

СЕКЦІЯ 5

ДІДЖИТАЛІЗАЦІЯ: ПЕРСПЕКТИВИ ЗАСТОСУВАННЯ ІНФОРМАЦІЙНИХ ТЕХНОЛОГІЙ ДЛЯ РОЗВИТКУ БІЗНЕСУ

THE KEY DRIVERS AFFECTING THE FUTURE OF DIGITALIZATION IN THE CONTEXT OF SUSTAINABILITY

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Key drivers in scientific research are dynamic and interconnected forces that shape the scientific landscape. Recognizing and understanding these drivers is essential for scientists to navigate the complex and evolving nature of their disciplines. The key drivers refer to the fundamental factors or forces that significantly influence the direction and outcomes of scientific advancements. These drivers are often multifaceted and dynamic, shaping the landscape of research and discovery [1].

Here are some perspectives on key drivers in scientific research.

1. Technological Advancements.

- *Driver.* The development and improvement of cutting-edge technologies.

- *Impact.* Technology often drives the ability to observe, measure, and analyze phenomena with greater precision. Advancements in tools and methodologies open new avenues for scientific exploration, enabling researchers to delve into previously inaccessible realms of knowledge.

2. Interdisciplinary Collaboration.

- *Driver.* Increasing collaboration among scientists from diverse fields.

- *Impact.* Interdisciplinary collaboration fosters a holistic approach to problem-solving. It allows researchers to combine expertise from different domains, leading to innovative solutions and a more comprehensive understanding of complex phenomena.

3. Globalization of Research.

- *Driver.* The global interconnectedness of scientific communities.

- *Impact:* Collaborative efforts on an international scale accelerate the pace of research. Shared resources, expertise, and data contribute to a more rapid dissemination of knowledge, allowing researchers to address global challenges collectively.

4. Open Science and Data Sharing.

- *Driver.* Embracing transparency and sharing research outputs openly.

- *Impact.* Open science practices enhance reproducibility, encourage collaboration, and accelerate the scientific process. Shared datasets and methodologies facilitate the validation of results and enable the community to build upon existing knowledge.

5. Funding and Policy Landscape.

- *Driver*. Government policies and funding priorities.

- *Impact*. The allocation of funds and policy decisions influence the focus and direction of scientific research. Research initiatives aligned with societal needs and global challenges tend to receive more support, shaping the trajectory of scientific inquiry.

6. Environmental and Societal Challenges.

- *Driver*. Urgent challenges such as climate change, public health crises, etc.

- *Impact*. Pressing issues drive scientific research to find solutions. The need to address real-world problems motivates researchers to develop practical applications and technologies that can contribute to the well-being of society.

7. Ethical Considerations [2].

- *Driver*. Increasing awareness of ethical implications in research.

- *Impact*. Ethical considerations are becoming central to scientific inquiry. Researchers are increasingly mindful of the ethical implications of their work, ensuring that scientific advancements align with societal values and norms.

8. Education and Outreach.

- *Driver*. The promotion of science education and public engagement.

- *Impact*. Investing in education and outreach fosters a scientifically literate society. This, in turn, generates interest and support for scientific research, influencing the direction of research priorities [3].

Key drivers are important factors that are characterized by a certain degree of uncertainty. Although we acknowledge their significance, we cannot predict the exact direction in which they will go. It is important to note that key drivers are not concrete linear trends. For example, climate change can be considered a trend, but policies that are designed to address climate change are not trends because they are complex and uncertain. The success of efforts to deal with climate change will depend on a variety of factors, such as policy design, countries involved, and other unpredictable factors.

The concept of key drivers is divided into two categories, internal and external. While external key drivers are beyond the influence of certain actors, internal key drivers can be influenced to some degree. For example, large corporations like Apple can sway economic policies. Although smaller companies, for instance, in Ukraine may not be able to influence global climate policies, they can still develop strategies to adjust to different changes. However, larger entities such as the US, the EU, China, and the hold the power to affect global climate policies, and their policies can be influenced by major corporations based on specific circumstances.

Let's try to analyze the key drivers of digitalization and its connection with sustainability in the example of Tesla Inc. By studying the key drivers affecting Tesla's digitalization efforts, we can gain insights into the future of sustainable transportation and its interaction with sustainability goals [4,5]. Tesla Inc. has been chosen as the company to focus on due to its significant impact on the digitalization of the automotive industry and its commitment to sustainability. Tesla is a leading manufacturer of electric vehicles and renewable energy solutions, and it has been instrumental in driving the adoption of EVs worldwide.

The first key driver might be the Technological Advancements in Electric Vehicles (EVs).

Technological advancements in EVs, such as improvements in battery technology, charging infrastructure, and autonomous driving capabilities, are crucial drivers for the future of digitalization in the automotive industry. These advancements have the potential to enhance the performance, affordability, and convenience of EVs, making them more attractive to a wider range of consumers. Additionally, innovations in EVs technology can lead to increased energy efficiency, reduced carbon emissions, and improved overall sustainability.

The second Key Driver we offered is the Government Policies and Regulations on Renewable Energy and Transportation.

Government policies and regulations play a pivotal role in shaping the digitalization of the automotive industry and promoting sustainability. Policies that incentivize the adoption of EVs, invest in renewable energy infrastructure, and set stricter emission standards encourage companies like Tesla to continue their digitalization efforts. Such regulations can drive the demand for sustainable transportation solutions, accelerate the development of charging networks, and create a supportive ecosystem for electric mobility. By aligning digitalization efforts with government policies, Tesla can contribute to achieving greater sustainability goals.

What is the connection of these key drivers with the Sustainability Goals?

The chosen key drivers, technological advancements in EVs and government policies on renewable energy and transportation, have a positive impact on sustainability goals. Tesla's focus on electric mobility and renewable energy aligns with the broader objective of reducing greenhouse gas emissions, mitigating climate change, and achieving a more sustainable future.

Technological advancements in EVs contribute to sustainability by reducing reliance on fossil fuels, minimizing air pollution, and promoting energy efficiency. Improved battery technology enables longer driving ranges and faster charging times, making EVs more practical and convenient for consumers. These advancements also pave the way for vehicle-to-grid integration, where EVs can serve as energy storage systems, enhancing the stability and resilience of the electrical grid.

Government policies and regulations play a crucial role in shaping the market for sustainable transportation. By implementing supportive policies, governments can stimulate the adoption of EVs, foster the development of renewable energy sources, and reduce carbon emissions from the transportation sector. Tesla's digitalization efforts can benefit from favorable policies and collaborate with governments to achieve shared sustainability goals.

In combination, these key drivers can lead to positive scenarios for sustainability. As technological advancements continue, EVs can become more affordable, accessible, and integrated into smart grids, creating a virtuous cycle of increased adoption and reduced environmental impact. Government policies and regulations that prioritize renewable energy and transportation can provide a conducive environment for Tesla's digitalization efforts, fostering innovation, investment, and sustainable growth.

Alternative key drivers for Tesla's digitalization could include:

- Consumer Demand and Awareness. Increasing consumer demand for sustainable transportation solutions and growing awareness of the environmental

benefits of EVs could be a key driver. This could be influenced by factors such as public education campaigns, incentives, and social trends.

- Partnerships and Collaborations. Collaborations with other companies, organizations, and governments to build charging infrastructure, develop advanced technologies, and expand market reach could be a crucial driver for Tesla's digitalization efforts.

Different combinations of key drivers can lead to various scenarios for the future of Tesla's digitalization and its impact on sustainability. For example, if technological advancements in EVs continue to accelerate, while government policies provide strong support for renewable energy and transportation, we could see a scenario where Tesla achieves widespread adoption of its electric vehicles, significantly reducing carbon emissions and contributing to a more sustainable transportation sector. However, we should also take into consideration Tesla's competitors

Conversely, if technological advancements stagnate, or if government policies do not prioritize sustainability, the digitalization of Tesla and the adoption of EVs may face obstacles, hindering progress towards sustainability goals.

Thus, in the Tesla example, the importance of monitoring key drivers and their interactions to predict and react to emerging trends and uncertainties, ensures that sustainability remains a core focus in the digitalization efforts.

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