



## ICT in Malta – The next ten years

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A RELATIVE WHOM I recently met at a wedding reception told me that her son wanted to take ICT at the University. She told me that she was worried that the ICT industry was becoming saturated with graduates and she expressed concern that her son might not find a good job. My reply was that she should definitely encourage her son to read ICT at the University and that she need not worry about his job prospects. I explained that her fears were unfounded and that the ICT industry in Malta has a bright and prosperous future.

Malta, like many other semi-developed countries, needs to reindustrialize and modernize its economy. For too long we have depended on low-cost manufacturing of goods such as textiles. These industries employ a lot of people but depend on low wages in order to be competitive. If our standard of living is to improve substantially, we have to move to goods and services that have much higher added value. Taking the lead of the United Kingdom, we must make the move to service-based industries such as financial services and ICT services such as software development, data warehousing, etc. There are some encouraging signs in this regard. A number of foreign, mostly British and German, companies have successfully set up software development houses in Malta and this trend is set to continue now that Malta is a member of the European Union. I have always believed that Malta can become the 'Silicon Valley' of Europe if the right planning, investment and commitment are made in the nation's ICT Industry. Malta has many benefits for the foreign investor: the climate, geographic position, air links to all major European cities, a well-educated and English-speaking workforce and good telecommunications infrastructure. With due improvement to Internet infrastructure, Malta will be an ideal place for software companies to base their development houses. I also strongly believe that we should invest money in setting up European centers of excellence in areas such as ICT security, natural language processing, machine translation and perhaps even bioinformatics. Almost exactly four years ago, the EU leaders declared that they want to make the European Union the most dynamic, knowledge-based economy in the world by the year 2010. Malta actually has a head-start over other European countries in this regard. A recent WEF report ranked Malta higher than some major European countries in areas such as financial services and the information society. However we got poor marks for innovation, research and development. Obtaining funds for research and development has always been very problematic. Malta should succeed because of, rather than in spite of, its small size. The Maltese people are dynamic, hard-working and very adaptable. We should not lose such an opportunity to excel in the new united Europe. With wise investment and planning the ICT industry will expand and will easily provide well-paid employment for all the ICT graduates from the University of Malta for years to come. One must point out, however, that if the local ICT industry does not expand and develop, the small local market will eventually become saturated. This will mean our ICT graduates will have no choice but to turn to the EU for employment.

ICT is changing very rapidly - technologies constantly evolve and new ones emerge all the time. In the next ten years we are going to see the introduction and adoption of a number of new and exciting technologies. TCP/IP Version 6 (IPv6), for example, will eliminate the need to configure a PC manually for network access. It will allow for fast and efficient routing and for session maintenance when roaming, enabling a PC or laptop to be moved around from one building to another whilst the network

session is automatically maintained. Retailing will also be revolutionized. RFIDs (Radio Frequency IDs) will replace barcodes on products. The RFID will take the form of a tiny chip embedded in the label of all products. The RFID will emit a signal that is captured by special sensors on point-of-sale systems. The signal will contain all information about the product such as description, price, date of manufacture, expiry dates, etc. Appliances such as fridges and freezers will become RFID compliant and will inform the user when a food item is due to expire. The PC as we know it will change drastically. By 2010 we expect PCs to run at 15-20 GHz and have terabytes of memory and hard disk space. New operating systems, such as Microsoft's Longhorn, will provide users will new, intuitive, interfaces that help users organize and search such vast memory stores. The world of the future is a connected world. All devices and appliances will talk to each other. We will be able to control the TV with our mobile phone, start the microwave at home from our work place, again using our mobile phone and order cinema tickets and make restaurant booking directly from our mobile phone or PDA.

All of these novelties present exciting challenges to our present and future ICT graduates. Malta must have a dynamic and healthy ICT industry that is capable of taking the opportunities available in the EU and international markets. If the ICT industry is to survive, local ICT companies cannot just aim their products and services at the small and restricted local market. Our ICT industry must be able to compete and excel, in the huge, completely liberalized EU market.

The Department of Computer Science and A.I., to which I belong, is aware of the challenges and opportunities that lie ahead. We are all looking forward to a very exciting decade ahead. In order to meet these challenges and exploit these opportunities, we constantly change the courses we teach and offer new ones in order to ensure that our students are exposed to the latest concepts and technologies. One must emphasize however, that we are very much aware of our position and obligations, as a department in an academic institution. Some in industry have sometimes criticized the University of Malta for not teaching a course in a particular programming language or some other specific technology in our ICT degree programs. We must never forget that the University of Malta is a university and not a polytechnic or technical institute. Our main focus is to teach the theory and concepts of each area in ICT and not to concentrate on a particular technology. These so-called 'vocational' courses are best left to technical institutes. We maintain that once a student is exposed to the theory and concepts of a particular area, s/he should have no problem in becoming familiar with the different technologies that implement those concepts. We only have one university in Malta. In the UK, for instance, some universities concentrate mainly on theory and research while other, mostly ex-polytechnics, offer 'vocational', industry-oriented, degrees. We do not have such luxury. In our ICT degree programs we have to cater not only for students who want careers in industry but also for students who want to do postgraduate studies and research. We realize that, in order to produce 'marketable' graduates we must ensure that our graduates are not only well versed in theory and concepts but also have certain industry-oriented skills. In this regard we have initiated two programs that allow students to obtain industry certifications from Microsoft and Cisco. The courses are held in the evening and lead to sought-after, industry-recognized, certifications. This will ensure that our graduates will, as it were, have the best of both worlds – a good ICT degree and a recognized industry certification.

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