

# SDG PROGRESS REPORT

on **SDG-9 INDUSTRY, INNOVATION and INFRASTRUCTURE**



# SDG PROGRESS REPORT

ISTANBUL MEDENIYET  
UNIVERSITY

**Istanbul Medeniyet University  
Sustainability Office**

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## **SDG Icons**

<https://www.un.org/sustainabledevelopment/news/communications-material/>

## **Sustainable Development Report Maps**

<https://dashboards.sdgindex.org/profiles/turkey>

## **SDG Statics**

<https://unstats.un.org/sdgs/report/2023/progress-midpoint/>

<https://sdgs.un.org/goals>



Investment in infrastructure and innovation are crucial drivers of economic growth and development. With over half the world population now living in cities, mass transport and renewable energy are becoming ever more important, as are the growth of new industries and information and communication technologies.

Technological progress is also key to finding lasting solutions to both economic and environmental challenges, such as providing new jobs and promoting energy efficiency.

Promoting sustainable industries, and investing in scientific research and innovation, are all important ways to facilitate sustainable development.

More than 4 billion people still do not have access to the Internet, and 90 percent are from the developing world. Bridging this digital divide is crucial to ensure equal access to information and knowledge, as well as foster innovation and entrepreneurship.

**36.8**  
BILLION

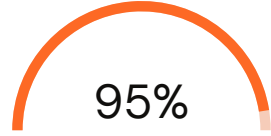
tons of Co are released from energy combustion and industrial processes



of people who still do not have access to the internet live in developing countries

**3.3%**

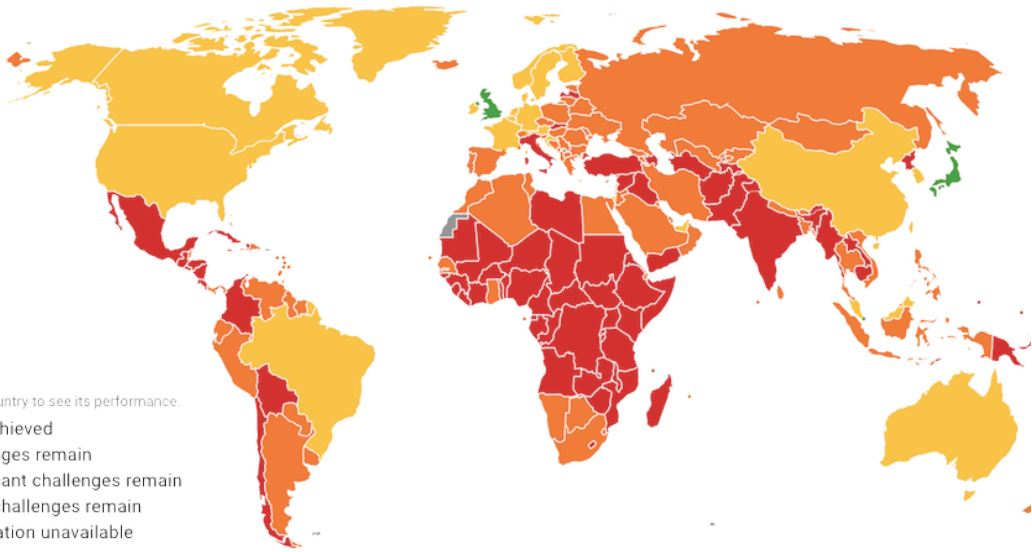
global manufacturing growth in 2022



population rate with mobile broadband access in 2022 (3G and above)

**1,342**  
PEOPLE

number of researchers per million people in 2020



- Legend**  
Click on a country to see its performance.
- SDG achieved
  - Challenges remain
  - Significant challenges remain
  - Major challenges remain
  - Information unavailable

**3,489,483€**  
**TOTAL**  
research income from industry and commerce



capacity occupancy in IMU Technopark's operations

**601-800**  
Industry, Innovation and Infrastructure  
2023 Rank in



**11%**  
**INCREASE**  
in the number of staff in the STEM field



**8**

number of patent applications filed in 2022

Istanbul Medeniyet University is committed to the mission of being an innovative and entrepreneurial world university that adds universal values to science, technology, and art. Founded on the five pillars of 'Innovative,' 'Entrepreneurial,' 'Society- and Civilization-Oriented', 'International', and 'Research-Oriented', our University has a **Technopark** to carry out its innovation activities; a **Technology Transfer Office**; an **Incubation Center**; 15 application and research centers; **2 research laboratories**, **7 service laboratories** and **30 R&D laboratories** within the **Science and Advanced Technologies Research Center**; and **5 department laboratories** operated by our departments.

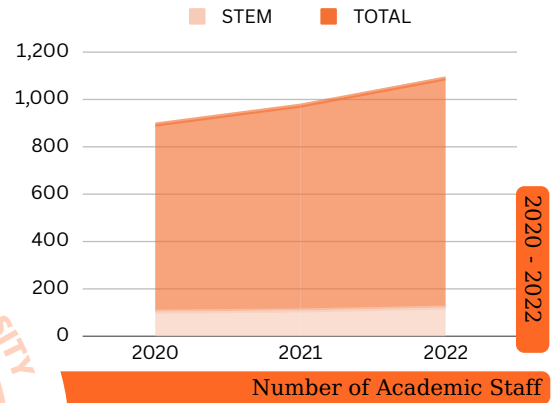


IMU **Scientific Research Projects Coordination Unit (BAP)** is in charge of selecting the scientific research projects, dissertation projects, and other projects conducted by our faculty members, to carry out the secretarial work for and finalizing the procedures for these projects, and to provide funds for scientific research projects. In this context, a total of **23 scientific research projects** were supported in 2022 with total funding of 935,027 TRY. Our BAP unit also informs our researchers about the projects supported by different institutions such as TUBITAK and ISTKA projects, EU Grant Projects, the projects supported by the Ministries of Youth, Culture, and Development, and SANTEZ projects and coordinates all the projects receiving support from other institutions.

“ **935,027 ₺**  
FUND  
given to our academic staff  
for their research projects ”

Istanbul Medeniyet University has a **Technology Transfer Office (TTO)** which is in charge of licensing the technologies developed and produced within the institution and securing industrial collaboration. TTO carries out activities to protect and coordinate the intellectual properties developed by our faculty members, students or researchers and promotes the intellectual properties and technological products owned by the institution so that they can reach more users for further improvement.

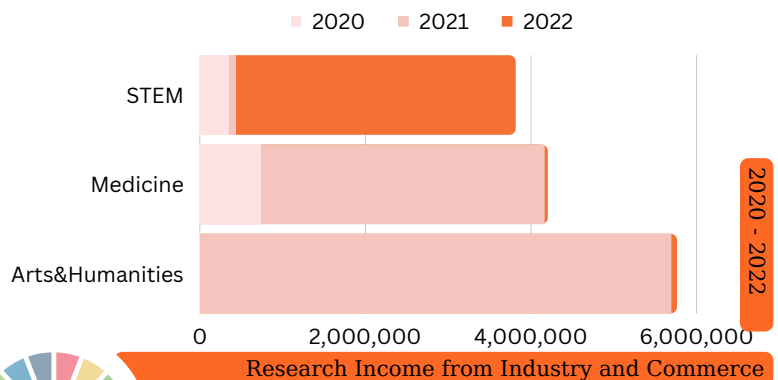
In 2022, the total number of our academic staff increased by 8%, while the number of our academic staff working in STEM fields increased by 11%.



As a result of the academic studies conducted by our academic staff members, **8 patent applications** were made in 2022. 5 of these applications were national and 3 of them were international.

There are **2 R&D firms** that were founded/partnered by our academic staff members at least 3 years ago and that are still active.

The **research income** IMU earned from **industry and commerce** in 2022 amounted to **TRY 3,489,483**. While 1% of this income came from Medicine, this rate was followed by Humanities/Social Sciences with 2% and STEM with 97%. Compared to 2021, the highest increase in research income was achieved in the STEM field with 3987%.



Istanbul Medeniyet University has a technopark that serves firms using or working on advanced technologies. In **IMU Technopark** located in Tuzla/ Akfirat, companies develop technologies or software; transform their technological inventions into commercial products, methods or services and thereby contribute to regional development. With a capacity occupancy of 100%, IMU Technopark houses 20 firms.



IMU Technopark

Istanbul Medeniyet University has an **incubation center** that supports all entrepreneurs and chiefly our students and academic staff members who would like to start their own business. IMU incubation center helps people gain the practical knowledge and skills required for this process and provides entrepreneurs with business ideas with entrepreneurship training programs, consulting support, office space, infrastructure services, and meeting halls.



Istanbul Medeniyet **University Laboratory Animal Facility (DEHAL)** was established within the body of our university's Science and Advanced Technologies Research Center (BİLTAM) in order to provide the husbandry and breeding services of laboratory animals needed in the fields of scientific research, testing and training in accordance with national and international standards. DEHAL, as a unit licensed by the Ministry of Agriculture and Forestry in the fields of research, breeding, use and procurement, provides high quality in vivo research infrastructure to academia and R&D institutions within the framework of legislation and ethical principles. All studies to be carried out within DEHAL are subject to the approval of IMU Animal Experiments Local Ethics Committee (HADYEK).

İMÜ **Tobacco and Tobacco Products Analysis, Research and Development Laboratory** was established according to the **collaboration protocol** between the Tobacco and Alcohol Department of the Ministry of Agriculture and Forestry and Istanbul Medeniyet University. In the world and in our country, the usage of tobacco and tobacco products is widespread and it has also become one of the most important public health problems due to the negative effects of the substances in its smoke on human health. In this laboratory, analyses are carried out during the production, export, import, and marketing of tobacco products. Our laboratory aims to contribute to the country's economy by ensuring that the analyses previously made abroad are carried out in the country. The internationally accredited laboratory also has the capacity to meet the analysis demands from abroad. The fact that the laboratory has been established within the university allows it to contribute to the research and development of existing tobacco and tobacco products analysis techniques.



IMU Science and Advanced Technologies Research Center

IMU BILTAM houses **7 service laboratories** that offer analysis, measurement, imaging, and equipment services for our academic staff members and students as well as **for all researchers**. Institutions or researchers can fill in a request form to have their analyses made; to perform their own analyses using the devices and 41 pieces of equipment provided or to attend the analyses performed as observers.

Istanbul Medeniyet University collaborates with numerous public institutions, research institutions, universities, local schools, and NGOs toward numerous goals that would help us achieve the objective of building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation.



A collaboration protocol was signed between **BMC** and Istanbul Medeniyet University concerning project development and execution and staff training on subjects to be determined according to R&D needs of the university and company.

IMU became the partner of the **entrepreneurial women trainings** organized at the Tuzla Municipality Women's Entrepreneurship Center (KAGİM), implemented by the Ministry of Industry and Technology through the Istanbul Development Agency and financed within the scope of the Social Development Support Program. Thanks to this partnership, which we support with 14 instructors, vocational trainings will be provided in 12 different branches including entrepreneurship, customer relations, accounting, product photography, digital marketing, patent and license readership, tradesman exemption, e-commerce, sales marketing, foreign trade, IT law, TÜBİTAK, SME and KOSGEB supports an entrepreneur need to know in order to develop women's entrepreneurship, empower entrepreneurial women and the development of small enterprises. At the end of the 6-month training program, it is planned that participants will be able to commercialize their enterprises with the sustainability of their skills through a 3-month consultancy program and mentoring activities. Also, at the end of the training, consultancy and mentoring program, online store memberships will be opened to commercialized female entrepreneurs. IMU and Tuzla Municipality have undertaken a nice project together to encourage women entrepreneurs to participate more in the business world and provide them with the necessary support with this collaboration, which also aimed to support industrial growth. Thanks to this project, a big step will be taken in supporting women entrepreneurs and developing their skills.

Entrepreneurial Women Trainings

Learning processes are key in achieving SDGs. Thus, universities play a critical role both by training professionals who will prioritize SDGs in their future practices and by increasing local, national, and global capacity to successfully achieve SDGs. As Istanbul Medeniyet University, we are aware of our critical role and therefore, we primarily inform our students, the leaders and decision-makers of the future, about the Sustainable Development Goals through course contents, co-curricular activities and student club activities and strengthen their awareness. For this purpose, each of our faculties and departments prepares SDG-related course contents, including courses that address the Sustainable Development Goals holistically, as well as specific contributions that can be made by the expertise of the relevant professional field in which they provide training. In 2022, 17 bachelor degree courses related to SDG-9 were given at IMU.

Some of these are listed below.



Faculty	Course
Education Sciences	GNK062 - Innovation and Entrepreneurship
Engineering and Natural Sciences	END407 - Production Information Systems
Engineering and Natural Sciences / Health Sciences	IMU053 - Innovation and Entrepreneurship
Health Sciences	HEM113 - Health and Technology
Political Sciences	İŞL323 - Entrepreneurship and Small Business Management
	İŞL434 - Enterprise Resource Planning
Tourism	GMS404 - Entrepreneurship
	TİŞ407 - Entrepreneurship and Innovation



**“Tissue and Organ Production with Three-Dimensional Bioprinting”** event was organized by IMU Biotechnology Student Club of our university, in order to provide our students with information about product innovation and bioproduction processes in the field of biotechnology. The event, which was held online on January 26, 2022, was attended by Dr. Buğra AYAN from Stanford University Department of Cardiothoracic Surgery as a speaker. A total of 117 people attended the event, which was free and open to outside participation. In his speech, AYAN mentioned that 3D printers are used in a wide variety of sectors today. Stating that bioproduction is developing both in the world and in our country, AYAN emphasized how 3D printers have responded to the increasing need for tissue and organs in recent years and the success of the resulting products. He also said that the share of biotechnology in human and health will increase further in the future.

Digital transformation has led to significant industrial innovations in various fields, from the business world to entertainment industry, from design to education system, with the acceleration of technological advancements in today's world. In order to discuss the technological developments in the digital world, to introduce our students to the Metaverse universe, and to facilitate their access to information technologies related to product innovations in the field of technology, three different informative events on Metaverse were held for our students in 2022.

The first event, **“Digital Transformation: Metaverse”**, was organized by Medeniyet Engineers Club, one of the student clubs of our university, on December 15, 2022 at Ziraat Bank Conference Hall of our University with guest speakers Dr. Cem KINAY, Devrim DANYAL and Hüseyin BAYER. The future and limits of Metaverse technology, the NFT world and crypto-

currencies were discussed at the event, which was held to research and support domestic technological development related to Metaverse technology. It was pointed out that the metaverse universe, which allows people to communicate with each other and carry out various activities by combining the real and virtual worlds in a digital environment, has an economic value and that the interest in metaverse patents will increase with the product and process innovations to be realized in this field. It was stated that with the development of this technology, companies will have the opportunity to test the products they will offer to the market before they are launched and thus an important economic sustainability will be achieved. Within the scope of the event, a workshop was organized for the participating students.



The second event titled **“Digital Transformation and Metaverse”** organized by the Art Design Student Club of our university at İstanbul Medeniyet University Göztepe Campus Aşık Paşa Conference Hall on May 23, 2022 hosted Yıldız Technical University faculty member Assoc.Prof.Dr. Ertan TOY, who conveyed the effects and workings of digital changes to the participants. Additionally, he emphasized the importance of the “Metaverse” concept, its potential future applications, and the usage areas of virtual reality devices, enlightening the participants about this new digital world. He focused on the new opportunities that the technological innovations brought by the world of Metaverse brought to the field of design. TOY talked about the opportunities such as the visual design of this virtual world, the aesthetic modeling of virtual spaces and the development of creative thinking away from the limitations of the physical world. Furthermore, business opportunities and challenges that will contribute to the development and transformation of the digital world were discussed with the participants.



The final event was a talk on **“Metaverse, Technology of the Future”**, which was organized by IMU Informatics and Information Club on April 1, 2022 with Gürcan SERBEST, the founder of Negenra&Fernville, a pioneer in the field of Metaverse. SERBEST discussed various topics in his speech, including what Metaverse is, its impact on our lives, its contribution to scientific activities, and its evaluation from the perspective of human rights. SERBEST conveyed that users can create their own digital characters, explore virtual worlds, participate in activities, and interact with other users. In the later parts of the speech, SERBEST emphasized the importance of ensuring that Metaverse respects and safeguards fundamental human rights, mentioning that one of the key areas to address is privacy rights. He stated that individuals can share personal data and participate in conversations within Metaverse, and it is mandatory to ensure the protection of personal data and ensuring data security to prevent unauthorized access, misuse, or exploitation of personal information.

animal experiments, standards in animal experiments, animal species used in animal experiments and laboratory safety. In the last session of the event, Sabancı University Faculty of Engineering and Natural Sciences faculty member Asst.Prof.Dr. Emrah EROĞLU gave his speech on **“Biosensor Technologies”**. In his speech, he gave information about the development and operation of genetically encoded biosensor technologies, especially the Nitric Oxide sensor geNOps.

The **second event of the Biotech Talks series** organized by the Biotechnology Student Club of our university was held on December 9, 2022 at Bankkart Hall of IMU North Campus Ziraat Bank Library. In the first session of the event, Prof.Dr. Murat KAZANCI, an academic member of the Biomedical Engineering Department of the Faculty of Engineering and Natural Sciences of Istanbul Medeniyet University, made a presentation titled **“Studies on the Extraction and Production of**

**Biopolymers in Different Forms at Istanbul Medeniyet University”**, in

which he discussed product innovations such as the production of nanofibers resistant to physiological conditions by using the electrical spinning method from collagen obtained from the skin with alternative methods. In the second session of

the event, faculty member of Istanbul University Molecular of Biology and Genetics Department, Prof.Dr. Şule ARI made her presentation titled **“Genetically Modified**

**Organisms and Biosafety”**, in which she defined GMOs, talked about historical development of these organisms, and discussed the mistakes in

consumer behaviors towards genetically modified organisms and related biosecurity concerns. In the last session of the event, Can KAYACILAR, who works on Supercritical Extraction Technology at Arşen Makine, talked about the importance of

plant proteins, plant-based nutrition and upcycling in food in terms of sustainable food consumption and production in his presentation titled **“Functional Food Development”**. He discussed **“Functional Foods”**, which means non-synthetic food that is created by adding bioactive

substances obtained from completely natural foods to the foods we consume in daily life, while providing healthy food to meet current food needs, reduces the negative impact on the environmental footprint and contributes to the protection of natural resources.

First Event of the “Biotech Talks” Series



The **first event of the “Biotech Talks” series** organized by Istanbul Medeniyet University Biotechnology Student Club was held online on 17-18 June 2022. On 17 June 2022, the first session of the event hosted Prof.Dr. Tuba GÜNEL, who talked about **“Life According to Genetic Structure”**. In the speech, Dr. GÜNEL discussed the human genome project, which aims to map human genes and decipher genetic codes, diagnosis and treatment with genes to lead a healthy life, and genetic profiling. In the second session that took place the next day, Dr. Tolga AKKOÇ from TÜBİTAK Marmara Research Center gave his speech on **“Bioethics”**. In the speech, he discussed the differences between the concepts of ethics and morality, academic ethics, ethics in





A **“C++ for Gaming” Training** was organized for our students by our University's Computer Engineering student clubs to contribute to vocational education. The “Kickoff” event, organized jointly by the Developer Student Club and MedeniyetTechno Club, two student clubs of our university, was held on March 28, 2022 at Hasan Polatkan Hall in Medeniyet University Library. The following sessions of the event, which consisted of 6 weeks in total, were held online.

In the first week of the event, “C++” language was introduced. Participants were introduced to this language used in game programming. In the following weeks, Stuct/Class structure, Class constructors / Templates, Dynamic Memory Management, Arrays and Vectors were covered respectively. On the last day of the event, graduation project presentations were made and important resources to follow were mentioned. At the end of the 6-week event, our students were awarded certificates.

#### “Entrepreneurship Talks” Event



Career Club of our university organized the **“Entrepreneurship Talks”** event on April 28, 2022. Şerafettin ÖZSOY, the founder of the 'in4startups' platform, which brings entrepreneurs and investors together, took part as a speaker in the online event. ÖZSOY gave information about the purpose of the establishment of 'In4startups' and the services it offers. He emphasized that for start-up entrepreneurs to be successful; they should create something different from the existing one by giving importance to product innovation and taking risks. He mentioned that unsuccessful startups are usually those that develop a product that is not needed, work with the wrong team or enter the sector with insufficient financial resources. In the last part of the event, which was very useful and productive for our students about the entrepreneurship ecosystem, successful startups in Turkey were discussed.

The academic staff members of our university carry out research on developing sustainable and resilient infrastructure with equitable access for all promoting inclusive and sustainable industrialization; increasing access to financial services and markets; upgrading all industries and infrastructure to make them sustainable; enhancing scientific research and upgrading industrial technologies; facilitating sustainable and resilient infrastructure development in developing countries; supporting domestic technology development and industrial diversification; and providing universal access to information and communications technology, publish the results of their research and share them with other researchers, decision-makers, stakeholders, and the public as a foundation for policies toward achieving SDGs.

Our university's Faculty of Engineering and Natural Sciences Electrical and Electronics Engineering graduate student M.Koray YILMAZ's master thesis titled **“Tracking of Moving Targets with an Air Robot”** supervised by our faculty member Dr. Haluk BAYRAM was awarded the support of the 2210/C Domestic Priority Areas Graduate Scholarship Program by TUBITAK. The project aims to detect and track the instantaneous location of a moving target, which has a radio transmitter on it and does not follow any predetermined trajectory and speed. The product developed within the scope of industrial innovation was aimed to be used in the defense industry for location detection and tracking of signal jammers or other targets. It also aims to detect living ecosystem on land by tracking the location of an animal on a collar with a radio transmitter without the possibility of encountering dangerous animals in difficult terrain conditions, and to detect the whereabouts of missing people from phone signals in search and rescue efforts. This work, which was carried out at IMU Science and Advanced Technology Application and Research Center Field Robotics Laboratory, through the creation of a suitable policy environment for industrial diversity and value increase in industrial products, was successfully completed in January 2022. The project added value to our university particularly in supporting domestic technology development, research and innovation in developing countries.

Team IMU AV, consisting of the students of IMU Faculty of Engineering and Natural Sciences, supervised by faculty member Asst.Prof.Dr. Haluk BAYRAM, received significant awards for their vehicle design in TEKNOFEST 2022 (Aerospace and Technology Festival). The vehicle they designed was selected as the first in the Original Vehicle category in the “Robotaxi-Passenger Autonomous Vehicle Competition”. In addition to being the first, the team was also deemed worthy of the **“Most Original Software” award**, the most prestigious award in the competition, with the electric vehicle software they developed. Another leg of the competition was held at Samsun Airport between 30 August and 4 September. Here, the team was deemed worthy of the **Special Jury “Best Presentation” award** with their presentation. The team also took **first place in the Critical Design Report**. The mechanical and electronic revisions necessary for the electric vehicle developed by our university's team to have autonomous driving capability were made in the Field Robotics Laboratory within our university. The competition track and autonomous vehicle were transferred to the simulation environment on a one-to-one scale, the necessary software was developed in this environment and transferred to the vehicle in real environment. The autonomous vehicle has the features of AI-supported traffic sign detection, lane detection and tracking, active obstacle avoidance and instant high-accuracy location estimation.



Team IMU AV

The article titled “Eco-friendly technologies, international tourism and carbon emissions: Evidence from the most visited countries”, of which Prof.Dr. Seyfettin ERDOĞAN, a faculty member of the Department of Economics, is one of the authors, was published in the 180th issue of the Journal of Technological Forecasting and Social Change. In their study, ERDOĞAN et al. emphasized that the tourism sector causes a significant environmental footprint on a global scale. Stating that transportation is the primary source of carbon emissions, especially from international tourism, ERDOĞAN et al., in the study, examined the regulatory effect of environmentally friendly innovations on the transportation sector for the relationship between international tourism and carbon emissions. The authors concluded that environmentally friendly industrial innovations in the transportation sector will eliminate the harmful effect of international tourism on carbon emissions. ERDOĞAN et al. emphasized that the empirical results obtained in the study are important for policy makers because the countries included in the analysis are committed to reducing their carbon emissions according to the Paris Agreement and the SDGs. They recommended these countries to attach more importance to innovative processes, especially in transportation, and to increase the share of innovation expenditures in GDP.

Assoc.Prof.Dr. Ahmet VATAN of IMU Tourism Faculty presented his paper titled “What do publications about robots in tourism clue in about sustainability?” at the 3rd International Hospitality Research Symposium held in the Netherlands on June 9-10, 2022. The single-author article aims to determine how studies on robots in the tourism literature give clues about sustainability. VATAN reviewed articles on robots in tourism scanned in Web of Science between 2012 and 2022. As a result of the study, it was revealed that robots contribute to the sustainability of enterprises by reducing waste, reducing errors, reducing some costs, improving service quality, increasing demand for the enterprise, increasing productivity, facilitating work/reducing workload, and providing superiority in marketing and competition.



Asst.Prof.Dr. Ayşenur ERDİL, faculty member of the Department of Management of our university, presented the results of her research on the importance of information security and technology in the sustainable growth of businesses with her paper titled **“The Importance of Information Security and Technology: Evaluation of the Business in terms of Sustainability”** at the 8th International European Congress on Social Sciences held in Croatia on 4-5 December 2022. In her research, ERDİL stated that process innovations in encrypting information, especially against threatening situations, provide benefits in terms of ensuring the reliability of the information system of the enterprise and the sustainability of information security. However, she pointed out that in parallel with the advances in technology, there is now a greater need to pay attention to the elements that threaten the security of information and she highlighted the concepts of data security. The results of the research revealed that information management is vital for the sustainable growth of businesses and business employees should be informed about product and process innovations in technology and trained on information security, information management, information systems, etc.

Asst.Prof.Dr. Ayşenur ERDİL presented the results of her research on technology-oriented product innovations and product development process with a paper titled **“Technology and Innovation-Oriented Product Design and Development Process”** at the Latin America 4th International Conference on Scientific Researches held in Mexico City on 3-6 November 2022. In the study, a new product design was created by adding new features and new functions to traditional market carts. This newly designed market cart was characterized as an ergonomic, easy-to-use, eye-appealing, quality-oriented, and useful product that features various functions simultaneously, as well as having the features of price collection and expiration date display as the product is added. The study also discussed the growth strategies developed for the design of the products to make them competitive in the market. Efficiency analysis was used to measure competition targets. It was emphasized that innovations that meet social needs contribute to productivity by integrating them with technology.

Assoc.Prof.Dr.Cevdet KIZIL and Asst.Prof.Dr. Erol MUZIR, faculty members of the Department of Business Administration, Faculty of Political Sciences of our University, presented the results of their research, in which they examined the impact of the digitalization process experienced as a result of Industry 4.0 and the Covid-19 pandemic on technological product and process innovations in management accounting, with a paper titled **“Digitalization in Management Accounting as part of Industry 4.0 and in the process of the Covid-19 Pandemic and Technological Integration of Management Accounting”** at the International Eurasia Congress on Scientific Researches and Recent Trends. The research aimed to analyze digitalization in management accounting and the integration of management accounting with technology within the scope of Industry 4.0 and during the Covid-19 pandemic. The research results revealed that in the context of innovation and Industry 4.0, accounting practices have become faster, more efficient and cost-effective. The researchers stated that digitalization reduces errors and fraud, and at the same time, it supports the formation of transparent institutions by increasing the controllability and comparability of data, thereby providing significant benefits to corporate accountability. Stating that with the pandemic, there have been developments in conducting auditing and consultancy activities remotely, the researchers pointed out that some new accounting and financial frauds have also emerged in this process. For this reason, they stated that in the digitalization process, it is essential for accounting professionals to keep themselves constantly updated by participating in the necessary training processes in the fields of Industry 4.0, digitalization, technology and innovation.

