MODELING THE HUMAN RESOURCE DEVELOPMENT PROCESS IN THE AUTOMOTIVE INDUSTRY SERVICES

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The fast evolution of the automotive industry generates the need for development and diversification of the employees' competences required in the industry specific services. Human resources follows the industry trends; thus, the main characteristic of the employees in the automotive industry services to be developed in the immediate future is the adaptive expertise. The research methodology relies both on a literature review and on the experience of the authors, which allowed for designing a new model of human resource development process for the automotive industry services. Within this context, the human resource development is approached from the perspective of acquiring new competences or developing existing ones in accordance with the new market requirements.

Keywords: automotive industry, human resources competences, human resources development process.

1. Introduction

Globalization is a phenomenon present in all industries, being driven by the recent technological progress, starting with the internet to the satellite communications.

Within current globalization context and of overall economic, technological and legislative development, the automotive industry is undergoing an intensive process of change. According to OICA (International Organization of Motor Vehicle Manufactures), the automotive industry represents one of the main drivers for global economic growth. Furthermore, the automotive industry represents one of the top global employers with 9 million employees which manufacture 60 million motor vehicles, representing 5% of the manufacturing activities at international level. The automotive industry is considered by scholars as being the "industry of all industries", leaving a significant and powerful mark on the 20th century.

The automotive industry market underwent various changes in terms of massive product cut-back on the traditional markets, such as Germany and France,

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while the new Chinese market is continuously growing. Until 2000, the main markets of the global automotive industry have been the United States, Western Europe and Japan, comprising of the main global annual production of motor vehicles and specific services, while ensuring a yearly profitable growth for the main motor vehicle manufacturers. The global economic landscape has radically changed in the past 10 years. The 21th century brings an accentuated decrease in demand on the traditional markets.

Moreover, a fast advancement of new technologies takes place in domains such as auto safety, motor vehicle mounted communication systems, vehicle engines, etc. Still, the humankind need for mobility is continuously growing, which the authors appreciate will develop rather in an evolutionary than a revolutionary manner.

The current urban consumer purchasing behavior is expected to change, while further determining the change in the market structure. In 2010, the demand was situated in the C and D segment intervals, i.e. the compact class and the mid-size class, closely followed by the B-segment, i.e. small class. The afore mentioned three segments represent approximately 85% of the global motor vehicle demand. The researchers believe that by 2035 the conventional market structure between A-segment (mini class) and F-segment (Premium, luxury class) will shift towards the small class zone.

The « IHS Global Scenarios - Global Redesign » consultants have predicted a scenario where the world will undergo a major structural change by 2035 due to the increasing focus of all governments and policies on CO_2 reduction and on worldwide fuel consumption reduction, while the global economy will be more than double its current size. Within this context, the evolution of the global structure and motor vehicle sales are presented in Table 1 bellow:

Table 1

The evolution of the global structure and motor vehicle sales

	Worldwide		Europe		China		U.S.A.	
SEGMENT	**2010**	**2030**	**2010**	**2030**	**2010**	**2030**	**2010**	**2030**
A	5,74	10,57	1,34	1,96	0,78	1,88	0,02	0,23
B	**10,42**	**20,59**	**3,72**	**5,73**	**1,27**	**3,46**	**0,4**	**1,24**
C	**14,16**	**23,87**	**3,27**	**3,81**	**4,57**	**8,96**	**2,08**	**4,2**
D	7,63	11,52	1,68	1,8	1,38	3,12	2,88	4,07
E	2,37	3,65	0,54	**0,52**	0,57	1,35	5,77	7,51
Other	26,32	43,86	4,5	5,13	6,29	13,34	5,77	7,51

(Source: IHS Global Scenarios, 2010)

The European automotive industry ranks 4th place among the manufacturing industries in terms of added value, generating 8.9% of the overall added value of the manufacturing industries, while employing 7.24% of employees. Many of the enterprises in Romania are being influenced by the aforementioned changes in the automotive industry. At the same time, the automotive industry plays a significant economic role in Romania. Furthermore, a significant success is recorded by Romanian enterprises well-positioned in the automotive industry. Starting a few years back, Romania is part of a select group of motor vehicle manufacturing European countries, ranking 10th place in 2011, as depicted in Fig. 1.

No.	COUNTRY	2011
1	GERMANY	6,304,457
2	SPAIN	2,353,682
3	FRANCE	2,294,889
4	UNITED KINGDOM	1,463,999
5	CZECH REPUBLIC	1,199,834
6	POLAND	846,500
7	ITALY	790,348
8	SLOVAKIA	639,763
9	BELGIUM	562,386
10	**ROMANIA**	**335,232**
11	HUNGARY	202,800
12	PORTUGAL	192,242
13	SWEDEN	188,969
14	SLOVENIA	174,119
15	AUSTRIA	152,505
16	NETHERLANDS	41,972
17	FINLAND	2,540
	TOTAL	**17,746,237**

Source: OICA

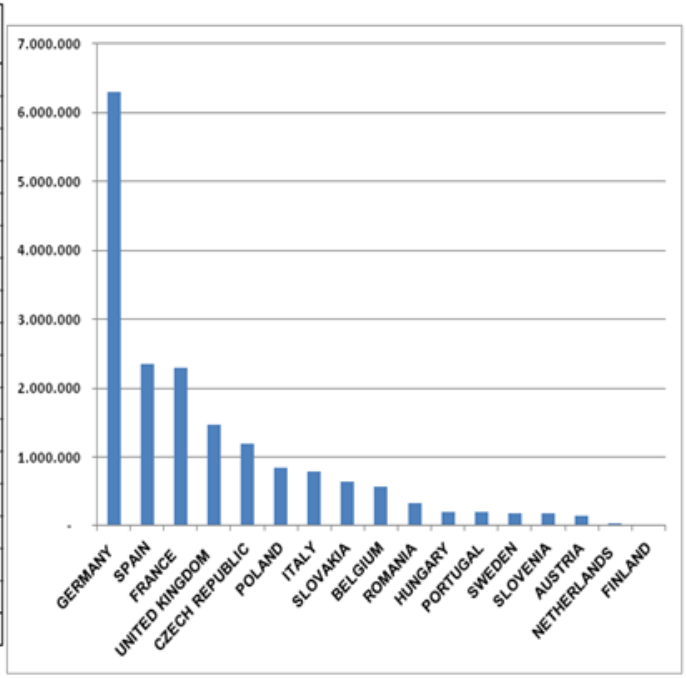

Fig. 1.The significance of the automotive industry in Romania
(Source: The International Organization of Motor Vehicle Manufactures)

There is yet a need for the automotive industry in Romania to become more competitive, same for all countries. To this end, the automotive industry requires sustainable efforts for adapting to technological progress, massive investments in the human resource formation and human resource development, which is required for the production of specific products and services.

In terms of job and occupation diversity within the labor structure, the most relevant are those with a high level of competences. Although manual workers represent a big percentage (i.e. approximately 60%), they are employed to perform qualified or semi-qualified jobs, especially in the service sector. The

personnel employed to perform various qualified manual labor jobs, such as mechanics, have a similar educational background. Within EU, only 63% have high school level of education, while in the newest member countries, 94% have high school level of education. The middle level of education is nevertheless increasing, representing a requirement of the technological development and the changes in the consumer behavior. A major unbalance can be observed in the automotive industry in terms of the proportion of women to men in the workplace, men dominating the workplace. The production processes and the industrial services are dominated by men, while the women are predominantly employed to perform jobs in secretarial or administrative services.

2. Human resources in the automotive industry

The development of high technologies requires the development of know-how which is actually represented by people. Human resources follows the trends of the industry, the main characteristic needed in the future by the labor force in the automotive industry being the adaptive expertise. The fast evolution of the automotive industry generates the need for the development and the diversification of the employees'competences, while requiring technical skill formation and behavior training in terms of labor relations.

The literature review has revealed that the academic society has allocated significant resources and time for establishing the clear relation between competences and acquired knowledge, the concept definition and terminology varying from on author to the other. Competences represent the essential attributes of one individual, which are in direct relation with the professional performance and are based on a wide spectrum of knowledge, cognitive skills and abilities. The relation between competences, knowledge, skills and abilities is as follows:

Competence = knowledge + skills + abilities

Competence can further be defined as the science of acting in a particular situation as a result of a combination of knowledge, professional and relational practices allowing for managing an unfolding professional situation in order to satisfy the beneficiaries involved. It can also be defined as the capacity to make decisions within the established limits for the purpose of fulfilling job specific duties. There should be an obvious balance between competence and job duties. Therefore, competence can be defined as comprising of al knowledge, abilities and experience allowing for fulfilling all duties in an efficient and effective manner due to three factors: training, experience and personality.

Fig. 2 presents the main activities requiring the increase in the level of knowledge and professional competence.

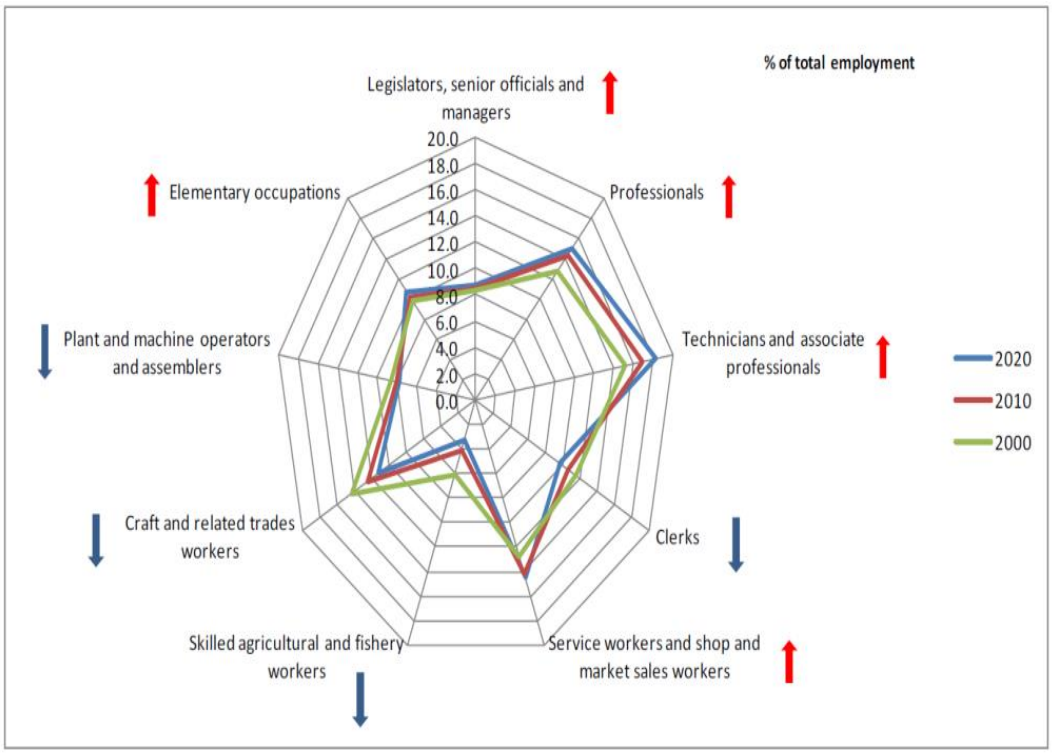

Fig. 2. Activities requiring the increase of competences

(Source: Adaptation from Eurostat)

Early detection of new requirements in terms of human resources competencies in the automotive industry services represents an efficient method for determining the qualification standards that employees will have to meet in the future. The development of competences required within a new context is becoming more important as the labor market undergoes continuous gradual change, while organizations and employees are confronting continuously emerging new requirements.

The main competence the employees of the automotive industry services needed to have in the past was manual dexterity. Nowadays, the enterprises in the automotive industry are employing qualified personnel who have the ability to work in a team, who have initiative, who can exercise multiple responsibilities and who can qualify as multi-tasking in order to easily adapt to the new demanded profile. Within this context, a major gap can be observed between current competences of employees in the automotive industry and those required in the future.

As previously mentioned, in terms of job and occupation diversity within the labor structure, the most relevant are those with a high level of competences. Although manual workers represent a big percentage (i.e. approximately 60%), they are employed to perform qualified or semi-qualified jobs, especially in the service sector. The personnel employed to perform various qualified manual labor jobs, such as mechanics, have a similar educational background. Within EU, only 63% have high school level of education, while in the newest member countries, 94% have high school level of education. The middle level of education is nevertheless increasing, representing a requirement of the technological development and the changes in the consumer behavior.

It is for this reason that the authors consider human resources in the service sector as undergoing a continuous formation and development process based on competences. It is now more than ever that the formation and development programs are making the difference, thus becoming a factor for competitiveness and a focus point of the human resources policies.

3. Modeling the human resource development process

3.1. Human resources development

Countries, industries, organizations and individuals undergo a continuous process of change under the influence of internal and external environment factors, which are specific to each entity. Now, more than ever before, the change as a process of adaptation to new challenges is becoming a critical and essential factor for maintaining the organization's level of competitiveness. The organizations in the automotive industry meet the same requirements for change due to the changes taking place in the external competitive environment and those in the internal environment, which call for adapting the strategy and objectives of the organization by redesign and alignment within the new context. Human resources is increasingly becoming strategic resource needed for ensuring the required change in the quest for better market positioning [2]. Therefore, the management of competences and knowledge represents a critical factor for the organizations in the automotive industry. The new context is determining the human resources involved in manufacturing or services to develop new competences, which are indispensible for maintaining the level of competitiveness and for creating sustainable success. The new operations and technologies require the development of new competences. Both academic scholars and industry experts view the human resource development process as a systematic and long-term process, requiring the attainment of new knowledge, abilities and attitudes for employees to efficiently fulfill the responsibilities of a particular job [3]. This

process demands permanent changing of competences and attitudes of an individual in the workplace.

For each organization all three aspects are important as they contribute to:

- the development of employees for undertaking new responsibilities
- the conventional training of new or young employees
- the increase in the level of efficiency and the increase in performance standards
- the information of employees (e.g. induction training, health and safety training courses)
- meeting the legislative requirements (the Labor Code instructs on the obligation of the employer to train their employees).

Human resource development leads to organizational development as the individual represents the only recourse which can integrate all other resources, thus having the capacity to drive the organization to a level of competitiveness allowing for maintaining long-term success.

3.2. The new model of human resources development process

An organization's level of competitiveness depends mostly on its capacity to permanently adapt to the changes of the business environment and to the new requirements of the market. This requires the development of the learning and innovation capacities. The human resource development process thus becomes an instrument for increasing such capacities. In order to better analyze and manage this process, a new conceptual model has been developed.

Modeling processes and phenomena has evolved overtime. Nowadays, it has become more flexible, adopting a multidisciplinary approach. Scientific modeling is viewed as a necessity as systems become more flexible, and phenomena and problems more diverse. The need for analyzing such phenomena and systems is thus generated. Said analysis cannot be performed in real conditions, requiring simplification and sub-systemic approach in order to uncover the core of the problem. The model involves the interaction of multiple sciences, helping with making the decisions for change within the organization or helping with increasing the efficiency of processes and of performances [4]. A model is creative and innovative. Process modeling has advantages and disadvantages, as synthesized in Fig. 3.

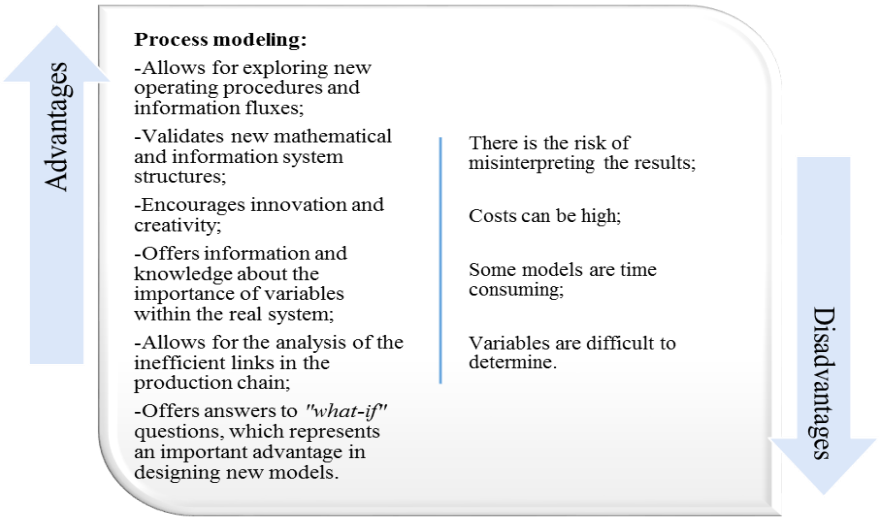

Fig. 3. Advantages and disadvantages of process modeling

All these aspects about process modeling can either be performed with minimum time, budget or human efforts or can require significant resources, depending on the complexity of the model. The output of the model can determine if the aforementioned disadvantages can be gradually transformed in significant advantages. The new human resource development model is depicted in fig 4 [1].

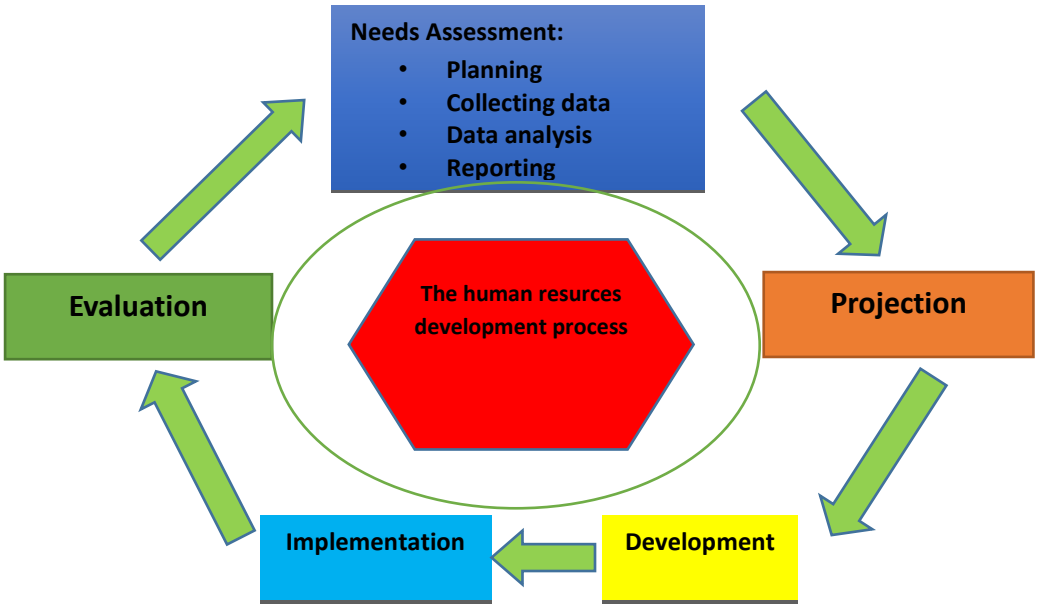

Fig. 4. Human resource development model

a) Evaluation of needs

It represents a *useful diagnostic instrument* by colleting relevant data for determining the actual training needs required to support the employees and the organization in achieving the objectives. This evaluation allows for analyzing the level of knowledge, abilities and competences at individual and organizational level with the aim of identifying the areas requiring improvement. Furthermore, it allows for developing the objectives to be achieved by training and development programs, representing the basis for creating criteria for measuring the success and effectiveness of such programs. Moreover, it allows for identifying the difference between existing competences of employees at a particular time and the actual needs of a certain job, of the organization itself or of a particular context. *The evaluation of the training needs has the potential of becoming the basis for analyzing the efficiency of the designed training programs.*

Various *methods* can be employed for identifying the training needs, the most common being as follows:

- The questionnaire for evaluating the training needs
- Discussion/ Development interview
- Performance evaluation discussions
- Carrier planning discussions
- Evaluation and development centers

Furthermore, the following can be also employed:

- Surveys
- Observation
- Customer complaints
- Tests
- Focus groups

Employees' personal development cannot be achieved solely by attending training sessions; it requires also activities such as:

- Shadowing (learning by observing another trained employees in their day-to-day job)
- Coaching (provided by senior managers);
- Mentoring
- Learning by participating in project teams or by participating at conferences
- Experience exchange
- Self learning by studying and reading
- Participation in research activities

b) Designing the human resource development programs

The phase of designing the human resource development process can be synthesized in the following questions:

Why is the human resource development program necessary?

What type of development programs should be employed?

When should the development process start?

Who needs development? Who will manage the process? Who will deliver the program?

Human resource development strategies comprise of clear plans and programs designed to deliver objectives (e.g. new personnel, carrier development, succession planning). Such plans and programs are designed, developed and implemented. The objectives which are formulated within the human resource formation and development programs provide the framework for enterprise development in terms of the production and service processes. The strategy must consider all enterprise capabilities (i.e. strengths, weaknesses and basic competences), competitors' capabilities (i.e. strengths, weaknesses, basic competences and strategy), market opportunities, objectives and financial resources. Table 2 exemplifies a few basic objectives of the human resource development programs and their characteristics [1].

Table 2

The objectives of the human resource development programs

Duration of formation programs	It represents the strategic orientation towards the timeframe when the labor force requires particular competences. It refers to how fast the employees should develop certain competences. Said strategic orientation is designed especially for enterprises developing their activity under conditions of rapid technological change. Undertaking such strategy leads to the optimization of the employees' performance and cost reduction.
Low formation costs	Such strategic approach focuses on obtaining the lowest cost or the highest value when implementing a formation program.
Low development costs	Such strategic orientation has the objective of minimizing de development costs within a limited budget.
Performance, technology, innovation	Such strategic orientation refers to attaining the highest level of human resource performance and functionality. It can be applied to all industries.
Quality and trust	The industries requiring high qualified jobs due to the fact that error correction can result in huge costs (e.g. vehicle recalls) should have as strategic approach to ensure the high quality of formation programs and to build the trust in the employees' competences.
Customer orientation and flexibility	Such strategic orientation focuses on ensuring high quality services by responding to customer demands and by maintaining the flexibility required to continuously reply to the development of new markets or to any market opportunity.

c) Process development

During this phase, job descriptions, standards, methods and procedures are being prepared. An efficient development phase comprises the following basic activities:

- ***Determining the formation curricula.*** An efficient development program cannot take place without this phase considering the significant difference between an "intuitive" and non-formal curriculum of the development program and a strategic, exact and explicit curriculum.

- ***Establishing the human resource development methods***. It refers to highlighting the distinct benefits of various formation methods and to combining these methods in order to create the most effective learning experience. Some believe that the online development programs are the most effective method in terms of time and costs. Nevertheless, it should be emphasized that there are situation where the face-to-face traditional formation methods are mandatory.

- ***Defining the required competences and establishing the proper media*** for delivering the program. A certain balance between theoretical and practical aspects is needed for this activity.

d) Implementing the human resource development programs

The implementation represents the actual delivery of the program by employing the proper formation techniques for the communication of the new knowledge, the abilities and the attitudes. Table 3 presents a few implementation methods which the authors consider as being the most effective in terms of impact on the formation process. The authors presented only these methods of implementing the human resources development process in the automotive industry, process very complex, but HR department may adopt other methods based on policy regarding on the employees of the company.

Tabel 3

Formation program implementation methods

TYPE OF LEARNING	FORMATION ACTIVITIES	EVALUATION ACTIVITIES
Information	• Presentations • Reading material • Brainstorming • Audio-video materials • E-learning	Exams (written tests) Oral exams
Abilities (manual dexterity, communicatio, planning, etc.)	• Demo + control list • Instructions followed by practice + feedback • Case study • Small work groups • Aquarium • Brainstorming	Direct observation for: *practicing abilities *simulation *role paying (in the case of communication abilities) The use of the control list
Attitudes/ values	• Discussions, aquarium • Role playing • Brainstorming	Indirectly by observing the behavior especially during practice Role playing

e) Analyzing and evaluating the human resource development programs

In order to ensure that the objectives of the program have been met, an evaluation of the development program should be performed by identifying the effects of the program:

- the employees are more efficient, effective and flexible
- the employees become operational and efficient much faster than when accumulating direct experience
- the employees are more efficient in terms of following procedures and use of technical equipment
- fewer work accidents take place
- the level of employees' qualification and their capacity to takeover other responsibilities increases
- the employees become more open to innovation and to accept changes

The development process requires on one hand to understand the current position and to evaluate how good or how bad the situation is and on the other hand to understand the position needed to be reached in a particular timeframe, after a body of knowledge has been accumulated. The more informed the employees of one enterprise, the more efficient the enterprise is going to be.

4. Conclusions

The automotive industry represents an important pillar of any economy both as share of the gross domestic product and as powerful job creator. The organizations within this sector are developing their activity in a competitive market, undergoing changes due to factors such as the environment, the legislation, the technological progress and the evolution of the traditional business models. In order to overcome the problems generated by the competitive market, the organizations in the automotive industry must undergo changes for becoming more competitive and for ensuring their survival and sustainable success. An important approach to change for the organizations in the automotive industry focuses on human resource formation and development by designing and developing various programs in accordance with the dynamic of the business environment.

The human resource development process can be viewed as a service the enterprise is providing for its employees with the aim of increasing their motivation, developing their innovation capacity and ensuring their loyalty. Since human resources represents the most important capital of the organization, the value of human capital can grow overtime with the help of human resource development programs, thus representing an important competitive advantage.

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