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SUMMARY OF THE DOCTORAL THESIS

MANAGEMENT AND COMMUNICATION IN ECONOMIC ENGINEERING IN THE EUROPEAN SYSTEM OF ENSURING QUALITY IN HIGHER EDUCATION

CASE STUDY: MANAGEMENT AND COMMUNICATION IN ENGINEERING

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KEY WORDS:

- National economies;
- Market;
- The role of the state;
- Macroeconomic performances;

- NDP;
- The business cycle;
- Fiscal, monetary, energetic and industrial policies.
- Work relations and production;
- Relations between technical, economic, international relations and communications disciplines;
- Globalization;
- Economic engineering;
- Business;
- Communication;

INTRODUCTION

Economic development, understood as a manifestation of economic growth, requires a set of quantitative, structural and qualitative transformations in economy, scientific research and manufacturing technologies, in the operating mechanisms and organizational structures of the economy and society as a whole, in the mentality and behavior of people.

One of the categories of the new economic growth theories is that which focuses on the role of a particular growth factor – namely **human capital, the knowledge in the research and development process** - in increasing the productivity of all other production factors and not on any externality specifically associated with capital accumulation. "The respective factor is, by itself, subject to an external increase of proportional profitability."

Many organizational development projects relating to business involve complex plans related to the structure and culture of the organization changed; they are followed by the implementation of elaborate programs designed to train people on new procedures and to change their attitudes. The latter attempt is a very difficult, if not impossible task, given the objectives set by the European Union through the Lisbon Strategy and the Bologna Process, whose goal is that of reforming the higher education system so that it would become more flexible, coherent and open to the needs of a society that should be able to meet the challenges of globalization and the need for training and reforming the European labor force.

In this context, taking into account the fact that in Romania the National Framework of Qualifications in Higher Education (NQFHE) has been set up as a single instrument for establishing a qualifications framework and providing national recognition, as well as international compatibility and comparability of qualifications acquired in the higher education system, and that, by its means, the learning outcomes acquired in the higher education system (licentiate, master and doctoral study cycles) are recognized, measured, and related, while it also ensures the coherence of qualifications and certified titles, by this doctoral thesis, entitled MANAGEMENT AND COMMUNICATION IN ECONOMIC ENGINEERING IN THE EUROPEAN SYSTEM OF ENSURING

QUALITY IN HIGHER EDUCATION, we intend to establish the set of relationships existing in the economic environment, in order to increase the degree of improvement, evaluation and certification of managerial activity quality, and in connection to this, to improve the education with managerial character in economic engineering; at the same time to promote economic engineering education as form of interdisciplinary education of managerial nature; and last but not least to promote the profession (occupation) of economist engineer.

The fundamental aim of our approach is to increase the degree of improvement, evaluation and certification of management activity quality, and in relation to this, to improve the education with managerial character in all its forms. We also attempt to promote the economic engineering educational domain as a form of interdisciplinary learning, of managerial nature, and the profession (occupation) of economist engineer.
To achieve this goal, we believe that the following several objectives should be accomplished:
- establishing a set of relationships among economic environments, universities and research institutions that are concerned with management practices, in order to facilitate a mutually advantageous professional dialogue in the field of management;

- organizing activities such as: master's programs, training sessions, consulting services, research, technology transfer, auditing, postgraduate training courses etc, leading to the formation and development of a management culture, to the improvement of the managerial act, so as it might increase the competitiveness of enterprises;

- promoting excellence in management activities and developing economic engineering;

- initiating and developing links with professional organizations, in the country and abroad, which have similar or converging activities and objectives.

Our concrete application is part of this commitment, through which we have established a research hypothesis, namely: "The independent variable X" - RELATIONS AMONG

TECHNICAL DISCIPLINES, ECONOMIC DISCIPLINES, INTERNATIONAL RELATIONS AND COMMUNICATION, causing "the dependent variable Y – THE ACQUISITION OF KNOWLEDGE, SKILLS, respectively COMPETENCES in the master's program specialization MANAGEMENT AND COMMUNICATION IN ECONOMIC ENGINEERING, in accordance with the NQFHE - National Framework of Qualifications in Higher Education, so that other main objectives may represent challenges for other research hypotheses in different fields.

We intend to make an analysis of management in economy, of economic engineering in business, of business communication and present a case study that will focus on the following approaches:

• National economies;
• The administration (management) of economy;
• Globalization;
• Economic engineering in business;
• Economy and business;
• The role of communication in starting and running a business.
• Case study: The Master's Degree Program: Management and Communication Engineering, University of Oradea, Faculty of Electrical Engineering and Information Technology, the Department of Engineering and Management.

In this approach we intend to overcome the limits of engineering disciplines and their discourse, distancing ourselves from the familiar space. The process of research on communication and management in economic engineering remains nevertheless within the strict limits of the engineering disciplines. We must acknowledge the contribution of economic disciplines, international relations and communication in this research process. It is precisely those experiences that we have to reach and that enrich our own disciplinary training. This does not mean that the researcher should be "interdisciplinary", pro-active, but that, getting beyond the limits of engineering disciplines, one is often impelled to reassess pre-established premises – a good practice in scientific work and a

form of defense in relation to the danger of limiting oneself within strictly engineering disciplines.

The **thesis** traces the relations between technical disciplines and the management of the economy, in order to provide knowledge, skills and competencies that are in accordance with NQFHE – National Framework of Qualifications in Higher Education, with the view of attracting graduates towards the ever-changing labor market, increasing the degree of improvement, evaluation and certification of managerial activity quality, and in relation to this, improving the educational activities related to management in all their forms, as well as economic engineering as form of interdisciplinary learning of managerial nature, and promoting the profession (occupation) of economist engineer.

THE MAIN MODERN NATIONAL ECONOMIES

The first chapter, entitled **National Economies**, will seek to demonstrate that the organization of national economies is based on modifications over time, as a result of changing social, political and technological developments, since the global economy is dominated by free-market democracies, which are the modern microeconomies, and on the role of the state, in order to establish a set of relationships between knowledge, skills and competences of economist engineers, generated during the initial (first cycle) of education by means of technical, economic, management and communication-related subjects; we aim to promote the specializations associated with the economic engineering education, by clearly defining the role and the place of the economist engineer, mainly but not exclusively in the Romanian economy, with the view of protecting this specific title, certification and occupation. We are confident that we can develop a Master of Science degree program that includes, in the structure of its curriculum, disciplines, and didactic or research activities themes that address the issues presented in this chapter.

The scientific approach to the study of national economies, by the economist engineers attending the program of Master's studies in management and communication in economic engineering will be presented in three stages:

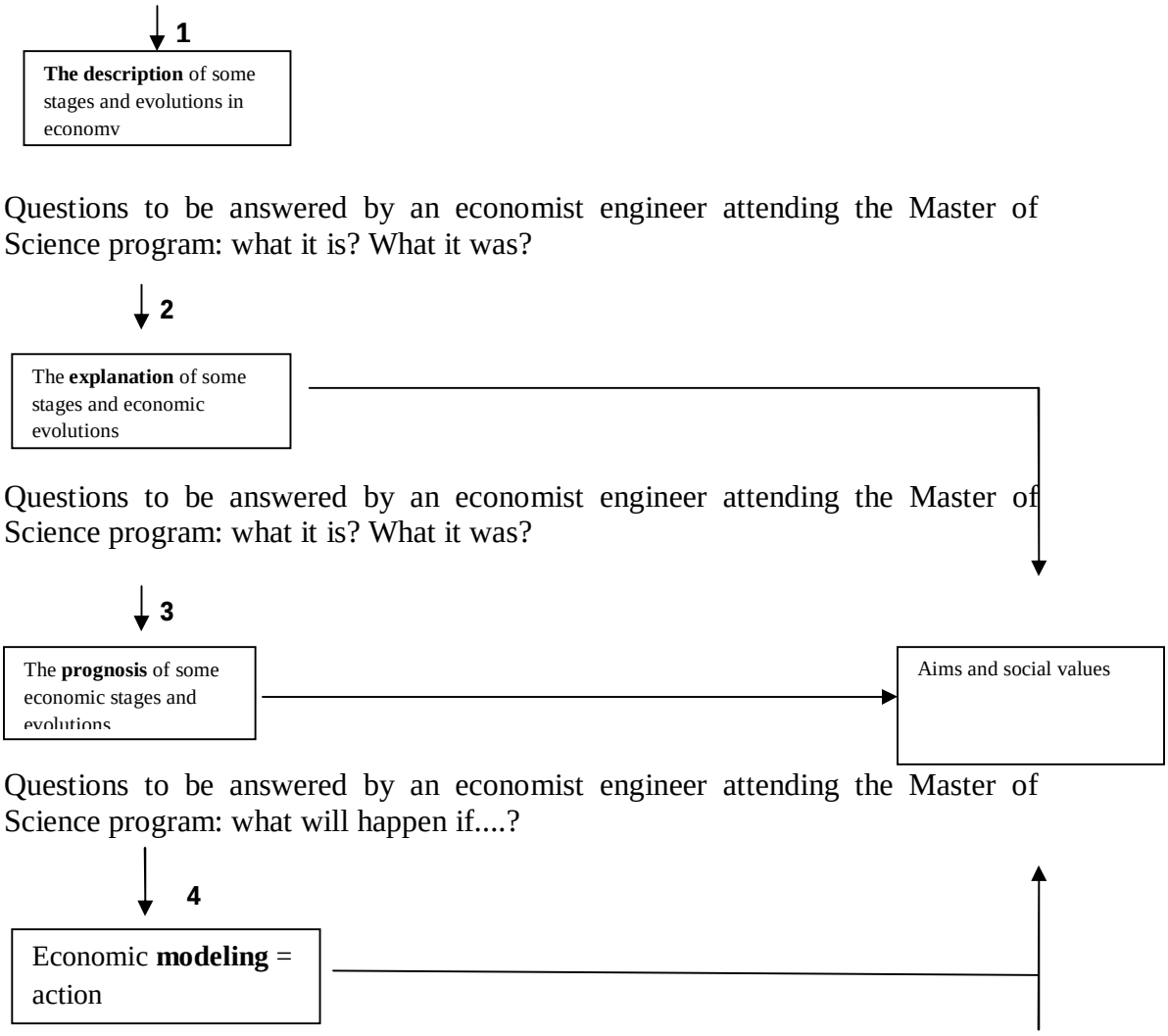
a) Basic tasks (objectives) related to the study of the national economy;

b) The subjects associated to the study of national economy;

c) The areas of research in the study of the national economy.

We believe these steps would lead to the detection of relations existing between the organization of national economies and the competences of economist engineers, generated by their initial training, and implicitly to the attainment of the main objective of the first report of this thesis.

a) Basic tasks (objectives) related to the study of the national economy;



Questions to be answered by an economist engineer attending the Master of Science program: what means would contribute to the achievement of certain objectives?

Source: Cristian Niculescu – Introducere în economie: defini□ii principii, scheme, (Introduction in Economy: definitions, principles, charts), Niculescu Publishing House, Bucharest, 2007, p.45

Fig. 1. Basic tasks (objectives) in the study of national economy

Experts unanimously agree that, in a market economy, economic activity is carried out without interference from the government or with very limited intervention. The phrase laissez-faire (in French: "let them work") was chosen to describe the government's attitude towards business people, workers and consumers in an entirely free market economy.

In all planned economies, the government makes decisions on production and distribution of goods and services, usually through a large bureaucratic organization and planning. A key feature is the state ownership of all buildings and equipment used in producing goods and services. The government establishes the role of individuals in the production process. There is little or no private property and individual freedom is restricted.

Mixed economies, combining aspects of a pure market economy with those of a planned economy, are to be found everywhere in the world. Citizens who live in a mixed economy enjoy certain freedoms: they are allowed to hold property over land, to travel, to buy and sell goods and services, to hire and fire, to organize business and join unions. The government takes an active role in economy by subsidizing certain industries, such as transport. People preserve autonomy over their finances, but must contribute to the general welfare. The government also adopts laws and regulations that protect citizens.

During its leadership over the Eastern block, the USSR imposed an economy planned at the centre, coupled with limited individual freedom, which was influenced by many government decisions. The Soviet economy was led and organized by the Gosplan State Planning Committee, which coordinated the "five year plans" to increase production. The five-year plans called for a forced industrialization, having unrealistic production goals. The state-planning system was reorganized in 1985 by Mikhail Gorbachev, through perestroika ("restructuring"). Although some capitalist-type reforms have been initiated, such as the private planning of factories, entrepreneurial opportunities remained limited for the individual. By 1990, the Soviet government had lost control over the economy and, in the absence of functional free market mechanisms, it collapsed. It was one of the factors which led, eventually, to the disintegration of the Soviet Union in 1991.

Western market economies of the mixed type developed in response to economic shocks and under the influence of Keynes. The institutions that were created allowed these economies to avoid the devastating consequences of mass unemployment and inflation.

In postwar Europe, the German economic miracle, which is due, to a large extent, to the development of social market economy, came to influence other European countries, which implemented their own systems. Germany's social market economy, initiated after the defeat of the Nazi totalitarian ideology and the destruction of a significant part of the economic infrastructure of Germany during the Second World War, West German Federal Republic needed an economic system compatible with a democratic constitution. The German economist Alfred Müller-Armack defined, in 1947, the principles of social market economy.

Today we talk about the concept of sustainable development, defined as "the ability to meet the needs of the present generation without compromising the chance of future generations to meet their own needs."

ECONOMIC MANAGEMENT

The second chapter, entitled **The Administration (Management) of the Economy**, discusses key issues arising in relation to economic management, by addressing the analysis of macroeconomic performance, the components of GDP as the scoreboard of the economy, the policies concerning the options for development and stability, which condition employment, the role of governments and central banks in managing the monetary Fund and interest rates in the economy, the energy policy, industrial policy, labor relations and production, social services, which will establish a set of relationships among knowledge, skills and competencies that are provided to Master of Science students in the field of management and communication in economic engineering. These skills will provide graduates the opportunity to establish relationships with the economic environment, universities and research institutions with managerial concerns, to facilitate the professional dialogue in the field of management. They may promote the specializations associated with economic engineering education by clearly fulfilling the attributions held by economist engineers in economy. They may contribute to developing guidelines aimed at the development of economic engineering education through contacts and consultations with certain associations, with the view of improving the structure of curricula, disciplines, and teaching or/and research activities. Also, graduates of master's degree in management and communication in engineering can organize activities such as: training, consultancy, research, technology transfer, auditing, training courses, etc., leading to the formation and development of managerial culture, the improvement of the managerial act, in order to increase the competitiveness of enterprises in which they work. They can promote excellence in management

activities and in economic engineering training. In this sense, they can develop assessment and certification activities, and disseminate their positive results.

As generally acknowledged, governments, businesses and private entrepreneurs should be aware of the economic performance in order to make decisions on policy, investment and consumption. GDP, rising inflation, unemployment and interest rates are four widely used indicators, which measure economic development. Economists, governments and businesses closely monitor these indicators, making economic forecasts, starting from current trends.

A tool used extensively in studying economic activity is represented by economic models, respectively the technique of modeling economic activity, "by economic model one referring to the conventional, simplified image of the area to be investigated, according to the objective pursued." Economists have developed the circular flow model in order to represent the macroeconomy. This illustrates how economic activity produces flows of both goods and services, as well as cash flows. The circular flow model for a national economy can be represented as consisting of households and firms.

Governments adopt policies that condition employment, in order to keep inflation under control and ensure sustainable development in the context of changing economic circumstances; monetary and fiscal policies have the same objective.

Fiscal policy deals with the way a government collects revenue to finance expenditure. Monetary policy determines how the government influences the treasury and central bank money in circulation and the level of interest rates in the economy. Fiscal policy is a conception of the state, as well as a series of measures and actions concerning the role of tax revenues in the system, types of taxes, their collection and use as a tool to stimulate economic growth, the way the fiscal effectiveness is perceived in that particular country. It consists of a set of

government decisions that are intended to influence economic activity and social mobility through public revenues and expenditures.

The more and more obvious global economic interdependence has emphasized the impact of a nation’s economy upon world economy. We should take notice of the fact that we live in a world that tends to develop globalized economic relations in a rapidly changing environment, where balance is restored, new security structures appear, and presents a new framework for economic competition, in which the place of each country tends to be determined by its domestic capital strength, by the dynamism of the internal market and resource accumulation efficiency, by the system of interdependence in which it is integrated. The global economy, in the true sense of the word, is a standardized theoretical vision of a regulated structure, of the harmonization observed in the freedom of movement, of a strengthened social finality of the economy so as performance may be achieved, given the conditions of some progressive cohesion standards in the whole world. "Today, both in theory and in practice, there are three models of economic and social development, which confront with the tendencies of globalization: the American (Anglo-Saxon) neoliberal model, the European model and the Asian model. "

The central bank, by administrating the monetary fund and managing interest rates in an economy, aims to keep inflation under control and promote sustainable economic development. In our view, the central bank is independent of governments, applying different policies to stabilize fluctuations in the economy of a country.

Oil remains, in the XXI century as well, the most important source of energy. The consequences of this are numerous and range from negative environmental impacts to the positive, economic ones. Literature in the field indicates that approximately 40% of world oil production comes from countries of the Middle East and Africa, which together with Venezuela form the Organization of

Petroleum Exporting Countries (OPEC), founded in 1960. It is based in Vienna, Austria. The organization currently includes 12 members that ensure, together, 35% percent of world production. "OPEC was founded at the initiative of the main oil producing countries who wanted to preserve and increase their revenue by strengthening their bargaining power by a dominant group of oil companies. OPEC was observed in October 1973, during the Yom Kippur War. OPEC members have used oil as a political weapon in the conflict between the Arab world and Israel. Since then, the oil market reacted to the crisis in the Middle East and the Gulf. "

Politicians around the world realize that the intense use of oil as main energy source, resulting in harmful emissions of carbon dioxide, has a negative impact upon the environment, causing climate change and global warming.

Government policies on industry vary depending on the tradition, national culture, economic development and degree of industrial maturity. Businesses are the source of prosperity in an economy. Governments shall take measures to support important business to promote economic development and to adapt to the changes that occur imminently. Measures aimed at influencing production are part of the industry policy and are frequently directed towards a specific sector.

We consider the regulation of markets, aimed at ensuring their stable functioning, to be an important aspect of industrial policy. Take for example, U.S. antitrust law, which includes provisions according to which it is illegal for companies in the same industry to reach a certain agreement on prices, which would harm consumers by raising prices beyond the limit they could not go beyond on a competitive market.

Sometimes, government policies are conducive, so as to protect from competition some key industries. For decades, the German government has subsidized its huge coal exploitation industry. Coal was very important for Germany in the first half

of the twentieth century, but later it has not managed to cope with more efficient international competitors and other forms of energy. A grant of this type is useful only if it is temporary and is accompanied by readjustment measures of the sectors affected.

In the early twenty-first century globalization confronts industrial policy. International agreements aimed at opening markets and fostering trade are increasingly incompatible with industrial policies designed to protect production in the face of foreign competition. There are however some exceptions, including agriculture, military and parts of the entertainment.

So as the relationships between employees, which represents labor, and employers, who are offering jobs, would be fair, a regulatory framework is needed. Paid work is of great social importance. It is the principal means by which people receive income in order to buy goods and services they need, to save and secure their retirement period. Beyond its economic importance, the work of a person largely defines its social status and ensures the achievement of individual capacity. Companies rely on people with a strong professional background, in order to produce goods and services.

At the beginning of 21st century, the rapid development of intercontinental transport, of the Internet and other communication networks, alongside the removal of barriers to trade, had a positive effect on overall economic development. Keeping pace with change, modern economies are based on knowledge rather than on raw materials or physical labor.

FROM NATIONAL ECONOMIES TO THE GLOBAL ECONOMY

In the third chapter of this work, entitled **Globalization**, we analyze the relationship among the quick technological progress (which has contributed to the rapid expansion of world trade and allowed the separate placement of manufacturing processes in different places on the globe, and the possibility for each firm to develop its own specialty, the

final product being assembled in the region closer to the place it is sold), the enormous advances in the logistics of transport (which have contributed to the intensification of international trade), the emergence of information and communication technologies, especially the Internet (which has been a driving force in development of international trade) and the disciplines assimilated by those having became specialists in economic engineering and, of course, having acquired competences and a master's degree in management and communication in engineering. The relationship mentioned above is approached through an analysis of national economies into the global economy, an analysis of the expansion of world trade, international trade organizations, present and future trends, the impact of globalization on the environment, and international aid on developing nations. Understanding such relationships ensures that graduates have equivalent conditions as regards their access, development and recognition of studies and socio-professional orientation; it offers the possibility to promote economic engineering education as a form of management education and the interdisciplinary nature of the profession (occupation) of economist engineer; it allows the organization of international debates on specialized topics, through the intercession of professional contacts and transfer of experience; it ensures the promotion of excellence in business management and economic engineering education, as well as the initiation and development of links with other professional organizations in the country and abroad, which have similar or converging activities and objectives.

Rapid technological developments have contributed to the expansion of world trade. Production processes can now be placed separately in different places on the globe, and each company develops its own specialty, the final product being assembled in a region close to that of its sale. Advances in transport logistics have contributed to increased international trade and the emergence of information and communication technologies, especially the Internet, were a driving force for development. Thus, "globalization is the main trend of the 21st century".

Liberalization, regarded as the elimination of state interference in the activity of financial, and capital markets, and in establishing trade barriers, has several dimensions. "Nowadays even the IMF acknowledges that it went too far in achieving these goals -

financial and capital market liberalization contributed to the outbreak of the global financial crisis of 1990 and may have devastating effects on a small country, in the process of development". "Developing nations are confronted with problems caused by globalization".

During the past 50 years, international trade was an important driving force for global economic development. One of the aspects of liberalization, which enjoys massive support, at least among the elites of the advanced industrialized countries, is the liberalization of trade. If we do a more thorough analysis on how this was achieved in many developing countries, we may understand more easily why it often encounters so much resistance. Here we might consider the protests in Seattle, Prague and Washington, DC. "Removing trade barriers between countries remains one of the most debated issues in the world."

In the early twenty-first century, most businessmen, economists and politicians were convinced that a deeper trade liberalization will create a huge space for development and global prosperity, and estimated a dramatic increase of profit - U.S. $ 500 billion per year. The main argument was that the systems that are located on competitive positions will generate new and better paid jobs as the ones that wind up. They bring forth the argument that the production processes that requires intensive labor and offers poor wages should be moved in developing countries (that movement of resources in the section quoted above), while the processes that require more skill and are likely to prosper in industrialized countries.

Globalization should have brought unprecedented advantages to all countries. However, curiously enough, it came to be denigrated in both developed and developing countries. "America and Europe are facing the threat of directing resources towards other countries; developing countries see that the industrially developed states use the economic system against them. In both types of countries, corporate interests are promoted at the expense of other values."

Since 1945, international trade has contributed significantly to the economic development of the world. This was beneficial for both wealthy nations and the emerging economies of

countries such as India, Brazil and China. Implicitly, a country's exports are the imports of another, but while the expansion of export markets is considered beneficial to economic development, a greater openness to imports is often regarded, both by governments and ordinary people, as a threat. Many countries consider that massive imports replaced the of goods and services produced in their country, threatening the jobs of their own country's industries, which are seen as being undermined by imports. We can give the following example: "China, the world's fourth largest economy, is one of the fast-growing economies, having registed an annual increase of 10 percent in the last four years. This increase has been driven largely by exports".

The supporters of trade liberalization argue that this will be beneficial not only to industrialized countries and to average-income countries and developing economies, but will also help third world countries. Thus, "in 2000, world leaders gathered at the Millennium Summit in New York, pledged to halve poverty by 2015. They agreed on some '*millennium development goals* "in health, education, women's rights and environmental protection. Many of those present described these goals as being morally correct, they spoke also of our mutual global interest - linking the fight against poverty to stability and peace. The Annual Report published in 2004 by the IMF and the World Bank launched a warning: most of these objectives will not be fulfilled in most poor countries by the 2015 deadline. " We believe that the world is at a crossroads: either the leaders reaffirm their commitment to achieve objectives, or they will remain only a promise, with the world's poor remaining further behind.

Due to the problems presented, governments have taken measures to protect domestic industries in the face of foreign competition. These measures include the setting of duties on imports, subsidizing domestic firms from taxpayers' money and encouraging exports through tax relaxation of exporting companies. United States and Europe have perfected the art of supporting free trade while trying to enter into commercial agreements to protect themselves against imports from developing countries. Thus, "Much of the success of advanced industrialized countries is associated with the development of their program - in setting the agenda so as to open markets for goods and services is their comparative advantage."

In the era of globalization, it is essential for governance systems to negotiate and establish uniform and accepted trade practices. World Trade Organization (WTO) is the international coordinator in the field. This necessity has occurred given the large number of countries participating in international trade, as it would be inefficient to negotiate individually trade agreements among themselves.

We believe that blocks were formed naturally, establishing rules of trade between members, in order to facilitate the exchange of goods among them, reducing or removing trade barriers.

Once the United States rejected, in 1950, the proposal regarding the creation of the International Trade Organization (ITO), "given the concerns expressed by some conservatives and corporations and the fact that this would result in a transgression of national sovereignty and too many rules" , World Trade Organization was established only after forty-five years (1994).

World Trade Organization (WTO), with its headquarters in Geneva, was founded as a result of the Uruguay Round of negotiations, by signing the Marrakesh Agreements on 15 April 1994 to help manufacturers, importers and exporters to conduct business globally. Currently, it is the only organization in the world that has assumed such a role. Its main objectives include, inter alia, the development and promulgation of rules of international trade, ensure trade liberalization and fora for resolving trade conflicts, balancing subsidies to farmers, and reducing import tariffs.

The European Union joined the WTO with the entry into force of the agreements above, on 1 January 1995; in the context of negotiations, "EU had to make major concessions to its trading partners, namely reducing import duties on industrial products, charging protection measures for agricultural products, reduction of customs duties and export subsidies for these products. EU's intention is to retain the "European model of social and rural areas" of agriculture and promote the "multifunctional role of agriculture."

As globalization affects many aspects of society, decisions of international organizations such as World Trade Organization, World Bank and the Group of Eight, are always under close observation. With the increasing proliferation of global corporations, the meetings

of organizations such as WTO and the Group of Eight are constantly occasions for massive protest rallies. Decisions taken by such organizations have an enormous impact on the entire world, drawing the criticism of those who oppose globalization.

Globalization remains a controversial topic among environmentalists. The largest and most developed economies of the world also tend to be the most polluting ones. Both governments and non-governmental organizations (NGOs) discuss intensively about climate change and emissions of greenhouse gases. We believe that the environmental impact of international trade is an issue of globalization. Fears are related to cutting valuable rainforests and the destruction of other ecological systems, the explosion of carbon dioxide emissions caused by increased use of fossil fuel operated cars, airplanes and power plants.

As time proceeds in the twenty-first century, scientists argue that human factors contribute significantly to climate change. Natural processes are constantly changing the Earth's climate. With the development of the industrial revolution, another factor was added. Specialists simulated computer models of greenhouse gas emissions and have followed the long-term climate. They examined climate data from past centuries and concluded that they can only be explained if one takes into account the human factor. Thus, "In the last 150 years humans have released into the atmosphere increasing amounts of high gas emissions and other pollutants". Because climate responds slowly, the effect was not identified yet.

There were several initiatives to address climate change. The most important is the Kyoto Protocol. Submitted in December 1997, the Kyoto Protocol was signed at the United Nations Framework Convention on Climate Change (UNESCO) and entered into force in February 2005. Thus, "its objective is to reduce emissions of six greenhouse gases in 38 developed countries in the period 2008-2012".

In our opinion, more than a fifth of world population lives in extreme poverty, on less than $ 1 per day. Industrialized countries consider it is in their interest to help poor countries in their economic and social development. Poverty is often associated with

political instability: "countries with extreme economic and social problems can be fertile recruiting grounds for active groups, prepared to use violence to achieve their goals."

BUSINESS – THE APANAGE OF QUALIFICATION IN ECONOMIC ENGINEERING

Chapter IV, entitled **Economic Engineering in Business**, examines the relationships that are established, with the view of conducting business, among the knowledge, skills and competences gained from technical disciplines and those acquired from subjects in the curriculum of the Master's program in Management and Communication in Engineering. We shall approach this topic by analyzing the organization of work from the perspective of the organizational theory and the motivation of employees in business, by the analysis of what it means to change the business from hierarchical to network structures, the analysis of business in the production of goods in terms of achieving products, of production factors: human resources and raw materials. It is very important to understand these relationships as they ensure that graduates of the master's degree in Management and Communication in Economic Engineering will acquire: the competences they need in order to develop their own business or run any business; the understanding mentioned above also ensures the setting of a series of relationships among the economic environment, universities and research institutions with managerial concerns, in order to facilitate a professional dialogue in the field of management, with mutual benefits; organizing activities such as: training, consulting, research, technology transfer, auditing, postgraduate training, etc., leading to the formation and development of a managerial culture, the improvement of the managerial act, so as to enhance enterprise competitiveness, promote excellence in business management and economic engineering preparation; the initiation and development of links with other professional organizations with similar or converging activities and objectives, in the country and abroad.

Businesses play a key role in market economies, because they conceive, develop and create products and services that are subsequently promoted and later sold to customers. In this process, they invest capital, consume raw materials and create jobs. Businesses must also generate a profit, which should be higher than production costs and at the same time, to remain in competition with other businesses offering similar products or services and which, in turn, are seeking to obtain profit. All these activities contribute to the economy as a whole.

The role of economist engineers, having completed the Master's program in management and communication in engineering, as business people and / or as managers is to create and run well-

structured companies, where employees, the information technology and machinery produce goods that are sold to obtain the maximum possible profit.

Economic engineering, and even more, the Master's program in Management and Communication in Engineering, as a border area of engineering, has emerged worldwide in the late '90s, as an absolute necessity to the challenges of increasing of the design and developing of commercially successful products on the global markets. Economic Engineering is part of the so-called "Competitive Engineering" and is an interdisciplinary field that combines, in the formation of skills, methods and instruments specific to engineering with methods of economy management, international relations and communication.

We appreciate that economic engineering, in business, deals with the development and application of methods, tools and approaches that can develop, at higher technical and economic parameters, various economic, technical or mixed systems (products, processes, services) in actual working conditions (constraints and multiple requirements).

Economist engineers, graduates of the master's degree in Management and Communication in Engineering, as business people, must understand the fundamental issue in the private sector, which is the role it plays in the Romanian economic movement. Thus, "indeed, it is used more as leverage in ensuring the subsistence revenues at low income groups, interested in obtaining an easy gain easy, that, for the most part, is used for consumption. As many of these associations are small family businesses, it is clear that they serve to help families survive". We know that most of these focus on trade, an activity that does not produce but is merely doing business, usually at small-scale. With regard to the virtues of entrepreneurs of economist engineers, in relation to economic development, they are difficult to assess, while relying on information available in public circulation. We have one certainty, however, namely the lack of experience, as well as a still incomplete social and legal framework, causing a certain behavior on the part of the small entrepreneurs.

Economist engineers, graduates of the master's degree in Management and Communication in Engineering, as business people, must know the significance of internal and / or external competition, to which they should relate as owners of small and medium-size enterprises. They should realize that lack of a real environment for business activities, regulated by the existence of specific laws in the field, influence their way of thinking and acting as authentic businessman and thus a part of the small entrepreneurs are seeking to circumvent the law by not paying taxes, or by providing lower wages than the public sector. In fact, they do not promote modern development,

unwilling or unable to invest in modernizing the company's business. As it can be observed, the owners live a little better than the employees and retirees, but the difference is rather insignificant.

Organizational theory, which is the study of structures and people within organizations, provides valuable insights on communication and production channels of companies, constituting an important part of business management. In the nineteenth century, the American engineer Frederick Winslow Taylor has tried to streamline industrial production as much as possible, studying in detail the actions of each employee and the time they need to meet them. He also analyzed the interaction between workers and managers. The German sociologist Max Weber, a contemporary of Taylor, studied the benefits of hierarchical administrative organizations, which he called "bureaucracy", a term that had gained a pejorative meaning in the meantime. Managing a business is not an easy task since today being a manager means to be accountable to: your employees, and their welfare; the objectives and tasks of the organization in relation to the business itself - its essence and performance; the provision of products, goods or services offered to the clients of the organization; the constant improvement of quality and competitiveness of supply brought to market and, last but not least, to the society in which they operate; the confirmation and promotion of the company’s values and ideals. The achievement of the goals mentioned above requires, above all, clarifying the significance, content and essence of management as a theory, by its inclusion in the curricula of the master's program Management and Communication in Engineering by means of disciplines such as: advanced methods of management, strategic management , project management, microeconomics, the fundamentals of communication, innovation management, marketing and promotion campaign, advanced manufacturing systems, etc.

Economist engineers and / or master's degree graduates in Management and Communication in Engineering, who become managers and aspire to a leadership position - from the position of supervisor to that of the CEO, could eventually come to complain that "people are not motivated to work", but at the same time, they should understand that the fault lies with both their organizations and the practices they adopt, and not with their employees. Thus, "When the latter are lacking motivation, the problem almost always lies in one of the following: improper selection, unclear objectives, inadequate evaluation of the activity system, inadequate reward system of the organization or the manager's inability to influence how the employees perceive the assessment and reward systems. "

Economist engineers and / or master's degree graduates in Management and Communication in Engineering should build the management structures of the twenty-first century so as these are flexible and easily adaptable to the changing circumstances present in all markets. In the nineteenth century and early twentieth century, mass production and standardized work quickly led to the formation of rigid hierarchical structures in all industries. We could observe that what had proved effective on stable markets, with long-term production cycles, proved inflexible and slow in economic environments characterized by change and competition.

The production process is a combination of technological, economic, social and organizational activities that should be analyzed and resolved, while taking account of both the natural and the operational environment. The essence of business is to create a product that can be sold. Products can consist of goods that are sold by the company, or the services it provides. While a commercial or service company of any size can be established quickly, the production of goods may require a substantial investment and require the creation of a space, hiring staff and purchasing equipment; efficiency is also crucial. Thus, the simplest management decisions in a manufacturing company have strategic relevance. The production function can be defined as "the set of work processes within the enterprise, by which the objects of work are turned into finished products and the technical-material, organizational and provision conditions are created, as these are all necessary for the good development of the production process."

When trying to classify a company, the first question that is raised refers to its products: what does this company produce? Economist engineers and / or master's degree graduates in Management and Communication in Engineering are called to make an even more difficult decision. Therefore a good strategy is necessary when planning a new product.

Wages have long since become the central factor in production cost, in all Western industrialized countries. The cost of production is an economic indicator of quality and has a central role in the enterprise-wide system of indicators and those used to measure and assess growth. Economist engineers and / or master's degree graduates in Management and Communication in Engineering should understand that efficiency may be assessed in relation to the way the results of their economic activity correspond to social needs, and the resources made available are spent in accordance with the market requirements.

ECONOMY – THE ENVIRONMENT OF BUSINESS

Chapter V, entitled **Economics and Business**, examines the relationship between the conclusions reached by the economists who have studied the factors that determine the functioning of markets and the collapse of their business knowing that the organization includes the study of markets and adaptation to bigger profits, while governments focus on building an accurate picture of the economy and the adoption of policies to ensure a stable development and to prevent market collapse, the instruments used being the supply and demand curves, which determine optimal production and prices, and the disciplines of the Master's program in Management and Communication in Engineering. We will approach the topics mentioned above by analyzing the operation of market forces, the analysis of imperfect markets. It is important to understand these relationships as they might provide the graduates with the capacity to establish a set of relations in the economic environment with business management concerns. As a result they might also promote excellence in business management and economic engineering training, and develop their own business.

Economists have investigated the factors that determine the functioning of markets and their collapse. In the XXI century, the organization of business includes the study of markets and adaptation to their conditions, so as higher profits may be obtained. It would be natural for governments to focus on building an accurate picture of the economy, adopt policies to ensure a stable development and to prevent market collapse. Tools such as the supply and demand curves, which determine optimal production and prices, may be helpful in achieving this task. Thus, "The majority of economic activity branches in the world can produce many more goods than consumers are able to buy. Overcapacity is the result of each competitor desire to increase its market share at a rate that is actually impossible. If every company wants a 10 percent sales growth while the overall market grows only with 3%, the result can only be excess capacity. "

Markets are the heart of capitalist societies. Here, businesses agents are struggling to maximize profits by offering products and services that consumers want and can pay for. National economies have not always existed. They were formed after the emergence of capitalism, over several centuries. Their formation and development, as well as their functioning, have been and are investigated by economic science.

Businesses must comply with the rules of the markets in order to be profitable and create value for their shareholders. Economist engineers and / or master's degree graduates in Management and Communication in Engineering, together with economists and policy makers must prevent problems that can cause a market failure or a "failure" in maintaining a safe and prosperous society.

At the beginning of 21st century, the market mechanism is considered to be a good organization way for the greater part of world economic activity. Global currency and goods markets have appeared in unexpected locations, such as in Communist China's planned economy and in the sectors of public services within the mixed economies of European countries.

While free markets work naturally to effectively distribute resources, monopolies, cartels and information asymmetry may become obstacles. In Western societies there is a free monopolistic competition in which many firms, offering slightly different products, compete with each other. Production costs are slightly higher than in perfect competition, but potential buyers benefit from the variety of products. In industrialized countries, where this form of competition is widespread, consumers can choose, for example, among the many brands of cars, etc.

Not all markets are made up of a large number of suppliers and a large number of consumers. When one supplier meets the needs of many consumers, that provider has a monopoly, as if a single company provides electricity generating power for all households in an area. It has no competitors and, if unattended, will try to cut production to force up prices and thus made less than optimal production means form the social point of view.

Companies that merge in order to limit competition by obtaining a monopoly, generally form a cartel. The formation of a cartel is an attempt to turn an oligopoly into a monopoly. In most countries, cartels are illegal. Governments carefully evaluate the market indicators to determine if the companies secretly plan to form cartels, imposing sanctions if it finds such cases. Thus, "In April 2000, Microsoft was called by a U.S. court an ‘abusive monopoly’ and was forced to divide into separate units. Meanwhile, the

decision was partially lifted, following an appeal made by Microsoft". Another example: "Angola, Ecuador and Sudan have announced their intention to join the OPEC oil cartel."

In addition to monopolies and cartels, the markets may also present other flaws. For example, if property rights are inexistent, confusing individual behavior can create negative externalized costs imposed on third parties. Thus, the ecologist Garrett Hardin has mediated such a conflict between individual interests and common good in a 1968 essay entitled "The Tragedy of Communes". With this essay he describes that in a farming village; most land is privately owned, except for a large field owned jointly, where anyone may graze their cattle. On private land, the owner is motivated to limit access to pasture cattle. If too many cows are allowed to graze there, the owner might be able to raise short-term profit, but as a consequence the land becomes impoverished and the long-term profit is lost.

COMMUNICATION - THE ABILITY OF FOCALIZING RESOURCES IN BUSINESS

Chapter VI, entitled **Communication in Starting and Running a Business**, analyzes the relationships established, with the view of conducting some business, among the knowledge, skills and competences gained while studying technical disciplines and those acquired from subjects in the curriculum of the Master's program Management and Communication Engineering. We will approach the analysis of communication and marketing techniques - from target groups to loyal customers, customer knowledge, product promotion, communication analysis through strategic planning, strategic planning tools, communication analysis by fixing prices and income, income and pricing strategies, cost optimization, analysis of legal structures and those used to attract capital, the situation of companies with unique capital, of partnerships, the attempt to find capital, performance measurement analysis, communication through financial measures, non-financial measures of communication, communication through forms of assessment. It is very important to understand these relationships to ensure that graduates of the master's degree in Management and Communication in Engineering will gain: communication

skills, i.e. the ability to transmit symbolic knowledge and be efficient both as senders and as receivers of information, using specific communication channels. This process is considered as basic factor for: performing the function of coordination as manager, establishing a relationship between overall economic environment, universities and research institutions, concerned with management, so as to facilitate a professional dialogue in the field of management, with mutual benefit; organizing activities such as training, consulting, research, technology transfer, auditing, etc. postgraduate training. leading to the formation and development of a managerial culture, so as to enhance enterprise competitiveness, promote excellence in business management and training in economic engineering, initiate and develop links with other professional organizations in the country and abroad, which have similar or converging activities and objectives.

It takes more than a great idea to run a successful business. Economist engineers and / or master's degree graduates in Management and Communication in Engineering, as holders of knowledge, skills and competencies provided by the disciplines included in the above-mentioned study program, must be convinced that not only implementing high performance management practices is important for the success of the company's competitive business but in addition managerial communication is crucial. The transmission of information between two or more persons, in the form of symbolic messages, some with the status of the transmitter, the other with the status of receptor, is achieved through communication channels and is called communication. Thus, "Communication is a process of transmitting information in the form of symbolic messages between two or more people, some with the status of the transmitter, the others with the status of receiver, through specific channels". This process is considered by the authors cited as the main element for fulfilling the function of coordination management.

The distribution and marketing of products is only one aspect of marketing; the understanding the market mechanisms, consumer needs and establishing long term relationships with all business partners is the real challenge of marketing. Almost everyone is talking about customer relationship management as a new panacea. Thus, "until it is defined, it has absolutely no meaning. Some define it as a way of applying technology to learn more about each customer, so as each of them might be answered

individually. Others do not see it as a matter of technology, but rather as a socio-human one: treating each client with empathy and sensitivity. One of the skeptics used to say that customer relationship management is an expensive way to learn things that the client would say if one has five minutes to talk with him/her." Some believe that of all the functions that a business must meet in order to be successful, perhaps none is more important now than marketing - the task to develop, promote and deliver products and services to consumers and businesses. This concept (marketing) is a business philosophy that challenges the other three (production design, product design and sales). "The fundamental elements of this took shape in the mid-1950s". Thus, "according to the marketing conception, a way for the organization to achieve its objectives is to be more effective than competitors in creating, providing and communicating customer value on the chosen target markets."

A modern business will first turn its attention to its customers, both existing and potential. Through market research consumer is trying to identify features and needs of potential target groups. Thus, "the company finds out about customers' needs while listening to or questioning them and afterwards tries to find a solution that suits each of the identified needs. Today, however, there are few needs that companies may not know or do not address". The target group may be defined as "that group of customers with similar socio-economic attributes and a comparable 'need' for a similar type of product or service." Customer needs ca not be created by marketing, but they can be intuited, studying the general interest for certain goods and services.

The key to successful marketing is the identification, by economist engineers and / or by the master's degree graduates in Management and Communication in Engineering, of the relevant market sector and the definition of a target group within it.

Economist engineers and / or by the master's degree graduates in Management and Communication in Engineering need, in order to initiate and run a business, something more than a great idea. Starting and running a business requires a complex analysis, not only in the planning phase, but also along the entire life of the commercial action. Economist engineers and / or by the master's degree graduates in Management and Communication in Engineering, in their capacity as entrepreneurs, must seek internal and

external factors that are relevant to decision making, which is important especially today, when communication may benefit from the existence of some external factors such as the Internet, which plays a significant role in disseminating information. When these entrepreneurs want to start a business, they need to check aspects related to feasibility and design a plan before putting ideas into effect.

CASE STUDY: SELF-ASSESSMENT REPORT ON THE ACCREDITATION OF THE PROGRAM FOR MASTER STUDIES: MANAGEMENT AND COMMUNICATION IN ENGINEERING, UNIVERSITY OF ORADEA, FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY, DEPARTMENT OF ENGINEERING AND MANAGEMENT

The major objective to be achieved in the context of a modern Romanian higher education system of qualifications is that the scheme should be convergent with the European Commission's recommendations and requirements of the Bologna process, correlated with labor market requirements and developments. The mechanisms of such research are available to academics, students and the representatives of the social and economic environment, organized in university consortia - enterprises, in accordance with the structure of undergraduate fields of study. One such consortium is the "Engineering and Management" one that, according to the structure of undergraduate fields of study, should be designed to amend or validate qualifications descriptions associated with the field of study "Engineering and Management". The profession (qualification) of economist engineer in the electric, electronic and energy field will be described by experts in projects.

Using the National Framework of Qualifications in Higher Education (NQFHE) is the academic value that might ensure the national economy the chance to survive and return to a situation of normal development, which would provide higher skilled labor absorption and increased living standards for the population. The National Framework of Qualifications in Higher Education is required to describe as accurately as possible the highly qualified professions (occupations) that are needed on the ever-changing national labor market, while also taking into account the requirements on the international labor

market. One should also be aware that NQFHE it is an integral part of the National Qualifications Framework and has no utility beyond it.

It is well known that, since 2005, besides the Romanian regulations concerning both undergraduate and master degree academic studies, the foundation of study programs on skills and learning outcomes, as prerequisites of a qualifications framework designed as a basic tool in developing the European Higher Education Area (EHEA), has become an obligation assumed by the Ministers of Education of the signatory states of the Bologna Process, through the declarations of Bergen, (2005), London (2007) and Leuven (2009).

An impressive number of students have graduated from faculties in Romania in recent years, and the effect is that the labor market could not absorb them all; a number of such graduates accepted jobs below their level of training or increased the number of the unemployed. It is a "luxury" for a country to produce unemployed persons with higher education.

There are many reasons to address this challenge. It requires willingness to look beyond the limits of engineering disciplines, to learn and correct our own views on economic management and communication in economic engineering. The aspects that are common and overlapping with economics, international relations and communication sciences enables the interdisciplinary exchange, a dialectic between subject disciplines and not the merging of disciplines into an amorphous mass of interpretation and explanation.

But the most important context in which we develop, accredit and implement a program of Master’s studies is the goal to achieve a Common European Higher Education Area, where of great importance is the compatibility of a quality higher education system in Romania and the quality system in European higher education.

Although the role of universities as educational institutions that establish connections between the professional training of people and the requirements of the job market has become more important recently, the situation is not similar as regards the aim of creating new European frameworks for the elaboration of quality criteria and standards in higher education.

A particularly controversial issue was the one regarding the conceptual approaches to quality assurance, as there was no consensus of definitions, only many approaches to tackle this phrase.

Despite efforts to increase the quality of European cooperation in higher education towards internal quality assurance (internal audits and balance sheets) and in the assessment of teaching, student success, the quality research in universities, the quality of the management and support systems for students, and the external evaluation of teaching, it appears that this system, called the System of Quality Assurance and Assessment is inefficient. This is demonstrated not only by the number of unemployed with higher education, found in labor market statistics, but also through regular analysis and expert reports (see: barometers of quality, the EUA Report of Evaluation by ARACIS, ARACIS Assessment Report for ESU, ARACIS Evaluation Report by ENQA).

In our opinion, the prospects for quality development in higher education, the teaching and research processes, should consider overcoming the stage of a System for Quality Assurance and Assessment and witness a transition to a System of Quality Management in Universities.

CONCLUSIONS

Including disciplines related to the field of economics, management and communication alongside the technical ones is indicative of an intention to allow economist engineers, who have obtained a master's degree in Management and Communication in Engineering, to acquire competences that would be useful in the context of the new theories and practices aimed at economic growth.

We believe that such an approach will contribute to the reform of higher education, making it more flexible, coherent and open to the needs of society, able to meet the challenges of globalization and the need for training and reform on the European labor market, in correlation with the objectives set by the European Union, through the Lisbon Strategy and the Bologna Process.

Our approach corresponds to the structure of qualifications established by the National Framework of Qualifications in Higher Education (NQFHE), and it will provide national recognition of the economic engineering specialization and of the Master's degree program in Management and Communication in Engineering, as well as the international compatibility and comparability of these qualifications. We believe that, through this approach, in accordance with NQFHE, all learning outcomes acquired in the higher education system (bachelor and master courses of studies), as well as the preparation for the doctoral school cycle will be recognized, measured, and interrelated.

The "Management in economy" approach ensures the consistency of qualifications and certified titles and sets the ensemble of economic relations, in order to increase the degree of improvement, evaluation and certification of management activity quality and, in connection to this, the improvement of management-related higher education in economic engineering.

Graduates can promote the study cycles in the field of economic engineering and clearly fulfill the tasks of the economist engineer in economy. They will also be able to contribute to the elaboration of guidelines that regard the development of education in the field of economic engineering through contacts and consultations, within certain associations, that have in view the structuring of the the curriculum structure, the content of disciplines and other teaching and research activities. They may also organize activities such as: training, consultancy, research, technology transfer, auditing, preparation courses, etc., which might lead to the formation and development of a managerial culture, the improvement of the managerial act, the enhancement of competitiveness within the organizations where they work. They may also promote excellence in the managerial activity in the field of economic engineering. In this sense, they may develop assessment and certification activities, and make public their positive results.

The acquisition of knowledge related to disciplines of international relations, economics, management, and communication, alongside the acquisition of technical skills, is aimed at giving economist engineers, with a Master's degree in Management and Communication in Engineering, the opportunity to solve the serious challenges faced by

manufacturing firms in terms of business development. Being aware of disruptive factors such as globalization, poverty, increasing customer demands relating to product quality, along with their requirement for new products (e.g. software products, electronics and mechatronic products) might contribute to the elimination of international trade barriers, competition pressure on the time needed for new product development, frequent changes in customer behavior and values, society's pressing demand for eco-products, the pressure generated by the progress in science and technology, the need for multi-skilled personnel. Economist engineers with a Master's degree in management and Communication in Engineering are determined to be constantly and radically innovative, in order to generate superior engineering solutions to various conflicting issues associated with products, processes or business (see, for example, the requirement to produce attractive products in a short time, attractive in terms of price and of high quality, or the requirement to create products that might solve different problems and increase the quality of life

We believe that, as far as the knowledge to be acquired is concerned, they might complement the knowledge acquired during the undergraduate cycle of studies, in order to promote economic engineering education as a form of interdisciplinary education of managerial nature and the profession (occupation) of economist engineer.

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