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EMPLOYMENT AMONG YOUNG PEOPLE AND GRADUATES IN TERMS OF PERSONNEL STRATEGY

Romana Hricová
Technical University of Košice, Faculty of Manufacturing Technologies with a seat in Prešov, Department of Industrial Engineering and Informatics, Bayerova 1, 080 01 Prešov, Slovakia, romana.hricova@tuke.sk

Keywords: unemployment, graduate practice, graduate, employee, employer
Abstract: In many countries, after finishing their education, graduates get into an unenviable position when they come out of school, they want to get started and hit the unemployment problem. Many businesses look for employees among those who already have several years of experience, but this gets graduates into a vicious cycle where they cannot obtain work because they have no practice and they have no practice, as they have never worked anywhere. In Slovakia, the situation is not different; Business Insider magazine even ranked Slovakia at the 26th position in the number of unemployed young people from whole world. A state which recognizes seriousness of this situation attempts to change this situation using various means and thus it comes with several programs to reduce unemployment of graduates. This article focuses on such programs as well as a brief evaluation of results.

1 Introduction

"Unemployment can be considered a global macrosocial flow generated by causes that have to be the economic situation of users, or the status of tenders for work." [1] A high involuntary unemployment may reflect the fact that the labour market is not a "standard" market. Policy paper - Economic analysis of Unemployment in Slovakia says, that the average rate of Slovak unemployment in the last 20 years reaches 14.5 %, well above the majority of European countries. [2] One of the big problems is unemployment of young people. Of course there are also another problems in Slovak conditions (for example very low skills and discrimination exclude Roma population from the labour market; inadequate initial structure of the economy and high contributions and inappropriate tax - benefit system reduces job creation among low-income households) [2], but young people without chance to work means generation without appropriate work habits.

To be clear on who is statistically taken into the category of "young people", it is necessary to define certain terms. There are different age or conceptual definition, but in the document of the European Foundation for the Improvement of Living and Working Conditions [3] there is an abbreviation NEETs (Not in Education, Employment and Training), which includes young people aged 15-29 who are not in employment, not in education and not in training. It means that, those who are studying and constantly preparing for their future careers are excluded from this category. The term NEETs is now used internationally.

The ambitious of the article is to show, how successful tools, which use Slovak republic, are. Data from official Slovakian sources (as for example the Office of Labour, Social Affairs and Family) are used for comparison. Although used data are secondary, there is no accurate method to obtain primary data, as Slovak companies are required by law to provide the information requested. The data used in this article belong to this type of data.

2 Unemployment of young people – a global problem and a nationwide problem in Slovakia

European Employment Strategy has as its key policy issue the integration of young people into the labour market. The young people integration into the labour market is a very important objective not only all over the world but mainly in former communist countries of East-Central Europe [4]. Youth unemployment rates are generally more than twice as high as the adult rates, with significant differences across countries and regions [5]. Youth unemployment dramatically rose again after the recent global economic crisis [6].

On December 3, 2015 Business Insider Magazine published ranking of 47 countries where youth unemployment is critical [7]. Given that many countries do not release a list of their monthly official (nor even annual) economic data, the data from the International Labour Organization were used for the estimate data for 2014. If we only take the European countries, according to the aforementioned statistics the situation in Greece is the worst. In 2014 the youth unemployment rate (estimated) was 64.8 %, while the percentage of population aged 15-24 is 9.72 % (under 24 years it is 23.73 %). The second place was taken by Bosnia and Herzegovina, where the estimated rate of unemployment is 60.2 %, while the country has 12.36 % of young people aged 15-24 years (generally 25.84 % under 24 years). Spain is in third place with 58.2 % of youth unemployment and their representation by 9.56 % (25.01 % under 24 years). Macedonia is in the 7th place (54.32 %), number 9 is Croatia (49.5 %), 10 is Serbia (46.6 %), 15 is Montenegro (40.5 %), 17 is Italy (38.3 %), 19 is Cyprus (37.1 %), 21 is

Portugal (35.9 %) which brings us to the 26th place taken by Slovakia. Slovakia thus came with its 33.8 % between Jamaica and Suriname. Such a figure is alarming because it says that every third young person under 24 years is unemployed. The situation is even worse because if a young person does not obtain work habits soon after graduation they have a lifelong problem, not only in the work area.

The Statistics Portal „Statista“ shows Youth unemployment rate in Europe (EU member states) as of July 2016 (seasonally adjusted) [8]. The source defines youth unemployment as unemployment of those younger than 25 years and Slovakia is taking the 7th place with 24 %.

Young Slovak people solve the problem of unemployment in different ways, typically it is going abroad, and this number is alarming. Years 1980-1990 were baby boomers, because every year about 80 thousand people were born [9]. However, about 30 thousand of them are leaving every year to work and live abroad, which is more than a third. Therefore, it is a responsibility of the State to create such conditions for the young that they do not leave to work abroad but have plenty of job opportunities in Slovakia. It is not possible to officially find out how many Slovak citizens permanently live and work abroad, as this figure is not being recorded by any institution. The most precise statistics are those of the health insurance companies, since every citizen is obliged to pay health insurance. In case a person goes to a foreign country, they must choose which country they will pay health insurance. In 2013, the health insurance system was left by almost 30 thousand people under 30 and roughly the same number left since 2009 every year. This means that within five years about 150,000 young people under 30 years of age went abroad [9]. Since this number is truly alarming, there is an effort to create the conditions that employers were interested in employing young people and those not departed abroad.

3 Assistance in employment of young people in Slovak republic

Every organization that wants to operate in the market successfully and for a long time must have a personnel policy that is well formulated and clear, understandable, acceptable, long-term stable both in terms of employees, as well as from the perspective of the surrounding area [10]. The actual personnel policy of a company encompasses many sectional policies such as recruitment and selection of employees, remunerations, education, personal and social development of employees as well as their evaluation. Not to mention that a good organizational personnel policies must also respect the laws and legislation on the rights of workers and their working conditions.

Enterprises are trying to make a profit using various sources, ranging from technology through financial, natural, to know-how, etc., but continuously crucial role is being played by employees; corporate human resources, due to which the company can maintain in the market [10]. Many Slovak companies underestimate this fact, yet a modern organization knows that finding, nurturing and retaining high-quality, efficient and loyal employees can be a key factor for success. That is why more and more businesses seek quality graduates since they have an opportunity to train them according to their own requirements. On the other hand, such training usually takes several weeks to months, while experienced employees need a much shorter time - sometimes several hours are sufficient. On the other hand, lack of experience and skills of young workers can be balanced out by the employer by lower wage costs. On the other hand, it is certainly clear that not every vacancy can be filled by a graduate or a young professional without experience. There are even jobs where experience is necessary. Therefore, human resource management department must know exactly which jobs are suitable for graduates and which are not.

A company recruiting graduates usually faces the question of whether to allocate a new employee to a regular employee, who should help them, train them and, if necessary, check them, or the graduate should remain on their own. Such a decision entails a number of disadvantages, starting with the one that the graduate does not obtain right work habits and ending with the fact that they do not identify with the corporate strategy, they do not meet the demands of the job that may culminate in leaving the position. It means a loss to the company, of course, because it has to start looking for a new graduate and again devote time, energy and often also money to that process. On the other hand, if the graduate is assigned to a regular employee, the employer must realize that he will have to, especially at an early stage of the learning, devote more time to the graduate, which may result in a lower performance in his own work. Therefore, the learning of a graduate should be reflected in the job descriptions of regular employees, so they do not have time constraints and can fulfil their own responsibilities.

Employers are well aware of the disadvantages associated with the employment of graduates and therefore often prefer recruitment of new employees with work experience. On the other hand, there is a social interest of employing young people. It is not only Slovak but Europe-wide problem, as statistics clearly show that since 2009, the time of the deepest crisis, the situation has stagnated at about 33 % unemployment of young people, which means that around one in three young people is without a job. Because these young people do not gain basic work habits, the phenomenon of so-called "Lost generation" has arisen, a generation that wants to work, but actually cannot. These are not only university graduates or secondary school leavers (although they most contribute to statistics), but the overall problem of a large group of people for whom no jobs have been created. This is one of two main reasons.

The other reason is incorrectly set fields of study, which are not in the line with labour market needs.

To help companies to employ young people and so to prevent young people from leaving their country to work abroad, the European Commission by means of its implementing Decision CCI 2014SK05M0OP001 dated 9th December 2014 adopted and approved the Operational Programme Human Resources (HR OP), where the role of managing authority is performed by the Ministry of Labour, Social Affairs and Family [11]. The aim of the OP is to promote regional development and to initiate support of youth employment. Funding is from the European Structural and Investment Funds for the programming period 2014-2020. OP itself contains several ways how employers can encourage employment of young people - graduates and thanks to that train employees needed for the future. A graduate can be found in some of these contributions offered by the Office of Labour, Social Affairs and Family (which is directly controlled by Ministry of Labour, Social Affairs and Family) [11]:

a) Contribution to support job creation in the first regular paid employment.

The target audience is a job seeker that before the adoption did not have regular paid job, i.e. it did not last for more than 6 consecutive months. An applicant under 25 years of age should be kept in the records for three months, an applicant under 29 for 6 months, with an emphasis on the long-term unemployed job seekers. A financial contribution in this case is provided for at least six months and a maximum of 12 calendar months, and the monthly amount is 80 % of the total labour costs, not more than € 515.40. The employer´s obligation in this paper is to maintain the created job at least to the extent corresponding to half of the agreed duration of the contribution (i.e. in providing the financial contribution for six months the job must be maintained for nine months). Job creation means increasing the number of workplaces, i.e. the employer cannot replace existing workplaces. The contribution is provided to the employer monthly by repayment on the basis of submitted documents.

b) Practice leading to employment

It is contribution for mentored practice by an employer who creates a job for that purpose. The target group of this contribution are young people registered in the register of job seekers; job seekers under 25 should be kept in the records for at least three months and a jobseeker under 29 for at least six months. The Authority subsequently provides refunding to the employer:

- **mentoring contribution** of a maximum of € 68.44 / 1 mentored employee / one month paid once for the whole period of mentoring,

- **contribution to cover part of the total labour cost** (TLC) for an employee who has been accepted for mentored training and practice - of no more than 95 % of the TLC, maximum of € 273.77 at ½-time employment, provided monthly for the mentored training and practice,

- **contribution to cover part of the necessary costs associated with mentored training and practice** – e.g. personal protective equipment, protective equipment, working tools, a maximum of € 58.06; it is a single financial contribution for one mentee training and practice.

This contribution may be claimed by the employer who employs a job seeker from an eligible target group for part-time work for at least nine months, or indefinitely, with this contribution being granted for a maximum of nine months.

c) Contribution for graduate practice

This contribution is focused on the acquisition of professional skills and practical experience with an employer, which corresponds to the level of education achieved at school within the group of study branches or fields. A condition for the graduate practice is that a graduate has been on the register of job seekers for at least one month (a graduate means a citizen less than 26 years of age, who has completed the appropriate level of education systematic vocational preparation in full-time study less than 2 years ago and since then had no regularly paid job. This status of graduate must be met by a job seeker throughout graduate practice.

A graduate apply for graduate practice placement and for a contribution at the competent authority within the territorial jurisdiction of their residence. The practice is carried out at least three months and not more than six months without a possibility of renewal and repetition, for 20 hours a week. The beginning of practice as well as its extent is determined by the employer. During the graduate practice, the Office may provide a graduate with contribute a lump sum of 65 % of the subsistence minimum for one adult person (i.e. currently € 128.75) per month to cover their essential personal expenses connected with the practice. During the practice a graduate is also entitled to 10 working days of leave. After the practice the employer shall issue a certificate of completion of practice.

d) Graduate practice starts employment – this program consists of two activities:

Activity No. 1 - to provide a financial contribution for graduate practice (3)

Activity No. 2 - providing financial contributions to promote job creation

Activity No. 1 follows the same rules as those mentioned in contribution 3). Then contribution to the employer is made on the basis of submitted documents (attendance records confirmed by the employer and the contract of accident insurance) amounting to 65 % of the subsistence minimum monthly, maximum of € 128.75 and compensation premiums for accident insurance. Financial contribution is made at least three months and not more than six months.

Activity No. 2 is explicitly tied to activity No. 1 and on condition that the employer employs this job seeker without undue delay, within 30 calendar days after the end of the graduate practice. The target group is NEETs under 29 years, who at the time of entry into the program meet the requirement of graduation and must be in the eligible area (outside Bratislava Self-Governing Region). The contribution is provided in the amount of the advance on the premium for compulsory health insurance, social insurance and compulsory contributions to superannuation, paid by the employer, a maximum of € 302.35 for the year 2016 on a full time basis. Applicants must be admitted to full-time employment for at least 9 months, or indefinitely, while the benefits are provided for six months.

e) Contribution to support the employment of disadvantaged job seeker

The contribution is granted to an employer by the office in the territory of which the working place is created, if the employer asks for the contribution in writing and the job created is given to a disadvantaged job seeker who has been in the register for at least three months, if the employment relationship is understood at least one half of the set weekly working hours. A disadvantaged job seeker is also a citizen under 26 years of age, having completed the appropriate level of education in systematic vocational preparation in full-time study less than two years ago and before registering as jobseekers had no regular paid employment. The monthly contribution is 40 % of employee TLC calculated from the average wage of employee in economy for I-III quarter of the calendar year preceding the calendar year in which the contribution is made – i.e. € 464.54. (For 2016, the average wage of an employee in the Slovak economy in I-III quarter 2015 is set at € 859 and TLC calculated on the average wage of employees thus is € 1,161.35. The contribution is provided based on a written agreement for at most 12 calendar months - if a candidate kept in the records of three months is employed; if the employer employs a candidate kept in the records for more than 24 months - contribution is made for no longer than 24 months. The employer must maintain the newly created job, which was tied with a contribution, at least to the extent corresponding to half of the agreed period, providing post, i.e. if the contribution is paid for 12 months, the employment lasts for 18 months; if the contribution is paid 24 months, the employment relationship is concluded for 36 months.

As seen from the survey, the state is trying to assist the employment of young people. Statistics of the Office of Labour, Social Affairs and Family [11] evaluates how many young people do their graduate practice every month.

Table 1 Number of job seekers participating in graduate practice in April and May 2015

R	May 2015	April 2015

R	May 2016					April 2016				
	Number of job seekers	Job seekers %	Job seekers aged 20- 24	Job seekers aged 25-29	**Graduate practice**	Number of job seekers	Job seekers %	Job seekers aged 20- 24	Job seekers aged 25-	**Graduate practice**
Bratislava	20,415	5.80	2,366	2,677	74	19,664	6.24	2,380	2,711	87
Trnava	24,142	6.86	3,277	2,876	241	22,236	7.06	3,336	3,013	296
Trenčín	28,862	8,20	4,016	3,628	238	26,440	8.39	4,073	3,745	330
Nitra	41,565	11.80	4,814	4,662	284	37,112	11.78	4,796	4,723	390
Žilina	36,514	10.37	5,483	4,491	350	33,561	10.05	5,570	4,647	552
B.Bystrica	60,334	17.13	7,337	7,199	310	52,587	16.69	7,277	7,330	471
Prešov	74,266	21.09	10,978	9,974	576	66,282	21.04	10,990	10,043	842
Košice	66,044	18.75	8,343	8,533	377	57,208	18.15	8,351	8,616	547
Total SR	**352,142**	**100**	**46,614**	**40,040**	**2,450**	**315,090**	**100**	**46,773**	**44,828**	**3,515**

Table 2 Number of job seekers participating in graduate practice in April and May 2016

	Bratislava	Trnava	Trenčín	Nitra	Žilina	B.Bystric	Prešov	Košice	**Total SR**
Number of job seekers	17,513	19,18	23,018	33,64	29,347	52,683	67,792	59,07	**302,264**
Job seekers %	5.79	6.35	7.62	11.13	9.71	17.43	22.43	19.54	**100**
Job seekers aged 20- 24	1,741	2,334	2,684	3,372	3,820	5,764	9,311	6,902	**35,928**
Job seekers aged 25-29	2.201	2,269	2,852	3,551	3,626	6,077	9,037	7,495	**37,108**
Graduate practice	64	145	167	199	296	242	390	320	**1,823**
Number of job seekers	17,799	19,88	23,742	34,84	30,350	54,126	68,819	60,02	**309,583**
Job seekers %	5.75	6.42	7.67	11.26	9.80	17.48	22.23	19.39	**100**
Job seekers aged 20- 24	1,675	2,324	2,690	3,279	3,779	5,740	9,115	6,812	**35,414**
Job seekers aged 25-	2,231	2,367	2,924	3,634	3,749	6,192	9,021	7,546	**37,664**
Graduate practice	75	211	242	284	374	344	580	531	**2,641**

Comparing the results of two months in 2015 (Table 1) and 2016 (Table 2) there is a certain tendency of development. Firstly, although the overall unemployment has fallen in 2016, interest in graduate practice has not changed significantly.

Second, in both years, there is apparent decline in interest in graduate practice in the month of May. Surveys on the employers' side, this annual decrease due to the fact that young people prefer foreign brigade in the summer before graduate practice.

Although participants of graduate practice are not counted in the total unemployment rate (which is lower than the total number of job seekers) it shows that there is interest in graduate practice, although it is questionable whether it involvement of graduates is sufficient. In the month of April 2016, 3.61 % (April 2015 = 3,8 %) of jobseekers aged 20 to 29 years were involved in graduate practice. In the month of May 2016 it was only 2.50 %. (May 2015 = 2,8 %) The statistics cannot sort out how many job seekers aged 20 to 29 years qualified for graduate practice, so the percentage would actually be higher.

In addition to that it can be observed that with increasing unemployment across regions, also the number of graduates at the graduation practice is increasing. The only exception is Žilina Region, where in despite of lower unemployment, the graduation practice is higher, which may be related to the industrial character of the region.

4 Conclusion

Human resource management in today's society plays an important role because it having the right people in the right positions is the basis for success. Investment in human capital is relatively high, so investors (individuals, organizations and society) occupy a return on investment [13]. Because in most cases the employer can still choose from potential employees, it is necessary that this selection was conducted as accurately as possible with regard not only to the needs of the employing company but also the potential future employee. A job-seeker who has never worked anywhere thus gets to be in a disadvantageous position, since they often have no work experience that many employers take as a disadvantage. HR professionals often say that even at a personal interview with the candidate it is difficult to detect their pros and cons, so a candidate who has already had some practice gets a more favourable position thanks to the work experience. On the other hand, a young graduate with no work experience is often a "blank sheet" who does not bring any improper work habits from a previous job and the employer can teach everything necessary to their liking. Not to mention that the employment of graduates also comes with a societal effect, which consists in the fact that there is no "lost generation" that never worked anywhere and that if the graduate holds good at work, they have an opportunity to obtain a permanent job.

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SELECTED LEGAL CONDITIONS VALID BY TRANSPORT OF DANGEROUS GOODS BY RAIL IN EUROPEAN UNION

Lucia Knapčíková
Technical University of Košice, Faculty of Manufacturing Technologies with a seat in Prešov, Bayerova 1, 080 01, Prešov, Slovakia, lucia.knapcikova@tuke.sk

Michal Balog
Technical University of Košice, Faculty of Manufacturing Technologies with a seat in Prešov, Bayerova 1, 080 01, Prešov, Slovakia, michal.balog@tuke.sk

Keywords: rules, EU, dangerous goods, rail
Abstract: The purpose of transport of dangerous by rail is to harmonise the rules applicable to the national and intra-community transport of dangerous goods by rail. Harmonisation of the rules makes it possible to remove obstacles to the free movement of goods between Member States with regard to transport equipment. Such transport will therefore be carried out under the best possible safety conditions. In EU legislation the application of RID rules is extended to domestic transport. In addition Directive 96/35 on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway requires employers whose employees load, transport or unload dangerous goods in significant quantities to appoint, a special vocationally certified `adviser' to monitor compliance with the transport by road, rail and inland waterway requirements.

1 Introduction

In EU railway "substance safety" is defined by the International regulation concerning the carriage of dangerous goods by rail (RID, appendix C of the COTIF international convention) which is derived from the UN regulation model for TDG and from the Global Harmonized System for classification and labeling of chemicals [1]. RID rules include: classification of dangerous substances following their physical properties, hazards' types and intensities; design of packaging, containers and tanks; specific provisions for loading/unloading operations of containers and tank-wagons; handling and disposal of packages and containers on wagons as well as labelling of packages and wagons marking [1]. Also RID defines and allocates responsibilities to competent bodies and authorities concerning the correct implementation and control of RID rules. In particular competent authorities are identified for tests, controls, maintenances and inspections applicable to the tank part of the tank wagons.

The EU framework Directive on inland TDG (2008/68) defines the application scope in the EU legislation of RID (rail TDG), ADR (road TDG) and ADN (waterways TDG), and sets common conditions for transport derogations or additional restrictions in EU-MS [2]. In EU legislation the application of RID rules is extended to domestic transport. In addition Directive 96/35 on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway requires employers whose employees load, transport or unload dangerous goods in significant quantities to appoint, a special vocationally certified `adviser' to monitor compliance with the transport by road, rail and inland waterway requirements. In the Fig.1 it is to see the scope of RID Application.

2 Legal conditions valid by transport of dangerous goods by rail

The Regulation concerning the International Carriage of Dangerous Goods by Rail (RID). RID was drawn up by the intergovernmental Organisation for International Carriage by Rail (OTIF), comprising 46 member countries. It is established on European territory through European directive 2008/68/EC, and transposed into French law by the Ministerial Order known as the "arrêté TMD", or "TDG Order". [3] Similar transposition exists in each Member State. This Regulation applies to international traffic. Directive 2008/68/EC transposes RID into the EU's internal law, including for national transport. OTIF and the Commission have put in place the necessary coordination. As a result of coordination work between the UNECE in Geneva and OTIF, the provisions on the carriage of dangerous goods by rail are also harmonised with the provisions for road transport (ADR) and inland waterways transport (ADN). The RID (international railway transport regulation for hazardous goods) regulation specifies the conditions under which selected hazardous goods must be transported. More or less 3,500 products are approved with specific identification and coding [4],[5].

The HG Task Force of the United Nations regularly releases new versions of their recommendations for dangerous transport, which take into account recent technical progress, appearance of new dangerous matters and new building materials, the needs for the modern systems of transport and, initially, the requirements for safety of people and property and environmental protection [1]. Each transport mode covers particular constraints, there it exists particular international legislations adapted from these UN recommendations (ADR for road, IMDG for the sea transport, IATA for the air, RID for railway). These international texts are also introduced in the national legislation (in France, the "Arrêté RID" for rail transport) [2].

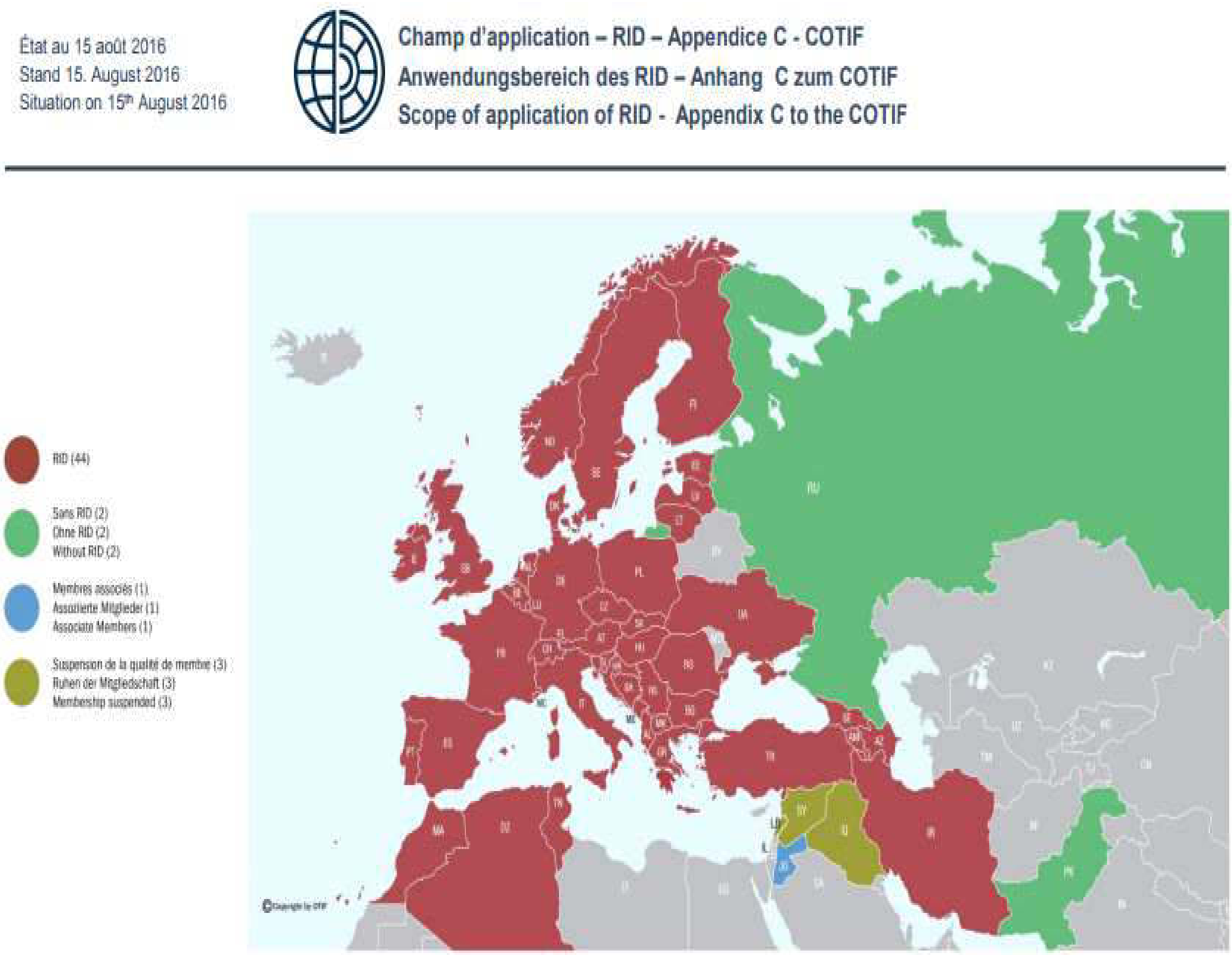

Figure 1 Scope of RID Application [1]

2.1 EU railway legislative processes

There are three Directives that directly impact on the transport of dangerous goods: **2008/68/EC Directive** of European Parliament and the Council of 24 September 2008 on the Inland Transport Directive of Dangerous Goods [3]. This Directive requires Member States to apply the provisions of the RID, ADR and AND to all transport operations in the Community domestic and international. The Directive also provides the Commission with powers to permit derogations from the international modal provisions after consulting the Regulatory Committee on the Transport of Dangerous Goods (TDG Committee). This committee meets about twice a year (meetings are called by the Commission) and is attended by Member States and industry representatives. Only Members States' representatives can vote and the procedure will depend on the so-called "comitology procedure" applied [4],[6].

2010/35/EU Directive of European Parliament and the Council of 16 June 2010 on transportable pressure equipment. This Directive replaced an earlier version. It is not relevant to this study. **95/50EC Council Directive** on uniform procedures for checks on the transport of dangerous goods by road [2].

2.2 Rules related to transport safety

The EU railway 'transport safety' is regulated by the EU Railways Safety Directive . This Directive defines the roles and the responsibilities for safety management, improvement and development of the EU railway transport system. Transport of dangerous goods is part of the Directive's application scope which also includes requirements for common safety targets (applicable safety levels) and the prevention of serious accidents. From technical perspective the 'transport safety' of Community railways is also related to the Technical Specifications for Interoperability (TSI), which takes into account the principles of the Railway Safety Directive [2],[3],[4].

In particular, the requirements of the freight wagon TSI apply to the wagon part of wagons carrying dangerous goods, similarly to other freight wagons. Thus, a full set of requirements for 'transport safety' is defined by these directives and responsibilities for control of design, construction, placing in service, upgrading, renewal, operation, maintenance and safety management of freight transport, including dangerous goods wagons, are defined. Additional requirements having an impact on the technical specifications of wagons and specific to DG requirements are not in the TSI but only in the RID [5].

Finally both 'substance safety' and 'transport safety' influence the overall safety of railway transport as well as the technical compatibility and the performance of EU railway system [6]. This is why it is so important to ensure a good consistency between EU legislation and the RID provisions. The United Nations has played a pivotal role in the transport of dangerous goods since 1953 (see above) the Economic and Social Council of the UN has established a number of regional commissions and acts as a coordinating organisation for specialist bodies of which the following have a direct interest in the transport of dangerous goods:

- ECE (Regional Commission),
- IMO (Specialised agency),
- ICAO (Specialised agency),
- IAEA (Specialised agency).

In addition, the UN Committee of Experts on the Transport of Dangerous Goods (TDG) and on the Globally Harmonized System of Classification (GHS) and Labelling of Chemicals (UNCoE) is an Expert body appointed by ECOSOC [6]. The committee has two sub committees, one responsible for TDG and one for GHS. The membership of the two committees is different and this report only addresses the TDG. The UNECE provides the secretariat for the whole body (UNCoE, TDG and GHS) on behalf of ECOSOC [4],[5],[6].

Conclusions

Fuller details of the legislative process are given in "The ABC of European Union Law" published by the EU Publications Office. The European Commission makes proposals for legislation but decisions are made by the Council and the Parliament.

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APPROACHES AND KEY FACTORS OF MASS CUSTOMIZATION

Robert Poklemba
Technical University of Kosice, Faculty of Manufacturing Technologies with a seat in Presov, Department of Manufacturing Management, Bayerova 1,080 01 Presov, Slovakia, robert.poklemba@tuke.sk

Keywords: mass customization, concept, modularization, approaches
Abstract: Mass customization does not mean the production of products of one type, as was the case in classical mass production. It is the production of a large number of product variants, of the same product family at competitive costs of mass production and quantity economics. New production concepts for Industry 4.0 and mass customization will require totally revolutionary ways of planning and managing production. These must be based on the autonomy and application of artificial intelligence and evolutionary principles.

1 Introduction

New production concepts for Industry 4.0 and mass customization will require totally revolutionary ways of planning and managing production. These must be based on the autonomy and application of artificial intelligence and evolutionary principles. Although the level of automation in production is growing rapidly and in the future this growth will be exponential, it is far from reaching the level, versatility and flexibility that people have. Today, in the transition period, due to the complexity and variety of the production of personalized products and their enormous variation or complexity, production is not made without people. On the contrary. Man will remain the most intelligent part of production for a long time, the most versatile and most flexible part of it. It is to be expected that even in the coming decades the need for highly skilled and skilled workers in manufacturing will be high. Production jobs are gradually being eliminated, mainly those jobs where routine work or repetitive operations are performed and can be easily automated [1].

However, future production also requires new production concepts that will focused on industry conditions 4.0. Current organizational and operational models of production will not suffice to introduce mass customization. Therefore, a new concept of organizational-management models will need to be overlooked, which would provide manufacturing companies with guidance on how to gradually re-orient themselves to future production, especially for small and medium-sized enterprises. The most important factor that will affect the existing production environment will be the customer. He will be able to configure his product in detail. This configured, customer design will be sent to a factory that will have to be able to produce the product he wants in a short time. In order to complete the product in a very short time, the suppliers' activities will be managed in the same way as the final manufacturer [2].

2 Concept of mass customization

The process of globalization and the 4th Industrial Revolution force researchers to look for new flexible business-organizational structures. It is clear that the classical vision of the business and its activities no longer corresponds economic reality. This is especially true for manufacturing companies. Today's manufacturing businesses must have a high degree of specialization in different areas of work and a flexible production system that listens to and adapts to customer needs [3,4].

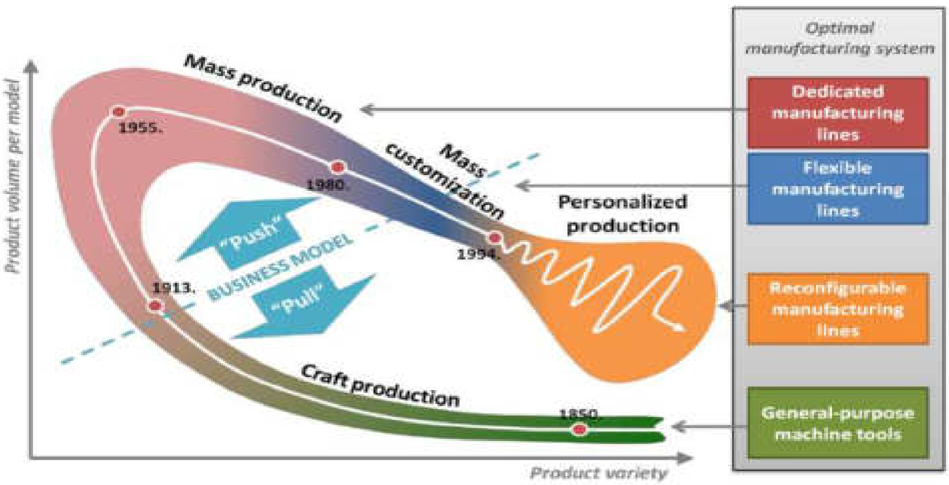

Figure 1 Volume variety relationship in manufacturing paradigms [3]

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2.1 Advantages of mass customization

For mass customization, it is imperative that the operating network is flexible and dynamic because the main purpose for mass customization is to adapt to individual customer requirements. The goal is to give the customer the opportunity to design their own specific products [5].

Main advantages of mass customization:

- Better position and market share - maximize customer satisfaction, better references
- Lower cost of material waste and inventory - it is a contract production, it is not necessary for the company to have a stock of finished products
- Faster cash flow: quick production - quick turnaround
- Reducing delivery time ensures flexible production and information flow enables manufacturers to quickly adapt to customer requirements.
- The manufacturer's ability to offer a wide range of products with low production costs - various product types with the same basic components but different final design will allow manufacturers to offer a whole range of products to satisfy every customer.

3 Mass customization approaches

According to Joseph Pine, II [6], there are Four Approaches to Applying Adaptation in Mass Customization:

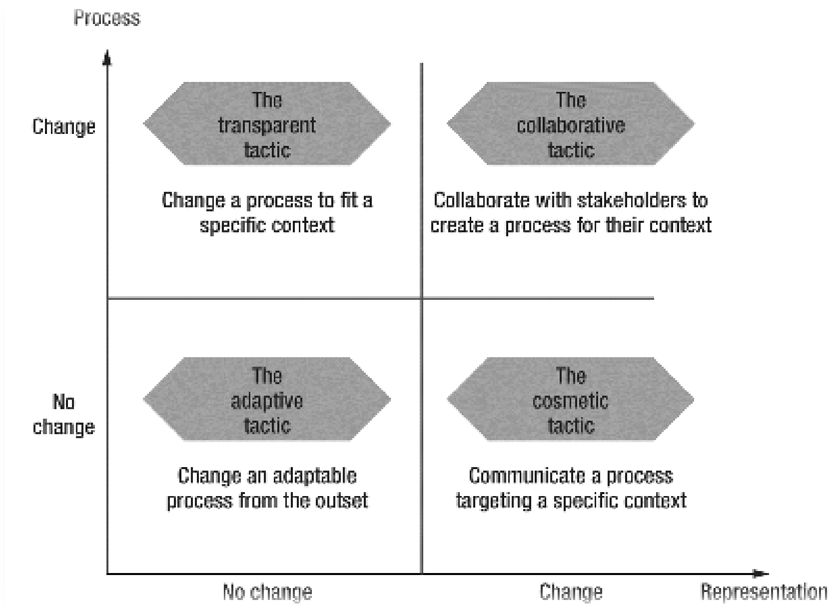

Figure 2 Two approaches of mass customization [6]

- **Collaborative customizers:** These organizations offer customers the opportunity to participate in the resulting design to meet their needs (size, colour, functionality).
- **Adaptive Customers:** Customers buy a standard product but can customize it according to their needs (software, programming language).
- **Cosmetic adaptations**: These companies (mostly suppliers) offer a standard product but present it differently from different customers (different packaging).
- **Transparent adaptations:** these companies offer customers customized products without knowing (e-shops).

4 Key success factors

Mass customization is able to customize products in bulk for less cost in a relatively short time. Many experts on mass customization agree that the success of mass customization is dependent on some key factors:

4.1 Modular product design

In the modular design of products, products are designed within some modules or processes, so they can be used for different types of products. For example, Boeing Co. has thousands of components for its standardized aircraft, configured for different finite aircraft types. This system enables companies to simplify ordering, engineering and production. Modular product design can be built on "project shop" models or workspaces with required throughput [5-8].

Requirements for the modular system:

- enough input standardized components (the need for reliable suppliers),
- skilled, highly educated employees with excellent technical qualifications,

- relevant organizational structure that improves coordination between modules [12].

Benefits:

- the ability to use standardized components for different product types,
- shorten production time - modules can be run simultaneously, thereby reducing production time,
- simple problem diagnostics, possibility to isolate individual errors, quality problems, easier control [7,9].

4.2 Flexible Manufacturing Process

This factor envies the capacity, the difference of products and the delivery times. If the company is able to efficiently organize a modular product design production system is flexible what brings more variety and lower costs to the market [5].

4.3 Sophisticated Order Management

Mass customization is based on customer requirements. Because Individual Claims are different order management is a critical factor in the relationship between the customer and the company. Therefore, any company that wants to meet the requirements should have an established system that would include the open profiles of each customer and would be so easy to meet its requirements [9-13].

Factor requirements:

- close customer relationships,
- system for processing a large amount of information (orders, delivery dates, payments),
- integrating the value chain from customer communication through marketing to sales [5,9].

4.4 Integrated Information System

The main requirement for mass customization is an efficient information system that ensures a smooth and accurate flow of information between customers and manufacturers, including among corporate divisions. To handle such decision-making between minutes and multiple decisions, a decision support system is required that integrates information from all participants throughout the organization as well as between customers and producers [9].

4.5 Organizational structure

Organizational hierarchies with many levels are not relevant to a mass personalization society. The organizational structure should have a lower level and effective coordination between processes (modules). It focuses on a high degree of integration between the various functions and employee participation. The result is a much higher degree of decentralization in decision-making. In addition, the structure is open to both suppliers and customers because (suppliers and customers) are seen as an extension of the organization [5,12].

With regard to the concept of mass customization, the organizational structure should be as follows:

- Management focuses on three parts: vendor relations, customer relationships, and resource management.
- All departments are integrated along the value chain.
- The information system connects parts of the organization and also provides relationships with suppliers and customers [5].

Conclusions

The concept of future production systems will require completely new approaches to the organization of work in production. They will use all the good of past production approaches and combine it with the latest advanced technologies. The latest technologies, often referred to as breakthroughs, will make it possible to change existing production principles.

The future production will produce product which will be tailored for needs of customer. Future production will produce products that are tailored to the needs of a particular customer, highly sophisticated, comprehensive, capable of offering new functionality, and will therefore require a completely new production environment.

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