Business Transformation Towards Digitalization and Smart Systems

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Abstract

For easing the Business Transformation and to keep pace with the rapid digital developments by sensitization, potential determination, assessment of existing structures and processes, tailor made blended learning modules for training of employees and managers of SMEs. Impaired impact: Transformation of SME to the developments in the digitalization and smart systems to gain competitiveness and profit. There is no digitalization and no digital transformation without digitization (of paper and processes). Digitization is used in many contexts it is very often con-fused and/or interchangeably used with digitalization. So, what is digitization? Digitization and digitalization are two conceptual terms that are closely associated and often used interchangeably in a broad range of literatures. There is analytical value in explicitly making a clear distinction between these two terms. Digitization is used in several meanings as said but for me it has two meanings which are closely related with each other.

Entrepreneurship key competence refers to an individual’s ability to turn ideas into action. Entrepreneurship formation should offer students tools to be creative, to solve problems efficiently, to analyse a business idea objectively, and to communicate, cooperate, lead, develop and evaluate projects. Formation must be at the core of society's response to these powerful forces. Innovations and corresponding skills should be used in all sectors of education and training, because technology skills are essential for global citizenship.

Keywords: Entrepreneurship formation; Business transformation; Digitalization; SMART systems; Innovation

Introduction

Innovation involves the utilization of new formation or a new use or combination of existing knowledge. New knowledge may either be generated by the firm during its innovation activities (i.e. through intramural R&D) or acquired externally through various channels (e.g. purchase of new technology; utilization of IT resources). The use of new knowledge requires innovative efforts that can be distinguished from standardized routines". (OECD, 2005). The transition from an industrial to a knowledge-based society and the short-time adjustment of knowledge, competences and skills for new business should change also entrepreneurship education. Changes in work and living conditions, digitalization progress and societal change require adapted education forms, life-long learning new concepts, providing more and more short-termed, and new structural answers. Besides different approaches to modernize and improve EE, social innovation is becoming prominent in policy, scientific and public debates in Europe and global. For a fair and accurate analysis of how to develop the concept of digitization in companies and in society, how to form the new utilisations, we needed to know the initial situation [1-2].

a. Technological change has a strong impact on daily work
b. Manufacturing processes change rapidly
c. The networking of systems and applications is increasing
d. Teams are increasingly working virtually
e. Higher customer requirements (new business models/

service offers, personalization of products (batch size 1), short delivery times)
f. Results of the study “vocational training trends in Germany 2017” show:

g. Digitalization has reached companies at all levels of qualification.
h. In order to be prepared for the digital transformation, companies need employees with versatile digital skills.
i. Training portfolios in companies are still far from meeting digital requirements

j. Under these circumstances, we launched a European project BITTMAS “Business Transformation towards digitalization and smart systems”, on the Erasmus + program, with partners from: Germany, Ireland, Spain, Austria, Turkey and Romania, representing both the university, research and innovation environment, as well as the business environment, professional associations, Chambers of Commerce and Industry, with several goals:

k. Raising awareness of the digitalisation of SMEs in particular (micro-enterprises, SMEs; up to 249 employees; max. annual turnover EUR 50 million; according to the recommendation of the EU Commission dated 6 May 2003)
l. To improve vocational training offers for digitalisation
Intelligent factories can lead to increased productivity in processes and a higher market value of the individuals with regard to job opportunities. In order to identify the real problems of the target group, a market survey was carried out in each of the represented countries and we made a necessary science.

The following market needs were identified:

a. Increased sense of initiative and entrepreneurship: Most of the SME are not yet aware of the implications if they are not prepared for the Business Transformation required because of the further digitalization in all spheres of life.

b. Increased sense of initiative and entrepreneurship of owners, managers, and staff can only be expected if sensitization and tailor-made measures are applied with the companies.

c. Improved levels of skills for employability and new business creation: Improved levels of skills and the upgrading of competencies for new business creation will only succeed, if specific solutions for the environment each company/case is developed.

a. Increased opportunities for professional development: Extended digital competencies will lead to increased productivity in processes and higher market value of the individuals with regard to job opportunities.

b. The need for more digital skills with regard to Business Transformation/Processes with employees will help them to stay in work and will be decisive to create new businesses and products.

c. Increased motivation and satisfaction in their daily work: Decision-making reliability through extended competencies leads to increased motivation and work satisfaction based on process security.

In order to identify the real problems of the target group/companies, a market survey was carried out in each of the represented countries and we made a necessary science.

The following market needs were identified:

a. Industry is one of the pillars of the European economy - the manufacturing sector in the European Union accounts for 2 million enterprises, 33 million jobs and 60% of productivity growth.

b. The European industry needs to explore the future potential of ICT, automation, sustainable and clean as well as human-centered manufacturing and processing technologies.

c. According to Oettinger areas like big data, the internet of things, cyber-physical systems and robotics offer great opportunities for industry.

d. In order to seize them, there is urgency for acting fast, at the right scale and jointly at the European level.

e. Industry in Europe has assets to build on leadership in industrial robotics and factory automation, enterprise software or 3D- and laser-based manufacturing.

f. At a recent roundtable in Brussels on the Digital Transformation of Industry, hosted by Gunther Oettinger, EU
Commissioner for Digital Economy and Society, European business leaders to discuss ways to energize the digital transformation of Europe’s industrial sector.

g. Across Europe, digitalization raises the potential for increasing flexibility, efficiency, productivity, competitiveness - all helping to create jobs and growth.

h. Top priorities are small and medium-sized enterprises. After all, Europe is a continent of SMEs - where nine out of 10 companies are SMEs and, two out of three jobs are in SMEs.

i. They have to be part of the digital journey; they are crucial to Europe’s growth and competitiveness

Obtained results; next steps

Until now we have completed the following modules of the training system provided:

a. Methodology to determine the potentials for new business solutions

b. Tool Box (Figure 1-4).

![Figure 1: BITTMAS glossary (definitions digitalization).](image1)

![Figure 2: BITTMAS library (Basic and specialized knowledge in digitalization).](image2)
Based on the self-assessment and the generated roadmap, the company can take measures and make investments to implement predictive maintenance in line with the gaps (difference to the highest level) identified. (Base on the presentation of Jörg Bauer, Dipl.-Kfm. (Univ.), Hochschule Reutlingen, Conference, Leipzig, 2017) [3-5] (Figure-5,6).
Figure 5: Methodology to develop a roadmap and derive the necessary measures.

Figure 6: BITTMAS Use Cases.

**a.** Training modules to provide knowledge in regard to digitalization and smart systems, to support the implementation and running of the developed assessment and training solution.

- a) Digital twin of the facility
- b) Digital twin of the assets
- c) Connected Company
- d) Decentralized & flexible value creation
- e) Digital Assistant systems
- f) Technical Assistant systems
- g) Integrated transparent value chain
- h) Autonomous intralogistics
- i) Predictive maintenance
- j) Data Driven Decision Making
- k) Data-enabled resource optimisation
- l) Track and trace
- m) Smart Product
- n) Digital Human Resources Management
- o) Digital Marketing
- p) Digital Procurement
- q) Cyber Security
- r) Informatics systems in the automotive industry

In the next period we aim to achieve the following modules of the training system provided:

- a) Roadmaps
Conclusion

To face the challenges of remaining fit for the future, other countries have been developing strategies to build their industries to a level where they can compete within the global economy in the years to come. Most relevant for the Netherlands is the German Industry 4.0 initiative, but Belgium, Denmark, the United States and South Korea are also developing their own manufacturing strategies. In the Netherlands, this strategy is called “Smart Industry”. Digitalization has increasingly become an important communication tool for conducting business. Well-designed and properly maintained systems expedite business communications, create trust, efficiency and competitiveness and automate routine business tasks.

Entrepreneurship is the art of to be able to turn ideas into action. This implies creativity, innovation, risk taking, and the competence to plan and manage projects in order to achieve proposed objectives.

If the vision of Industry 4.0 is to be realized, most enterprise processes must become more digitized. A critical element will be the evolution of traditional supply chains toward a connected, smart, and highly efficient supply chain ecosystem. The supply chain today is a series of largely discrete, soloed steps taken through marketing, product development, manufacturing, and distribution, and finally into the hands of the customer.

Digitization brings down those walls, and the chain becomes a completely integrated ecosystem that is fully transparent to all the players involved - from the suppliers of raw materials, components, and parts, to the transporters of those supplies and finished goods, and finally to the customers demanding fulfillment. This network will depend on a number of key technologies: integrated planning and execution systems, logistics visibility, autonomous logistics, smart procurement and warehousing, spare parts management, and advanced analytics.

The result will enable companies to react to disruptions in the supply chain, and even anticipate them, by fully modeling the network, creating “what-if” scenarios, and adjusting the supply chain in real time as conditions change [5-9]. The entrepreneurship competence is relevant not only for those who would like to start/ carry up a business but for all who would like to be competitive and efficient, to support changes in individual, collective, economic and social environments. It is necessary to consider formation, education, entrepreneurial culture, digitalization and personal formation, on each stage of development of eco-innovation models. The development models should work in innovative eco-systems, and functional complex that creates competitiveness, efficiency and added value. Entrepreneurial training and digitization are not two different components of the road to competitiveness but complementary components, which should be approached unitarily in the process of creating an efficient entrepreneurial culture.

Once built - and the components are starting to be developed today - the digital supply “network” will offer a new degree of resiliency and responsiveness enabling companies that get there first to beat the competition in the effort to provide customers with the most efficient and transparent service delivery.

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