Energy Usage and Green Public Transportation in Future Smart Cities: An Innovate Teaching Program for Students, Stakeholders and Entrepreneus
nº 2020-1-TR01-KA203-094242

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E-Newsletter/ 04

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Detail info about Module 2

Module-2

"Smart mobility and other smart parts assuring green future"

Module 2 focuses on various concepts such as digital transformation and technology use, smart mobility and a green future, the role of a smart society and managerial issues related to assuring the green future. **Currently, digital transformation** is becoming a necessity with continuous innovations in technology. Thus, it is important to identify the reasons for the increase in the popularity of digitalization in an extensive research literature, and practice and to explain the main issues behind the changes inmanagement congesting the digital transformation and **smart city**. However, digital transformation is a growing disruption that drives the changes in society and business, opens new markets as well as it strives for changes in business models, and paves the way for the creation of new and innovative business ecosystems.

Even more, interestingly, it shifts the mindsets of the organizations, and their employees and customers. Thus, it is crucial to understand the key areas of digitalization, precisely **customer experience** (including customer engagement), **business model,** and **process digitization**. In addition, with the omnipresence of the internet driving the emergence of new business models and approaches, the cost of the transaction has been reduced and the marginal costs of additional customers are on the lowest level ever. Digital transformation is a **complex process**.

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Thus, organizations need to motivate their employees to believe in the benefits of changes, and readiness for change plays a crucial role. Despite all new technologies (social media, cloud computing, business analytics, etc.), organizations need to shift their mindsets and be open for innovations and changes in of their business models if they want to be competitive in dynamic environment and rapidly changing world. Foregoing, organizations need to digitally transform, which is prominent for implementing new and innovative business models, i.e. freemium, on-demand, e-commerce, or marketplace model. Hence, organizations need to understand the characteristics of digital business models and exploit the **digital technologies** to excel in their value proposition.

One of the important areas for decision support is **business intelligence and analytics** dealing with data management solutions implemented in the organization to collect and present (usually big) data, while using statistics and software to analyze the data, and deliver insights for making better future decisions.
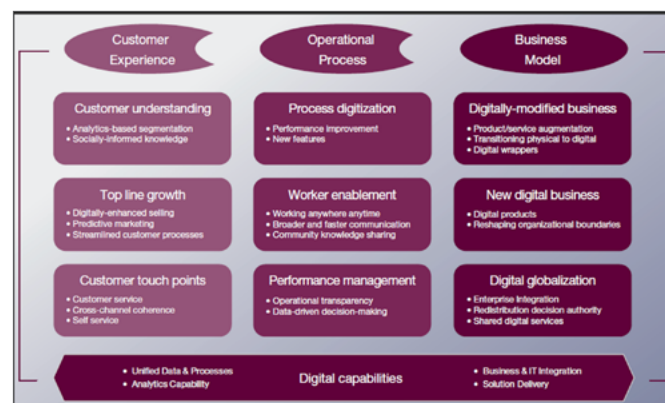

Figure 1. Building blocks of the digital transformation (Westerman et al., 2011)

Thus, it is particularly important to explore the data analytics process and present the key stages, such as identification of data quality issues, extraction of the data from various sources, cleaning and preparing the data to be analyzed, and interpretation of the data to support organizational change towards more informed decision-making behavior. Foregoing, organizational change affects the current dynamic business environments and should be carefully managed in order to succeed. **Change management** is a continuous process of renewing an organization's direction, structure, and capabilities to serve the ever-changing needs of businesses' ecosystems. However, using technology and innovation to facilitate and support enhanced decision-making and planning within governing bodies, enables organizations, communities, and other parts of the future smart cities to develop toward sustainable and **green future**.
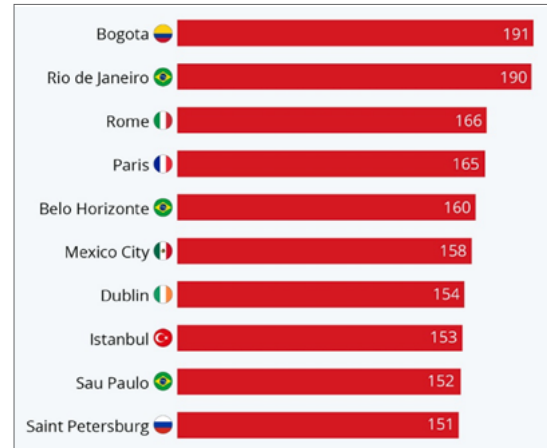
One approach toward the green future refers to **smart mobility**. Smart mobility is a crucial aspect of a smart city for it to function properly, since mobility and transportation cause a wide variety of issues in the rapidly urbanized world, that need to be addressed (e.g., traffic congestion and traffic jams, high accident rates, and air pollution).

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Would you like to **spend 7 days per year** in a car … to move zero kilometers? **Smart cities** offer solutions to these problems by implementing digital technologies that enable sensing, computing, actuating, and communication between internet-connected objects. Smart mobility systems include the fields of Intelligent Transportation Systems, Automotive Technology, Information, and Communications Technology (ICT), and Embedded Systems. Those systems can collect **distinct types of data** from various sources, for example, traffic data from traffic management systems, transport timetables from

(INRIX global traffic scorecard, 2019)

Figure 2. Cities with the Biggest Traffic Jams (cities where the average commuter spent the most hours in congestion in 2019

transport systems, crowd data from citizens, and sensor data from vehicles, traffic lights, parking lots, roads, etc.

Some examples of practical applications of digital solutions include digital transit payment, predictive maintenance of transportation infrastructure, intelligent traffic signals, smart parking, demand-based micro-transit, bike sharing, integrated modal information, and real-time road navigation, and street light control. Some of the benefits that smart mobility offers to the city are providing innovative traffic and transportation infrastructure, saving resources, improving efficiency, providing accessibility to urban services, improvement of quality of life for residents, reduction of costs, and more efficient energy usage.

Overall, smart city initiatives together with smart mobility initiatives should aim to improve the quality of life and ensure a green future for its residents, by acknowledging their needs and avoiding unnecessary development of undesirable or useless infrastructure, which would overwhelm and upset citizens. In the module, we are presenting established definitions of smart mobility, its drivers, main components, and advantages to traditional transportation, impact on the environment, and future predictions together with case studies of current practices.

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Detail info about Module 3

including visuals of project outputs developed up to now

Module-3 *"Energy-Related Smart Grids"*

Module 3 will introduce learners to the concept of smart grids and trends in energy use in transportation. These are important topics because there are major changes in energy use, primarily for environmental reasons. Efforts are being made to phase out fossil fuels and transition to other, cleaner energy sources. The module will look at the transition to different renewable energy sources and how to incorporate them into the energy system. We are experiencing rapid growth in electricity consumption in transportation and other areas such as heating buildings. This presents many challenges and opportunities for managing the power grid and providing a stable power supply.

Therefore, the use of advanced technologies in all parts of the power grid is getting traction in order to make it more efficient and stable. In this module, we will provide learners with the knowledge to identify the role of smart grids and energy in smart cities and their relationship to mobility. Learners will gain an understanding of the concept of traditional and smart grids. Since transportation is a major energy consumer and electrification of transportation or electric mobility/electro mobility seems to be the most viable alternative to fissionable fuel-powered vehicles at this time, we will also focus on the adoption of electric vehicles and their integration into the power grid.

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