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Bilateral R&D Project (this document will be shared with potential Spanish
companies)**

Intelligent Tool & Portal for e-learning of Environmental Management

ESITIP Pre-proposal Submitted to the ITAC Collaborative Research Fund

By

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Egyptian Partners Contacts

Egyptian Academic Partner		Egyptian Company	
Date of Request:	29/1/2019		
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Proposal Information

Project overview

(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)

Abstract

The Abstract is a one-page summary of the proposal. It may consist of three paragraphs. The first paragraph describes the general discipline the proposal falls under. The second paragraph explains the benefit of the proposal to the ICT industry. The third paragraph lists the specific deliverables of the proposal plan and its duration.

The pre-proposal length should be 6-8 pages, which requires that applicants clearly identify what this research has to offer to the ICT industry and the outcome of the project if funded.

The advantages of e learning has been well asserted in the literature (Bell, 2007; Biggs 2007). E learning is expected to hold benefits to all stakeholders.

E learning can provide opportunities for group discussions, problem based or collaborative learning (McGregor et.al, 2009) which is seen as one of the main learning mechanisms of the several courses developed by Erasmus + such as those for Master of Science in Enterprise System Engineering (ESE). Students interactivity and engagement is facilitated by the shared network space, wikis and chat tools.

E-Learning represents a huge market for ICT globally. It promote cross border education and training that is International and available around the clock 24-7. It also plays a key role in spreading education and training in rural areas.

Travel expenses are becoming the major part that consumes the program budget. This is for both rural areas and crowded cities. Therefore, an e learning portal is expected to result in huge cost savings.

Furthermore, environmental management is a concern for both developing countries and developed countries. Yet, it is important to focus courses and training in environmental management on critical thinking and problem solving rather than memorization. This in turn requires the impeding of intelligence in the education/training process.

Using internet technologies to acquire and share knowledge is expected to match the technology savvy students and instructors involved in the environmental management program. Both parties are expected to have a high readiness level for adoption since IT is an integral component. Yet the students potential benefits and readiness, staff and curricula perceived benefits are worth further empirical investigation in the case of the environmental management.

Therefore, this project aims at developing an intelligent e learning tools and portal through which a course on environmental sustainability can be

	delivered. This can possibly be generalized to other courses of environmental management and training as well as courses in other disciplines.
Proposal Area	<p><u>Strategic Areas:</u></p> <p>Wireless and Cyber Security <input type="checkbox"/></p> <p>Electronics and Embedded Systems for ICT Applications <input type="checkbox"/></p> <p>ICT for Homeland Security <input type="checkbox"/></p> <p>ICT for Transportation <input type="checkbox"/></p> <p>ICT for Health <input type="checkbox"/></p> <p>ICT for Agriculture <input type="checkbox"/></p> <p>ICT for the Disabled <input type="checkbox"/></p> <p>ICT for Education <input type="checkbox"/></p> <p>ICT for Energy <input type="checkbox"/></p> <p><u>Technology-Trend Areas:</u></p> <p>Mobile Applications and Computing <input type="checkbox"/></p> <p>Cloud Computing <input type="checkbox"/></p> <p>Data Analytics and Big Data <input type="checkbox"/></p> <p>Internet of Things <input type="checkbox"/></p> <p>Gamification <input type="checkbox"/></p> <p>Cognitive Computing <input type="checkbox"/></p> <p>Smart Machines <input type="checkbox"/></p> <p>Blockchain <input type="checkbox"/></p> <p>Virtual and Augmented Reality <input type="checkbox"/></p>
<p>Technology Review</p> <p><i>This part should report the evolution of the topic and the current state-of-the-art. Set-up the historical evolution of your category. Define recent trends that make your solution possible show the importance of the proposal topic and its relevance to the ICT</i></p>	<p>Information technology (IT) is considered as one of the most fundamental forces for change in the all sectors of our lives (Alshurideh and Alkurdi, 2012; AL-Syaidh et al, 2015; Hajir et al., 2015; Shannak et al., 2012). Today many students want to learn online and in turn get degrees from worldwide colleges and universities, but still cannot go anywhere as they live in isolated areas without proper communication systems (Tarhini et al., 2014; Darawsheh et al., 2016). Consequently, many researchers encourage learning courses under the e-learning System as it saves time and energy of those students staying at any far off distant regions from the universities or colleges they have enrolled (Hubackova and Golkova, 2014; Alenezi et al., 2015). Indeed, e-learning adoption is increasing in most universities and institutions of higher</p>

<p><i>industry. Explain why your technology is novel and innovative, paying particular attention to the prior art.</i></p>	<p>learning all around the world. E-learning which is also known as web-based learning, is defined as the delivery of education in a flexible and easy way through the use of internet to support individual learning or organizational performance goals (Clark and Mayer, 2011, Maqableh et al., 2015). Furthermore, there are different kinds of e-learning system such as blackboard and second life. Both of blackboard and the second life systems are used for attended lecturers, do homework and so many services.</p> <p>For instance, the second life was launched by Linden Lab in 2003 for the public use. It is commonly used for educational trainings. The second life makes the students feel as them in the university because it uses 3D technique (Masa'deh et al., 2012; Alenezi and Shahi, 2015; Maqableh et al., 2015). The second life has a lot of benefits as people can attend classes at home, engaging in the entirely new forms of communication to interact with others, have an entirely new way to solve the problems that might not been possible to perform in the 'real world' scenario and offers range of opportunities for researchers because of collaboration and connection between the users. Alenezi and Shahi (2015) explained that the second life needs high speed internet connection and computer devices. So some poor countries maybe faced many difficulties to use it. The researchers argued that virtual world will be the most effective arm for universities in the near future to support all sorts of distance learning systems. Although there are many drawbacks in the second life applications but its benefits make it at par and attractive. In the current scenario, second life cannot replace traditional online e-learning systems completely.</p> <p>Initially, Smith (2009) stated that e-learning is among the most recent types of education systems that has been attracted the attention of the educators in the world. According to Arasteh et al. (2014), Draghici et al. (2014), and Mustea et al. (2014); e-learning is the method which allows people especially students to take courses form home or anywhere as he/she can access the internet, among other platforms such as peer-to-peer, clientserver, and web services. Moravec et al. (2015) mentioned that there are several studies which are looking at how e-learning tools affect the result of students such as Fatih Baris and Tosun (2013) who described the influence of using e-tools in the education process at the high school and concluded the positive influence of this tool on students. In addition, the e-learning platforms allowed users to access information</p>
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on the personal computers while mobile e-learning (M-learning) allowing users to access through mobile devices (Zamfiroiu and Sboru, 2014; Masa'deh et al., 2015; Almajali et al., 2016). Therefore, students could interact with their courses online via such technological platforms.

Currently, the eLearning industry is experiencing a revolution due to the recent advancements in technology. The introduction of new gadgets, innovative tools for trainers, and cutting-edge equipment has allowed us to create new e-Learning experiences that we could only dream about a decade ago. According to the Education Sector Factbook, eLearning has grown at a rapid average of 23% per year in the years 2013-2017. The present day's hottest technological trends play a major role both in influencing eLearning and offering brand new ways to share knowledge and deliver content. Let's take a look at these emerging technologies, and how they are taking eLearning to the next level.

Virtual Reality (VR) is a computer technology that utilizes Virtual Reality headsets or multi-projected environments, sometimes in conjunction with props or physical environments, in order to create realistic sounds, images, and other sensations that promote a user's physical presence in an imaginary or virtual environment.

Augmented Reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. This, also, includes real-world sensory input like video, graphics, or sound.

Artificial Intelligence is referred to the intelligence displayed by machines, as opposed to natural intelligence displayed by humans and animals. It is revolutionizing the whole eLearning experience due to the many advantages it has to offer. AI can help highlight areas that require improvement and assist students in focusing on areas where they are lagging.

According to Christopher Pappas, as stated in the article Big Data in eLearning: The Future of eLearning Industry, Big Data, in terms of the eLearning industry, is the data that is generated by learners while they are taking a training module or an eLearning course. For instance, if an employee is interacting with a training module based around company policies, their progress, social sharing, assessment results, and another

	<p>relevant data that is being generated throughout the eLearning course is referred to as "big data".</p> <p>Machine Learning is a field of computer science that gives computers the capacity to learn without being directly programmed. There is a range of benefits that Machine Learning can offer to online learners, as well as organizations that invest in LMS platforms.</p> <p>Wearable devices also referred to as wearables, are smart electronic devices that can be worn on the body as accessories or implants. These wearable devices can act as versatile corporate training tools since they have the capacity to deliver training experiences virtually anywhere. Wearable devices have the potential to take scenarios and simulations to the next level, which is why they can be used to make learning solutions much more interesting and comprehensible.</p>
<p>Gap Definition</p> <p><i>This section clearly defines the gap in current solutions/products that the proposed research will fill in and the available opportunities if this gap is bridged.</i></p>	<p>The functional applicability of Virtual Reality has made it an incredibly popular tech in eLearning. For now, potential applications in the fields of medical training and physics show the most promise. That said, what benefits can this exciting technology bring? First, VR can transmit students to the farthest corners of the universe in just a blink of an eye and surround them with an engaging and deeply educational environment. An improved motivation to learn is another key benefit. Students will no longer be stuck with pages upon pages of boring text, bullet points, and illustrations, but they will have a chance to actually go through the experience and get the most out of it instead. Virtual Reality holds great potential and is expected to go further beyond gaming, to include areas such as training and education, as well as VR films, sports, and music.</p> <p>When it comes to eLearning, Augmented Reality can make the learning process more interesting and easier to grasp. For instance, if you were an online instructor and your target subject was astronomy, you could offer your students a virtual tour of Mars without asking anyone to leave their home. The concept would also be excellent for research. Experts predict that the AR market could be worth \$200 billion by 2024, showing real potential for the future.</p> <p>Advanced AI models can solve many problems for the users in a more comprehensive way as compared to the typical classroom curriculum. Furthermore, the technology can also create more realistic experiences</p>

	<p>compared</p> <p>Big Data allows eLearning experts to understand how the users are digesting the information and which learning aspects appeal the most to them. In addition to that, it allows them to pinpoint learning interactions that should be fine-tuned within the eLearning module or course. Based on the learning patterns, eLearning experts can predict where learners may excel or struggle. This way, they can improve their eLearning courses so that the learners get a fair opportunity to accomplish the best possible outcome to traditional linear pre-programmed lessons and eLearning courses.</p> <p>Machine Learning has the ability to offer more custom eLearning solutions based on the learner's past performance and learning goals. Secondly, it enables efficient resource allocation since online learners receive the exact eLearning resources they require in order to fill knowledge gaps and accomplish their learning goals.</p>
<p>Proof-of-Concept</p> <p><i>A very important part of the pre-proposal is a clear description of the status quo of the current research of the Principle Investigator (PI), which serves as the starting point of the project. This section may be used to present relevant results from work published by the applicants, a patent owned by the applicants, or promising preliminary results of the proposed research or methodology.</i></p> <p><i>Details of the technical approaches adopted to</i></p>	<p>Prof. Dr. Hazem El-Gendy (The PI) has many International Publications in the area of Intelligent Networks and the Integration of both the Voice/telephony networks and the Data/computer networks. He has also contributed tens of proposals to the International Standards in these areas such as ECMA (European Computer Manufactures Association), ANSI (American National Standards Institute) and TSS/ITU (Telecommunications Standardizations Section/International Telecommunications Union). He Chaired multiple of such meetings as well as International Conferences in these areas. He invited multiple ICT-based Applications. Nevertheless, Prof. Dr. Hazem El-Gendy has both an academic experience and Industrial Experience working for multinational corporations such BT (British Telecom) and BNR (Bell-Northern Research). He has also experience working on Business Informatics and the EU Tempus / Erasmus + Projects.</p>

obtain such results.	
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Egyptian Company Profile

Your Company Profile

(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)

Business Sector	Software Development
Company mission or core functions	An Egyptian software house that develops solutions for; healthcare, industrial sector, financial apps, and tailored solutions; National projects and portals serving millions of people every year.
Date of establishment	1983 Please, refer to http://dmsegypt.net/
Ownership (if public and traded, add stock exchange and ticker symbol)	Private Owned Company
Total number of employees	200 Employees in Egypt, Saudi Arabia, and Lebanon.
Number of employees in R&D	+25
Key products sold or services provided	<p><u>Healthcare</u></p> <p>Provide the most compliant and secure environment for the transfer of protected health information. Improve ROI workflow efficiency and streamline medical exchange information processes.</p> <p><u>Industrial Sector</u></p> <p>Is a leading industrial package that effectively handles all requirements of businesses and industrial corporations.</p> <p><u>Financial</u></p>

	<p>The financial part of your global business is handled through providing our customer with real time view of data and processes.</p> <p><u>Services & Tools</u></p> <p>Tailored Solutions DMS tailored almost every single one of its solutions with integration to satisfy extremely specific requirements demanded by the different industries.</p>
Company core technical competences	Accumulated Experience in different technical aspects; Software development with Java, .Net, Python, ...
Key R&D programs and activities	<p>POCs for newly adopted technologies.</p> <p>Software tools.</p> <p>Product enhancement.</p>
Examples of accomplishments and clients	<p>Egyptian Ministry of Health:</p> <ul style="list-style-type: none"> - Treatment on state expense portal; serving millions of Egyptians a year. Since 2008, and redevelopment contract awarded 2018. - Supply chain management for Egyptian Pharmaceutical Affairs.[2017] - Patient Waiting List Management Portal. [2019]
Company strategic orientation	Award and Maintain national scale project in Egypt and spreading towards South Africa.

Potential Spanish Partners

Partner of Interest

(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)

Profile of ideal technology partner	Corporation specialized in E-Learning Tools and systems and Educational tools.
Core technological competencies and expertise	E-Learning Tools and systems and Educational tools.
Other essential qualifications (e.g.: ownership, track records etc.)	Market share in various EU Countries
A list of possible beneficiary governmental agencies can be listed, explaining how they will benefit from the project output.	Erasmus + will benefit directly by having tools that aid in significant reductions in cost and enhancements in effectiveness and productivity.
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	
Please explain in details the reasons behind the need to have a Spanish company in the project and what technologies, research, ...etc they can provide that the Egyptian company cannot provide	E-learning technologies and cloud computing technologies.
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	
Interested areas of collaboration	e-learning technology and use of cloud computing technology.
Specific R&D contribution you are seeking/offering <i>Please indicate the research needed to overcome the problems or achieve opportunities.</i>	Development of systems for the application particularly over a cloud.