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E-LEARNING IN A SUSTAINABLE SOCIETY

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Abstract: *The paper focuses on e-learning to support IT (information technology) skills for a sustainable society. Perhaps all entrepreneurs are interested in innovation, artificial intelligence and industry 4.0. IT delivers solutions in the form of simulation, alerting, autonomous robots, and machine learning based on artificial intelligence data. For education and e-learning, it is the responsibility to refine the skills of students to work with intelligence and automated processes. Advanced skills are needed to work with an intelligent personal assistant, intelligent knowledge navigator, smart calendar, views of social media conversation, or personalized marketing. Practical examples are based on experiences from courses devoted to operating systems and CRM systems.*

Keywords: automated processes, e-learning, information technology, intelligences, sustainable society.

INTRODUCTION

The theme of sustainable society is increasingly important for the future of life on the Earth. People use information technology to share experience and knowledge. Day-to-day activities are changing at a rapid rate through innovations and hard pressure of market. It is a competitive society, but life is not just about a competitive environment. Life is precious and it is important to develop life in all forms with respect. From long-term life on the Earth, this is the age of a sustainable society (Sachs 2015). A sustainable society promotes real development needs from presence to the future that all generations may live in. Rules based on a competitive society often bring conflicts. This reality has solutions linked to a sustainable society and sustainable development.

This development affects the social, environmental and economic conditions of life (Miller, 2014). Information technology is used in all activities and it is natural

that information technology also has an important place in sustainable development.

Sustainability is necessary for all aspects of life. Perhaps everyone will devote the first thought to energy, water and food. These aspects are associated with changes in energy technology, minimizing water consumption and increasing food production with optimal quality. And it is not all. The changes are also designed for processes in manufactures and are increasingly one of the most important technologies such as information technology (Caets 1995). In the last century, information technology has provided support through information systems in various forms and contexts (Williamson & Johanson, 2017) such as Transaction Processing System (TPS), Management Information System (MIS), Decision Support System (DSS), and Online Analytical Processing (OLAP). There are many proven approaches to developing these information systems to support operating and database systems with links to various intelligences and data mining.

Information technology and knowledge (Barbosa 2018) are irreplaceable for a sustainable society with different forms of intelligences (Lamm 2018) such as product, customer, competitive, business, and artificial. For the current view of e-learning in a sustainable society, this paper is divided into several chapters. The first two chapters focus on the real view of a sustainable society and the new roles of intelligences for industry 4.0. The third chapter is about the importance of e-learning and education 4.0. The actual contribution of this work is evident in the fourth chapter, which describes the integration of automated processes and intelligences into courses focused on operating systems and CRM. The aim is to extend knowledge of students about work with selected operating and CRM systems based on automation and intelligence.

1. SUSTAINABLE SOCIETY

The importance of sustainable development is evident in the specification of a sustainable society. A sustainable society is a measure of consumption with respect to the environment and the balance of resources. It is about equality of citizens, freedom and a healthy standard of living (United Nations 2018; Bonnedahl & Heikkurinen 2019). In Europe, it is the urgency of progress based on the implementation of sustainable development in the activities undertaken to achieve a more sustainable future with regard to solidarity and human rights, social justice, equality, democracy and participation, entrepreneurship and environmental responsibility (Sustainable democracy in Europe 2019).

The importance of a sustainable society is becoming increasingly important in the context of efforts to prevent financial crises and people's passivity to life. There are also predictions about a new financial crisis from some experts, and again about doubt from the devastating effects on economies (Sustainable

Equality 2018). Reaching sustainable society goals goes through innovation in business that combines information technology, infrastructure and human sources (Peris-Ortiz et al. 2018). Focus is on drones, robots, and artificial intelligence in many implementations based on special training program and performance assessment methods. These include transparency, decision-making processes, product information for consumers, independent reports, and good information orientation that provides access to verified data against online disinformation and fake news.

Basic information skills, cooperation skills and more experience are important. Education and information on sustainable society and best practices have to be at the forefront of e-learning. At all times developing knowledge and information enables prosperity and better quality of life. It is about ability of change and innovation based on new technologies, which new technologies will have a positive impact on global society (Johannessen 2016). Again, this is artificial intelligence, robots, and other scientific and technological changes that are visible in machine learning algorithms to improve service quality.

Current forecasts say that new technologies will have a negative impact on jobs, as many routine jobs will be lost as we know today. However, new jobs will be needed, with links to new technologies. It will be about high specialization and optimal skills and knowledge. The pace of technological change is unexpected and it will be a big challenge for education and e-learning to have optimal methods (Collins & Halverson 2018). Towards a sustainable society requires optimal e-learning and dialogue on sustainability to have good knowledge and skills. There is room for workshops, webinars, forums and other projects that use information technology for the new roles of intelligences and industry 4.0.

2. NEW ROLES OF INTELLIGENCES AND INDUSTRY 4.0

The new roles of intelligences are fundamental in industry 4.0. Industry 4.0 introduces the idea of smart factories, where machines have added web connectivity to integrate them into one system for visualizing production and making decisions on their own (Embracing Industry 4.0 2019; Pabbathi 2018). Intelligences play an important role, but there are other technologies that transform industry. These include big data and analysis, autonomous robots, simulations, system integration, the Internet of things, cyber security, cloud, additive production and augmented reality.

Smart technologies are important for creating information technology and implementing it in practice. One of many examples is about customer relationship management (CRM) systems. In the new century, CRM systems must be more than a place to store data in a database (Fatouretchi 2019). There are alerts, simulations, and autonomous learning based on data with artificial intelligence. Such an approach requires the collection and comprehensive

evaluation of data from many different sources and customer management systems, such as the standard for real-time decision support.

Artificial intelligences have a practical implementation in different situations. The idea is that search engines use it to improve answers to queries (speech recognition, language translations), email programs use it to filter spam, banks use it to predict exchange rates and stock markets, robots use it to localize obstacles, autonomous cars use it to drive, video games use it to improve player experience, or smartphones use it to recognize objects (Narula, 2019; Schmidhuber, 2019).

In order to gain a competitive advantage from information technology, it is important to know about needed terms and work with them to adopt a framework of intelligences and technologies for a sustainable society. It is about integrating artificial intelligences and other powered automation and prediction across the enterprise. This method is based on three steps (Lamm, 2018).

Step 1: Clarify what focuses on business and what to automate such much as possible. Information technology processes are more integrated with artificial intelligence and automated.

Step 2: Artificial intelligence is used to collect and interpret data, making it easier to figure out what does not work and why.

Step 3: Realized analysis will lead to better prediction of product chain parts. Such automatic implementation leads to an improved machine learning system.

Good implementation of artificial intelligence is strategy based. The changes are focused on smarter products and services, better business decisions, automated business processes. The artificial intelligence strategy is based on nine areas such as business strategy, strategic artificial intelligence priorities, short-term artificial intelligence adoption priorities, data strategy, technology issues, skills and capacity, implementation, and change management issues (Marr 2019).

The first step to creating artificial intelligence strategy is by reviewing the business strategy that there is an obvious relationship of artificial intelligence to business goals. Strategic artificial intelligence priorities specify the main business priorities, problems to solve, and how artificial intelligence helps achieve strategic goals. It is about developing smarter products and services, more intelligent business processes and functions, or automating production processes. The short-term artificial intelligence adoption priorities focus on the ability to optimize processes quickly and cheaply. It is about smaller projects that help make artificial intelligence a priority.

Good work of artificial intelligence is based on many data. So artificial intelligence needs data, big data. There is a place for a data strategy to show whether there is the right sort of data, enough of data, the right type and volume of data

for artificial intelligence priorities. It is also a way to get the data you need and set up new data collection methods. Technological issues are interested in the technology required to achieve artificial intelligence priorities such as machine learning and deep learning. Implementation is about ideas to get artificial intelligence into reality through projects, key steps, and defined responsibility for actions. The volume of work is large and therefore information technology cannot be in interest of one department. For example, customer service and marketing teams work together to create a competitive advantage (Siggelkow & Terwiesch 2019) with artificial intelligence. Their understanding and direct customer experience contributes to intelligent system training. It is also about further e-learning and education.

3. IMPORTANCE OF E-LEARNING AND EDUCATION 4.0

E-learning is an important key to strengthening equality among people globally and locally. The whole global world economy requires knowledge and skills for international exchange and collaboration (McLagan 2017). Access to appropriate forms of education for all is a way to improve knowledge, prevent poverty and enable future generations to create a sustainable society. In this context, this theme has an impact on the role of education at all levels.

There are projects in education that use intelligences to help students and teachers gain more from their learning experience. Good experiences are with the implementation of artificial intelligence, such as: artificial intelligence automates educational activities such as grading, educational software is adapted to student needs, artificial intelligence seeks places where courses need to be improved, students have additional support from artificial intelligence teachers, artificial intelligence driven programs give students and teachers feedback, and artificial intelligence alters the way they find and communicate with information (10 Roles For Artificial Intelligence In Education 2018).

For e-learning, it is also important to introduce advanced IT practices into work with information technology. It is important that students, such as IT users, work with operating and information systems fixed with all benefits. The situation is harder because information is available, for example, on Google and many students think it is sufficient. However, the seminars show that this is a great weakness. It is not about finding information, but searching for optimal information with the following work.

For example, students who study an operating system in a bachelor's degree (the field of Managerial Informatics) have to select an operating system for practical work according to Linux/UNIX preferences. The Internet offers many life images that are used in a virtual environment such as Oracle VM VirtualBox or VMware Workstation Player, and the teacher prepares selected life images for seminars with advice on how to do it. This software is free and therefore used for learning without restrictions. Unfortunately, some students have difficulty

selecting the live operating system image according to their preference. The reason is, for example, that they try to work in this life image with knowledge of another similar operating system. In many cases, it is almost identical, but there are differences. Some students also have an operating system experience like Ubuntu or Fedora, but have lost up-to-date information and their orientation rate is lower. Overall orientation is good with basic operation on Linux/UNIX operating systems, such as user environment, user account creation, and displaying of important configuration files, but monitoring and configuration changes are already a problem.

Another example is a first degree course focused on CRM systems in (the field of Managerial Informatics). It also includes advice on how to work with selected CRM systems to optimize the focus on the possibilities offered by information technology. Students have also to select a CRM system for active work according to their preferences or they may use CRM systems based on a teacher's recommendation. What is positive is the fact that many vendors offer CRM systems in free format or a cloud for education and testing. In many cases, it involves a registration, in order to determine e-mail contact and destination for using their software. Unfortunately, similar difficulties are also visible in seminars. This is a low level of orientation in information from Google. Some students have difficulty with advanced work in CRM system and know more about benefits and weakness of this solution.

Building on industry 4.0 and the new role of IT intelligences, e-learning becomes increasingly important. Work in enterprises and organizations will bring different situations and information technology will have an important place here. Students must precisely control their own IT skill with all spectrum possibilities. They will work with different information technologies; they will increasingly need good orientation skills for using automated processes. And e-learning has to support these needs based on intelligences and automated processes too.

4. E-LEARNING FOR OPERATING SYSTEMS AND CRM WITH AUTOMATED PROCESSES AND INTELLIGENCES

Automated processes and intelligences are well placed in information technology at public level and the same place is in operating systems and CRM. In this respect, e-learning needs to prepare students, such as IT users, to work with IT with a higher impact on intelligences and automated processes. Artificial intelligence and automated processes are dedicated to found solutions faster than people and bring more personalization and learning from the behaviour of IT users.

The artificial intelligence for the operating system is an idea of the intelligence for managing computer software and hardware for providing common service. It is the intelligence to solve existing difficulties (Rilwan Ul Haq et al. 2017) with memory, processes, file systems, network connectivity, and compatibility of implemented information systems. One example is the First Intelligent

Operating System (FiOS) with integrated artificial intelligence to perform tasks for IT users (AiroCorp 2019)

Artificial intelligence and automated processes also have many implementations in CRM. It is about better working with customers with the most sensitive approach and understanding for their needs. Intelligences and automated processes form the basis for modern sales and marketing efforts to develop and categorize the ever-increasing volume of customer and business signals and data. It is about how to help achieve a sustainable society with predictive scoring, forecasting, and recommendations. A list of tasks that play an important role in artificial intelligence and automated processes is shown in Table 1.

Table 1.

Artificial intelligence and automated processes in tasks for operating systems and CRM

Artificial intelligence and automated processed tasks	**Integration into IT solutions**
Operating systems	
an intelligent personal assistant (Braina) that allows to interact with computer using voice commands	Windows PC
smart knowledge navigator lets you send messages, schedule meetings and make phone calls	iOS
provide environmental observation services, especially people's behaviour at home	the household operating system
system for tracking package deliveries, find files on a computer and setting reminders	Windows
CRM systems	
account overview, leadership prioritization, automated data entry, personalization of ads	Salesforce, Zoho, HubSpot CRM
automated monitoring of marketing trends	Salesforce
chatbot designed to act as a digital assistant for individual consumers to help them find products, make recommendations, request a refund	SAP
natural language processing to classify whether the text of a message is emotionally positive or negative	Salesforce
optimizing the selling process based on client analysis to create guidance for close deals	Oracle, Zoho, SugarCRM
personalized marketing/experience through personalizing the content for customers	Oracle, SugarCRM, HubSpot CRM
predictive recommendations using a customer data that recommended products of greater interest	Oracle, Zoho

smart calendar to show information needed before the meeting	Salesforce
understanding social media conversations, product recommendations, image classification	Salesforce

Source: Own work

Intelligences and automated processes have the ability to perform many tasks such as: advising, assisting people when making decisions, considering conclusions, deriving solutions, interpreting input, monitoring, predicting results, and designing alternatives. Students also need to work with them in courses focused on operating systems and CRM to learn more about automation and implemented intelligence.

CONCLUSION

Sustainability is necessary for all aspects of life, and changes are visible to industry-based 4.0 processes with IT support. There is interest in adapting to current conditions with high detail sensitivity. It is about knowledge and a wide range of skills. Education and e-learning are responsible for the practical skills of students (IT users) to work with IT, from a basic method to complex processes based on intelligences and automated processes. The interest is in updating itself without impact on other activities and IT users, checking and finding facts in the background so that they may be viewed by IT users, or knowing about current issues and searching in the background an optimal solution. Operating systems offer an intelligent personal assistant and a smart knowledge navigator. CRM systems rely on a smart calendar, automated monitoring of marketing trends, personalized marketing, or lead prioritization. E-learning has optimal possibilities of bringing these IT capabilities to students based on practical work in selected operating and CRM systems to support a sustainable society through the diverse skills of IT users.

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