

# Implementation of Innovation process into Moroccan Universities: from fundamental to applied knowledge

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## Abstract:

*The ability to create, distribute and exploit knowledge has become a major source of competitive advantage, wealth creation and improvement in the quality life. Some of the main features of this transformation are the growing impacts of information and communication technologies (ICT) on the economy and on society; the rapid application of recent scientific advances in new products and processes; as high rate of innovation across countries ; a shift to more knowledge-intensive industries and services; and rising skill requirements. These changes imply that science; technology and innovation are the key of improving economic performance and social being.*

*During these three past years, Hassan 2nd University of Casablanca has been a part of UNCHAIN (UNiversity CHAIR on INnovation) network. Therefore and in accordance with The EU higher education policy towards the MEDA countries, Hassan 2nd University of Casablanca focused in:*

- *strengthening the role of higher education institutions in society at large;*
- *addressing the “knowledge triangle” of education, research and innovation at university level;*
- *Invigorating links between higher education institutions and the labor market, including the promotion of entrepreneurship and the creation or support of business start-ups.*

*The project aims to build innovation capacity at universities and industries while supporting university-industry collaborations, and further fosters knowledge and technology transfer.*

*This EU-Tempus program supported especially by UNIDO (Vien) developed strategy aimed to :*

- *Help enterprises translating their needs to R&D subjects in the field of industrial innovation.*
- *Encourage and support the enterprises to pursue innovation in collaboration with the university thereby availing themselves of existing facilities and expertise.*
- *Promote university departments to carry out commercially relevant innovation projects with industrial enterprises.*
- *Disseminate new and useful knowledge resulting from University research, license technology to industry in order to promote the development of inventions towards practical applications,*
- *Employ a range of activities such as training of faculty, staff consultancy, seminars and specialist training*

*courses, facilitating R&D activities such as innovative products, processes and systems.*

- *Form different cooperation models with the industry such as closer and longer-term strategic alliances for mutual benefit. It presents a general framework encompassing the factors that can make university-industry collaborations more successful.*

*UNCHAIN-UH2C also developed partnership with Ministry of Commerce, Industry and New technologies in order to take advantage of funding programs implemented under the National Innovation Strategy. One way which permits to researchers to conduct applied research and R&D projects that can be realized within the framework conditions of quality, time, organization and communication.*

**Keywords:** *Knowledge management, University chair on Innovation, Innovation process skills empowerment, university-Businesses partnerships, Unchain-Uh2c,*

## INTRODUCTION

Different development approaches for countries with lower living standards than developed countries have emerged over the last half-century with different degrees of success. In the today's world of increasing poverty, inequality and climate change, the need for comprehensive solutions is increasing. While there is existing evidence that investments in science and technology that lead to technological progress are driving economic growth in developed countries, proven experiences in developing countries are lacking. Therefore, the focus on economic growth as a driver for development shifted to the concept of development “as a process of social transformation”.

Contemporary debates are considering the importance of a systematic approach of development including “the role of institutions, education, the quality of governance, of public administration, the presence of economic opportunities, and the increasingly crucial role of technology and innovation in enhancing the efficiency of the

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development process.” In the following paragraphs, the most important concepts the study is built on are introduced.

### **Innovation for development:**

Innovation is considered as the key driver for enabling growth potentially resulting in development. This can lead to economic and social progress, and environmental sustainability. The World Bank (2010) emphasizes that developing, as well as developed countries need to make innovation a priority in order to ensure the well-being of their people through creative and effective solutions. Despite the need for knowledge and innovation for development, most developing countries lack the ability to engage in the process of generating innovations at the technological frontier.

### **Development through knowledge and technology transfer:**

Universities as generators of knowledge, and industries as the users of this knowledge can be essential drivers for development. The exchange of knowledge at the regional level between universities and industries, and on the international level between multiple actors can lead to regional innovation processes. Despite this fact, knowledge can only contribute to development when there is a rich knowledge base in a country that is able to utilize new knowledge gained through research inside the university, through interaction with local industries and institutions, and with international knowledge providers.

### **The Chair on Innovation:**

Based on an initiative of European and Arabian universities, University Chairs on Innovation in Mediterranean and North African (MENA) countries have been established. The project is called UNCHAIN: University Chair On Innovation (COI). The main objective of UNCHAIN is to increase the success rate of innovations in industrial enterprises by bridging the gap between the needs of industry and the supply from universities and associate training institutions through building up human resource and

technology transfer. These targets are to be reached by establishing absorptive capacities at both universities and industries through increased awareness of the importance of innovation for sustainability. Realizing these objectives will contribute to the long-term goal of poverty eradication through sustainable industrial development by targeting it from social, economic and environmental perspectives.

### **Strategy for boosting the cooperation of business with MENA universities:**

The superior goal of that study is to develop a university-industry strategy for boosting the cooperation of business with MENA universities. The strategy is derived from literature research combined with the experiences of the Unchain project and is meant to function as a guideline for future set-ups of COI at universities with similar settings and conditions.

### **Research questions and structure of the study**

The Chairs On Innovation (COI) were established at MENA universities in order to become a platform for innovation between universities and industries in order to enhance innovation from a bottom-up process with the support of European partners. In developed countries, factors that ease the collaboration between universities and industries, and as a result lead to innovative behavior, are well known and transfer processes are intensively analyzed. Actions that enhance this process in developing countries, and especially in Arabian countries, are not as well researched. That study investigates the feasibility of theoretically examined actions in MENA countries. Therefore, the central research question of this study is the following: *What factors contribute to successful university-industry collaboration (UIC) with the goal of enhancing innovation in an Arabian country?* Various forms of relationships between university and industry exist, ranging from models that presume a close integration of universities with industries to models that state the importance of keeping distance and

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a division of labor between those parties. The role of universities in developing countries in this discussion is analyzed in the research question that reads: *What roles do universities in developing countries have in the commercialization of innovations?*

**Effective knowledge transfer** depends on issues such as the transfer capacity of the generating agent and the absorptive capacity of the knowledge-using agent. In developing countries, these capacities are often missing, which can influence the appropriateness of knowledge transfer channels and therefore, the following research questions aim at investigating which channels are appropriate in the context of Arabian countries and which factors enhance capacity building in developing countries: *Which capacity building actions are usable in the context of Arabian countries? Which channels of knowledge transfer are especially adequate in Arabian countries?*

The framework of the study is built on the following structure. The study is divided into two main parts. The first part aims at analyzing the UIC situation and international collaboration situation based on literature. The second part is the empirical investigation in MENA countries.

Part one inherits the following topics: deals with introducing the main theoretical concepts and definitions. It highlights the need for knowledge and technology exchange for innovation and briefly introduces UIC as an important driver of this process.

UIC partnerships, the motives and barriers relating to collaboration and their relevance for developing countries with the question about the appropriate role of universities in this context are analyzed. We tried to list and examine the factors that influence academic industry partnerships and therefore enhance the collaboration process through literature research in developed as well as developing countries. Special importance is given to intermediary institutions that can support the collaboration process between universities

and industries. The research question regarding the appropriate KTT channel in developing countries is also answered. The focus of the UNCHAIN project is not only on domestic collaboration but also on international knowledge and technology exchange.

Consequently, the situation of absorptive capacity of MENA countries as a precondition for UIC as well as international technology diffusion is extensively analyzed. The different characteristics and dimensions underlying the different transfer forms are furthermore explained in this section. We finished with a brief overview of factors that can enhance the absorptive capacity in developing countries.

The second part of that study deals with the case study of the COI in MENA countries. We introduced the approach of the COI and provide the university profiles that are the basis of the empirical research contained. The factors introduced in the theoretical part that enhance UIC are tested in the especial case of the MENA countries through a benchmark and an interview survey that are the foundation for the derivation of the strategy. Finally, we will discuss the results and provide an outlook for future analyses.

### Key theoretical issues and definitions

Hereby, the terms *knowledge and technology transfer* (KTT), *innovation*, and the concept of *university-industry linkages* are at the centre of the investigation. A comprehensive consideration of the nature and factors of these focal terms are needed for further examination and provides the basis for the following chapters.

To begin with, the use of the terms *developing countries* and *developed countries* need to be clarified. Extensive literature criticizes the categorization of countries, based on per capita measurements. However, it is important to mention that the terms used in this study do not express the judgment of the author. As a matter of fact, designations such as developed, developing, least developed, or transition countries are

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frequently used to conceptually define low from high per capita income countries. However, no clear definition of the designations exist and in that study, developed and developing countries or areas are used in line with the statistical grouping of the United Nations Statistics Division (UNSTAT), as presented in Table 1 (UNSTAT, 2011). Consequently, the Arabian countries targeted in the study are in the group of developing countries.

<u>Developed regions</u>	<u>Developing regions</u>
Northern America	Africa
Europe	Americas excluding Northern America
Japan	Caribbean, Central America, South America
Australia and New Zealand	Asia excluding Japan
	Oceania excluding Australia and New Zealand

**Table 1:** UN composition of developed and developing regions (based on UNSTAT, 2011)

### Network of Chairs on Innovation

Based on prior activities of the United Nations Industrial Development Organization (UNIDO) and an initiative from three European universities confirmed by five Arabian universities, a concept of establishing a Global UNIDO Network of University Chairs on Innovation has been agreed upon. The project is called UNCHAIN: UNiversity CHAir on INnovation and is funded by the TEMPUS program due to its focus on commercially and sustainably relevant research combined with the international exposure and connections.

The main objective of the UNCHAIN project is to increase the success rate of innovations

in industrial enterprises, bridge the gap between needs of industry and supply from universities and associated training institutions through building up human resources and technology transfer. One of the biggest goals was to establish capacity to update (national) innovation policies and increase awareness of importance of innovation for sustainability. Realizing these goals will contribute to the long term goal of poverty eradication through sustainable industrial development by targeting it from a social, economic and environmental view.

The world is changing very fast. It is undergoing new industrial revolution 'the knowledge revolution' fuelled by the pace of technological change. Research and development is at the heart of scientific and technological progress and to increasing productivity, exploiting growth opportunities in emerging markets and creating knowledge-driven competitive advantage.

The need for Innovation as a core issue for a sustainable development:

UNCHAIN is targeting specific problems and obstacles facing innovation and the University –Industry relation in MENA region. The preliminary analyses identified the following key issues:

- MENA industry lags behind in terms of its ability to exploitation of knowledge and the use of R&D and Innovation to create value ;
- Research conducted by universities is generally of little interest to industry or relevance to the economy ;
- Graduates lack the problem-solving skills applicable to real life situations ;
- The needs of industry are real and industry is generally aware of its needs. However, few in industries, in the industry associations or in research in a relevant domain are currently able to translate these needs into



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requirements for R&D or Innovation ;

- e. There is an almost total lack of communication between universities and industry. The process is not managed by the universities and when it happens, it is usually based on personal contacts of the company and someone based at the university ;
- f. Lack of awareness among university researchers of the importance of devoting their research to solve local industrial problems ;
- g. Lack of public awareness of the importance of university-industry link in particular and innovation in general ;
- h. Lack of communication and exchanging information not only between the MENA universities but also between MENA and EU universities. This prevents the exchange of experiences and making benefit of the best practices ;

Therefore, for solving these or a part of these problems, the university chair of Innovation focused thoughts mainly in the starting period on how to:

- Help enterprises translating their needs to R&D subjects in the field of industrial innovation.
- Encourage and support the enterprises to pursue innovation in collaboration with the university thereby availing themselves of existing facilities and expertise.
- Promote university departments to carry out commercially relevant innovation projects with industrial enterprises.
- Disseminate new and useful knowledge resulting from University research, license technology to industry in order to promote the development of inventions towards practical applications, to employ a range of activities such as training of

faculty, staff consultancy, seminars and specialist training courses, facilitating R&D activities such as innovative products, processes and systems.

- Form different cooperation models with the industry such as closer and longer-term strategic alliances for mutual benefit.

When established, the chair had to work on the main common objectives defined in 10 work Packages (WPs) that constitute the project as a whole. ([www.unchain-vu.net](http://www.unchain-vu.net))

The methodology and activities to be followed should take in account some important aspects like:

Why universities should intensify their relations with businesses?

What services can be offered to businesses by universities?

The role of innovation and knowledge transfer in the cooperation of universities with businesses?

How to establish the innovation centre/unit at the university: preparing for a Chair on Innovation?

We are going to try answering these four questions and understand the key role of Universities in knowledge and technology transfer, fostering innovation, invigorating creativity and empower sustainable entrepreneurship.

### 1. Why universities should intensify their relations with businesses?

There are several different types of research and innovation partnerships between academic and businesses that can be divided in five general knowledge and technology transfer channels. A Swiss survey about industries most important knowledge transfer channel resulted in the following conclusion: *'informal contacts and/or further education*

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*are the most important ones since they especially allow the transfer of tacit knowledge, a critical factor in learning and successful innovation'.*

### ✓ **Transfer of Information**

Scientific publications, conferences, awareness measures, clubs and networks, R&D registers, expertise registers, technology offers, invention disclosures, licensing, Informal contacts and personal networks...

### ✓ **Transfer "via heads"**

Personnel mobility between public science institutions and enterprises, student/graduate placement services...

### ✓ **Transfer via education and training**

Supervision of master theses and dissertations, continuing education like in alumni clubs, academic and industry co-operated education of students, vocational trainings for employees...

### ✓ **R&D projects**

Research collaboration, contract research, research and technology services and consulting (certificates, expertise sharing), shared laboratories...

### ✓ **Spin-offs; joint ventures...**

Collaboratively managed science parks, competence centres...

Going through these principal aspects, University and Industries can gain through collaborating in partnership by:

- **Improving market awareness**
- Enables access to real-world problems of companies or industrial sectors that are useful for MSc/ PhD and other applied research projects.
- **Enriching teaching programmes**
- The feedback gained from industry can be useful for curriculum development and course reviews, sourcing ideas for student projects and gaining new perspectives.

### ▪ **Complementing the university's skills base**

▪ Staff and students can learn about new skills and techniques developed in industry through knowledge transfer and exposure of real-world problems. Industry contacts through guest lecturers or internships can be a possibility of exploring how business processes like managing projects can look like in real life.

### ▪ **Acquiring private and public funding**

▪ Research collaboration can be seen as another source of income next to university budget. Consultancy activities, sponsored research or income from lending out research facilities are examples of such income possibilities. Furthermore, better access to public funds that require industry funding.

### ▪ **Building on excellence and reputation**

Through successful collaborations, a university can enhance the reputation and prestige of their education level and therefore attract more (and better) students. Students themselves can benefit from a practical view and better chances on the employment market.

### ▪ **Sourcing job opportunities and improving students perspectives**

▪ Through placing students and university staff in industry projects, practical hands-on experiences can be collected. For students, this can be an essential hiring criterion after graduation and professors can increase their applied research knowledge. Improved student employability rates can higher the reputation of the university and in turn, motivate students to engage in industry projects.

### ▪ **Applying knowledge**

▪ Cooperating with industries can be a chance to apply skills and knowledge in a real setting and help solving business

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problems. This can be a benefit for students as well as for university staff.

- **Complementing the university's physical resource base**
- Sharing laboratories or facilities can be a big advantage for universities that lack appropriate research equipment or services.
- **Achieving greater impact on society**
- Enhancing a country's innovation success rate through intensified university-industry linkages can benefit the society as a whole.

### 2. What services can be offered to businesses by universities?

- **Complementing the company's skill base**  
Through collaborating with universities, companies can get easier access to specific expert skills additional to in-house know how. Universities can offer advanced trainings for employees where industries can especially work on creating innovation capabilities.
- **Multi-disciplinary problem solution**  
Universities can offer the possibility to solve an industry problem on a multi disciplinary level ranging from technical research to industrial design to business applicability. A multidisciplinary view on a problem additionally offers the ability to achieve excellent problem definition and innovation challenge framing that eases the solution finding process.
- **Enhance a company's reputation and corporate image**

As mentioned earlier, engaging in innovation development became an important promotion factor for research institutes. Universities that publish a collaborated solution in scientific papers can mention their partner enterprise as best practise example and therefore higher the reputation of the company. Furthermore,

businesses are given the opportunity to be the first ones to try a new technology, to be early adopters.

Meet and greet events at universities can serve as networking options where industries are given the opportunity to present themselves, meet high potential students and diverse complementary enterprises for future collaborations.

#### ▪ **Financial**

Likewise universities financially benefit from research partnerships, also enterprises can profit from cost-effective focused research. Laboratory sharing, public funds possibilities, spread research costs, outsourcing of research activities and "cheap" consulting services through students' internship placements or graduates are only some examples of possible financial advantages.

#### ▪ **Reducing risk**

Through sharing the costs and effort with university research institutes, possible risks can be limited. Another benefit is the fact that a large university network can better analyse competitor's research areas and carry out comprehensive needs analyses.

#### ▪ **Complementing the company's physical resource base**

Universities often have specialised equipment and advanced research facilities that can be accessed by the partner enterprise.

#### ▪ **Easy Recruitment**

Through accessing the university network, initial contact to future employee's like students, post-doctoral researchers and academic supervisors can be established and built on.

#### ▪ **Thinking longer term**

Generally, industry research is concentrated on fast solutions and short time activities.

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Cooperating with universities can brighten their horizon related to emerging fields and enabling technologies developed in universities.

### ▪ Benefiting from new ideas and past experience

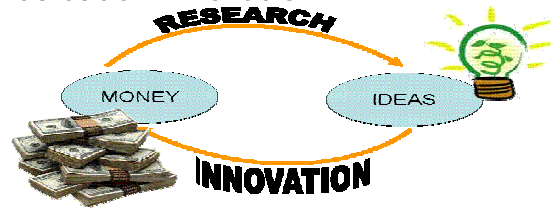
Universities inherit an enormous information database consisting of accumulated research and scholarly knowledge, enterprises can benefit from. Access to alternative and unconventional perspectives, new research stimuli can be gained and pre-competitive research can be expanded.

### ▪ Going global

One of the big advantages when collaborating with academia is the entrance to a big network of national and international knowledge institutes and enterprises.

### 3. The role of innovation and knowledge transfer in the cooperation of universities with businesses?

**Innovation** can be the key driver behind economic growth and can strengthen the competitive position of industry. Nevertheless, the term is used in many different contexts and needs to be defined precisely. Innovation can be “*the commercial or industrial application of something new— a new product, process or method of production; a new market or source of supply; a new form of commercial, business or financial organization*”<sup>1</sup>. The Brockhaus dictionary defines innovation as follows:



- the planned and goal-oriented modernization of existing (technical, social,...) systems through the use of new ideas and technologies;
- the creation and introduction of new products, product technologies and forms of organization in the economy

In the developing countries' context of the present paper, an innovation does not need to be new in absolute terms, but can be new to a given society<sup>2</sup>.

Innovation can happen on multiple levels and can be categorized through the following steps: incremental, radical and fundamental innovation ranging from small step improvements to the development of completely new scientific knowledge<sup>3</sup>. Incremental and radical innovations are on especial focus when dealing with developing countries context since high technology developments may not be a source of job opportunities and wealth.

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**Innovation** results out of the market demand need to be more efficient and increase productivity due to competition pressure, resource scarcity or simply creativity and therefore needs to be distinct from **research**.

New ideas and knowledge that are acquired through research done at universities or R&D laboratories at enterprises are called **inventions**. There is a big difference between



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the creation of an environment where ideas are born (brainstorming ...) and the management of an innovation process. The „innovation process“ does not only include the – often seemingly intuitive – proposing of new ideas, but also the analytic consideration of the problem as well as the choice of ideas and the establishment of the implementation strategy. *„Innovation is the process of finding economic applications for inventions“*

Innovation can be the process of commercialising inventions depended on a society's need, but in fact does not need to result from it. Nevertheless, **universities** can contribute by serving as **a hub for innovation** through enabling **knowledge and technology transfer** as a precondition for innovation. They can support knowledge transfer by providing platforms, using synergies between different disciplines and connecting experts from several disciplines. Businesses can connect with universities due to their need for sustainable innovative solutions and the universities huge potential of creative ideas.

**Innovation** requires **multidisciplinary settings**, knowledge that is arising from many sources and is spread widely across sectors, as many technology solutions have become extremely complex. Enterprises are developing toward specialising, not all research needs to be done at their own laboratories any more. This situation inherits big chances for universities and industries seeking to enhance their applicability and innovativeness of research. **Co-operation and knowledge transfer** among participants in different fields of expertise like university and industry can result in scientific progress as a driver of innovation and simultaneously reduce uncertainty and cost sharing.

An effective communication between universities and enterprises, leading to innovative solutions, can be supported by establishing intermediary institutions like the Chair on Innovation- approach of the UNCHAIN project. For better managing the innovation process, as well as the context the innovation is taking place, and therefore increasing the **success rate of these innovations**.

Furthermore, **Innovation** is always **goal-oriented**. A fact showing that the goal is defined in the forefront. In the UNCHAIN project, sustainable economic development that enhances the quality of life in the partner countries is the main goal. In detail, UNCHAIN deals with questions about health, environment, resources, energy and agriculture.

### **The approach of the “Chair on Innovation”**

The conventional approach of enhancing the university-industry collaboration in a country is by establishing a **Technology Transfer Office (TTO)** that is responsible for managing the link between university and industry. In this classical technology transfer process, the focus is on commercialising collaborated research results.

Experiences of the UNCHAIN project prove that preparing the market and the awareness situation at the industry and university with the help of a **Chair on Innovation** is the right approach at the beginning due to several reasons.

The goal of technology transfer in the UNCHAIN project is focused on collaboratively creating innovative solutions for industry needs. In order to examine industry needs and the environment the solutions will to be embedded in, the first step of the project needs to focus on the

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market: a society's need and their capacity to pay.

Working on setting up proper Intellectual property rights and licenses agreements will be the next step after raising awareness for the need of innovation at the university and its related networks. Therefore, the Chair on Innovation can be used as an intermediary platform, spreading the innovative message, promoting the universities role and gaining trust from future collaboration partners.

Nevertheless, a TTO will be necessary as soon as the first successful collaborations are established and new products resulting from university-industry collaboration are launched. In the meanwhile, European partners can help to examine the legal situation of the university and finding the right actions that need to be set in the diverse contexts.

Following context needs to be considered before establishing a TTO: developing countries usually face low number of patents and the awareness level of patents is low. Furthermore, the acceptance of the required time to achieve patents and the linked investment costs are a big barrier at the beginning.

In the UNCHAIN project, different other options for establishing the Innovation unit at the university were discussed: **Innovation Research Centres, University Centre on Innovation and University Institute on Innovation.** .. All these options are mainly carrying out teaching and research activities. However, they can only be taken into consideration when implemented additionally to the Chair on Innovation that is more aiming into the direction of being an intermediary platform. This results out of the fact that no Chair has planned any teaching activities but mainly deals with managing and organising a university-industry

connection. The only teaching activities Chairs have planned include spreading information through seminars and conferences in faculties.

Confronting the responsible Arabian Chair holders with this issue, resulted in the following statement. "Starting the innovative approach at the Arabian university with a Chair is the right approach for the first years and can be developed or transformed from there." Additionally, till now there was not enough time to sufficiently test the approach. It cannot be known for sure what approach fits every university from the beginning, but till the best solution is found, the Chair can fulfil the necessary requirements.

Therefore, every university can choose its individual solution. The only necessary requirements are that it is a coordination unit between the research and enterprise close to the university's top management.

#### 4. How to establish the innovation centre/unit at the university: preparing for a Chair on Innovation?

##### ■ Contacting the universities top management level

The starting point of establishing a Chair on Innovation is by **directly contacting the highest level of a university** (president, vice president, research president) by proposing the idea. Especially in this step, the fundamental commitment of the top management level is needed for granting full support and assuring the influence needed to set up such a position. Before starting

##### ■ What has been done during three past years [2010-2013]?

Internal activities for setting up and maintaining the proper framework devoted to innovation

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- As soon as installed, the Chair holder worked on detailing and updating the **task description** and consequently a **Business Plan** for his term of office.
- Since the unit should not be only financed by the university budget, a **basic financial plan** needs to be set up accordingly, including the return from industry collaboration contracts. A detailed financial plan can only be worked out by the Chair holder itself after experiencing the university-industry situation for a while. Proper university commitment is an essential part of the funding plan. This has been possible in the way that Ministry of Commerce and Industry & New technologies (MCI&NT) gets some important programs aiming to encourage partnerships between university and Industries like consultancy or expertise and also technology provider. These programs are all financially supported and the partnership is one important step in which industry takes enough time to get to know the university expert. Furthermore, the ministry of high education, R&D Association gives 50% of funds to some applied research program shared between university and industry. The whole duration of this kind of programs called: INNOV'ACT is varying from 12 to 18 months and Master or PhD students are Involved.
- The Chair holder has also started by a series of conferences and workshops in which both industrials and university people are gathered. The exchange is interactive and the personal is sensitised.
- After this step, UNCHAIN-UH2C which worked with the network in MEDA region trained a local team to various aspects of innovation and technology transfer. That allows UNCHAIN to be more efficient and autonomous.
- The internal platform of UNCHAIN-UH2C started to work as a communication channel between the Chair, professors and students. It participates to all events related to innovation and creativity like: Innovation Caravans, National Innovation Summit, exhibitions and Fires (Med-Innova 2011, Morocco), Open days of high schools of engineering (ENSAM, INPT, EHTP, ...) or 'Doctoriales' PhD days in which an opportunity to present works of PhD students to Industrials or evaluate the creativity degree and patentability of the research works is offered. The best applied research works can be awarded or financially supported to create start-up or spin-off structure.
- Each faculty should work on providing **competence sheets** for interested stakeholders. These are detailing information about the available competences and skills at the faculty and can promote commercially relevant innovation projects with industrial enterprises. Providing competence sheets will help the Chair holder in getting in contact with industries by providing detailed information about the present competences at the university. Unchain-Uh2c made connection with potential actors like: Moroccan Center of Innovation, Moroccan Office of Intellectual and Commercial property, R&D Maroc, etc.
- The Chair holder can start especially promoting **applied research** in order to offer practical solutions to industries. But also purpose different existing programs and financial tools.
- It is important to assess the **Intellectual property rights (IPR)** situation at the university and work on establishing a guideline for filling and prosecuting IP applications and patents. Each university should appoint one responsible person for assisting the IP situation. A model guideline for filling, drafting the registration, maintenance, commercialisation, prosecuting of IP application and patents can be formed. We collaborate strongly during these three years with national IP office (OMPIC) and

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have seen the number of deposit patent jump from 3 to 24 !

- In order to deepen the north south relation between MENA region and European researchers, the supervision of collaborated diploma theses can be fostered. These **twinning theses** can help to build trust especially at the beginning of the unit with success stories that are linked to internationally respected networks. In these twinning projects, MENA region and European professors collaboratively supervise trainings that are created by one Arabian and one European student. Students and their supervisors preferably spend some time in the partner country in order to deepen the experience, exchange knowledge and learn about the context of the requested solution. At the end of training, the two teams exchanged experiences and presented their exploitable result in what we called “Souk of Innovation” (small exhibition of results obtained from the two parallel works by the two twinning teams). Five prizes have been awarded for the five first ranked projects.
- With the help of the Ministry of Industry, one promising common project was identified and a joint-venture convention has been ratified on 2010, it's “Innovation City” one building reserved to Incubation, prototyping, essay, spill-over and spin-off creation. We still work closer to foster creativity and innovation as well as in the University or in industry.
- Finding **mechanisms of how to approach and communicate with industries**. The goal of encouraging and supporting enterprises to pursue innovation in collaboration with universities while offering existing facilities and expertise needs a well-prepared mechanism behind. Since the innovative approach is completely new to some enterprises in Arabian countries, the first step needs to deal with raising the

innovation awareness and to help building trust between industry and university.

Therefore, it is recommended that universities together with industrial associations or ministries design seminars that especially target in making industries aware of the actual problems and needs. A crucial point is to offer industries easy adoptable innovative solutions in the direction of “innovation through participation, without big investments”. “Innovation in the work place” could be a possible topic for such a seminar, concerning management, design, communication, and recycling, waste optimisation or water reduction issues. In general, the focus should be on already existing products and technologies and their improvement through incremental innovations.

Success factors of these trainings include professional external speakers, high quality content, nationally and internationally utilisable certificates and the visibility of cost savings through energy and resource reductions. An additional advantage of such introducing seminars is the fact that personal networks can be created and industry needs can be indirectly collected.

After successfully carrying out the introduction seminars, trainings on technology innovations can be offered. Another strategy after building trust between university and industry is the method of actively approaching industries by knocking on their doors with solutions and collected university research competences.

**In conclusion** we can say that, UNCHAIN-UH2C is one recognized, structure working on Innovation and creativity at different levels:

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- Fostering collaboration with the **ministry of industry and ministry of higher education** in order to get industry contacts and have an additional intermediary platform that is linked to governance issues ;
  - Approaching the **local industries** and collect their research needs to form different short-term and long-term cooperation projects. The Chair on Innovation can offer trainings that especially target in helping enterprises to translate their needs into clear defined R&D subjects ; two Diploma have been launched : **"Engineering and Innovation Management"** [Rais, O. 2013] and **"management of Innovation and R&D at enterprises"** [Tahiri, M 2013]
  - Contacting **national IP offices** in order to work together for establishing innovation friendly IPR policies. During the period 2010-2012, we noted a net increase in the number of patents filed by Hassan II-Casablanca University researchers (from 3 to 24) ;
  - Setting up an **Alumni database** in order to collect graduates and their current workplaces for easier contacting industries that employ former graduates (informal contact possibility) ;
  - Unchain-UH2C organized from October 2010 to February 2011 a **call for Interest** for students from all structures of UH2C, mini bachelor, masters, PhD students, ... ; a training for selected applicants was provided ; a coach to realize Business Model and business plan. Then, Unchain launched of competition "best idea" in entrepreneurship ; and organized ceremonial fest for "awards"
  - In cooperation between potential operators (bank foundation, industry confederation, university), Unchain-Uh2C started a package of seminars, workshops and meeting in order to stimulate innovation and foster sustainable and entrepreneurship culture at University world ;
  - Additionally, the Chair on Innovation organized **job fairs** for connecting students and industries. This helped students and industries to get together and exchange ideas and needs. Students can also get familiar with the requirements of job descriptions and other related issues.
  - Unchain-UH2C organized "Innovation Souk" (Innovation market) in which twinning masters students from the Mediterranean two sides presented a common projects of their training at the industries. The best projects were awarded.
  - Merging together with available information/research centres or departments at the university. For example, contact the **career guidance** centres for offering trainings to students and staff aiming for building up additional competences. Career guidance centres can especially help the Chair in offering entrepreneurial support to students.
  - Engaging in creating **University Chairs on Innovation network (National and international)** in order to exchange experiences and share knowledge on an international level.
- Often when collaboration projects between two or more parties are accomplished, the partnership ends due to missing incentives or impulses for future collaborations. Therefore, it is necessary to find **mechanisms for establishing future projects even before the lifetime of the projects ends**. This will help in forming long-term strategic alliances for mutual benefit. Possible actions include: carrying out creativity techniques like brainstorming for collaboration possibilities before the project is finished; or confidential questionnaires filled out by all involved parties concerning the satisfaction or improvement possibilities of the partnerships. Another innovation success increasing factor is **spatial proximity** resulting out of face-to-face partnerships where informal contacts between parties are secured. In order to enhance this regional proximity where innovation can be spread easier, the Chair



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needs to connect with all possible **regional research institutes** and **available technology parks or incubators**. Furthermore it is important to connect to **local industries** and Associations (NGOs). Virtual communication platforms can help to maintain these connections.

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