Industrial Productivity in Bulgaria: new challenges for the e-economy

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Summary

As in other COMECON countries, the Bulgarian industry received a large shock in the early 1990s when the economic transition from centrally planned to free market economies occurred. The removal of protection challenged local industries, and substantial realignments occurred. At present the main objective of Bulgaria is to rejoin the regional and global labor division, i.e. the labor division of Europe and the world as whole. It is by being part of that international network of production and activities that the real value will come in a long-term perspective and the dynamic economic growth could be achieved. The penetration of ICTs in Bulgarian industry is one important factor that can facilitate this drive.

Bulgaria enjoys several advantages. The first is a low level of wages for highly skilled labor relative to the level in more developed countries. This should be viewed as a temporary advantage: using low wage rates is helpful only as a tactics to secure market entry and initial penetration. Examples of building vendor-customer relationships starting with low wage rates and growing to more durable factors in the long run already exist in Bulgarian software industry.

Secondly, Bulgaria should be able to compete on the basis of a historical tradition of good education, a tradition of rigorous mathematics training, and a strong work ethic. Assuming that the secondary schools and the university programs can be maintained at an acceptable level, the production of similar graduates should be able to be maintained, perhaps due to the use of some of the tools that the ITC industry can itself provide. The issue of outflow of specialists remains, but maintaining the rate of production of skilled people is central nonetheless.

However, a critical factor appears to be missing. The level of business know-how, of experience in dealing in free enterprise markets is low on average and very unevenly distributed. Without these skills, firms do not perform well, and worse, they cannot grow. They remain small groups of engineers who know well how to build a product, but not how to manage customer relationships, present their product, use the market to define where the demand for further development is, or any of the many other skills that differentiate a well functioning firm from a cooperative work group.

The Internet is an important element in this discussion, because of its ability to bring to connection a large set of separate technologies and entities. It's crucial that this sector has no artificial barriers to entry and that it operates in a legal, regulatory and policy environment that promotes its effective growth.

In conclusion we can say that:

- Accurate understanding and effective use of ICTs is essential for Bulgarian companies.
- Bulgaria's ICT sector needs to come together to define strategy and goals both for themselves and in relation to the government.
- It is important to continue the liberalization of the communication market in Bulgaria allowing new GSM operators to enter it and privatizing the Bulgarian telecom company. This will bring for wider access to the net and will drive prices down.

- Accelerate the e-commerce, especially for Bulgarian SMEs.
- Step-up education of as wider part as possible of the population in digital skills.

Introduction

The *Bulgarian Quality and Productivity Centre (BQPC)* was established in 1985 as a not-for-profit corporation of governmental and public organizations. Its purpose is to transfer knowledge, expertise and technologies related to improving quality, productivity and company management by means of training courses (open and in-company), consultancy, information dissemination (it publishes a dozen titles annually). Recently BQPC has stepped-up industry research activities also.

Between 1991 and 2000 consultancy on productivity was carried out with the help of experts sent on short-term missions to Bulgaria by Japan Productivity Center for Socio-Economic Development (JPC-SED). Subsequently, BQPC has successfully developed its own consulting capacities with JPC-SED assistance drawing on a model-company approach. Staff have also benefited from 2-4 week JICA training assignments in Japan.

Macroeconomic Environment

Bulgaria presents an uneven competitive record. Despite remarkable steps to open its economy, control inflation, lower the budget deficit and create a welcoming environment for foreign investment, Bulgaria still scores low in many important indicators of competitiveness.

In 2000 Bulgaria registered positive economic growth of 5,8% - the highest rate since 1990 (3,5% in 1998; 2,4% in 1999).

Inflation has stabilized at single digit levels, except for the year 2000 when the level of prices in the domestic market was affected by the costs of energy imports.

There has been an increase of investment in the country over the past few years. Direct foreign investment reached USD 975 million in 2000, a rise of 19% on1999.

Relatively low salaries, however, have constituted a negative influence on the economy limiting national consumption levels.

The export growth rate has shown improvement in recent years as trade with Western European countries increased. However dependency on the export of natural resources and basic commodities makes Bulgarian trade vulnerable to international market fluctuations.

Bulgaria’s infrastructure ranks above average if compared to many transitional economies, yet it is far from that of the most developed countries.

Its policy environment has experienced significant liberalization. Nevertheless, Bulgaria shows a mixed record of liberal investment policy and high levels of corruption and bureaucratic inertness.

Price regulations are now mostly limited to natural monopolies such as electricity, telephone, and postal services. Also, new legislation dealing with monopolist behavior was adopted in 1998.

The private sector's share of value added was 65.3% in 1999.[1] By June 2000, 51.7% of total state owned assets had been privatized, including 82.2% of assets in the industrial sector. According to an EBRD estimate[2], the private sector share of GDP in mid-2000 is 70 percent.

Trade policy has been consistently liberalized. In addition, Bulgaria has a non-restrictive foreign investment code. There are no formal restrictions in foreign ownership and, in some cases, tax incentives are available to foreign investors.

In 1997, the World Bank reported 29 computers per 1,000 people in Bulgaria. Thus, Bulgaria ranked 45th out of 103 countries. Based on information in "*European Survey of Information Society*" this computer penetration has increased since 1997 reached 37 computers per 1,000 people in June 1999.[3] As computer acquisition and diffusion have been growing rapidly in many countries, it is unlikely that Bulgaria's global ranking has changed considerably.

In terms of Internet access, there were 11.9 hosts per 10,000 people in 1999 placing Bulgaria 46th out of 146 countries, an increase of 64.2% in three years. However, given that similar or greater expansion took place in many countries, it is likely that Bulgaria still retains a similar global ranking to its 1997 position.

As a result of a more liberalized Bulgarian Internet market, however, there were 170 Internet access providers in Bulgaria at the end of 1999.[4] Competition in the Internet market has recently encouraged lower access costs, better quality of Internet access, flexibility of Internet services and higher Internet penetration in Bulgaria.

Bulgaria in 1999 had a relatively high number of scientists and engineers per million people – 1747 - placing Bulgaria 28th out of 88 countries. However, it is not clear at what level this human potential has been saved during the continuous crisis in Bulgarian since 1990, or how well it is being applied to the competitive needs of business. R&D expenditures as a percentage of GNP were very low in Bulgaria - 0.57% - 48th place out of 78 countries or. However, in many cases companies may not have separately recorded their R&D expenditures, as there is no particular incentive to companies to record R&D expenditure.

Bulgaria had 329 phones per 1000 people in 1998. It ranked 33rd out of 147 countries. Bulgaria inherited one of the highest line densities amongst the former communist

[1] Source: National Institute of Statistics.

[2] Source: Transition Report 2000, EBRD, page 14.

[3] According to the same, the level of computers per 1,000 people at the end of 1999 in several Central Eastern European Countries was significantly higher than in Bulgaria: Slovenia - 250, Poland - 137, Czech Republic - 107; Latvia - 91 From the countries covered by the above-mentioned survey, only Romania had lower level than Bulgaria – 28.

[4] (Source: "*European Survey of Information Society Projects and Actions*"). By comparison: as Poland (250), Romania (150), Slovenia (33), Lithuania (29), Latvia (22), Czech Republic (13), Albania (10) Estonia (9) and Bosnia&Herzegovina (6).

countries. However, the quality of the service is less impressive, which in the past few years has prompted the rise in mobile, satellite phones and data transmission service as 'quick fix' solutions. Recently Bulgarian Telecom Company has made progress in the replacement of non-digital technology with digital, especially in long-distance transmission (78.0%), long-distance switching (78.6 %), international transmission (95.5 %) and international switching (100%).

Despite Bulgaria's mobile telephone penetration almost doubling during 1998 from 8 to 15 mobile phones per 1000 people, it still only ranked at 68th out of 149, lower than Bulgaria's fixed line penetration. There are only two mobile phone operator providers. Nonetheless, mobile phone density increased during 1999, to 33.9 mobile phones per 1000 people. This growth is expected to continue.

The 1999 penetration rate of phones lines, including mobile phone lines and fixed phone lines, was about 380 per 1,000 people that is higher than the average phone lines rate of Central and Eastern European Countries (about 351 per 1,000).[5]

Productivity in Bulgaria

If we consider that the economy of a nation is sustained by a number of entities engaged in economic activities, called companies, we can say that in a successful economy, there exist a greater number and a higher proportion of successful companies, which are giving vitality to the economy. On the other hand, there are fewer and a smaller proportion of successful companies in less successful economy.

What is the reason that a company is more successful than others? Again a simple answer can be given - productivity (or Value Added per employee) of that company is higher than the others. In addition, in the successful company the distribution of productivity gains is fairly made among all stakeholders.

In this respect we can define that the shortest way for a developing economy to succeed and improve the welfare of the nation is to increase the number of successful companies and at the same time to increase their proportion in the country's economy. Such a simplified reasoning can help us to focus our policies and efforts to promote productivity, especially when we are working in the conditions of an economy into transition, coupled with strong constrains of government resources.

Given the current conditions in Bulgaria, company performance requires better-qualified human resources, better information and more modern infrastructure. Company policies should be based on competitive advantages built on unique products and processes of better quality and greater value added.

By the last available official data the Bulgarian companies are classified by number of employees as shown in Table 1. While the number of micro-enterprises and small enterprises continued to grow in 1999, the number of medium-sized companies

[5] Source: European Survey of Information Society. Bulgaria has higher rate of phone lines per 1,000 people than Albania (5), Romania (230), Bosnia (240), Macedonia (250) and Poland (340). The level in Bulgaria is lower than in Lithuania (390), Latvia (430), Hungary (480), Czech Republic (520), Estonia (610) and Slovenia (760), mainly due to the higher level of mobile phones penetration in some of these countries.

remained generally the same. However, there was a decrease in the number of companies employing 101-250, and in the number of large companies. The overall size structure of enterprises remains unchanged. After the initial rapid growth in the number of small and micro-enterprises, these two groups now exceed 98% of the total number of enterprises in Bulgaria. This speaks about the great importance which networking of SMEs has for Bulgarian economy.

Table 1. Changes in the Number of Enterprises (by size)

Enterprise size	1996	1997	1998	1999
Total	178000	189367	205643	211329
Micro-enterprises	164092	175101	190008	195313
Small enterprises	9109	9825	11 129	11761
Medium enterprises	2076	2040	2153	2104
Enterprises employing 101 to 250 people	1786	1626	1555	1412
Large enterprises	937	775	798	739

Source: National Statistical Institute (NSI) and own calculations

In the beginning of 2000, the Bulgarian Agency for Small and Medium-Sized Enterprises conducted a survey among 1 752 companies, covering the period 1996 – 1999. The parameter "labor productivity" defined as the gross value added generated by one employee was also measured. The results are shown in Table 2.

Table 2: Labor productivity by company size and sector

(In thousand BGL and constant 1996 prices)

	All companies	Micro companies	Small companies	Medium companies	Companies of 101 to250 employees	Large companies
1996						
Total	490.7	295.5	470.7	351.8	338.2	639.5
Public sector	601.2	7,096.1	630.4	322.0	318.6	670.8
Private sector	328.7	218.7	420..9	377.3	380.0	391.0
1997						
Total	406.1	137.6	294.4	296.3	328.2	605.2
Public sector	580.1	324.3	386.9	276.1	311.7	685.6
Private sector	270.5	135.4	276.0	304.6	342.2	404.7
1998						
Total	354.8	157.5	243.7	248.7	305.2	529.7
Public sector	522.4	391.9	276.6	267.0	286.9	608.8
Private sector	260.0	155.3	239.2	241.7	315.3	391.6

Source: *National Statistical Institute and calculations by Agency for SMEs*

According to that data, the labor productivity in the private sector grows with the size of the companies – it is two to three times higher in the largest companies from the private sector compared to the "micro" companies. This again indicates that networking of small and micro companies will lead to increase of productivity. The lack of capital in the micro and small companies limits the entrepreneurs in selecting the field of activity, type of production technology and equipment.

The labor productivity in the sector production and distribution of electricity, gas and water dominated by public companies was the highest according to the ASME's calculations based on the survey (Table 3). But this result should be excluded from

our consideration, because this sector is dominated by natural monopolies, which operate with fixed prices by the government.

Table 3: Labor productivity by sector
(In thousand BGL and constant 1996 prices)

	1996	1997	1998
Agriculture and forestry	339	361	208
Mining and quarrying	709	576	462
Manufacturing	534	451	339
Electricity, gas and water	1,059	1,185	1,334
Construction	281	277	341
Trade	540	309	241
Hotels, hostels and restaurants	254	200	246
Transport, communications, travel and tourist agencies	499	407	503
Financial service	-478	184	891
Real estate operations	251	150	208
Education	499	112	182
Health care	553	69	143
Other services	266	159	250

Source: *National Statistical Institute and calculations by Agency for SMEs*

In most of the categories we can see some decline in the labor productivity, which reveal that the stable political, macroeconomic and institutional environment is necessary but not sufficient condition for prosperity especially in the case of Bulgaria. The problem is to provide such conditions on a microeconomic level that will allow companies to produce and manufacture goods and services of greater value added by applying methods that are more productive. Such an approach may bring about an increase in wages and return on capital.

The opinion of the business circles on the business environment in the country is quite interesting in this respect. In March 2001 the Center for Economic Development (CED) conducted a representative survey among 230 Bulgarian and foreign companies operating in Bulgaria. The prevailing type of company, comprising 44,5%, were with staff of less than 250 employees. Firms with a staff of 250 to 500 employees accounted for 21,8% of the total, while those with a staff of over 500 constituted 22,7%.

According to the CED survey, entrepreneurs think Bulgaria continues to lag behind in terms of technological development. The assessment of Bulgaria's position in the field of technologies retains the low level of previous years, showing only a slight tendency towards improving. The government's policy to stimulate company R & D is found to be unsatisfactory. More than half of the participants in the survey emphasize the fact that companies receive no direct government subsidies and tax credits to carry out research activities. Government commissioning does not have a strong enough effect on the development of the innovation processes, since for the most part awarding these commissions is price-rather than technologically related. Business circles also give a very low mark to the cooperation with local universities in the field of research and the process of launching new products. Only 5% of the surveyed assess this process as intensive and continuous.

A look at the surveyed company activity and performance of strategies shows that the competitive advantages of Bulgarian companies are due to the low labor costs. Seventy-eight per cent of the respondents report this fact, while only 5% of the companies state their advantages are due to the unique products and processes they offer. More than 70% of the companies report, that manufacturing makes use of obsolete technologies. Thus, one of the main problems Bulgarian companies face with regard to competitive power is to increase productivity based on modern technologies and innovations. The advantages founded on cheap labor are not strong and may be lost at any one moment as new companies from different countries are appearing on the market all the time. It is necessary to outline advantages, based on technologies, uniqueness of the processes and products, and high quality of the goods and services on offer.

Regardless of the opportunities that the macroeconomic frame creates for business strategy development, most companies still carry on their business intuitively, i.e. without strictly defined goals and ways to achieve them. This fact predetermines the lack of a clear strategy on technological development, which is typical of most companies covered by various surveys. Therefore, it may be concluded that technological development in the country depends largely on raising the level of business culture, on managerial skills and abilities of the Bulgarian entrepreneurs.

The CED survey makes the following important conclusions:

Weak aspects of the competitive environment and company strategies
• Low level of efficiency of some institutions (e.g. the legal system, the police force);
• The existence of administrative barriers and bureaucracy;
• Serious difficulties in setting up a business;
• Lack of financial resources;
• Competition on the domestic market, which is not sufficiently keen;
• Buyers, who are not exacting enough;
• Low level of implementing modern methods of communication and trade;
• Lack of a deliberate company policy on human resource qualification and investments on further training and education;
• Low level of marketing strategies;
• Lack of sufficient professional expertise in managing companies (e.g. poor management);
• The main competitive edge of companies – cheap labor force rather than high quality of products and services on offer.

Strong aspects:
• Macroeconomic and financial stability;
• Stability of the banking institutions;
• Some flexibility of the labor market;
• High level of economic liberalization;
• High level of education in the natural sciences;
• Availability of qualified scientists and engineers (according to word standards).

ICTs and Bulgarian companies

Investment in equipment and human beings is essential for improving productivity. The considerable US investments in computers and information technology (IT) in the past two or more decades have now started to pay off in terms of American productivity increases. This only proves the importance of penetration of ICT in industry for the increase of the national productivity.

In March 2001, Bulgarian Quality and Productivity Centre (BQPC) took part in a survey of the Bulgarian industry, ordered by the Ministry of Economy. The survey covered a representative sample list of 850 companies. The questionnaire included 58 questions covering all aspects of the activities of a standard company. Six of the questions are asking for some information, on which we can judge about penetration of ICT in the activities of the Bulgarian companies. (These are multiple-choice questions with the possibility to choose more than one answer.) Please refer to the attached charts.

The analysis of the results of the survey shows that more than 91.7 % of Bulgarian companies are using computers in one or other way. The most popular application of PC is for accounting (74.3 %) and inventory control (42.3 % for raw material storage and 34.2 % for final products). All these are supporting activities and are not producing value added. So the effect on productivity in this case can be expected to come from reduction of time or stock, for which computerization can help. Very law is usage of computers in production (5.3 %) and project making (7.3 %).

63.0 % of the surveyed companies have access to Internet. Again we tried to check how they use Internet in their activities. Along with the traditional ways for gathering market information 25.8 % of respondents are using the Internet for that purpose. Again 24.3 % of the respondents are using Internet for gathering of information for new technologies and products. These results indicate that the processes of integration of old and new technologies in the Bulgarian industry have started.

Another aspect checked by the survey was human resource development. More than 37 % of the companies have carried over education of own personal in computer skills during the last 5 years.

Company A was started almost 8 years ago by three young people and now is one of the main PC hardware wholesalers in Bulgaria. They import PC components, assemble hardware configurations according to order, test them and deliver with correspondent guarantees within 24 hours to any place in the country. The components are imported from more than 30 foreign makers. The company is working on the home market mainly through resellers – more than 400 small computer companies or individuals. Nine dealers, stationed at the headquarters of the company, operate this reseller network through the Internet and phone/fax communication. An integrated computer system, developed in-house, is in the core of company operations and makes possible to keep short delivery times and big volume of sales with limited staff.

Another case is company B, which was established three years ago as a software JV. It started with two people and now is customer range from US Internet pure-play companies to the largest software companies in the world. They have started with low prices because of cheep labor costs and have proceeded to build a good customer relations.

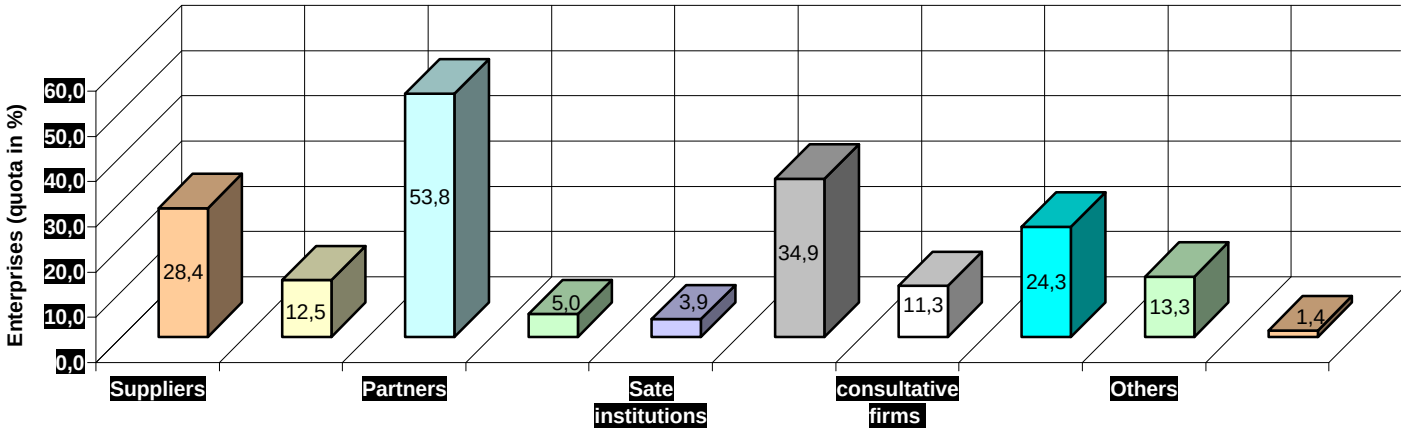
The common for both cases is that the staff is with good computer knowledge, which makes possible for the companies to make full use of Internet and ICTs and rise in this way productivity.

Our conclusions from the above discussion are that:

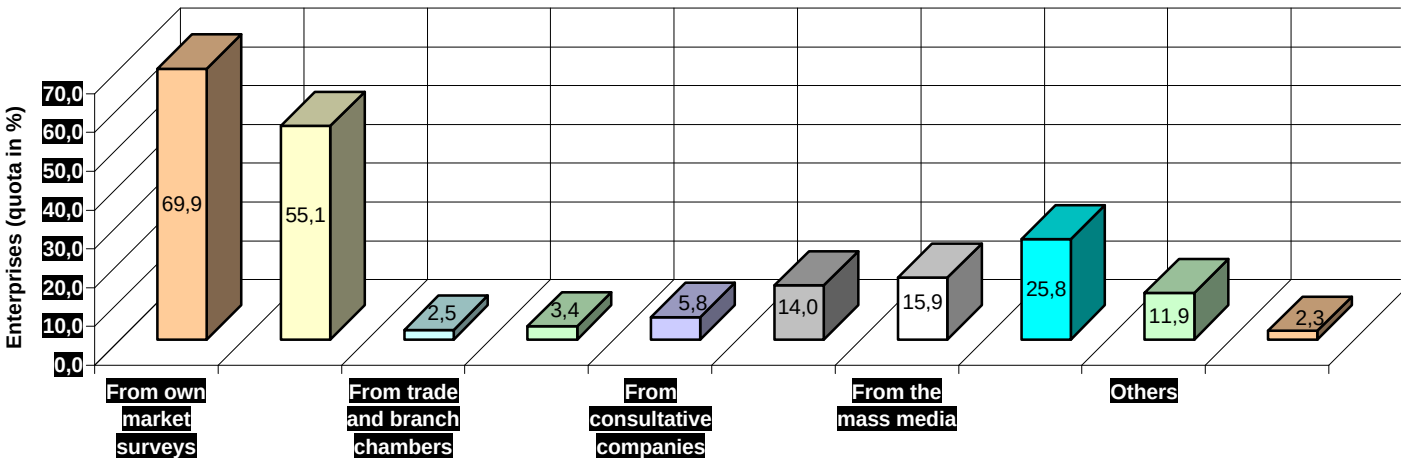
- It is important to make a specialized survey on the penetration of ICTs and e-business in Bulgarian economy. Catching the real situation will help to analyze the problems and plan a strategy for shift towards a networked and knowledge-based society;
- Bulgarian companies need to introduce integrated computer based information systems. Such standard programs exist but they are too expensive for them. The Bulgarian ICT industry can be most helpful in this respect but it needs some promotional and standardization body to coordinate the efforts in this direction;
- Education in computer skills is very important prerequisite for a company to enter the e-business.

Attachment

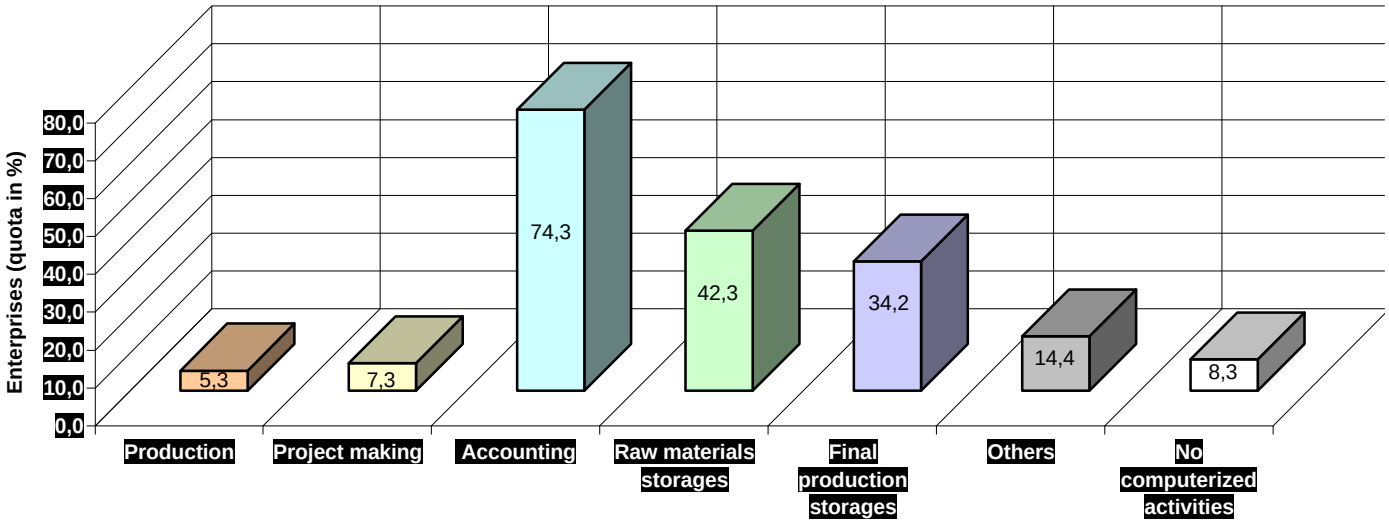
What are your basic sources of information for new technologies and products?



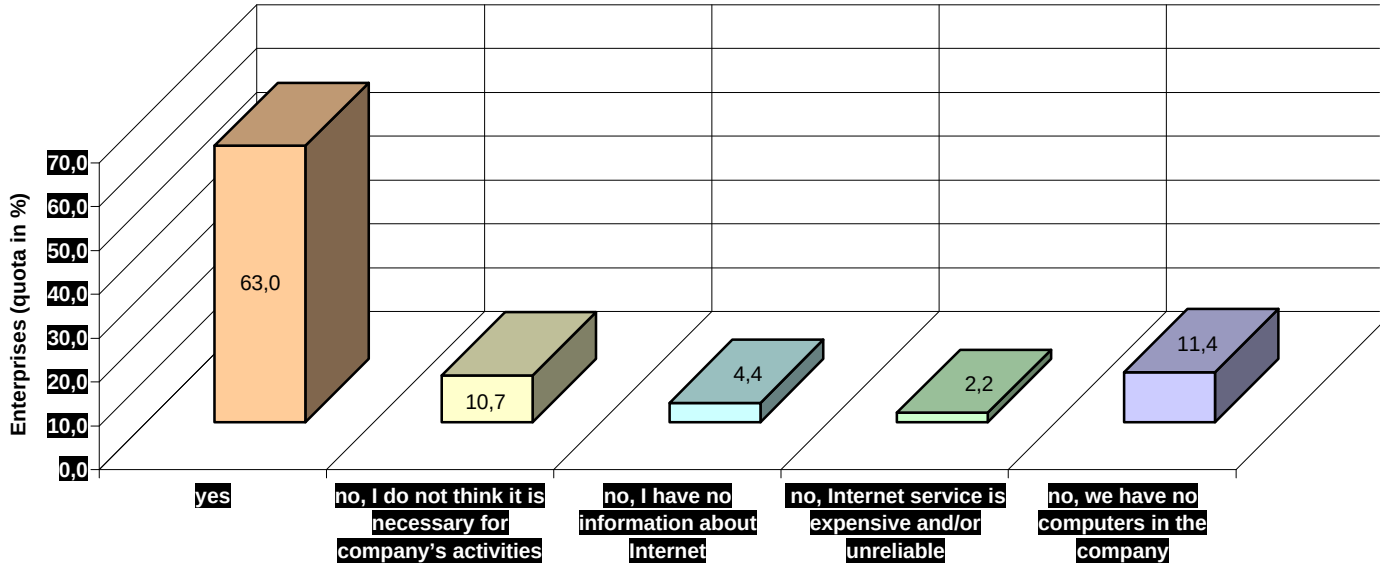
Where do you receive market related information from?



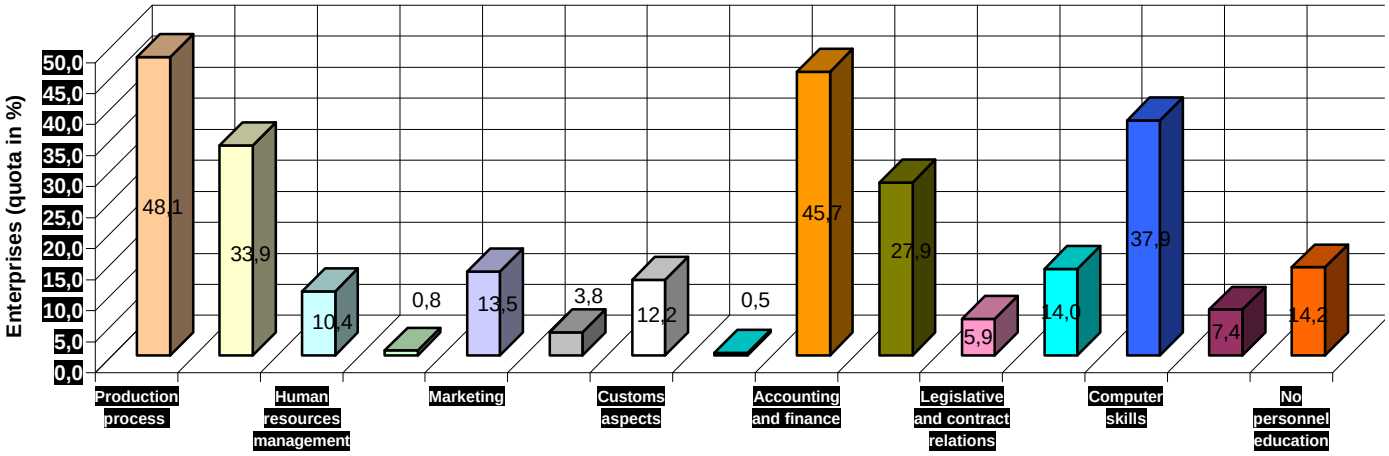
Which of the following activities in your company are computerized?



Do you have access to Internet?



What spheres have the personnel education of your company covered for the last 5 years?



What are the priority spheres you would like to expand your personnel skills/qualification in?