

# On relations between the index of innovation and the b2c e-commerce index (a regressive analysis), using a quality management holistic approach, as well as descriptive statistics for western balkans

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**Abstract:** Purpose – My goal in conducting this study is to clarify and present the relationship and strong connections between the innovation index and the B2C E-Commerce index worldwide, as a response to the new normalcy, because innovation and B2C E-commerce issues, as well as quality and quality management, have been subject to an increasing interest all over the world, and the position of Western Balkan countries for innovation index and B2C E-commerce index, using descriptive and interdisciplinary methods.

Design/methodology/approach – The article used exploratory research based on correlation and regression analysis to discover relationships between innovation and the B2C E-commerce index, using data supplemented by the Global Innovation Index and the B2C E-commerce index. The study technique consisted of gathering data and information regarding the global innovation index and B2C E-commerce index as well as explaining the recently launched ISO 56000 family of standards, handling a correlation and a regressive analysis for relations between the innovation index and the B2C E-commerce index, which resulted in the main conclusion of this study that statistically verified relations between the innovation and the B2C E-commerce are strong, so ISO standards in general, and ISO 56000 standards family application in particular, is required in the time of B2C E-commerce, achieving competitive advantage. In terms of descriptive statistics, a comparison between the Western Balkans and the rest of the globe has been conducted.

Findings – Because innovation is covered by the ISO 56000 standard, this research gives statistical insights into the relationships between innovation and the B2C E-commerce index. It indicates that to get a competitive edge, successful business organizations should invest in innovation, B2C E-commerce, and quality management. The main recommendation is that the use of ISO standards in general, and the ISO 56000 family of standards in particular, helps companies strengthen their commitment to their clients by improving innovation and B2C E-commerce activities, processes, and procedures, and economies worldwide to gain a competitive advantage. The study's descriptive data on Western Balkan economies reveal that a significant effort is still required for EU integration.

Research limitations/implications – Because of the selected study technique, the research results may necessitate more examination; consequently, researchers are urged to investigate the presented propositions further.

Practical implications – The study discusses the implications of developing a strong tool that combines innovation, B2C E-commerce, and quality control to gain a competitive edge.

Originality/value – This work addresses for the first time, using correlation and regression analysis, a recognized need to investigate how innovation, B2C E-commerce, and the ISO 56000 family of standards are significantly connected, as well as descriptive data for a region (the Western Balkans).

Article Type – Research paper.

**Keywords:** Innovation index, B2C E-commerce index, ISO standards, ISO 56000, quality, quality management, competitive advantage, Western Balkans.

Received: April 13, 2024. Revised: September 8, 2024. Accepted: October 11, 2024. Published: November 4, 2024.

## 1. Introduction

Business development and strategy (1), technology advancements (2), and social and legal challenges and repercussions (3) are the three fundamental driving forces that pervade all elements of e-commerce. Improvement and advancements in IT, innovation, doing business, marketing practices, etc., have been more evident during the last ten years, compared with 20 – 30 years ago. The twenty-first century will usher in a digitally empowered social and economic life, the contours of which we can only just now begin to see. Analysts predict that by 2023, consumers would spend over \$7.3 trillion on digital transactions, while companies will spend around \$34 trillion. If not sooner, it looks like most of the commerce shall be e-commerce by the next 30 years. Discussing innovation and e-business which often is expressed through the innovation index and B2C E-commerce index, we immediately think about new products and/or services, as well as new combinations that result in improved ones, new methods of processing, manufacturing, assembling, entering new markets, a new way of utilizing resources, innovated business models, and so on, all of which are related to the effectiveness and efficiency of processes, procedures, methodologies, methods, tools, and technologies involved in the process of producing goods and services and delivering them from manufacturers to final consumers via online e-commerce services.

Innovation and e-business may not necessarily necessitate innovations, but rather simple approaches to making decisions, individual and group activity-based ideas implementation, and so on.

There is a growing interest in innovation and e-business, particularly concerning a quality culture and ISO standards. Quality culture acts as a guide for continual development, and it belongs to all members of an organization(s), providing a link between internal clients and suppliers.

The essential principle of quality culture is expressed in ISO standards, which are gaining popularity globally as a means of gaining a competitive edge. The most required standards are ISO 9000, ISO 14000, ISO 20000, ISO 22301, ISO 27000, ISO 45000, ISO 50000 family of standards, and especially the ISO 56000 family of standards, which is directly related to Innovation management and creativity, introduced in 2019, which coincides with the period of Covid - 19 pandemics as well.

Under the new reality and new normalcy, innovation, e-business, quality, quality culture, quality culture management, and ISO standards are becoming important as aspects of business models attaining competitive advantage.

## 2. Literature review

Aside from the nation and degree of economic growth, there has been an improvement in the literature for innovation, e-business, quality, ISO standards, the culture of quality, etc. globally. This is because

concepts like innovation, B2C E-commerce index, quality, quality management, and ISO standards, when properly applied, aid both private and public organizations in becoming more competitive in an open market when and where the offer is significantly greater than the demand, a situation that has characterized the last 50 years of the global economy.

### 2.1 Megatrends of 2020 – 2030 and worldwide economies respond to Crisis and post-crisis period

For the next 10 years, the main megatrends shall be (1) Population increase, which is at the center of the change in economic power, (2) The effects of global warming, which are everywhere where and have a big influence on coastal areas and crop productivity, (3) Thanks to the fast development of technology, artificial intelligence (AI), and machine learning, we are currently experiencing the fourth industrial revolution, sometimes known as the "digital revolution.", (4) Changes in the world's population, density, ethnicity, level of education, and other factors affecting the human population will result in considerable societal transformation, which will present possibilities and challenges for both industry and government. These megatrends have a significant impact on regional, international, and national markets and society by supporting structural changes, technical advancements, changing economic power, etc (Peter Fisk. 2019).

The world is moving toward the following major trends in response to these major shifts/megatrends, the crisis, and the post-crisis period: (1) the information revolution; (2) flexible & learning organizations and innovation systems; (3) an explosion of skills, knowledge, and competencies; (4) improving systems of creation, production, and distribution; (5) usage and expansion of innovation systems, creativity, and quality management culture, etc., generally and also about e-commerce.

### 2.2 Definition of Quality and quality culture

Numerous authors have identified the fundamental definition of quality as a set of principles that guide how improvement is carried out in daily operations involving works and outputs, a collection of practices taken for granted that constitutes the working philosophy of organizations or working groups. To paraphrase, quality culture is a "social attack that supports people in the organization to stay together" (Robbins, 1999).

Both the variety of goods and services available as well as their features and applications have greatly increased. These difficulties are manifestations of this culture: (1) Personal development, (2) Tolerance and Respect, (3) Entrepreneurship, (4) Capability ( a proven capacity).

The definition of "culture of quality" is "a group of common, respected, and integrally formed approaches of features of products and services, identified on the culture of organizations and systems of management" (Vlăsceanu, Grünberg, & Pârlea, 2007, Ceko 2021).

"The importance of quality culture and quality

management culture on conducting business and gaining a competitive advantage, and their connections to corporate social responsibility, sustainable business, business ethics, diversity issues, international, cross-cultural management, national/international organizational culture, culture and sectors of the economy in a country, as well as currently as an important part of the history of economic thought (related to business management cult)" Harvey and Stensaker (2008), Gordon and Owen (2008), and Schein (2010) and (2013).

Numerous publications have discussed ISO standards, their significance, how they are used in practice, etc. (Harrington & Mathers, 1997).

Currently, the most important ISO requirements are:

- QMS – Quality Management System - ISO 9000 Family
- Document management — Business process baselining and analysis ISO 10244:2010
- Environment protection ISO 14000
- IT – Information Technology - ISO 20000
- BCMS – Business Continuity Management – Security & Resilience - ISO 22301:2019
- ICM – Information Security Management - ISO 27000
- HSW – Health And Safety At Work - ISO 45000
- Energy Efficiency - ISO 50000
- IMS – Innovation Management System 56002:2019
- Etc.

The following three sorts of advantages of using standards are listed by ISO (ISO, 2014):

#### Key benefit 1: Streamlining internal operations

One key conclusion is that standards may be utilized to speed up internal business operations, for instance by lowering the time required to complete certain tasks across a range of business functions, eliminating waste, lowering procurement prices, and boosting productivity (ISO, 2014). According to case studies, standards contribute between 0.15 and 5 percent of yearly sales revenues to the gross profit of businesses (ISO, 2014).

#### Key benefit 2: Innovating and scaling up operations

Some case studies give instances of how standards were used as the foundation for creative business procedures, enabling businesses to increase their network of suppliers or introduce and successfully manage new product lines. In other cases, standards assisted businesses in reducing the risk associated with launching new products onto domestic markets (ISO, 2014).

#### Key benefit 3: Creating or entering new markets

According to ISO (2014), standards have served as the foundation for the creation of new markets as well as for the development of new goods and their entry into new markets (both local and international). In exceptional circumstances, the impact of standards is substantially beyond the aforementioned amount, with businesses realizing a contribution to gross profit of up to 33% of their annual revenue, which enabled them to establish themselves as industry leaders, at least for a while (ISO, 2014).

## 2.3 Innovation

Entrepreneurship was described as an innovative act that combines existing resources and productive ability in an OECD report (Nadim Ahmad and Richard G. Seymour 2006) from roughly 30 years ago (Drucker, 1985), and, with the use of skills for doing business (Shane 2003), including creativity, which begins and develops throughout this process (Sarasvathy 2001). According to a Manual published by the OECD (OECD 2005), creativity and innovation are related to the improvement of products/services, and the launch of new products/services on the market, this, is accompanied by innovative marketing activities, new ways of organization, etc. Schumpeter has long emphasized the role of innovation as a gear that constitutes industrial mutation in the reformation of the economy and its structure, eliminating the old and continuously bringing the newer (Schumpeter, 1942)". it is precisely this concept that takes on great importance, especially in the period of transnationalism, where the basis of the economy remains skills, knowledge, and competencies, i.e. non-material resources, which take more and more advantage compared to material resources. it is clear from the past innovation constitutes a clear incentive for businesses' success and the economy accordingly. this is because innovation directly affects the efficiency and effectiveness of entrepreneurship, its productivity, as well as the level of the national, regional, and global economy. As a practical implementation of new and rational ideas, which bring new and improved products and services (Schumpeter, 1993). new standards for innovation management, ISO 56000:2020 (ISO 2020), have now been presented, where innovation is defined as a concept through which value can be changed and spread. It is precisely the International Organization of Standards, which presents innovation as something new, a process, a procedure, or a product different from before, which is presented to users. This is also one of the reasons why ISO standards are applied to evaluate innovation within an organization and between them (ISO, 2019). The commonality of almost all definitions regarding innovation is that they present innovation as something new or as an improvement. According to some researchers, innovation is not invention, but it is still related to it since we are not always dealing with new products and services, but also with improvements in processes, procedures, ways of realizing products and services, etc. (Bhasin, Kim April 2, 2012), and all this to influence as much as possible one or several markets and the society of one or several countries or even globally (Morgan 2015), even without necessarily bringing inventions (Schumpeter 1939). In every country, there is a system of institutions, legislation, rules, processes, and procedures according to which it is the system itself that absorbs, builds, spreads, and uses the skills, knowledge, and competencies, which are the foundation of innovation. To have internal and regional and wider development, there is a tendency to

always use more and more developing and new skills, knowledge, and competencies, which are obtained during the development process of the country, the region, and the world, where innovation has a very big role. This is also the main reason why to innovate, a suitable climate is required for doing business and for research and development.

The suitable climate for doing business and for innovation, combined with having the skills, knowledge, and competencies, which require suitable conditions to be applied, make it possible for creativity and innovation to exist in developing countries, according to local requirements. This combined with the freedom of the market from the bureaucratic approach, the approach of the diversity of harmful regulations and procedures that hinder business and innovative ideas (WB Institute, 2005).

Ultimately, achieving and maintaining economic advantages requires a favorable environment for innovation and this can only be achieved with two-way support of the private and public sectors, and this is related to appropriate investments and the promotion of R&D activities, the existence of scientific research institutions, cooperation with academia, industries, aspects of intellectual property protection, etc. (Porter & Schwab, 2008).

New ways of communication, innovative business models and new technologies, etc., are what bring innovation (Chaffey, 2015).

Sources of innovation

It is the failure of systems and the engagement of economic agents that bring innovation, as innovation can also happen by chance. It is the successive economic structural changes and developing industry, demographic changes, changes in the structure of the markets, and changes in people's perception of life and the future, including their spiritual state, that bring innovation (Drucker 2002).

Engineer in robotics Joseph F. Engelberger demonstrated that innovation simply needs three things:

- a known request for a need
- people to be suitable for the right technologies
- financial incentive (Engelberger 1982).

The competition is accelerating more and more, and products, services, and production methods are becoming more and more global, as well as new technologies, and this makes businesses succeed only through the intensity through which effectiveness is achieved. and efficiency of innovations. This constitutes an important prerequisite for achieving and maintaining the economic advantages of business and the economy of a country. this is a process that is carried out through several interdependent actions carried out by different actors and that constitutes a very important factor in the success of these businesses and economies. According to some authors, now the increasing results in production do not have the effect of fixed manufacturing elements such as labor, capital, and land,

but are related to non-fixed factors that are innovation and changing technologies (Ceko. 2022, Anderson, Potočnik, Zhou, 2015).

Some other authors also focus on the relationships between doing business, leadership, strategic management, research and development, innovation, etc. (Shin, Zhang, Bartol (2015), Byron, Khazanchi (2015), Gilson, Lim, Litchfield, Gilson (2015), Perry-Smith, Mannucci, (2015).

As above, it seems that priority is given to the economic advantages that constitute an incentive for creativity and innovation, two elements that require dedicated support to achieve the desired result.

Now the crises are seen as an opportunity for creativity and innovation, and now activities such as health consultancy, online learning, e-commerce, etc., have best solved the problem of mobility. The sustainable future of systems is now considered inseparable from innovation and this includes areas such as control and reduction of changes affecting climate aspects, green economy, circular economy, waste management, etc. (GII 2021).

The COVID-19 pandemic brought an unprecedented crisis to the global arena, and at the same time encouraged the explosion of innovative ideas in almost all areas of life, with the aim of economic growth and financial stability.

The crisis brought about by this pandemic was also accompanied by profound changes and impacts that need time to learn that they will be sustainable. The very fact that scientific research during the pandemic period in the field of health was immediately oriented toward the production of quality vaccines, shows that the awareness of the role of innovation, technologies, and scientific research performed its function, awareness that pushes you as such also in the field others.

This means that innovation is now seen as a tool for promoting, developing, and making business and trade sustainable in the transnational arena. The world of global commerce has transformed, particularly during the last two decades, with economies of scale increasingly being displaced by an innovation economy centered on goods and services with high added value. (GII. 2021).

#### **2.4 ISO 56000 – a new ISO standard family for Innovation**

The element that sets a business in motion and makes it successful is innovation. He is the fuel. The businesses that give this fuel to employees and managers are exactly the ones that have more profits and bring more benefits to society. Enterprises, regardless of their size and business model, through innovation improve their position in the market and achieve their business goals better and faster. It is these ventures that show even more agility in responding to challenges and unforeseen events (Ann Brady. 2021).

It is precisely the innovation management system that supports and encourages business organizations to grasp the best ideas and support continuous

improvement to be as competitive as possible in a more global market and even more difficult to be successful. In these management systems, one of the latest families of standards published by the International Organization of Standards (ISO), precisely ISO 56000 - the family of ISO standards related to innovation (Clare Naden. 2020) is a part.

It is this standard, says Casanove, technical committee head at ISOI, in charge for this standard, that makes enterprises develop and evolve, create products and services, business models, etc., that add value, which is not without value in the monetary or financial aspect, but it can be of value to society, the environment, etc. Applying the standards that are part of this family (ISO 56000) makes it possible for organizations to significantly improve their survival in conditions of change and uncertainty, allowing these organizations to make inventions and reinventions in a sustainable way (Clare Naden. 2020).

The IMS – Innovation Management System - ISO 56000 family consists of the following standards, published already:

- Innovation management - ISO 56000:2019 - Guidelines
- Innovation management System - ISO 56002 – Guidelines
- Innovation management – Tools and methods for innovation partnership - ISO 56003 – Guidelines
- Innovation management assessment – Guidelines - ISO/TR 56004
- Innovation management – Tools and methods for intellectual property management - ISO 56005 – Guidelines
- Innovation management – Strategic intelligence management - ISO 56006 – Guidelines
- Innovation management – Ideas management - ISO 56007
- Innovation management – Tools and methods for measuring innovation performance - ISO 56008 – Guidelines (ISO. 2019)

The International Organization for Standards emphasizes that, including this standard, the relationship between innovation and creativity is seen as inseparable, and strong, and ISO standards application as a whole and use and application of the standards that make up the ISO 56000 family in particular, make companies improve their commitment concerning to customers, continuously improving processes, procedures, regulations, data retention and their business activities, in search of economic advantage, maintaining this advantage and in search of other advantages, which makes these enterprises respond even better and more successfully to crises and disasters.

Changes in value over time (employee value, shareholder value, proportion, and value of sales from new items) may be used to gauge innovation. Management teams will create goals, precise metrics, goals, and activities to attain these goals for each of

these four areas (Chaffey. 2015)

## 2.5 Innovation Index

The World Intellectual Property Organization publishes the Global Innovation Index each year, which ranks nations based on their propensity for and success in innovation. It was established in 2007 by INSEAD and the British business journal World Business (Aubert, 2010). The World Intellectual Property Organization released it up to 2021 in collaboration with Cornell University, INSEAD, and other businesses and institutions. (Matthews & Brueggemann. 2015).

It is founded on subjective and factual data gathered from various and factual data gathered from a variety of sources, such as the World Bank, the International Telecommunication Union, and the World Economic Forum.

Since the GII's launch in 2007, an increasing number of countries have developed policy solutions to enhance their performance by methodically analyzing their yearly GII findings. The United Nations General Assembly passed a resolution on science, technology, and innovation for sustainable development on December 19, 2019, and it refers to the index (UN. 2019).

### Global Innovation Index (GII)

With the ongoing COVID-19 epidemic, sluggish productivity growth, and other shifting issues in the background, the Global Innovation Index (GII) monitors the most current global innovation trends. It identifies the nations with the most inventive economy while outlining the strengths and shortcomings of innovation in 132 economies.

The Index consists of over 80 factors, including assessments of each economy's political climate, educational system, infrastructure, and knowledge generation, to provide the most comprehensive picture possible of innovation.

The many measures provided by the GII assist in tracking progress and comparing it to economies in the same area or income bracket (GII. 2021).

## 2.6 Internet, E-Commerce, and Innovation

We have entered a new economic age as a result of the creation of communication infrastructure in the shape of the Internet in the late 1980s and early 1990s, as well as associated advancements in information, publication, and distribution technologies (together referred to as Web technologies). The digital economy is another name for this new economy, which is fueled by the Internet and web technologies (Bhasker, 2013). Innovative businesses like Dell Computers, Amazon.com, Intel, Cisco, and Yahoo! saw the potential and were among the first to leverage the internet and online as a tool for Integrated Information Management. These businesses established systems for accepting orders from customers, processing payments, providing customer support, gathering marketing data, and receiving online reviews by integrating various online information management technologies over the

Internet, E-commerce, or online commerce, is the umbrella term for these operations. These businesses have improved their profitability, net worth, and competitive dynamics by using e-commerce methods. With its expansion, e-commerce has already become a technical advancement. With the constant introduction of new technology, business models, and communication strategies, innovation is relentless. In today's continuing risks like security and performance, all businesses must evaluate new electronic and Internet-based communication technologies for their potential to increase corporate competitiveness. For instance, as part of initiatives to change their operations digitally, many companies are evaluating the advantages, disadvantages, and dangers of the digital business technology they are now using. Consider the takeaways from the dot-com busts as well as the fact that innovation and the expansion of Internet pure-plays did not halt in 2000 and that several online businesses, like digital publishers and social networks, have continued to thrive since then (Chaffey. 2015).

### Internet and innovation

Despite journalists' casual use of the term "Internet" time to suggest a mechanism for rapid, nearly instantaneous global change, the modern Internet actually began almost 69 years ago and developed slowly for the first few decades before accelerating with the rise of the Web and mobile platforms.

Three distinct periods may be identified in the development of the Internet.

The core components of the Internet, including packet-switching hardware, the TCP/IP communications protocol, and client/server computing (all of which are covered in more detail later in this section), were conceptualized during the Innovation Phase, which lasted from 1961 to 1974.

Linking massive mainframe computers on various college campuses was the initial goal of the Internet. Until recently, the main means of direct connectivity between campuses were the telephone network and private networks run by major computer manufacturers. Large organizations like the National Science Foundation (NSF) and the U.S. Department of Defense (DoD) provided financing and legitimacy for the developing Internet during the Institutionalization Phase, which lasted from 1975 to 1995.

The Department of Defense (DoD) made a \$1 million contribution to further develop the principles underlying the Internet into a reliable military communications system after they had been validated in several government-supported demonstration projects. Through this initiative, the Advanced Research Projects Agency Network, or ARPANET, was established. The NSF initiated a \$200 million expansion effort and took over the construction of the civilian Internet (then known as NSFNET) in 1986.

The U.S. government urged private firms to take over and broaden local service beyond military installations and college campuses to the rest of the world's

population during the Commercialization Phase, which ran from 1995 until the present. Only when paired with investments in process redesign, organizational change management, and innovation does the digital business contribute to productivity increases (Chaffey. 2015)

### E-Commerce and innovation

E-commerce is the practice of conducting business via the Internet, the World Wide Web (Web), mobile applications, and mobile browsers. Even though the phrases Internet and Web are sometimes used synonymously, they refer to two completely distinct concepts. The Web, which offers access to billions of web pages, is one of the Internet's most well-known services. The Internet is a global network of computer networks. A software application is referred to as an app (short for application). Although it is occasionally used to apply to desktop computer programs as well, the phrase is primarily used to describe mobile applications. A mobile browser is a type of web browser application used to access the internet from a mobile device. E-commerce, as it is more technically known, is the exchange of goods and services between and among businesses and individuals using digital technology. These are the parts of our working definition of e-commerce, and each one is significant. All transactions that use digital technology as a medium are considered digitally enabled transactions. This mostly refers to transactions that take place through the Internet, the Web, and/or through mobile devices.

In exchange for goods and services, commercial transactions entail the transfer of value (such as money) across organizational or human borders. knowledge of the boundaries of e-commerce requires a knowledge of the value exchange. There is no commerce if there is no exchange of value. The number of individuals who have access to the Internet has been increasing at an astounding rate as a result of the convergence of communication technologies and gadgets. Because internal and external procedures are more effective as a result of the switch from traditional to electronic commerce, practically every firm may benefit from these improvements.

While some additional models have evolved as a result of the development of the Internet, many electronic commerce enterprises are founded on models that have been imported from conventional commerce. For electronic commerce to grow, the supporting technologies must converge as well as for business processes that support the transactional environment to change and for public policy concerns to be resolved. Once online enterprises have been established, the electronic market needs infrastructure resembling traditional commerce to deal with the issue of discovering, identifying, and luring clients to these businesses. Better, more effective, and more appealing shopping experiences are essential to the expansion and success of internet commerce. When a consumer is attempting to find and identify the greatest offer in the broad Internet business environment, reference-based,

search-based, and directory-lookup-based techniques only provide a restricted answer. Today, we are seeing the emergence of agent-mediated electronic commerce approaches that may automate the process of searching through the massive amount of information and bargains on the Internet while also enhancing the shopping experience. (Bhasker. 2013), keeping in mind that e-commerce has had three stages—innovation, consolidation, and reinvention—since its inception, including a period of explosive expansion and tremendous innovation.

- The early years of e-commerce saw mixed business and technological success, with significant revenue growth and customer usage but low-profit margins. The digital infrastructure built during this time was strong enough to support significant growth in e-commerce during the following decade.

- In 2001, e-commerce began a phase of consolidation that lasted until 2006.

- With the development of the mobile digital platform, social networks, and Web 2.0 apps in 2007, e-commerce underwent a phase of reinvention and quickly garnered massive audiences (Laudon and Traver, 2021).

The remarkable expansion of electronic commerce can be ascribed to the lowering of network-based business transaction friction. This decrease has improved customer service, reduced prices to consumers, and sped up transaction execution, allowing immediate delivery of items in some circumstances (software, digital music). Electronic commerce is concerned with technology and business processes that enable the transfer of information through international networks and interaction between producers, customers, middlemen, and sellers, which must be successful and efficient.

In the modern economy, it has become difficult to keep pace with technical development since there are so many different technological orientations being driven by competing discoveries. Although ideal in the early stages of new technology, the lack of any standards makes the work even more challenging. Competitive forces emerge from non-traditional sources for established businesses with typical business practices. As more people had access to the Internet, new markets arose and old businesses were compelled to use electronic commerce to survive and expand. The 1980s personal computer revolution has now reached a point beyond which it can no longer be reversed, and Internet connection and digital transformation have propelled the economy into the age of electronic business and trade. A new force resulting from the innovation occurring in wireless technologies has already started to drive enterprises farther up the ladder of evolution as the present advancements in digital transformation that are driving the electronic commerce age are being solidified (Bhasker. 2013).

The new catchphrase is mobility, and advancements in wireless technology are what's making it happen. Customers are no longer compelled to reach for their computers, as is the case with internet commerce. They

may access information, pay bills, make reservations, play games, download music, and movies, chat with friends and family, and conduct transactions all on the little screens of their mobile devices (Bhasker. 2013)

Of course, a successful company plan does not ensure success. The start-up will fail if there are issues with certain components of the idea's execution (Chaffey, 2015). The following execution-related elements can be considered as having failed for certain businesses:

- Promotion - Online or offline marketing strategies are insufficient to get enough site visitors.

Performance, availability, and security - Some websites have suffered from their success and are unable to provide quick access to the websites, or technological issues have led to the unavailability or insecurity of the service. Due to delays in building the website and its accompanying infrastructure, several sites have remained inaccessible despite extensive advertising campaigns (Chaffey, 2015).

- Fulfillment - The site may be efficient in and of itself, but if things are not shipped accurately or on time, customer service and, in turn, business image, will suffer (Chaffey, 2015)

The ability to determine which new technology developments may be implemented to create a competitive advantage—what is "the next big thing"—is one of the major issues of managing e-commerce. The fact is that no one can foretell the future, and many businesses have misread the product market (Chaffey, 2015)

Trott (1998) lists some prerequisites that must be met by an organization to enable it to successfully adapt to technological change or innovation:

- Growth orientation is a long-term perspective as opposed to a short-term one.
- Vigilance is the capacity to monitor the environment.
- Technology commitment is the readiness to invest in it. Accepting risk is being willed to accept calculated chances.
- Cross-functional cooperation is the capacity for cross-functional cooperation.
- Receptivity is the capacity to react to technological advancements made by outside parties.
- Allowing time to research new technical prospects is slack.
- Adaptability is the capacity to adapt to change.
- Wide variety of abilities, including technological and business expertise.

Being an early adopter (as an organization) has its drawbacks because of the possibility of failure; the leading edge is sometimes referred to as the "bleeding edge." Bugs will be present in new technology, they might not integrate well with the current systems, or the marketing advantages might not materialize as promised. Naturally, taking risks is motivated by the potential for great benefits; for example, if you employ

a strategy that your competitors do not, you will have an advantage over them (Chaffey. 2015).

## 2.7 B2C E-commerce index

An economy's readiness to accommodate online shopping is gauged by the UNCTAD B2C E-commerce Index. Four variables with a strong connection to online purchasing make up the index. Eight of the top 10 economies, much like the 2019 ranking, are located in Europe. With only 4.1 points separating first and tenth place, index values are quite close. As the top-ranked nation on the survey, Switzerland has just barely surpassed the Netherlands. The top ten's makeup only changed a little, with Australia being replaced by China, Hong Kong, and SAR. Despite being the largest B2C marketplaces in the world, China and the US are ranked 12th and 55th on the index, respectively. They are not placed higher in part because the index does not take into account their scale. Even while the two nations are ahead in several absolute comparisons, they fall behind. For instance, China ranks 87th in the world for Internet penetration, whereas the United States has lower Internet penetration than any of the top 10 economies. The United States is ranked 12th in terms of shopping penetration, whereas China is ranked 33<sup>rd</sup> (UNCTAD B2C Index. 2020).

### Asian nations dominate the top positions among developing economies

The top ten emerging economies in the 2020 index are all from Asia and all have incomes in the upper middle or high range (Table 2). The range of index values is bigger than it is for the top ten countries in the world, with Singapore at the top and Oman at the bottom, separated by a 24-point difference.

There was only one difference in this group's makeup from the 2019 index: Oman took Turkey's place when it left. Malaysia saw the greatest index value improvement.

Some emerging nations had the biggest gains in index scores. Algeria, Ghana, Brazil, and Lao PDR were the top four, and each of their ratings increased by at least five points as a result of considerable increases in postal reliability (UNCTAD B2C Index. 2020).

### Least developed countries are trailing the most in e-commerce readiness

The index's opposite-end nations are the ones that are least prepared to participate in and profit from e-commerce. The Congo and the Syrian Arab Republic are the only non-LDC economies in the group of the 20 economies with the lowest 2020 index scores, which include 18 LDCs.

In light of this, 25 Rapid e-Trade Readiness Assessments of LDCs have been conducted by UNCTAD during the last few years.<sup>15</sup> These evaluations aim to offer an analysis of what issues need to be resolved in many policy areas to improve a country's ability to engage successfully in e-commerce. Since most LDCs lack the knowledge and awareness

necessary to articulate their needs for development assistance in the area of e-commerce, donors have seen a relatively low demand for such assistance, which can help to overcome a significant market failure. There are significant geographical variations. Less than one-third of people in Africa have access to the Internet, compared to three-quarters of people in Western Asia. The proportional advantages and disadvantages are often different. The levels of the four indicators are often comparable throughout East, South, and Southeast Asia; Internet use is the only indication that is below the global average. The most significant need for development in Latin America and the Caribbean is postal dependability. African nations would profit from catching up in all policy areas to enable more inclusive e-commerce. There is no overall change in the index value from the 2019 index. Latin America and the Caribbean was the only region where the value increased (UNCTAD B2C Index. 2020).

## 3. Research framework, the purpose of the case study

The degree of innovation, the B2C E-commerce index, and their relationships within a worldwide ecosystem of entrepreneurship served as the basis for the study.

The link between innovation and the B2C E-commerce index has not been supported by any numerical, statistical, or algebraic reasoning; thus, this study employs a theory-building approach and tries to answer the following research questions:

- RQ1: Does the B2C E-commerce index have any relationship to innovation?
- Two possibilities have been developed in light of this:
- Ho: There is no relationship between the B2C E-commerce index and innovation.
- H1: The innovation index and the B2C e-commerce index are related.

... considering that there are few different types of research on the relationships between innovation and the B2C E-commerce index, which are listed in the literature review of this paper research, and considering that theoretical approaches to the relationships between innovation and the B2C E-commerce index exist, but there aren't any arguments based on numbers, statistics, or math studies.

## 4. Methodology

While recognizing the significance of innovation, the B2C E-commerce index, and quality management in the business and entrepreneurship ecosystem, previous empirical research has not explained how innovation and the B2C E-commerce index influence and connect quality management. In addition, only a few serious theoretical studies have demonstrated the strong relationship between innovation and the B2C E-commerce index; no numerical, statistical, or algebraic studies have been conducted in this area. Thus, a hypothesis that is backed by research and data must be developed. A single comprehensive case study



technique should be used with an exploratory strategy, which is suitable for developing a deep understanding of phenomena and enabling a deeper examination of theoretical structures.

#### 4.1 Case selection

The example was chosen based on three key factors: a theoretical approach, applicability of relationships, and practical benefits of relationships between innovation and the B2C E-commerce index, taking into account innovation as a characteristic of the ISO 56000 family of standards.

The case project was broken down into three phases: determining the needs for quality management, determining the rank of the nations for innovation, and determining the needs for the B2C E-commerce index.

#### 4.2 Data collection

- The World Intellectual Property Organization's Global Innovation Index Report 2021, 14th Edition, served as the source for the innovation data. Every year, nations are ranked according to their propensity for and success

with innovation in the Global Innovation Index (GII).

- Information for the B2C E-commerce index was also taken from the 14th edition of the World Intellectual Property Organization's Global Innovation Index Report 2021.

#### 4.3 Data analysis

1. The Global Innovation Index Report 2021 (World Intellectual Property Organization, 14th Edition) was used to compile statistics on innovation throughout the world.

2. The Global Innovation Index Report 2021 (World Intellectual Property Organization, 14th Edition) was used to compile statistics on B2C e-commerce globally.

3. For 132 countries globally, descriptive statistics for the Innovation Index and Creativity output were conducted, as well as a correlation and regression analysis (inferential statistics) between the Innovation Index and the B2C E-commerce Index.

### RELATIONS BETWEEN INNOVATION AND B2C E-COMMERCE INDEX

(128 COUNTRIES WORLDWIDE)

Table 1. Innovation index and B2C E-commerce index

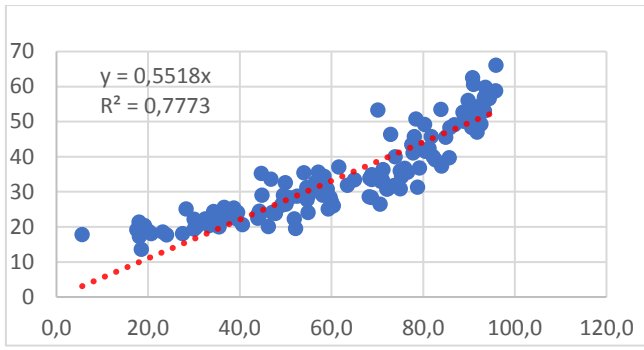
Rank for B2C from top to bottom	Rank for the innovation about rank for B2C	Economy	B2C index	Innovation index	Rank for innovation from the top to bottom	Economy	Innovation index
1	1	Switzerland	95.9	66.1	1	Switzerland	66.1
2	5	Netherlands	95.8	58.8	2	Sweden	62.5
3	6	Denmark	94.5	57.5	3	USA	60.6
4	8	Singapore	94.4	56.6	4	UK	59.8
5	4	UK	93.6	59.8	5	Netherlands	58.8
6	9	Germany	93.4	56.5	6	Denmark	57.5
7	7	Finland	93.4	57.0	7	Finland	57.0
8	15	Ireland	93.4	53.0	8	Singapore	56.6
9	20	Norway	92.6	49.3	9	Germany	56.5
10	11	Hong Kong	91.8	54.2	10	Korea	56.1
11	26	New Zealand	91.8	47.0	11	Hong Kong	54.2
12	3	USA	91.0	60.6	12	France	53.7
13	17	Canada	90.8	52.3	13	Israel	53.5
14	24	Estonia	90.8	48.3	14	China	53.3
15	2	Sweden	90.8	62.5	15	Ireland	53.0
16	23	Australia	90.6	48.4	16	Japan	52.7
17	12	France	90.0	53.7	17	Canada	52.3
18	10	Korea	89.8	56.1	18	Luxembourg	50.8
19	19	Austria	88.8	50.1	19	Austria	50.1
20	16	Japan	88.7	52.7	20	Norway	49.3
21	22	Belgium	86.8	49.1	21	Iceland	49.2
22	25	Czechia	85.8	48.3	22	Belgium	49.1

23	38	Slovakia	85.7	39.7	23	Australia	48.4
24	30	Spain	84.9	45.6	24	Estonia	48.3
25	41	Croatia	84.0	37.3	25	Czechia	48.3
26	13	Israel	83.9	53.5	26	New Zealand	47.0
27	39	Lithuania	82.6	39.2	27	Malta	46.4
28	37	Poland	82.2	40.0	28	Italy	45.7
29	28	Italy	81.8	45.7	29	Cyprus	45.7
30	33	Malaysia	81.3	42.4	30	Spain	45.6
31	35	Hungary	80.5	41.5	31	Portugal	43.5
32	21	Iceland	80.3	49.2	32	Slovenia	42.9
33	43	Greece	79.2	36.8	33	Malaysia	42.4
34	32	Slovenia	78.8	42.9	34	UAE	41.8
35	64	Belarus	78.8	31.3	35	Hungary	41.5
36	18	Luxembourg	78.4	50.8	36	Latvia	41.1
37	34	UAE	78.2	41.8	37	Poland	40.0
38	29	Cyprus	78.1	45.7	38	Bulgaria	40.0
39	36	Latvia	77.8	41.1	39	Slovakia	39.7
40	31	Portugal	77.5	43.5	40	Lithuania	39.2
41	47	Russian Fed	76.6	35.6	41	Croatia	37.3
42	44	Thailand	76.0	36.7	42	Viet Nam	37.1
43	53	Serbia	75.3	34.3	43	Greece	36.8
44	66	Iran	75.0	30.9	44	Thailand	36.7
45	46	Romania	75.0	36.0	45	Ukraine	36.3
46	38	Bulgaria	73.9	40.0	46	Romania	36.0
47	63	Georgia	73.6	31.8	47	Russian Fed	35.6
48	27	Malta	72.9	46.4	48	India	35.6
49	67	Saudi Arabia	72.3	30.9	49	Montenegro	35.4
50	68	Qatar	72.1	30.8	50	Philippines	35.2
51	45	Ukraine	71.2	36.3	51	Turkey	34.9
52	57	N.R Macedonia	71.1	33.4	52	Mauritius	34.4
53	59	Moldova	70.8	33.0	53	Serbia	34.3
54	83	Oman	70.6	26.5	54	Chile	33.9(mean)
55	14	China	70.1	53.3	55	Mexico	33.6
56	56	Costa Rica	68.8	33.5	56	Costa Rica	33.5
57	51	Turkey	68.8	34.9	57	N.R Macedonia	33.4
58	77	Kuwait	68.7	28.4	58	Mongolia	33.4
59	54	Chile	68.4	33.9	59	Moldova	33.0
60	76	Kazakhstan	68.2	28.6	60	South Africa	32.7
61	58	Mongolia	65.0	33.4	61	Armenia	32.6
62	62	Brazil	63.5	31.9	62	Brazil	31.9
63	42	Viet Nam	61.6	37.1	63	Georgia	31.8
64	86	Lebanon	60.4(mean)	26.0	64	Belarus	31.3
65	81	Azerbaijan	60.0	27.2	65	Tunisia	31.2
66	78	Bahrain	59.7	28.4	66	Iran	30.9
67	89	Dominican Rep	59.3	25.1	67	Saudi Arabia	30.9
68	69	Colombia	59.1	30.8	68	Qatar	30.8
69	52	Mauritius	58.4	34.4	69	Colombia	30.8
70	72	Bosn&Herz	58.1	29.0	70	Uruguay	30.8
71	48	India	57.1	35.6	71	Jamaica	29.1
72	70	Uruguay	56.6	30.8	72	Bosn&Herz	29.0
73	60	South Africa	56.5	32.7	73	Panama	29.0
74	71	Jamaica	55.0	29.1	74	Morocco	29.0
75	96	Trnd & Tbg	54.9	24.1	75	Peru	28.8
76	80	Jordan	54.7	27.8	76	Kazakhstan	28.6
77	65	Tunisia	54.6	31.2	77	Kuwait	28.4

78	49	Montenegro	54.0	35.4	78	Bahrain	28.4
79	75	Peru	52.5	28.8	79	Argentina	28.3
80	119	Algeria	52.2	19.5	80	Jordan	27.8
81	105	Ghana	51.9	22.3	81	Azerbaijan	27.2
82	79	Argentina	50.9	28.3	82	Albania	27.1
83	84	Indonesia	50.1	26.5	83	Oman	26.5
84	61	Armenia	49.9	32.6	84	Indonesia	26.5
85	82	Albania	49.5	27.1	85	Kenya	26.1
86	73	Panama	49.5	29.0	86	Lebanon	26.0
87	85	Kenya	49.0	26.1	87	Tanzania	25.6
88	99	Sri Lanka	47.8	23.8	88	Botswana	25.4
89	97	Paraguay	47.1	24.1	89	Dominican Rep	25.1
90	55	Mexico	46.8	33.6	90	Rwanda	25.1
91	115	Nigeria	46.2	20.1	91	El Salvador	24.8
92	74	Morocco	44.8	29.0	92	Kyrgyzstan	24.5
93	50	Philippines	44.7	35.2	93	Uzbekistan	24.5
94	92	Kyrgyzstan	44.3	24.5	94	Nepal	24.4
95	101	Honduras	44.2	23.0	95	Egypt	24.2
96	100	Senegal	44.1	23.7	96	Trnd & Tbg	24.1
97	102	Namibia	43.9	22.5	97	Paraguay	24.1
98	111	Laos	40.6	20.6	98	Ecuador	24.1
99	98	Ecuador	39.5	24.1	99	Sri Lanka	23.8
100	103	Bolivia	39.2	22.4	100	Senegal	23.7
101	88	Botswana	38.7	25.4	101	Honduras	23.0
102	91	El Salvador	37.0	24.8	102	Namibia	22.5
103	93	Uzbekistan	37.0	24.5	103	Bolivia	22.4
104	104	Guatemala	36.8	22.4	104	Guatemala	22.4
105	95	Egypt	36.6	24.2	105	Ghana	22.3
106	87	Tanzania	36.6	25.6	106	Pakistan	22.3
107	116	Cameroon	35.5	20.0	107	Tajikistan	22.2
108	112	Uganda	34.9	20.5	108	Cambodia	21.5
109	94	Nepal	34.3	24.4	109	Malawi	21.4
110	113	Bangladesh	33.3	20.4	110	Côte d'Ivoire	21.2
111	106	Pakistan	32.5	22.3	111	Laos	20.6
112	108	Cambodia	31.1	21.5	112	Uganda	20.5
113	117	Zimbabwe	30.5	20.0	113	Bangladesh	20.4
114	110	Côte d'Ivoire	30.4	21.2	114	Madagascar	20.4
115	120	Zambia	30.0	19.4	115	Nigeria	20.1
116	107	Tajikistan	30.0	22.2	116	Cameroon	20.0
117	90	Rwanda	28.3	25.1	117	Zimbabwe	20.0
118	124	Ethiopia	27.5	18.1	118	Burkina Faso	20.0
119	127	Myanmar	24.0	17.7	119	Algeria	19.5
120	123	Togo	23.2	18.5	120	Zambia	19.4
121	125	Benin	20.7	18.1	121	Mali	19.2
122	122	Mozambique	20.1	18.7	122	Mozambique	18.7
123	114	Madagascar	19.2	20.4	123	Togo	18.5
124	129	Yemen	18.5	13.6	124	Ethiopia	18.1
125	118	Burkina Faso	18.4	20.0	125	Benin	18.1
126	128	Guinea	18.1	17.3	126	Niger	17.8
127	109	Malawi	18.0	21.4	127	Myanmar	17.7
128	121	Mali	17.5	19.2	128	Guinea	17.3
129	126	Niger	5.6	17.8	129	Yemen	13.6

**Graphic 1.** B2C E-commerce Index and Innovation Index Correlation (Drawn by Authors Using GII 2020 and UNDP B2C Data), with Innovation Index at X

Axis and B2C Index at Y-Axis



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.986963
R Square	0.974096
Adjusted R Square	0.966222
Standard Error	5.791549
Observations	128

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	160186.3	160186.3	4775.687	4.9E-102
Residual	127	4259.839	33.54204		
Total	128	164446.1			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
95.9	0.549425	0.00795	69.10635	1.3E-102	0.533693	0.565158	0.533693

$$Y = ax + b$$

$$y = 0.5518x$$

$$R^2 = 0.9737$$

$$r = 0.986963$$

These findings demonstrate an association between innovation and the B2C E-commerce index. (Hypothesis 1).

### DESCRIPTIVE STATISTICS

Rank for innovation	Economy	Innovation index
	<b>Maximum</b>	<b>66.1</b>
49	Montenegro	35.4
53	Serbia	34.3
	<b>Mean</b>	<b>33.97364</b>
57	N.R Macedonia	33.4
72	Bosnia & Herzegovina	29.0
82	Albania	27.1
	<b>Minimum</b>	<b>13.6</b>

Rank for B2C	Economy	B2C index
	<b>Maximum</b>	<b>95.9</b>
43	Serbia	75.3
52	N.R Macedonia	71.1

	Mean	60.38295
70	Bosn&Herzg	58.1
78	Montenegro	54.0
85	Albania	49.5
	<b>Minimum</b>	<b>5.6</b>

Innovation index	
Mean	33.97364
Standard Error	1.098428
Median	31.2
Mode	30.8
Standard Deviation	12.47574
Sample Variance	155.6441
Kurtosis	-0.59075
Skewness	0.649514
Range	52.5
Minimum	13.6
Maximum	66.1
Sum	4382.6
Count	129
Largest(1)	66.1
Smallest(1)	13.6
Confidence Level (95.0%)	2.173427

B2C e-Commerce index	
Mean	60.38295
Standard Error	2.051592
Median	60
Mode	93.4
Standard Deviation	23.30161
Sample Variance	542.965
Kurtosis	-1.02106
Skewness	-0.25323
Range	90.3
Minimum	5.6
Maximum	95.9
Sum	7789.4
Count	129
Largest(1)	95.9
Smallest(1)	5.6
Confidence Level (95.0%)	4.059426

About the innovation index, in a total of 129 economies, values of the innovation index vary between a maximum of 66.1 and a minimum of 13.6, Western Balkan countries are around the middle of the list, far away from the EU countries, most of which are on top of the list for this index, with Montenegro and Serbia above the mean 33.97364, with the respective values of 35.4 and 34.3.1, while NR Macedonia, Bosnia & Herzegovina, and Albania are below the mean 33.97364, with the respective values of 33.4, 29.0, and 27.1.

About the B2C E-commerce index, in a total of 129 economies, values of the B2C E-commerce index vary between a maximum of 95.5 and a minimum of 5.6, Western Balkan countries are around the middle of the

list, far away from the EU countries, most which are on top of the list for this index, with Serbia and NR Macedonia above the mean 60.38295, with respective values of 75.3 and 71.1, while Bosnia & Herzegovina, Montenegro, and Albania are below the mean 60.38295, with the respective values of 58.1, 54.0, and 49.5.

- Implications for theory and practice

Regarding the theory, based on the study's final findings, a new avenue for investigation into the relationship between innovation and the B2C E-commerce index has been opened, to use it to help businesses and nations' economies gain a competitive edge.

- Limitations and further research

This study was conducted utilizing a wealth of information on the Innovation Index and B2C E-commerce Index for the year 2021.

If these relations hold for other times, more investigation is required to confirm this.

## 5. Conclusions and recommendations

1. Innovation and creativity are innovation and creativity is crucial in overcoming resource limitations due to the fixed nature of natural resources and limitations on unrestricted economic expansion.
2. Innovations have a propensity to save finite resources. Fixed factors may not be a significant impediment to growth if technological advancement will be fixed-factor saving. Since both the B2C E-commerce index and quality management are not fixed resources and have a close relationship with innovation, the same justification and logic may be used to support both.
3. Improving innovation, B2C E-commerce index, quality management, and business climate in SMEs are necessary to achieve competitive advantage. From a general microeconomic perspective, this study broadens our understanding of the relationships between innovation, the B2C E-commerce index, and quality management, which will be useful for future managerial decisions, with a possibility, future studies may concentrate on creating and validating the suggested framework and exploring the problem in other contexts and situations.
4. A regressive study confirmed the theoretical findings that a high correlation exists a high correlation between the Innovation index and the B2C E-commerce index.
5. The main advice is that, as a response to the crisis and post-crisis period, applying ISO standards generally and the ISO 56000 family

of standards will help businesses strengthen their commitment to their customers while also enhancing innovation and B2C E-commerce index activities, processes, and procedures, and economies worldwide to achieve a competitive advantage.

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#### **Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)**

Enriko Ceko carried out the paper research in all issues.

#### **Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself**

No funding was received for conducting this study.

#### **Conflict of Interest**

The author has no conflicts of interest to declare that are relevant to the content of this article.

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