Expert Seminar – Minutes - May 2016 – Tunis ENIT-DAAD-University of Bremen Programme

Compiled by Professor Karl Wohlmuth and Danielle Siakeu

Contents

Lists of Abbreviations

BAB	Bremer Aufbau-Bank
B.E.G.IN	Bremer ExistenzGründungsINitiative
BIBA	Bremer Institut für Produktion und Logistik
BITZ	Bremer Innovations- und Technologiezentrum
BMBF	Bundesministerium für Bildung und Forschung
Bremen UAS	Bremen University of Applied Sciences
DFG	Deutsche Forschungsgemeinschaft
ENIT	École Nationale d'Ingénieurs de Tunis
ETP	Master Degree Programme „Engineering and Technology Policy“
EU	European Union
Fraunhofer IFAM	Fraunhofer – Institut für Fertigungstechnik und Angewandte Materialforschung
InnoWi	Innovation für Wirtschaft (Patents Administration of Universities)
NIS	National Innovation System
R&D	Research and Development
RIS	Regional Innovation System
SPD	Sozialdemokratische Partei Deutschlands

1. Introduction

The following examination is a report based on the visit of a group of Tunisian Professors which came in Bremen in May 2015 with the aim of examining the Regional Innovation System (RIS) of the Country State Bremen – the role of actors, institutions, policies and processes – and identifying the possibilities for improvement of innovations efforts in Tunisian.

This visit follows the mission to Tunis done in November 2014 by a group of German Professors. This mission consisted in examining the Tunisian national innovation system (NIS) and identifying bottlenecks and possibilities for improvement. Special attention had been devoted to the tertiary education sector and the newly planned Master Programme at ENIT titled "Engineering and Technology Policy". The visit in Bremen occur with the purpose of strengthening the efforts made for the planning of the ETP Master programme and going forward with the concretization of this project.

The Tunisian delegation consisted of (1) Prof. Dr. Jelel Ezzine from École Nationale d'Ingénierus de Tunis (ENIT); (2) Prof. Bahri Rezig from ENIT Tunis; (3) Prof. Ridha Ben Cheikh from ENIT Tunis; (4) Prof. Hatem M'Henni from Ecole Superieure de Commerce, Campus Universitaire de la Manouba, Tunis; (5) Prof. Thouraya Guizani from ENIT Tunis; and Prof. Rim Kalai from ENIT Tunis.

Different institutions, industries, institutes and agencies were visited to gain insight into the Regional Innovation System (RIS) of the Country State Bremen: The Chamber of Commerce, the Economic Promotion agencies of Bremen, the chamber of Crafts, two research institutes at the University of Bremen: the Fraunhofer Institute for Manufacturing Technology and Advanced Materials und the BIBA (Bremer Institut für Produktion und Logistik), a scientific engineering research institute dealing with the issues of production and logistics systems. The

role of the University of Bremen and the University of Applied Sciences in the RIS was also underlined.

2. The Innovation System of the Country State of Bremen

2.1. Innovative Private Sector Institutions: Chamber of Industry and Commerce / Industrie- und Handelskammer Bremen / Bremerhaven

One of the main goals of the administration body of Bremen's economy is to promote the economy of the Free Hanseatic City of Bremen and its business enterprises. The Chamber of Commerce is not only the centre of commercial administration, but also asserts the interests of Bremen's business community in political and social aspects. This includes lobbying for efficient infrastructure, promoting regional and urban development, upgrading research infrastructure as well as the expansion of traffic connections in response to changing requirements.

- **The Chamber of Commerce: the "Parliament of Businesses"**

The Chamber of Commerce brings together traders, entrepreneurs and business people. Its members, approx. 40,000 Bremen companies, regularly elect the representatives for their industry into the Chamber of Commerce Plenary. The Chamber of Commerce is the democratically legitimized representation of the interests of Bremen companies. Large enterprises as well as small and medium-sized enterprises are represented. Besides these, more than 3000 persons volunteer their time and expertise in various committees and workgroups or as examiners and experts.

- **Enterprise support and start-up assistance**

Enterprise support and start-up assistance refers to the help the Chamber of Commerce provide to enterprises going through a phase of economic structural

change. This help includes consultancy services especially for start-ups, assistance in issues regarding successors for enterprises, and information on subsidies. The Chamber of Commerce is responsible for contract consultancy in the Federal State of Bremen. This is an important instrument designed to promote Bremen's economy and to provide consultancy services to Bremen's enterprises. It provides new companies with expert advice – e.g. advice regarding intellectual property rights (patents, utility models, trademarks, designs) – and accompanies them throughout their development. In business start-up seminars they learn how to set up a business plan, how to calculate costs and what liabilities they face when employing staff.

The Chamber of Commerce helps companies to economize more effectively. It provides enterprises with information whatever the industry; e.g. manufacturing, information and communication technology, or import and export businesses. New companies are provided with expert advice and accompanied throughout their development. The Chamber of Commerce also helps enterprises through its influence on opinion leaders and decision makers. Through its business surveys and the cooperation with trans-regional economic research institutes, the Chamber of Commerce analyses the Bremen economy and makes recommendations to the Federal state on Bremen’s fiscal and economic policies.

- **Innovation consultancy and support**

To promote innovation in Bremen the Chamber of Commerce helps enterprises in the implementation of their ideas. It offers a variety of information and advisory services for industry, product-related services, information and communications technologies. The Chamber of Commerce support strongly innovative start-ups by offering tailor-made consultancy services and informing them of the funding possibilities. They can benefit from the flow of information within the consulting network with, among others, the Economic Promotion Agency of Bremen, the Bremen Chamber of Crafts and the Bremen RKW GmbH (an independent

advisory body and operative subsidiary of the registered society the RKW Productivity and Innovation Centre of the German Economy).

The Chamber of Commerce also support innovation though knowledge transfer and support for higher education and non-university research institutions. With its contribution to the platform "Industry meets Science" the Chamber of Commerce promote the meeting between universities, research institutions and companies. It also supports the start-up competition CAMPUSideen (Jury participation, awards ceremony).

With its recommendations on innovation policies to decision makers the Chamber of Commerce influence the innovation policy in Bremen. It takes part in the dialog about innovation promotion and participates in the consultations of the SPD parliamentary group and the Economic Promotion Agency of Bremen. In its position paper on innovation promotion the chamber made some recommendation, among which the institutional restructuring of the Bremen's innovation policy by bringing together the decision-making authority in an innovation department, the further development of the innovation policy strategies, the strategic reorientation of the promotion of innovation with a focus on knowledge and technology transfer and the support for companies regarding research and development, and the creation of better conditions to foster the Bremen's innovation system (e.g. by increasing the quality of school education).

- **Educational Guidance**

The Chamber of Commerce takes actively part in the vocational training in Bremen. This is for the Chamber both a core task and a social responsibility for young people in Bremen. The vocational training system, called the dual system, is divided in on-the-job training and theoretical education. This system combines theoretical knowledge and practical skills. It is possible for trainees to learn how to cope with the constantly changing demands of the job and to appreciate the

variety of social relationships that exist in the working life. In addition, learning by doing gives a sense of achievement and provides a special source of motivation for the trainees. Independence and the sense of responsibility, two indispensable qualities in a developed industrial country, are promoted. By tackling concrete tasks under true working conditions the trainees are able to give evidence of the knowledge and skills they have acquired and experience the success of their efforts.

The tasks undertaken by the Chamber of Commerce in vocational training is advising companies on all issues connected with training – e.g. the structure of the training, the use of training aids, educational, psychological and legal questions. The company must be able to offer facilities, production programmes or services to train people. The Chamber makes sure before the start of the training and also during the course of training whether the company meets the requirements. The Chamber also gives advice to trainees. Its vocational training advisors act as contact persons for trainees and for parents. They serve as mediators between trainees and trainers.

- **Regional cooperation**

Bremen's economy is tightly interwoven with its environs. The Chamber of Commerce participates in several regional cooperation programmes designed to discuss, pool and advance common regional economic and political interests. Moreover, the Chamber of Commerce also cooperates with neighbouring chambers – one of them is the Chamber of Industry and Commerce Bremerhaven – and other organizations with the aim of satisfying the interests and information requirements of the regional economy.

The Chamber of Industry and Trade Bremerhaven

Like the Chamber of Commerce Bremen one of the main goals of the Chamber of Industry and Commerce Bremerhaven is to promote the economy in the region Bremerhaven and its business enterprises and to assert their interests. The Chamber of Industry and Trade Bremerhaven helps companies with advices. It supports business start-ups, from the idea to the market entry, gives information about financial support programs initiated by the state Bremerhaven, the German Government and the European Union. The financial support programs are also available for companies which face times of crisis. The Chamber of Industry and Trade Bremerhaven informs them about the terms and conditions for financial support.

In the field of innovation support the Chamber, though close contact with universities and innovation consulting, mediates between research institutions and companies in Bremerhaven. It offers a variety of information new technologies and promotes thus knowledge and technology transfer. The Chamber acts actively in vocational and further training. It helps companies wishing to train for the first time, assist the training enterprises and makes sure that legal requirements are observed. The Chamber is the contact for trainees, companies and training teachers in questions relating to vocational and further training.

2.2. Innovation Promotion: Economic Promotion Agency of Bremen / Wirtschaftsförderung Bremen

The Economic Promotion Agency of Bremen is on behalf of the State of Bremen responsible for the development, strengthening and marketing of business, trade fair and event location in the City of Bremen. Its primary task is to contribute with their services to jobs creation and securing employment and to offer good conditions for business success in Bremen.

The Economic Promotion Agency offers Bremen based as well as international companies a variety of services. It gives advisory services and assistance on all locational issues, assists companies in obtaining official approvals and in implementing their building plans, develops attractive commercial areas within the city, identify suitable commercial properties in partnership with local estate agents. The Agency also supports smalls and medium-sized enterprises and assists start-up. It advices on all matters relating to the various support programmes operated by the EU, the German government and the state of Bremen.

The Agency works in close partnership with the Bremen Bank for Economic Expansions. The Bank was specially created by the state of Bremen to support regional and business development. It finances all kinds of business activities in close partnership with local banks and savings banks. Especially SMEs benefit from the support measures of the Bremen Bank for Economic Expansions, particularly in critical phases such as start-up, growth, restructuring and during consolidation and reorganization.

Innovation consulting is one key task of the Economic Promotion Agency of Bremen. The Agency gives information about all matters relating to innovation transfer and support. Its experts have an extensive knowledge of the process operating within Bremen's business and scientific sectors. As an active and key member of a dense network the Economic Promotion Agency of Bremen acts as link between companies and institutions in the business and scientific communities. It supports innovation in several areas: Aerospace, wind energy and maritime economics and logistics are the main innovation clusters. Further areas are information technology, food and beverage, environment economy, cultural and creative industries, healthcare industry and innovative materials.

2.3. Financing Innovations: Development Bank of Bremen / Bremer Aufbau-Bank (BAB)

The Development Bank of Bremen was founded in 2001. It is the economic and development Bank of the State of Bremen. It works in closer and non-competitive partnership with local banks and saving banks. The BAB provides advisory and financial assistance through all stages of companies' development and supports all kinds of economic activities, as long as there are in the interest of the State of Bremen.

Especially small and medium-sized enterprises can benefit from support measures of the BAB. In critical phases such as business start-up, growth, restructuring as well as the consolidation and recapitalization the BAB completes the principal bank's commitment with loans, equity capitals or guarantees. The BAB is also the financing partner of the activities of the State of Bremen and a close partner of the Economic Promotion Agency of Bremen. It is the sole contact for housing promotion in Bremen and Bremerhaven.

The BAB is an active member of the B.E.G.IN network or B.E.G.IN start-up centre. B.E.G.IN helps start-ups enterprises with consulting, promotion and all important information relating to the creation of a company. They can benefit from a broad spectrum of services and get in contact with other consulting agencies, banks and economic development institutions. The BAB also supports the BRUT and the BRIDGE programs, two other support programs for start-up entrepreneurs. The University of Bremen is one of the founding members of both programs. BRUT has been initiated by university graduates and young professionals. The program is aimed at students who are about to complete their degrees, post-docs, post-docs qualified to lecture at universities, research assistants and young professionals. It includes, among others, a training seminar in administration, Start-up coaching (group coaching, team coaching) and the consultation on the formulation of a business plan. The BRIDGE program gives

the opportunity to establish and to improve a start-up. The BRIDGE-Network includes the University of Bremen, the University of Applied Sciences of Bremen, the University of Applied Sciences of Bremerhaven and the Bremer Aufbau-Bank.

2.4. Innovation and the Role of Independent Research Institutes on the Campus: BIBA Institut für Produktion und Logistik and Fraunhofer IFAM

BIBA and Fraunhofer IFAM count to the research institutes at the University Bremen, which cooperate with University researchers. Collaboration is organized through formal cooperation agreements. On the basis of these agreements it has been possible to establish a large number of intensive cooperation projects and collaborations between the researchers at the University of Bremen and at the research institutions. These research institutions hold joint professorships at the University and conduct collaborative research with their University colleagues. These professors also supervise master and doctoral theses autonomously.

BIBA Institut für Produktion und Logistik

The Bremer Institut für Produktion und Logistik GmbH (BIBA)[1] is a scientific research institute for engineering in production and logistics. It was founded in 1981 as first affiliate institute of the University of Bremen. The institute is involved in one collaborative research centre of the DFG[2] (German Research Foundation). It is also involved in the Bremen Research Cluster for Dynamics in Logistics (LogDynamics) as well as in the International Graduate School for Dynamics in Logistics. BIBA is divided into two departments “Intelligent

[1] Bremen Institute for Production and Logistics GmbH
[2] Deutsche Forschungsgemeinschaft

Production and Logistics Systems" (IPS) and „ICT applications for production" (IKAP). Based on distinct research the institute focuses on application-oriented research and industrial contract research on a national and international scale. The BIBA operates in the fields of logistics services, automobile, aviation and wind energy amongst others.

The BIBA's research activities stretch from the investigation of comprehensive methods and tools which can be used for a proactive maintenance strategy for offshore wind turbine generators to the support of production and logistics processes in industrial mass production and the installation of offshore wind energy farms right up to an integrated approach for the automation of rotor blade production. Within the research projects, the BIBA cooperates with renowned business partners to develop practical solutions. BIBA maintains an internationally unique service centre: the LogDynamics Lab which is used for the development and testing of innovative mobile solutions for logistic processes and systems[3].

Fraunhofer IFAM

The Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM was founded in 1968 as a work group in applied materials research. It was incorporated into the Fraunhofer-Gesellschaft[4], as an institute in 1974. The institute collaborates closely with the University of Bremen as a contract research institute with new focal points and systematic expansions. The current institute directors are professors in the Production Technology department at the University of Bremen.

[3] WFB 2014, 130

[4] The Fraunhofer-Gesellschaft promotes and carries out applied scientific research and development work. Founded in 1949, the work of the Fraunhofer-Gesellschaft is geared to the need of industry and society. Its contract partners and customers are companies in the manufacturing and service sectors as well as public organizations.

Fraunhofer as neutral and independent body counts among the largest R&D establishments in Europe. The Fraunhofer IFAM carries out research and development work in two main areas which constitute the two division of the institute: "Shaping and Functional Materials" and "Adhesive Bonding Technology and Surfaces". The Shaping and Functional Materials Division of Fraunhofer IFAM develops customized materials using optimized manufacturing methods and processes. R&D activities range from materials and shaping processes to the development, functionalization and evaluation of components and systems.

The Division of Adhesive Bonding Technology and Surfaces is the largest independent research institution in Europe working in the area of industrial adhesive bonding technology. The work in this department focuses on adhesive bonding technology, surface technology and fibre composite technology. The activities range from fundamental research through to production right up to the market introduction of new products with partners. Industrial applications are mainly found in the transport sector – manufacturers of aircraft, cars, rail vehicles, ships – and their suppliers, energy technology, the construction industry, the packaging sector, textile industry, electronics industry, microsystem engineering and medical technology.

The focus of all the R&D activities is to provide customers with effective, application-oriented solutions. Most of the products, processes, and technologies the institute develops are for sectors where sustainability is particularly important, namely for the aviation industry, automotive sector, energy and environment, medical technology and life sciences. The solutions developed at Fraunhofer IFAM are, however, also used in various other branches of industry including machinery and plant construction, electronics and electrical engineering, shipbuilding, rail vehicle manufacture, the packaging industry, and the construction sector.

2.5. Innovation and the Vocational Training System: Competence Centre for Crafts – das HandWERK gGmbH

The craft – das HandWERK – is the competence Centre of the Chamber of Crafts Bremen. The Competence Centre for Crafts and the Chamber of Crafts are the largest Crafts network in the region of Bremen. The aim of their joint efforts is to improve the career prospects of all craftsmen and artisans in Bremen and continued to maintain the quality of the profession at the highest level. Here comes tradition together with the most modern technology. The Centre combines the craftsmanship of 28 crafts, as well as the Hair Design Academy, which covers all areas of hairdressing. The Competence Centre for Crafts is an important point not only for craftsmen and artisans, but for all who want to discover the know-how of the Bremer craftsmanship for themselves. Companies and institutions can be partner of the Competence Centre for Crafts, cooperate in projects and have access to the largest craft network in the region. Together with industries, science and politics the Competence Centre for Crafts develops successful future strategies.

The Competence Centre of Crafts helps

- students to evaluate their own technical and handcraft skills
- job seekers to find new orientations, to be trained further or to retrain
- Craftsman and craftswomen from different fields and industries are being given basic and further/advanced training

The Competence Centre of Crafts supports and advises companies in the craft industry on business-related questions, e.g. on the takeover of a business. It gives advice on standards and certification issues and on questions about the intellectual property rights. It also helps companies to find qualified employees.

The Crafts Sector in the Regional Innovation System (RIS) of the Country State Bremen

The Crafts sector too contributes to innovation in the country State Bremen. For the Craft support, educate and advise craftsmen who are innovators.

- As inventor and developer craftsmen take suggestions from the concrete environment and from expectations of customers and convert their own ideas into marketable products.
- Craftsmen are problem solvers and optimizers: as competent and creative partner they develop appropriate solutions for individual and corporate clients
- They are multipliers: craftsmen deploy new technologies and bring innovations on the market.
- They are important drivers of innovation; particularly when their experience on feedback loops flow back into industrial product development
- They are technology intermediaries: they develop available technologies and processes further and thus open up new markets

2.6. Innovative Enterprises: Airbus Defence and Space

The Country State of Bremen counts a number of important enterprises. Airbus Defence and Space is one of the big enterprises. Besides the site in Bremen the Airbus Group, founded in 2000, has 28 other sites in Germany. More than 3,000 people work at the Airbus site of Bremen, the second-largest Airbus site in Germany. It is responsible for the design, manufacture, integration and testing of high-lift systems for the wings of all Airbus programmes. With its highly qualified employees, this north German site is responsible for key European contributions to the International Space Station (ISS), such as the Columbus space lab and the

unmanned Automated Transfer Vehicle (ATV). Airbus Defence and Space Bremen is the industrial operator responsible for operating the European elements of the Space Station. It is also the European centre for manned spaceflight, launch vehicles and space robotics – robotics is a key domain in which Airbus Defence and Space excels. In successive projects, which have started with the development of the ROKVISS (Robotic Component Verification on the ISS), a robotic arm for the ISS, the ATV automated transport vehicle, and the development of landing technologies, Airbus Defence and Space has continuously added to its know-how in the field of space robotics. The upper stage of the Ariane 5 launch vehicle – the global market leader for commercial satellite transportation – is developed and built in Bremen. Other work and research areas include automatic spacecraft landing, tank technology, zero-gravity research and mission planning.

For the military transport aircraft A400M the site in Bremen develops and built the integrated fuselage assembly, including the cargo loading system. Bremen is also known as the centre of competence for space transportation, manned space flight and space robotic. Its highly-skilled employees work on key programmes such as the Automated Transfer Vehicle ATV, the Ariane 5 space launcher and the Multi-Purpose Crew Vehicle – a joint project between NASA and ESA.

2.7. Innovative Regulation: InnoWi Patents Administration

InnoWi GmbH – "Innovationen für die Wirtschaft" – is a patent utilization agency in north west Germany. It supports inventors and research institutions in all matters relating to patenting and marketing of their inventions. It advises already in the idea stage and develops concepts and strategies for patent protection and the transfer of inventions in the market. The agency investigates whether an invention is new and checks on patentability and market relevance. It initiates and manages the entire process of patent application. For employees and students from

its partner institutions these services are free. The University of Bremen, the Universities of Applied Sciences of Bremen and Bremerhaven and the BIBA are among the partner of InnoWi. It secures and markets inventions of a total of 15 universities and research institutions in Bremen and in Lower Saxony.

InnoWi provides its partners with professional technology transfer between research and industry. It allows innovative companies the access to results of current research activities and opens them the door to the latest developments of its partners in technology. With this access they get the opportunity to acquire the exclusive right to use new and innovative technologies for the optimization of existing products and services, for the development of new products or for the establishment of new fields of business.

InnoWi offers services related to

- Patent rights and trademarks
- Application of intellectual property rights
- Management of inventions and intellectual property rights
- Freedom-to- Operate research
- Evaluation of the needs of the business and marketability
- Market analysis
- Marketing and distribution
- Negotiation of licenses

It is a valuable bridge between universities and enterprises in Bremen and surrounding regions.

2.8. Innovative Science Parks: The Technology Park University of Bremen / Technologiepark Universität Bremen

Over the years, the competence and dynamics of the University of Bremen have led growing numbers of research establishments and enterprises to locate in the Technology Park that surrounds the University. The Technology Park is one of Germany's leading high-tech locations, with 6,200 employees. More than 400 enterprises and research institutes**,** including the Max Planck Institute for Marine Microbiology and the Fraunhofer Institute for Manufacturing Technology and Applied Materials Research, are located there, on an area of 170 hectares. The Innovation and Technology Start-up Centre (BITZ), one of the key establishments of the Park, offers an extensive range of facilities for start-ups and young enterprises during their first years of existence.

A large number of small and medium-sized enterprises and important corporate groups, like Siemens, Kellogg's, and OHB AG, one of Germany's largest aerospace corporations, appreciate the value of being near to the University. Also known as Bremen's Area of Innovation the Technology Park brings entrepreneurs, scientists, researchers and students together. Contacts are established, active networks emerge. In the Technology Park of Bremen science and industry meet to create a new world of exchange and communication. It is the place par excellence for an efficient transfer of knowledge and technology.

Other key establishments are present in the Park:

- The 'House of Explorers' – the day care centre in the Technology Park: day care facilities for allowing the combining of family and career, is for the support of companies in the Park

- The Universum Science Center, with a ‘Schaubox’ exhibition area and a ‘Discovery Park’, is for informing the people about science and natural/technological phenomena in our world.
- Conference facilities in the Congress Centre of the Atlantic Hotel - Local accommodation for conference participants (Atlantic Hotel, Hotel Munte) is provided.
- University sports facilities and swimming pool are part of the Technology Park.

The Technology Park is managed by the University of Bremen Technology Park Association (Verein Technologiepark Uni Bremen e. V.). The Association is a network of enterprises and institutes in the Technology Park. It consists of around 90 members – diverse companies and research institutions, the University of Bremen and the Bremen Innovation and Technology Centre BITZ – who are working together on the quality development of the site into a technology district. The Association is committed to a future-oriented/forward-looking Technology Park management. It promotes the cooperation between companies and institutes as well as the cooperation between research and economy. Because the association is well connected in Bremen and in the economy development its members can benefit from the cooperation with partners from industry and science.

3. Innovation and the Tertiary Education System in the Country State of Bremen

The University of Bremen and the Bremen University of Applied Sciences are counted as two key actors of the innovation system in the Country State of Bremen.

Since the University of Bremen was founded in 1971 it has developed into a science centre of North West Germany. When it was founded it broke new ground in many ways, earning the label “Bremen Model”. Some of these breakthroughs have now become standard features of modern universities. For instance: interdisciplinary studies and researches, research-based learning in projects, and social commitment of students and teachers. Because of its STRENGTH IN RESEARCH for many years now, the University of Bremen is now in the top league of German universities in the area of research. Since June 2012, the University of Bremen is entitled ‘University of Excellence’, given its success in the Excellence Initiative, a competition launched by the German government to promote top-level university research. Research conducted at the University of Bremen is interdisciplinary. In other words: Bremen research transcends the borders of traditional disciplines and is embedded within six research concentrations, also known as high-profile areas: Ocean and Climate Research, Materials Science, Information-Cognition-Communication, Social Sciences, Health Science, and Logistics. The University of Bremen counts around 19,000 students, while 34% of them come from Bremen, 34% from Lower Saxony and 20% from other German regions. 12% of the students come from abroad. Among the 3,400 employees of the University are 2,200 scientists and scholars – 204 tenured professorships plus 35 affiliated professors – and 1,200 administrative and technical staff. The University of Bremen has 12 faculties. The different study programs are sorted into 8 main areas of study and future career fields: Society & Education; Culture, Media, Art & Music; Teaching Career; Human & Health Sciences; Nature & Environment; Language & Literature; Economics, Law, Mathematics, and Engineering & Production.

The Bremen University of Applied Sciences (UAS) too has developed into the largest university of applied sciences in the smallest German federal state of Bremen. While the official founding date of the Bremen University of Applied Sciences is 1982, its roots go back to 1799, the year in which its predecessor

institution was founded (Bremen School of Navigation). Over the last decade innovation and internationalization have characterized the profile of the Bremen UAS. Today, the University embodies excellence in applied and practically-oriented teaching and research. The internationalization component of the Bremen UAS include international programs – 2/3 of the 66 degree courses – with one to four obligatory semesters abroad, as well as 365 cooperative agreements with partner universities all over the world. This worldwide network of co-operative relationships with foreign partner universities enables German students and instructors to spend time abroad, as well as foreign students and instructors to come to the Bremen University of Applied Sciences. The University has more than 8,600 students and 5 departments: School of International Business; Architecture, Civil and Environmental Engineering; Social Sciences; Electrical Engineering and Computer Science; and Nature and Engineering.

At the University of Bremen as well as at the Bremen University of Applied Sciences the internationalization process has been included in teaching, study and research.

3.1. The Research Focus of the University of Bremen

The Research activities at the University Bremen cut across the disciplines represented by its different faculties. They cover six interdisciplinary areas:

- The area of "Marine, Polar and Climate Research"
- The area of "Social Change, Social Policy, and the State"
- The area of "Materials Science and Production Engineering"
- The area of "Information, Cognition, and Communication Sciences"
- The area of "Logistics"
- The area of "Health Sciences"

Among these areas the Research at the University of Bremen is focused to a great extent on Marine and Climate research in the natural sciences, Engineering in the field of Production and Manufacturing Technology, and the Social Sciences.

- The area **"**Marine, Polar and Climate Research" focuses on the role the oceans, the polar regions, and the atmosphere play in the Earth's system, from the geological past up to the present time.
- The area **"**Materials Science and Production Engineering" encompasses the entire process chain of materials development and application: from materials synthesis and processing, through manufacturing and component design, up to analysis, characterization, and the testing of properties and functioning.
- The area **"**Social Change, Social Policy, and the State" is for research into processes of transition of modern statehood, in particular in respect of the pressures brought about by globalization and liberalization, and the attendant impacts on social policy and social statehood.

University researchers cooperate in numerous projects with non-university research institutes on the campus and in the Land of Bremen. Collaboration is organized through formal cooperation agreements. On the basis of these agreements it has been possible to establish a large number of intensive cooperation projects and collaborations between the researchers at the University of Bremen and at the non-university research institutions. For example, non-university research institutions hold joint professorships at the University and conduct collaborative research. These professors also supervise master and doctoral theses autonomously. BIBA and Fraunhofer institutes count to the research institutions, which have located at the campus. This combination of research, teaching, living and working makes the campus a magnet for the enterprise sector. Over the last years several enterprises have established in the near of the University.

3.2. The Research Focus of the University of Applied Sciences Bremen

The University of Applied Sciences (UAS) Bremen is involved in numerous research and development projects: issues from social sciences and the humanities as well as specific subjects from the areas of natural sciences, engineering sciences and economics. The objective of the UASS Bremen is to actively contribute to the strengthening of the regional economy and to increase actively its activities in the areas of research, development, technology transfer and continuing education.

Research at the University of Applied Sciences Bremen focuses on different clusters:

- Dynamics, Tension and Xtreme Events
- Mobile Life
- Aviation and Aerospace
- Blue Sciences
- Quality of life
- Region undergoing change
- Society, city, environment, energy & technology in dialog

In the area of Aviation and Aerospace the UAS Bremen worked from 2007 to 2013 on the EU funded project “Fly High”. It was about the principles of aviation as an opportunity to make physical theory accessible. Other universities were involved, like the Technical University of Madrid and the Inholland University of Applied Sciences.

An example of a project in the cluster of Blue Sciences the UAS Bremen works on is the “nordwest2050”. This practice-oriented research project aims to increase the ability of the Metropolitan Area Bremen-Oldenburg to deal with climate

change and to implement measures into regional planning and development processes. This project is funded by the Federal Ministry of Education and Research (BMBF[5]) and carries out its tasks in association with other partners, like the University of Bremen and the University of Oldenburg and the research institute artec Forschungszentrum Nachhaltigkeit.

In the cluster "Region undergoing change" the project "KrOW!" aims to investigate the costs and risks which are based on operations of off-shore wind parks. Bremen has been relying increasingly on wind as an economic factor since the turn of the millennium. Alongside traditionally strong sectors such as the maritime industry, logistics, aerospace and electrical engineering, the Land of Bremen has become the centre of the cluster of wind energy businesses and services which is unique in Germany. To ensure the continuously optimization of technologies and materials in the sector of wind energy and encourage innovation this project has been set up by the Federal Ministry for Economic Affairs and Energy (BMWi[6]). The UAS Bremen works on this project in collaboration with the University of Hamburg as well as with non-university actors like the BTC Business Technology Consulting AG.

The UAS Bremen takes an active part in Knowledge and Technology Transfers. Partnering businesses between the UAS Bremen and companies / industries is one of the measures to ensure the technology transfer. Students' projects, Bachelor / Master, and PhD projects are also strategic elements of knowledge and technology transfer. Cooperation research and innovation projects, contract research, support of entrepreneurship and start-ups belong to other strategic elements of knowledge and technology transfer.

[5] Bundesministerium für Bildung und Forschung
[6] Bundesministerium für Wirtschaft und Energie

4. Conclusions

The visit of the Tunisian delegation in Bremen and the meeting with the different institutions involved in the Regional Innovation System (RIS) of the Country State Bremen was valuable in many regards. The Tunisian delegation met the unavoidable players in the promotion of innovation and the growth of the regional economy: public actors, research institutes, universities and enterprises. The purpose was to strengthen the efforts made for the planning of the Master programme at ENIT "Engineering and Technology Policy" (ETP). The Tunisian delegation told that the cooperation between the different actors is essential for the promotion of innovation. And that is what is missing in Tunisia. The delegation was willing to build a closer cooperation with Germany, research institutions, universities, to strengthen the efforts made in the promotion of innovation in Tunisia.

Concerning the Master Programme, the delegation was delighted to discover the advantages of the MOOC (**M**assive **O**pen **O**nline **C**ourse) and has shown interest to apply it for the ETP. The next conference concerning the further development of the ETP was discussed. It was agreed that the conference will be held in November 2015 in Tunis. The exact date will be set later after consultation with the persons involved in the project in Tunis and some African countries, because it is expected that the ETP Master Programme will be open also to other African students. It was agreed to continue ongoing efforts to build a cooperation between the universities in Bremen and ENIT to support the Tunisian transformation process.

5. Presentations and Discussions

5.1. Meeting at the University of Applied Sciences of Bremen

Monday, 18.05.2015 / 17:30

Present:

- Professor Dr. Hans-Heinrich Bass from the University of Applied Sciences
- Dr.-Ing. Uta Bohnebeck, Vice President for Research and Technology Transfer at the UAS Bremen
- Professor Emeritus Dr. Karl Wohlmuth
- The Tunisian delegation

Welcome words of Prof. Bass

Guizani: There are different projects at the University of Applied Sciences. What kind of project is the nordwest2050, and who manages this project?

Bohnebeck: The University of Applied Sciences combines tradition and innovation. With these projects the UAS wants to bring its contribution to future questions of society, to promote collaboration with regional economy, to encourage a strong relationship between education and research, and to foster further innovation. The project nordwest2050 is a young one. It aims to increase the ability of the Metropolitan Area Bremen-Oldenburg to deal with climate change and to implement measures into regional planning and development processes. The project is carried out in association with the University of Bremen, the University of Oldenburg, and the association of research institutes artec Forschungszentrum Nachhaltigkeit.

Ezzine: The University of Applied Sciences plays a huge role in the development of the region. How difficult is it to play that role?

Bohnebeck: In collaboration with other actors of the RIS the UAS can contribute to the development of the region. Professors play an important role. Students too. They work on projects at the UAS and in companies. Through the access which students have in companies the UAS gets more familiar with companies.

Bass: There are medium and small companies in Bremen which sometimes develop new sectors. Unfortunately, they do not have the human resources for research & development. The State of Bremen encourages them to cooperate with Universities. There is a particular advantage: two sides come together, the demand side and the supply side. Universities win from this collaboration too.

Rezig: How does the UAS Bremen support the mobility of students who go to companies?

Bohnebeck: The UAS Bremen does not pay for the mobility of students and does not pay them to work on projects with companies. The students work on their own in companies during their study.

Ben Cheikh: How many projects does the UAS Bremen work on, and how are these projects funded?

Bohnebeck: About 60 projects, supervised by professors of the University of Applied Sciences, are counted. The contracts depend on the duration of the project. The Bremer Aufbau- Bank counts as one

of the bank institutions which financially support the UAS Bremen. There are projects which are funded by the Federal Ministry of Education and Research, like the nordwest2050. The UAS Bremen also becomes financial support from the European Union.

M'Henni: There are many types of technology transfer. Which type is the best and brings most off the money for the University of Applied Sciences Bremen?

Bohnebeck: Technology transfer is about brains. The UAS gives students the knowledge. They can then work in companies. This is the type of cooperation that the UAS Bremen promotes. Education and knowledge transfer are important.

Ezzine: How do you deal with lobby groups? The Automobile Lobby group for example.

Bohnecke: To get closer with the University the lobby groups sometimes organize their own events. They talk about their needs. There is a platform for contacts.

5.2. Meeting with the Bremer Bank for Economic Expansion (BAB – Bremer Aufbau-Bank)

Tuesday, 19.05.2015 / 10:00

Present:

- Andreas Mündl, WFB (Wirtschatfsförderung Bremen. Economic Development Departement/BAB – Bremer Aufbau-Bank)
- Professor Emeritus Dr. Karl Wohlmuth
- Professor Dr. Cordula Weisskoeppel, cultural anthropologist at the University of Bremen
- Professor Dr. Achim Gutowski, International Business School of Service Management, Hamburg
- The Tunisian delegation

Ezzine: Which roles do B.E.G.I.N and BRIDGE have for the start-up and growth of SMEs?

Mündl: Through the innovative start-up support measures, such enterprises are promoted. This contributes then to the growth of SMEs.

Ezzine: How many start-ups do you support, and how many of them ultimately succeed?

Mündl: There are many start-ups. I don't have the exact number. Not all succeed, but about 80 – 85% are still alive. Before we support a start-up, we examine if the company can stay many years in the market, say 3 / 10 years.

Ezzine: What is missing in Bremen, when you consider the number of start-ups?

Mündl: In Bremen the universities are still very much research-oriented. It is not so easy to transfer the research outcome to the applied sciences and to the enterprises.

5.3. Meeting with Fraunhofer IFAM

Wednesday, 20.05.2015 / 9:00

Present:

- Professor Dr. Andreas Hartwig, Head of the Department "Adhesive and Polymer Chemistry" and Professor at the University of Bremen
- Professor Emeritus Dr. Karl Wohlmuth
- The Tunisian delegation

Ezzine: Does the Federal State have an influence on your work? Which ministry can influence your agenda? How do Fraunhofer institutes fund its research?

Hartwig: The Ministry of Economy can decide which projects the Fraunhofer IFAM will work on.

Ezzine: How do Fraunhofer institutes cooperate with enterprises? How does the institute bridge between research and enterprises? How does it manage cooperation with foreign partners?

Hartwig: Fraunhofer works mainly with industries. The big part of our money comes from contract research with industries Fraunhofer cooperates with. The institute has different projects with them,

related to nuclear chemistry, physical chemistry, and polymer chemistry. The research is based on the needs and requirements of the industries. We work in close collaboration with our partners in Germany as well as with partners outside. We also work together with an Australian enterprise which we provide with technical assistance. The enterprise develops a new kind of ceramic for teeth replacement.

Ben Cheikh: How many projects do you have?

Hartwig: In the Department "Adhesive and Polymer Chemistry" approximately 200 projects are running at the same time

M'Henni: Fraunhofer is a successful institute. What explains this success?

Hartwig: Fraunhofer combines technical research with social and economic demands. The institute has to deal with megatrends, such as health and the ageing society. The quality of our products is ensured by the competition with other research institutes. Without competition quality would be low. The success of Fraunhofer also comes from the close collaboration with companies. We cooperate closely with industries and support small industries in their work.

Ezzine: What is one of the big problems that Fraunhofer can face?

Hartwig: One problem that we can face is to have a good product but no company interested in it. Products, which the institute makes, have to go to companies.

5.4. Meeting with the Director of UniTransfer

Thursday, 21.05.2015

Present:

- Professor Emeritus Dr. Karl Wohlmuth
- Dr. Martin Heinlein, Director of UniTransfer, BRIDGE, and Technology Park University
- The Tunisian delegation

Ezzine: What does the "Excellence Status" mean for the University of Bremen?

Heinlein: With the "Excellence Initiative" the University of Bremen became internationally renowned. It gave the University the possibility to get additional funds for the research. Some research institutes are funded by the State of Bremen, like BIAS and FIBRE, but the need for funds to support research remains a big challenge for many institutes.

Guizani: Do institutes at the University receive funds for research from the Federal State?

Heinlein: At the Federal level research funds are allocated by various ministries, by the Federal Ministry of Education and Research for example. The European Union too supports the research. For the

University of Bremen, the State of Bremen is the main source of funding research. Nevertheless, the funds do not reach directly the University but are allocated to the University-affiliated research institutes.

Guizani: Some professors of the University work in research institutes. How do you deal with that?

Heinlein: Professors have the duty to do research. They do that in research institutes. Normally they are not directors in theses institutes. Because they are public employees they have to report on their activities in research institutes.

5.5. Meeting with the Chamber of Commerce of Bremen

Friday, 22.05.2015

Present:

- Dr. Dennis Stockinger, Department of Industry, Innovation, Environment
- Annabelle Girond, Department of International Affairs
- Volkmar Herr, General Manager, Department of International Affairs
- Professor Emeritus Dr. Karl Wohlmuth
- Professor Dr. Achim Gutowski, International Business School of Service Management, Hamburg
- The Tunisian delegation

Ezzine: Which role plays the Chamber of Commerce to improve innovation in the Country State of Bremen?

Stockinger: The Chamber of Commerce made recommendations to decision makers on reforming the innovation policy in the Country State of Bremen. We proposed the institutional restructuring of Bremen's innovation policy by bringing together the decision-making authority in an innovation department of the government, and by supporting the knowledge transfers between the Universities and the Economy. It is also important to turn business ideas into reality and to promote the vocational training system, to improve not only the legal conditions but also the scientific capacity and the infrastructure, and to foster closer forms of cooperation between research institutes, universities, and companies.

Ezzine: Is this the first time that the Chamber of Commerce tries to integrate the promotion of innovation in the context of their core activities?

Stockinger: We work to improve the innovation system in Bremen. Over the years we have reinforced our commitment to the promotion of innovation. We can do better to support start-ups and to foster a business-friendly environment and a strong entrepreneurial culture.

5.6. Closing the Seminar

Saturday, 23.05.2015 – 10:00

Present:

- Professor Dr. Hans-Heinrich Bass from the University of Applied Sciences
- Dr. Yildiray Ogurol, Managing Director, Centre for Multimedia Systems/Zentrum für Multimedia in der Lehre (ZMML), University of Bremen
- Professor Emeritus Dr. Karl Wohlmuth
- The Tunisian delegation

Dr. Ogurol presented the MOOC-agenda and its importance for the future of university teaching. MOOC is an abbreviation for **M**assive **O**pen **O**nline **C**ourse. The aim is to open up Higher Education by providing accessible, flexible, affordable and fast-track completion of university courses for free or at low cost for everyone who is interested in learning. Over the year the use of MOOC has gained importance. MOOC offers the advantage of being accessible for a large number of students, more than 100,000. It provides interactive user forums that help to build a community for the students, professors, and teaching assistants. Coursera, Udacity and edx are the major MOOC players. A MOOC is an innovation for universities; it is a new pedagogical approach. But beside the euphoria about the MOOC no one is quite sure what impact they will have on the future of education.

The professors from the Tunisian and Bremen universities discussed the future of cooperation, by highlighting potential projects. In the coming months they will be discussed on a more concrete level.

In the Closing Ceremony Professor Karl Wohlmuth and Professor Jelel Ezzine exchanged words of thanks. The Expert Seminar brought to attention the fundamentals of the Regional Innovation System of the Country State of Bremen. It is envisaged that the Workshop in Tunis will give the opportunity for further discussions.

6. Links to the Photo Gallery, the Programme and the Introductory Presentation

See the Dropbox with the Link:

https://www.dropbox.com/sh/zff9c64e2zspvzw/AAAJW-SjEJcnwuoCZSqI51Wba?dl=0

See the complete Programme of the Expert Seminar:

http://www.karl-wohlmuth.de/files/dateien/48_wohlmuth_final_revised_6_2015_daad_programme_bremen_17_24_may_2015.pdf

See the Introductory Presentation by Professor Karl Wohlmuth:

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes, accessed at:

http://www.karl-wohlmuth.de/files/dateien/47_wohlmuth_expert_seminar_tunesien_5_2015_%5bkompatibilitaetsmodus%5d.pdf