalisation, cost reduction, productivity gains, differentiation and internationalization. The Centre has public recognitions for training, and it is certified under ISO 9001 and ISO 17025, being also the national standardisation body for Leather, participating also in CEN – European Committee for Standardization.
Structure of the centre	**Laboratories:** • **Physical and Mechanical Testing Laboratory** • **Chemical Analysis Laboratory** • **Microbiological Laboratory** • **Environment Laboratory** **Tannery – pilot plant;** **Research, Development & Innovation Department for Leather;** **Rooms for training courses, Library and Auditorium.**
Activities	**Services** • Research & Development: preparation and realization of joint R&D projects at national and international level, with enterprises, other Centres and Universities • Consultancy/Technical Support and Technology Transfer • Environmental Solutions/Circular Economy • Laboratory Analysis and Tests • Safety, Hygiene and Health at Work • Quality Management Systems • Food Safety • Training courses • Standardisation for Leather • Consultancy in investment projects for enterprises • Conferences and seminars
Link to website	www.ctic.pt

2.5 Research Institute of Leather and Plastic Sheeting – FILK (Germany).

General information	**Year Registered**: Since 2001 Forschungsinstitut für Leder und Kunststoffbahnen (FILK) gemeinnützige GmbH**.** **Number of employees in the organisation**: not declared. **Legal form of organisation**: Research Institution.
Mission statement (self-presentation)	**We are**: • **Independent:** We continually and independently develop our institute and thus are not subject to external influence and expectations. We always act objectively. Our appearance and our publications are strictly impartial. • **Benefiting to the public**: We predominantly act selfless. Results of our economic activities serve exclusively to ensure our engagement for the community. • **Industry-oriented**: We maintain a close exchange of ideas with producing enterprises and industry associations. Our research activities and training and education offers comply with the demand of mainly small and medium sized enterprises for development and knowledge. • **Extramural**: We keep close contact with research institutions of any kind. Our collaboration with universities, academies and other large research centres bears a cooperative characteristic and is project-based. **Objectives**: • **Scientifically**: Results of our activities shall contribute to achieve selected objectives of economy and society. We are driving force and partner of the mid-sized sector. With this we are committed to the principles of good scientific practice. • **Societally**: As member of the Deutsche Industrieforschungsgemeinschaft "Konrad Zuse" e. V. we are inherent part of Germany´s research community. We are oriented towards the objectives of national and European research and economic policies. Our strategic positioning in selected fields of research are determined independently and self-contained. We stand for a society based on knowledge and committed to humanism. • **Socially**: Creativity and motivation of our personnel we consider as our most valuable asset. By provision of attractive work place, a trusting environment as well as comprehensive offers for professional training and education we seek for high employee satisfaction and commitment. We safeguard and support actively the health of our personnel. We realise the principles of equal opportunities for women and men and compatibility of family and work life. • **Sustainable**: Our daily action and research activities focus on contributing to the implantation and preservation of a balanced ecological, social and economic system. We are engaged in a careful use of natural resources and a responsible and conscientious energy policy. In sharing our knowledge and research results freely with the whole of society we support governmental and civil society initiatives promoting sustainability. Our business policy is founded on the principle of social and ecological responsibility and economically successful action. We shall leave an intact world for our children and following generations.

	Our path: • **Innovative**: On a complex path of innovative processes our institute takes role of a partner to the industry in the analysis of problems, in developing ideas and in research and development. We support the medium-sized sector in the transition of innovations into applications. For achieving our corporate objectives we utilise innovative ways and means. • **Based on partnership**: We are convinced that acting in partnership is the most reasonable way for achieving excellent results. By co-operating with research partners and service providers we cluster competences in the interest of our customers and clients. We are actively engaged in industry associations and research networks and therewith offer a platform for a prolific exchange of ideas. Honesty, trust and fairness in market participation have a high significance in our daily action. • **Responsibly**: As employer we take responsibility for a trustful relation to our personnel. As business partner we act responsible with regard to our customers and clients. We comply strictly with concluded agreements, safeguard information carefully and responsible and enhance confidentiality at all times. • **Economically**: The maintenance and continuous strengthening of the institute´s economic independency is a principle of our economic activities. A reasonable and careful deployment of available resources is a prerequisite for economic responsibility thus striving for adequate revenues. Sustainable action ultimately promotes economic success.
Structure of Institute	**Not available**
Activities	• **Research** The research activities at FILK always focus on the requirements of the companies in the respective target branches and industries. Especially the innovation capacity of small and medium-sized enterprises (SME) shall be supported and strengthened with industry- and application-oriented research. As an industrial research institution, FILK contributes efficiently in this connection. The range reaches from publicly funded research projects in the pre-competitive basic and market-oriented research via branch-connecting cooperation projects and lastly targeted contract research. The integration of the institute in national, European and international research networks and bodies beyond this, enables continuous extension of the knowledge base and active development of the research landscape. The thematic focuses of the research work are on laminar-flexible polymer materials such as leather and its natural source collagen as well as material compounds based on synthetic polymers. Especially the applied materials research such as the clarification of structure-property-relations, surface phenomena, bonding and reaction mechanisms and the behaviour of these materials under stress are of very high significance. Based on this knowledge, new developments and solutions with relevance to the industry can be implemented. **Main research activities**: ***Surface characteristics and tribology*** ***Functional polymer coatings***

Applied Collagen Research
Leather Technology

- **Products**

Based on its high material and technology competence and oriented towards the needs of its customers own products are developed at FILK. They are filling market niches supporting users in their daily work:

Catalogue - Assessment of Leather and Coated Textiles in Automotive Interior

The assessment catalogue is supposed to give assistance to users such as employees of garages, service managers, service consultants, persons responsible for complaints, experts or sales consultants in order to to differentiate and assess competently cases of damage and complaints according to latest standards and knowledge.

Freiberg Hide Powder

Freiberg hide powder for the gravimetric analysis of vegetable tanning agents and extracts is produced at Freiberg since 1905. Low-chromed hide powder is used for the analysis of vegetable tanning materials. In tablet form it can also be used for a quick test to prove the efficiency of leather auxiliaries

- **Training**

Vocational training and further education/Knowledge transfer

Within the industry-oriented research landscape, the transfer of knowledge, skills and experience plays an important role. FILK vigorously attends to these tasks. In particular by being involved in numerous bodies and associations, which promote the scientific exchange of knowledge and expert networks, the institute incorporates know-how into the industry and other scientific areas. In particular, the creation and extension of networks for pooling scientific competencies and for inter-disciplinary cooperation.

In addition, there are conferences for all main research areas of the institute which have become established as European trade meetings visited by international guests, and offer the participants, in particular representatives of small and medium-sized companies, a platform for exchanging experience and knowledge among experts.

The institute also contributes to covering the need of skilled personnel. In addition to the initial professional training, this includes academic teaching, project work with students about to take their diploma or doctoral candidates, but above all the professional development and further qualification.

With a number of specialist seminars and qualification measures accredited by the German Chamber of Commerce, and continuously adapted to the needs of the industry, enterprises can have their staff members trained and qualified at FILK in the field of flexible polymer materials.

- **Testing**

The independent and accredited test laboratory of the institute offers a wide range of testing services. These include standardised tests according to German, European and international standardisation bodies (DIN, EN, ISO, VDA), technical terms and conditions of supply of the automotive and furniture industries and other branches of industry in which flexible polymer materials are applied. In addition, there are test and service offers such as process or research accompanying analytics, the proof of usability or of

	functionalities, comparative material tests, pollutant analyses as well as analysis of the marketability of materials according to statutory provisions. Equipped with the most up-to-date laboratory and testing facilities, FILK offers a wide range of tests for the determination of typical chemical-analytical and physical-mechanical material properties. A technically profound consultancy concerning the selection of suitable testing methods and a secured interpretation of results complete the range of services offered. The high material and test competency, in connection with the scientific-technological background offer additional assistance and consultancy concerning problems in the product development, the production processes or the product quality. For this purpose, comprehensive special analytics is available for versatile tasks such as damage and material failure analyses. The tasks of the test laboratory also include expertise. • **Certification** Certifications are an important instrument for the assessment of conformity and comparability of products, services, processes, technologies or locations. They are encountered in nearly any area of economic or social life. They provide a reliable measure of safety with regard to quality and compliance with corresponding standards. Material and testing expertise combined with a scientific-technological background are the base for the institute´s activities as certification body in its established fields of competences. This comprises product safety as well as ecological and environmental aspects such as the efficient use of materials and resources. High expertise and qualified evaluation of results provide for a transparent certification process.
Link to website	https://www.filkfreiberg.de/en.html

2.6 BLC Leather Technology Centre (United Kingdom)

General information	Founded in **2009*** **Staff****: 26-50 **Organization type****: Goods Supplier, Development Consulting, Service Providers BLC is the leading, independent, leather testing and technology centre, established for over 95 years. As the only laboratory dedicated to leather, footwear, chemical, and leather product testing, BLC has the technical pedigree to ensure fast and accurate solutions to technical, management or environmental leather problems.
Sectors covered	**Industries**: • Chemical industry • Upholstery • Footwear • Leather goods and Accessories • Jewellery and Hardware • Leather Manufacturing • Garment **Materials:** • Leather • Textiles • Synthetic and Polymers • Metal components
Activities	BLC provides the complete risk management solution to bring your products into the global marketplace. BLC expert teams advise and guide brands, retailers, and manufacturers across a wide variety of industry sectors. BLC is a leading global brand within the leather industry and our reputation is built on over 95 years of experience. • **Testing:** BLC provides a range of quality and chemical testing services, for leather, textiles, hardware, jewellery and synthetics. • **Fault Diagnosis:** BLC highly skilled experts use state-of-the art equipment to resolve product and material problems. • **Consulting & Auditing:** BLC offers consultancy services and specialist audits covering Chrome VI, laboratory audits and Leather Working Group Awards. • **Training:** BLC offers leather training courses, workshops and webinars covering leather manufacture, chemical compliance and sustainability. • **Sustainability:** Our sustainability consulting services, target risk in the leather supply chain, covering raw materials, manufacturing and finished product. • **Chem-MAP Programme**: The BLC Chem-MAP Programme is a new, innovative process for verifying MRSL compliance of supplied chemical formulations to ZDHC conformance level 1 and level 3.

	Working directly with chemical companies, Chem-MAP offers a multi-module approach aimed at developing excellent standards in the chemical manufacturing sector to support the provision of responsible chemicals into supply chains • **Research & Innovation**: BLC is at the forefront of industry research, developing products such as DNA traceability solutions. We also provide confidential, research consulting services. • **Leather Industry Events**: In partnership, BLC delivers leading sustainability conferences in the UK and Hong Kong, as well as attending various industry events and exhibitions across the globe.
Links to websites	https://www.blcleathertech.com/ *https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=11851305 ** https://www.devex.com/organizations/blc-leather-technology-centre-ltd-24228

2.7 Institute for Creative Leather Technologies (University of Northampton, United Kingdom)

General information	Founded in **2005*** **Staff**: 7-9 **Organization type**: Research Institute The Institute for Creative Leather Technologies (ICLT) is a unique research and education centre. Our research responds to the scientific and technological needs of the automotive, fashion, footwear and allied leather industries.
Areas of interest	The Institute for Creative Leather Technologies currently has research interests in the following areas: • understanding and modelling the science underpinning leather technology • the viscoelastic response of leather to processing conditions • the role of the solvent in leather manufacture, including the replacement of water • the development of new tanning methods from traditional processes • the application of novel chemistries to make new leathers and collagenic biomaterials • the role of biochemistry in leather making • modelling the mechanical processing of leather • the management of the byproducts and waste from leather manufacture • sustainability of leather manufacture, including the environmental impact of processing • applied collagen research for medical applications, such as scaffolds for cell growth • the deterioration and conservation of leather and related heritage artefacts
Activities	**Leather Degrees and Professional Training:** • Leathersellers' Certificate • Leathersellers' Diploma • BSc (Hons) Leather Technology • BSc (Hons) Leather Technology Top-Up • BA (Hons) Leather for Fashion • MSc Leather Technology (Professional) • Leather Technology PhD **Professional Training:** • Three month Professional Leather Development Course • One week Creative Leather Applications • Three day International Marketing and Branding • Bespoke courses can be arranged by email with your requirements **Projects:** • Projects funded by EU • National projects • International joint projects
Links to websites	https://www.northampton.ac.uk/research/research-institutes/institute-for-creative-leather-technologies/ *http://internationalleathermaker.com/news/fullstory.php/aid/1986/ICLT_appoints_tanner_to_teaching_staff.html

2.8 CTC Group (France)

General information	CTC was created in **1899**. CTC is the worldwide leader in Quality Assurance and Sustainability for Footwear, Leather Goods and Apparel. With accredited laboratories and quality assurance inspection offices located world-wide, CTC offers testing, inspection, audit and consultancy services meeting government, industry, regulatory and client-specified standards. CTC's international team of experts brings cutting-edge experience and expertise into every project including research, development, standardization and professional training. CTC has a dedicated team of specialists for each market: Fashion, Luxury, Sport, PPE and Retail.
Services	CTC offers a matrix of services to assure and quantify the quality of their clients' products: • Audits: factory capabilities, environmental audits, social compliance and laboratories audits. • Inspections: pre-production, in-line, pre-shipment and loading inspections. • Physical and biomechanical testing. • Chemical analysis of raw materials and finished goods. Chemical and environmental analysis: water (Waste Water index), air and soil. • Personal Protective Equipment (PPE) certification and CE Marking. • Consultancy: environmental and safety concerns, manufacturing processes, business intelligence systems generating the unique CTC database resource, Corporate Social Responsibility (CSR). • Professional Training: in-company and CTC European Campus located in Lyon. • Innovation, Research & Development: international standardization, research concentrated in the fields of footwear, leather, environment, scanning techniques, comfort and time to market, traceability, product development and innovation. The CTC European Campus allows researchers to implement new processes on a small scale from the tanning stages to the production of finished goods, including 3D CAD system and rapid prototyping.
Links to website	http://www.ctcgroupe.com/images/plaquettes/ctc_corpo_gb.pdf http://www.ctcgroupe.com/en/about-ctc/values-57-1.html

2.9 Stazione Sperimentale per L'Industria delle Pelli (Italian Leather Research Institute)

General information	**Legal form of organisation**: Research Centre. **Number of employees**: not declared. The **Stazione Sperimentale per L'Industria delle Pelli (Italian Leather Research Institute)** is a National Research Body of the Chambers of Commerce of Naples, Pisa and Vicenza. Since 1885, it works in support of all Italian companies in the tanning sector with research and development, training, certification of products and processes, analysis, controls and consultancy. Currently underwent a process of legal reorganization assuming, following the Decree Law 31 May 2010 n. 78, initially the form of Special Agency of the Chamber of Commerce of Naples, and then formed, in December 2014, a new National Research Organization of the Chambers of Commerce of Naples, Pisa and Vicenza, as representative bodies of the main Italian tanning districts. Italian Leather Research Institute sets out specific strategies for research, innovation and technological development in the tanning sector based on the integration between industry and innovation, to support companies in industrial districts, through the RaIDto4.0Program - *Research and Innovation Driving for Leather and Fashion Industry*, within the framework of opportunities offered by the Industry 4.0 Programme, oriented both to improving the quality of products and production processes and to the development of an integrated assets-services supply chain that could pave the way to new markets and to the growth of new hi-tech companies.
Mission	Italian Leather Research Institute's mission is to develop and promote process and product innovation in tanning industry services in order to improve international competitive capability for quality production, technological development and environmental sustainability for the benefit of the entire supply chain and the main targets: Furniture, Automotive, Footwear, Interiors, Fashion, Leather Goods.
Business services	Italian Leather Research Institute provides services with high technical-scientific expertise for the resolutions of the needs of the branch's supply chain companies, with the support of researchers and technologists. To meet the needs of both *stakeholders* and market, services are organized in a structured way: • Consultation • Training on demand • Custom innovation • Scientific Documentation support
Activities	• Research and Development activities • Certification of products and processes • Analysis and controls • Technical scientific documentation with a specialized library • Training

	• Technical Standardization
Laboratories	**Research and services advanced tests** • Analysis activities with advanced diagnostic techniques that permit to obtain the data required for the development of the technologies aimed at the innovation of the tanning processes, not just for the final product but also for the valorisation of waste like second raw material with high added value (chemical and pharmaceutical). The laboratory also carry out analysis by Optical and Electronic Microscopy methods. **Chemical tests for processes and sustainability** • Performing activities the analysis of chemical characterization and research of unwanted substances in leather, wastewater and processing waste according to national and international test methods, internal procedures or created specifically for customer's needs. **Chemical tests for product performance** • Analysis of leather products and mechanics characterization intended to qualify the grade of raw material and the performance of the final product, according to the target markets (footwear, clothing, gloves, automotive and furniture). Also manages the activity of control measurement of leather surface for checks in commercial transactions.
Research and innovation	The activity of research and innovation supports tanning industry and its entire supply chain to develop solutions, methodologies and technical applications of process, product and new environmental and energy technologies, in support of the circular economy. • **Process technology area** elaborate, analyses and experiments innovative tools of different tanning processes, with the purpose of optimize the use of primary resources. • **Environmental and Sustainability Area** aims at find innovative solutions for the improvement of the use of water and wastewater in the industry produced today, enhance the waste recovery by directing companies to a correct use or to determine applications to other sectors, and energy recovery from sludge. • **Product technology Area** handles research activities related to relevant innovations to improve material performance, because of surface treatments or creating the perfect Structure-Property relationship, then enhancing the natural characteristics of leather, a necessary requirement to exploit all the Made in Italy manufacturers.
Links to website	http://www.ssip.it/ http://www.ssip.it/wp-content/uploads/2018/02/StazioneSperimentale_ENG.pdf

2.10 VIPO a. s. (Slovakia)

General information	**Legal form of organisation**: Join-stock company. **Number of employees:** not declared. Self-presentation: "In order to be a human protection and safety not just a phrase, by providing our services we try to help the manufacturer of personal protective equipment to meet this demanding goal. Our priority is to verify the properties of personal protective equipment in the testing laboratory so that the new product, or its innovation, will fully exploit its potential for safety, comfort and performance. Highly qualified professionals build on the tradition of the shoemaking industry in Partizanske that has already written its 79th chapter. Thanks to a long-term active approach and precision in the implementation of the latest testing methods and valid legislation, we have reached over 40 years of experience in testing so that we can objectively assess the conformity of products before they are marketed in a certification body under Directive 89/686 / EEC. The focus of the testing department is not only the area of personal protective equipment for protection of legs, hands or body at work. As well as in the work environment, also in common life, products must meet the highest safety, comfort and performance requirements. For this reason, we provide professional assessment services for both legal and natural persons. Last but not least, we specialize in the providing of comprehensive conformity assessment services for the import of personal protective equipment into the EU from third countries. The entire process of professional assessment, conformity assessment and product certification will be carried out by a notified, authorized and accredited Testing Department. Your confidence in our service is a commitment we want to contribute to a better protection of human health. For more information about Notified Body No. 2369 click HERE.**"**
Activities	• Nowadays, the most significant business activity of VIPO a.s. is research, development and production of machines and electronic systems. During its existence, the range of machine-building products of the company transformed from machinery and equipment for the footwear industry into machine-technology systems for the preparation of tire components and machines for machining and mounting of commutator carbon brushes for electric motors. • Another important part of VIPO's a.s. activity is chemical research and production wit specializing in rubber and adhesive chemistry. Chemical production of the company is concentrated mainly on hot melt, dispersion and solvent adhesives. • In 2012, the Department of Polymers and Testing and was established. In the field of testing, the Department focuses on assessing the conformity of personal protective equipment as Authorised and Notified Body to it. The Testing department is competent to test and evaluate the materials of the leather, gallantry, fur and shoe industry in accordance with the requirements of the relevant technical standards. The Testing laboratory and the Certification of products are accredited by the Slovak National Accreditation Service.

	• In the field of polymers, the Department of Polymers and Testing focuses on the research and development of natural polymers of plant and animal origin for industrial applications. **CERTIFICATION OF PRODUCTS** Permanent design and development activity should be completed with a certificate confirming the quality and performance of the final product. Meeting the standards and obtaining a certificate will allow a free movement of your product and its ability to be sold in the EU single market. If you are a manufacturer or an importer of occupational footwear, safety footwear, protective gloves or clothing, we offer you a third-party product assessment service as an independent, accredited, authorized and notified body. **TESTING LABORATORY** The required quality and safety can be guaranteed only by those companies that are ready to take full responsibility for the development and production of their own products. A complete control of all product parameters is essential to their successful achievement. Also thanks to that we can contribute to improve all offered goods and increase the health and safety of people. Check the status of your products and let our accredited laboratory test the materials and semi-finished products of leather, textiles, rubber, ready-made footwear, gloves, clothing and haberdashery. **PROFESSIONAL ASSESSMENT** The quality of the final product can only be as good as the quality of raw materials and tools used in the production process. Despite ongoing efforts of producers to control the demanding manufacturing process and despite the measuring of products properties according to standards, it is not excluded that products which do not comply with it will be placed on the market. Find out the answer on product quality question by qualified professionals and take advantage of our professional assessment service. **R & D** Water, air and soil. The elements whose quality affects the life of every human and the society as a whole. In VIPO a.s. we are not disregardful of the conditions we leave them in for the future generations. Our R&D team members successfully apply all of their knowledge and experience so that their results can be implemented in real world decreasing environmental pollution and increasing the quality of manufacturing processes. We applied our effort to research and development of dispersions, colloids, hydrolysates and hydrogels for the pharmaceutical industry and medical cosmetics (industrial utility model #7244 – Polymeric dispersions based on animal proteins and lipids). By researching the modification of characteristics of polymeric composites by bio-synthetic polymers, we contributed to ecologisation of the rubber and plastics industry (industrial utility model #5998 – Polymeric composites based on collagen). The negative effect of chromic waste materials of the leather industry also affected (amongst others) the dumping site BABICA near Bošany. The main challenge we faced to was the chemical stabilization of Cr^{3+} (Patent #288363).
Links to website	http://vipo.sk/en/

	http://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=notification.html&version_no=2&ntf_id=274609

3 CASES' ANALYSIS

There are 10 practices that institutes and centres should keep in mind for creating leather centres in Jordan and Egypt.

The described institutions can be characterised by function directly related with leather sectors, such as technology transfer; chemical, physical and mechanical testing; standardisation; research and development; training for leather technologists etc.

Five institutions provide activities practically only in the related with leather sector:

- Igualada Leather Cluster (Spain);
- The Portuguese Technological Centre for the Leather Industry – CTIC (Portugal);
- BLC Leather Technology Centre (United Kingdom);
- Institute for Creative Leather Technologies (University of Northampton,United Kingdom);
- Stazione Sperimentale per L'Industria delle Pelli (Italian Leather Research Institute).

Two institutions relate their function mainly with the leather sector but have another subjects for activity like rubber or textile:

- Leather and Footwear Research Institute – ICPI (Romania);
- Institute of Leather Industry (Poland).

Research Institute of Leather and Plastic Sheeting – FILK (Germany) divides function between two parallel sectors: leather and plastics.

For two institutions, the activity in the leather sector is not the main comparing with sum of all activities of the institutions:

- CTC Group (France);
- VIPO a. s. (Slovakia).

According to Body status there are:

Private companies or organizations:

- The Portuguese Technological Centre for the Leather Industry – CTIC;
- CTC Group;
- VIPO a. s.

Research and development institutions as separately units:

- BLC Leather Technology Centre;
- Stazione Sperimentale per L'Industria delle Pelli;
- Leather and Footwear Research Institute – ICPI;
- Institute of Leather Industry;
- Research Institute of Leather and Plastic Sheeting – FILK.

Research institution acting as University subdivision:

- Institute for Creative Leather Technologies.

Association:

- Igualada Leather Cluster.

The number of employees (based only declared data) varies from 7-8 (Institute for Creative Leather Technologies) up to 77 (Leather and Footwear Research Institute – ICPI).

Structure of institutions' differs and depends on Body status, sectors covered and activities carried out.

Main activities carrying out by the described institutions:

Title of activity	Amount of institutions characterised by the activity	Title of institution characterised by the activity
1. Testing for leather and leather quality	10	All institutions
2. Research, Development and Innovation	10	All institutions
3. Training for the sector related with Leather industry / Consultation / Technology Transfer	9	All institutions excluding VIPO a. s.
4. International cooperation	9	All institutions excluding VIPO a. s.
5. Certification of products	5	Institute of Leather Industry; Research Institute of Leather and Plastic Sheeting – FILK,; CTC Group; Stazione Sperimentale per L'Industria delle Pelli; VIPO a. s.
6. Standardization	3	The Portuguese Technological Centre for the Leather Industry – CTIC; CTC Group; Stazione Sperimentale per L'Industria delle Pelli
7. Auditing	2	BLC Leather Technology Centre; CTC Group
8. Organization of events: conferences, seminars, meetings etc.	4	Igualada Leather Cluster; Institute of Leather Industry; The Portuguese Technological Centre for the Leather Industry; BLC Leather Technology Centre
9. Production and commercial offer of own products	2	Institute of Leather Industry; Research Institute of Leather and Plastic Sheeting – FILK

4 DISCUSSION

Current situation in Jordan and Egypt leather sector: huge amount of hides and skins, but very low number of tannery's companies, low quality and high cost of semi-finished and finished leather due to the old technologies and equipment to be used, lack of regulations and policies to protect the industry from the competition with international producers. Innovative approaches are needed to improve Jordan and Egypt leather industry. It can be achieved by close leather industry and universities collaboration that should be aligned with company's commercial strategy and address a tangible need of the company.

Analysing EU best practice for the development of leather sector and facilitation knowledge transfer process four different models of collaboration between research institutions and industry were established:

- *clusters,* the main goal of which is the coordination of the international and national cooperation between various business sectors (leather tanneries, leather goods makers, etc.) as well as engineering universities to promote the activity (marketing) and support knowledge and technology transfer. High attention is paid to environmental responsibility.
- *research institutes* preferred in the case when leather applied high-tech industry (i.e., automotive, furniture, shoemaking, etc.) is developed. Main goal of research institutes is research, development and innovation activities, but training, testing services and certification for the assessment of conformity, comparability of leather products, services, processes and technologies also are very important, also.
- *universities*, the main goal of which is education, but research, development and innovation in leather sector are widely implemented in their research centres (institutes, laboratories, etc.). Professional training to transfer of knowledge, skills and experience is widely applied at the universities.
- *centres or groups,* the main goal of which is services, such as chemical analysis, physical, biomechanical testing of materials, standardization, certification. Research activity also plays an important role.

According to the analysis of EU best practice and leather industry analysis in Egypt and Jordan countries, the proper way to achieve improvements of the leather industry is the establishment of ***leather centres in existing universities or other research institutions***, where strong knowledge is concentrated. Researchers' community will facilitate knowledge transfer process, identification and application of new ideas.

Taking into account the main features of leather sector in Jordan and Egypt, the intended to establish new leather centres should to be characterised by ability to react to needs of the industry fast and professionally. The main advantages of such model should be:

- Educators and research fellows having experience in the field are easy accessible;
- Staff positions in the centres simultaneously can be combined with staff positions in the university;
- The centre's personnel can be augmented by students seeking their bachelor or master degree in the close or related specialities;
- Easy access to colleagues for consultations;
- Easy access to the university scientific equipment for execution of specific orders;
- The centre working in the frame of the known university seems more reliable partner comparing with any new and separate one.

According to the reports presented by Jordan and Egypt partners, a quality of domestic raw material (hides and skins), produced leather and leather goods consistently becomes lower and lower. This leads to weakening of the leather sector's importance in economics of countries. Due to this, the main activities of the established centres should be directed for the immediate stopping of the mentioned trend. Basing on the analysis of EU best practices cases and of the demands of leather sector in Jordan and Egypt, the main activities of the centres should be:

- Research on the requirements of the companies;
- Training and consultation providing knowledge transfer and technological support to employees of the enterprises related with the leather sector (owners and employees of small and medium slaughterhouses or separate farmers which supply raw hides/skins; tanneries' personnel; leather goods manufacturers);
- Consultation for management of the by-products and waste from leather manufacture, for the improvement of the use of water and wastewater in the industry; enhancement the waste recovery by directing companies to a correct use or to determine applications to other sectors, and energy recovery from sludge.
- Testing services for raw material and leather production, leather and leather goods carrying out chemical and physical-mechanical tests;
- Scientific activity leading to innovations in the field and to highest qualification of the personnel.

Due to low quality and, even, hazardous leather and leather goods import to Jordan and Egypt market, the second step should be an organization of additional activities in the centres:

- Certification of leather, items from leather and processes (certifications is an important instrument for the assessment of conformity and comparability of products, services, processes and technologies. It provides a reliable measure of safety with regard to quality and compliance with corresponding standards);
- Participation in law legislation (if possible) leading to ban on pass into the market of hazardous materials for leather processing and leather and items containing hazardous materials as well.

The proposals described above are not obligatory. They are presented only as guideline for the establishment of leather centres in Jordan and Egypt. The project partners in Jordan and Egypt are more close to the leather sector in their countries and feel the pulse of the market significantly better than the project partners from other countries. Accordingly, namely the partners in Jordan and Egypt should be the main players deciding, which model for the leather centres is mostly appropriate in Jordan and Egypt, and which activities of the established leather centres are the mostly important.

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