

E-Commerce new Trends: Virtual Design Support Center (VDSC)

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Abstract:

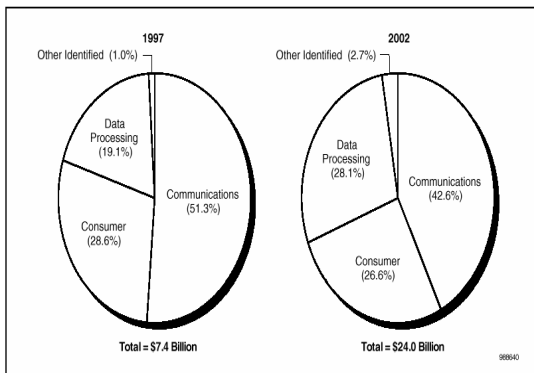
Learning on-line is one of the fastest moving trends in higher education as engineers and executives in technology industries are discovering. Today, thanks to the widespread access to the Internet, on-line education is enabling professional for continues learning and keeping pace with technological and managerial changes despite their heavy schedule. In this paper we will discuss the importance of E-learning in electronics technology as well as the need for the Virtual Design Support Center.

Introduction

The electronics industry has surpassed the steel and automotive industries in the USA and Japan in terms of both revenue and employment generation. By the year 2000, the worldwide electronics industry is expected to have a total turnover more than \$1000 Billion. During the last ten years the output of the semiconductor industry is expected to grow from \$60 Billion to \$200 Billion.

The increasing persuasiveness of the electronics industry is being manifested not only in the developed economies of the USA, Europe and Japan. This also appears in the growing markets of the newly industrialized countries like Taiwan, South Korea and Singapore as well as the developing world as China, India, Malaysia, Thailand and Indonesia.

Fig.(1) – Estimated Worldwide Soc Consumption by Application Group



Source: Dataquest (December 1998)

Today, electronics industry has the highest growth amongst other industries, annual growth rate of more than 8%. The major players today are USA (35%), Japan (26%), Europe (26%) and Pacific Rim (13%). The major market segments are Data processing (Computers, Peripherals and networks), Telecommunication, Consumer, Industrial, Military and Automotive. Telecommunication (Fig.1) is the most evolving sector where it has more than 30% annual growth rate.

During the last decade, several developing countries (e.g. Arab Countries) have conducted successful economic reform based on privatization, free trade and simplification of legislation and procedures. This reform has paved the way for industrial development movements aimed at sustaining economical growth and fulfillment of the needs of the society.

The electronics industry in most of these countries currently relies on imported know-how and kit assembly. Consumer electronics represents the major part of this industrial sector whereas communication equipment ranks second followed by medical applications, electronic components and others. In general, the total volume of the local electronics markets in these countries significantly exceeds their production capabilities. A crucial element in developing the industrial sector in any of these countries lies in:

- Providing assistance to private sector and specially Small and Medium Enterprises (SMEs).
- Focus on high value-added industries like electronics.
- Preparation and continuous development of human resources to cope with high-tech and open market demands and constraints.

Regarding the last point –Human Resources- and according to Figure (2) below, we can notice that the main problem facing the electronics industry right now is what we call The Productivity Gap.

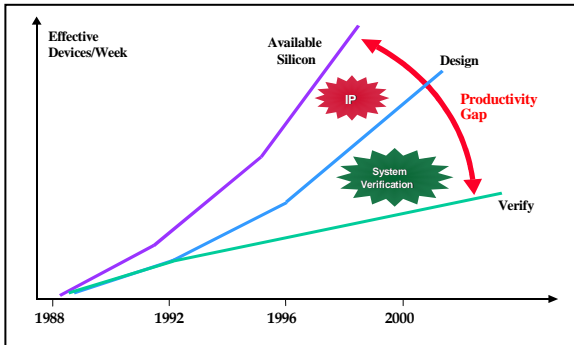


Fig.(2) - The Productivity gap

The productivity gap mainly occurred because of the tremendous increase and improvements in electronics industry and technology along with the lack of the qualified, Well-trained Human Resources.

To minimize this gap, the only solution was to export these qualified Human resources. And here we can see the tremendous role of establishing a specialized electronics Training centers. We have very well educated engineers, graduated from universities and they only need to be adopted by such centers to transfer the up-to-date technology and know-how to them, then we can export them to these countries that suffer from the lack in the Human Resources. That will lead us to have a strong base of electronics engineers and expertise that we can use to build our electronics industry in our region where the establishment of a local electronics industry in our region is of a strategic importance.

Virtual Design Support Center (VDSC)

The establishment of a local electronics in our region is of strategic important. A natural consequence of this is the creation of a local semiconductor industry. This linkage can be understood better when one considers that electronic system are increasingly getting captured on a single integrated circuit (Chip). The semiconductor industry is the crude oil for information based society, and if the Arab countries want to secure its portion in this new society, the time to start is now.

In most countries where the electronics industry is well developed, there exist what is called

“Electronics Design Support Centers”. These centers usually act as technology transfer nodes helping the local electronics industry to bridge the knowledge and technology gap facing them. Such centers provide several kinds of services to electronics companies. Most of these services are intended to help the companies increase the local design content in their products thus increasing their added value.

In most cases, Design Support Centers are initially established and funded by governments in order to support the industrial strategy however, with time, these centers succeed to be self sustained to a certain level.

The proposed design support center is intended to help the electronics industry in the developing countries, to innovate and improve its products to attain the ultimate goal of penetrating the international market. In order to achieve this objective, the design support center will act as a technology transfer node providing the industry with the following services: Training (modern design methodology, management, business and marketing); Consultation (project assessment, market survey, technical consultation for local and international); Technical Support (sub-contacts executing, virtual component and IP) and Incubator (start-up project and pioneers idea).

E-Commerce lets companies integrate internal and external business process through information and telecommunication technologies. E-Commerce lets business reduce costs, attain generate market reach and develop closer partner ships. There are many applications and different business executed today based on the E-Commerce concept.

Mentor Graphics Corporate (MGC) was the leader of the EDA (Electronic Design Automation) companies in applying E-Commerce concept and strategy in selling its tools and IP. Today MGC is building the E-Learning as well as E-Training concept on the Internet. E-Learning is one of the fastest moving trends in Higher education for engineering and higher executives. With the advanced technology of telecommunication and computer the E-Learning is today the most attractive business in technology.

Based on the E-Learning and E-training concept, today we do like to include the E-design or the Virtual design. Expanding the concept of the EDSC on the Internet will enable different countries to increase the number of highly skilled engineers, open more channel for local business as well as for the international market. We do like to establish such centers in the Arab region in cooperation with Universities and industry organization. Of course these types of centers again must be funded from the government at least for the first stage.

Established such project will help to reach the following goals:

- Fuel economic development
- Build intellectual capital and capacity
- Establish Infrastructure for learning, training and design
- Develop local expertise and skills
- Maximize the Return of Investment (ROI)

VDSC Components

The main component of such center are :

- Adanced Training Center (ATC)
- Technology Support Center (TSC)
- Virtual Component Center (VCC)

(1) The Advanced Training Center (ATC)

Electronics manufacturing technologies and consequently design methodology change very fast making it very difficult for companies to cope with continuous change. In particular, SMEs cannot afford to invest in the development and preparation of human resources that can use modern design tools and methodologies to address the current demands of the international market. The proposed center will be capable to fulfill these demands of human resources development by providing training programs to both engineers and technicians working in these SMEs.

The proposed center will organize training courses on modern design tools addressing a variety of electronics manufacturing technologies and applications. In specific, the proposed center should encompass the following domains:

- EDA software development methodology (development cycle, quality and testing).
- Electronic design methodology (FPGA, PCB and ASIC).
- Advanced System on Chip (SoC) design and application.
- Advanced System on Board (SoB) design and applications.
- Advanced IP design and Embedded Systems applications

Training programs will vary from tailored programs to suit specific needs to standard programs covering design tools and methodologies. In addition to the above technical subjects, the training and design support center should also cover the following training:

- Management.
- Quality.
- Marketing and marketing communications.
- Business planning.

(2) The Technology Support Center (TSC)

Brain ware is the basic ingredient for electronics design and production activities. In many cases, an economically viable project may not be implemented due to the lack sufficient funds to finance the procurement of adequate resources. These resources include design tools (HW and SW), testing equipment, communications infrastructure as well as administrative and marketing resources. The idea of incubating start-up projects has been adopted in several countries. It is based on providing the favorable environment for projects which prove to have a high potential for success till they become independent.

The TSC can provide incubators to host a limited number of projects at a given time. These projects should be technically and financially evaluated before being accepted in the incubation program.

The proposed center will also provide consultation services to help start-up enterprises as well as established companies in the following areas:

- Setting up new design and testing facilities.
- Project assessment.
- Market surveys and analysis.
- Technical consultation.
- Providing links to the international companies in the field of microelectronics.

- Constructing a network of consultants within and outside Country.

Technical support involves a higher level of technical assistance than technical consultation. This involves, among many others, the following services:

- Joint implementation of design projects with start-up companies in their early stages
- Carrying out parts of specific design projects for established companies lacking specific expertise or lacking sufficient human resources.
- Testing of implemented prototypes

(3) The Virtual Component Center (VCC)

As we described before Intellectual Property (IP) or Virtual Component (VC) development is part of the solution for the Productivity Gap. Based on the output from the two centers ATC and TSC we can get highly skilled resources that we may be able to use it for the development of IP or VC. Today the IP market is growing due to the proper business model exist as well as the technology evolving that needs Design Reuse as well as IP components. The following table summarizes the market share in 1999.

Company	1998	1999	Growth %	Share %
ARM	59.1	88.5	50	21.2
MIPS	54	77.2	43	18.5
RAMBUS	39.3	45.3	15	10.9
Mentor Graphics	33.1	31.7	-4	7.6
Synopsys	24.2	24.5	1	5.9
InSilicon	11.8	19.3	63	4.6
DSP Group	14.6	19	30	4.6
Artisan	15.6	17.3	11	4.1
Sican	4.2	6.9	64	1.7
SSL	4.6	5.7	25	1.4
Others	46	82	77.7	10.2
Total	306	417	36.2	

The different market studies on the IP highlight the continuous domination of the microprocessor growth which is about 51% of the market. Consumer application led closely followed by communication. In that market USA user is the largest one but the European market is growing faster. Based on a study made last year, there was a question: Can E-Business help IP market?. Taking into consideration the following:

- IP is intangible product like the software
- We can search for the right product electronically
- It can be marketed, delivered and paid electronically

So, the answer was yes, IP should be an ideal E-business product. The aim of the VCC to give the proper infrastructure as well as the technical support to develop different types of IP or VC. Also provide the necessary E-business environment to publish the IP as well as give the possibility for evaluation as well as possible design usage.

Conclusion

In this paper we described the potential for the Arab countries to get into the high technology market as a leader and not as a follower. The VDSC described here will not only support the skilled human resource development but also will provide mechanisms for SME to grow and participate on the evolution of the electronics industry in our region. Also the VC or IP development can be a winning part to share on the modern design methodology. Based on the experience already exist on both USA and Europe, the electronics design represents 33% of the added value of any Electronic product. We have in our region talented engineers can be part of our future economic growth. The success of these type of VDSC will bring the success in our region not only at the economic level but also on the strategic level and the right role we can play today in that evolving market.

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