BRAINS² TÜRKİYE

ARTIFICIAL INTELLIGENCE PROGRAM

"Development of Vision, Strategy, Ecosystem and Market, through the International Comparison"

BIOTECHNOLOGY PROGRAM
ROBOTICS PROGRAM
ARTIFICIAL INTELLIGENCE PROGRAM
NANOTECHNOLOGY PROGRAM
SPACE PROGRAM
STRATEGIC SERVICES PROGRAM

Artificial Intelligence
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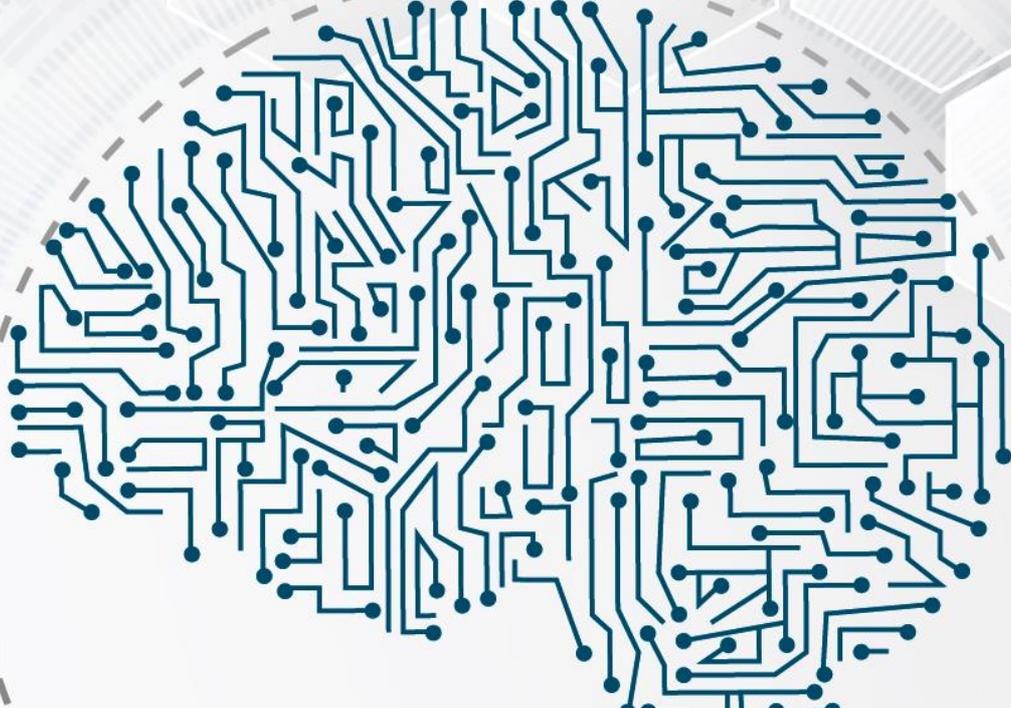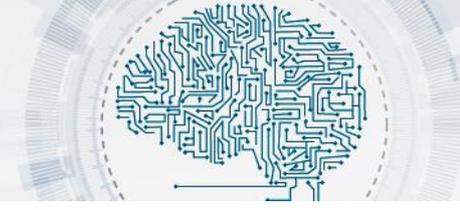ACADEMY AND INNOVATION GROUP

(**B**iotechnology | **R**obotics | **A**rtificial Intelligence | **N**anotechnology | **S**pace | **S**trategic Services)

BRAINS² TÜRKİYE* ARTIFICIAL INTELLIGENCE PROGRAM

"Development of Vision, Strategy, Ecosystem and Market, through the International Comparison"

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* BRAINS² TÜRKİYE is a brand/initiative with multi-programs based in Turkey which develops market, ecosystem and capacity in the 'Biotechnology', 'Robotics', '**Artificial Intelligence**', 'Nanotechnology', 'Space' and 'Strategic Services' fields. The programs planned through identical visions and strategies for each main fields which transforms the new business models and multidimensional power distribution in the global economy, are implemented under the common title of **BRAINS² TÜRKİYE.**

VISION (DRAFT)

The economy based on the production with muscle force and mechanical tools is replaced by knowledge-based economy through the production of high value-added products. The primary element of new economic order is digitalization. The processes of production and service sectors are digitalized day by day which requires new skills in the labor market. Traditional jobs and craftsmanship are replaced by technological skills which require advanced engineering knowledge.
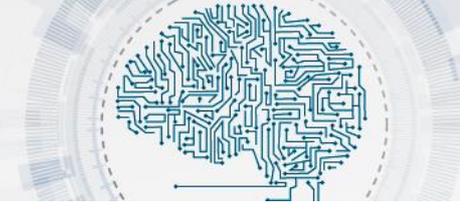
It is very hard for a person to catch this quickly developing and changing technology, hence it ish also harder for societies. After the "Industry 4.0" concept was defined by Germany in 2011, Japan presented the concept of "Society 5.0". Afterwards, other countries have presented their own strategies towards digitalization in the areas from production to the service sector. One of the areas which is influenced by this concept is "Human Resources", as it causes a radical change in the use of labor in production systems. It is anticipated that this concept, which will continue to affect human resources in many ways, would lead to radical changes especially in the labor force.

The effect of such a change in work force is defined by the human resources professionals as the idle labor will shift to new jobs. It is observed that the labor force share of agriculture sector in the USA was 100% once, while it corresponds to only 2% of the total workforce today, and a large industrial manufacturing economy has been established through employing idle workers in the factories. The same approach is also considered today for robots, especially the workforce which is required for works based on physical power and repetitive processes would be idle and shifted to other areas.

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Besides, "learning" which is the most important skill of human, has become a feature of the machines. Upon the development of machines which are operated by "Artificial Intelligence" - as a top level technology of digitalization; the technologies such as facial and voice recognition systems, autonomous (unmanned) vehicles, voice assistants, digital assistants for assisting the people with disabilities, smart applications for human and environmental health, management of energy efficiency are improving day by day.

Although it causes conjectural uncertainties both in business and daily life, it is possible to take advantage of this technology through utilizing it with correct actions. In this period, where the information and communication sectors will be leading sectors, there will be no demand for unskilled labor while the demand for skilled labor will continue to increase.

The artificial intelligence which is used and integrated in finance, national security, health services, criminal justice, transportation and smart city projects would also provide great opportunities for economic development.

It anticipated that the Artificial intelligence technologies would increase the global GDP by 15.7 trillion $ or 14% until 2030. The regional distribution of this figure is; China by 7 trillion $, North America by 3.7 trillion $, North Europe by 1.8 trillion $, Africa and its surrounding regions by 1.2 trillion $, and Asia rest of China by 0.9 trillion $, Southern Europe by 0.7 trillion $ and Latin America by 0.5 trillion $. China aims to become a global leader by 2030 through investing 150 billion dollars in this sector domestically.
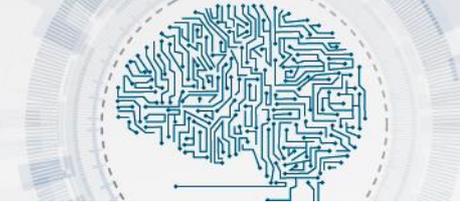
It is predicted that the artificial intelligence based automation would induce the productivity through creating 0.8 - 1.4% growth in yearly GDP of the Chinese economy - depending on the application speed. China is currently felt behind the US and the UK, however most of the artificial intelligence market provides tremendous opportunities for China in terms of preliminary experience and developments in the future.

This new ecosystem, which is developed in the Artificial Intelligence axis with the acceleration of technological and sociological developments, especially in the terms of 'Industry 4.0' and 'Community 5.0' in 2011, and which is still considered in infancy period, currently offers a huge market on this scale - which has no matured competition and provides many new opportunities - as it creates new markets for SMEs, main contractors and technology companies, and continues to grow with the private sector initiative.

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The world is in a transformation period which is caused by artificial intelligence and data analysis that affect many sectors, however as society will be affected by these technologies, it is required to understand the development paths of artificial intelligence systems. These technologies are utilized in order to transform decision-processes, business-patterns, risk-analysis and system performance in finance, national security, health services, criminal justice, transportation and smart city projects. Such developments create important economic and social benefits.

Even though, the path at which artificial intelligence systems appears would create important results for the society in general. It is very important to find answers for the questions such as: How political issues are handled? How ethical conflicts are reconciled? How legal realities are accommodated? What level of transparency is required in artificial intelligence and data analysis?

The preferences of people regarding the software development process will affect their decisions and their integration methods into corporate routines. A better understanding is required regarding how these processes are performed. Because, these developments will have significant effects on the society in the near future. Artificial intelligence would lead a revolution in human relationships and it would be the most influential human innovation in history.

It is important to increase the public and private investment, to expand the scope of data access, to encourage the development of artificial intelligence labor force, to create a national consultancy board, to produce effective policies through determining comprehensive targets and to promote cyber security in order to proceed with artificial intelligence through balancing the technological developments with basic human values.

BRAINS² TÜRKİYE Artificial Intelligence Program will analyze which AI fields would provide highest potential for future growth and which benefits can be gained from this growth by the Turkish AI sector, through considering Turkey's available strength and potential both in academic and industrial sectors.
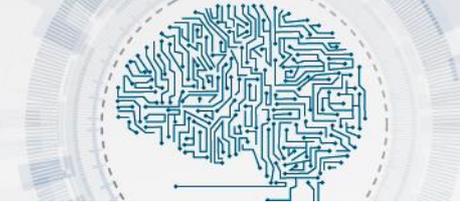
Upon determining the industrial fields together with their sizes and scales as a result of the studies performed towards discovering the idle potential of AI industry in order to find the most reasonable and promising interests for the **National Artificial Intelligence Sector** and to increase the efficiency of the private and public sector; such determined industrial fields shall be considered as the sectors which might have the strongest contribution to the competitiveness of the country, the efficiency of the economy and the welfare of the nation.

BRAINS² TÜRKİYE Artificial Intelligence Program; aims to provide "Artificial Intelligence Strategy" options to Turkey and to be one of the leading stakeholders in the field of Artificial Intelligence in Turkey through asking the right persons** the right questions ***.

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The purpose of the program includes: "Connecting the global trends with local needs" through the contributions of Turkish experts; bringing the AI experts in Turkey and to utilize the output of such meetings and knowledge for the benefit of the Country; preparing an environment for events to strengthen the connections between the expert community; **contributing Turkey's commercial position in the market which grows rapidly, determining the products which Turkish companies are capable to produce and which potential customers to which Turkish companies are capable to serve depending on the capability analysis and the potential of the markets, in order to contribute the Turkey's AI capacity, ecosystem and market development and** to offer a holistic / integrated vision to the Presidential Digital Conversion Office which has prepared the Turkey's Artificial Intelligence Strategy Document.

BRAINS² TÜRKİYE Artificial Intelligence Program; will match the products and customers in accordance with the domestic and global position of the Turkish companies through analyzing the capabilities of the leading Turkish companies while finding answers regarding where our country should be positioned in that sector. Within the scope of this Program; the multidimensional specific studies and activities which comparatively examines the AI Strategies/documents and markets of the countries such as US, Russia, China, France, Germany and Japan, and in which the ideal strategy option for Turkey is presented shall be analyzed.

Main Theme

Development of Vision, Strategy, Ecosystem and Market through the International Comparison

Sub-Themes

Development/Inventory of Artificial Intelligence R&D

Artificial Intelligence Sources Ecosystem

Artificial Intelligence Governance and Regulation

Artificial Intelligence Human Resource

Artificial Intelligence and Security

Sectorial Analysis and Classification of Global Artificial Intelligence Market

Analysis of Leading Turkish Firms and Product Matching

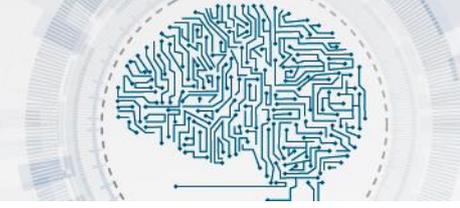**Cooperation and Competition through International Comparison**

Diplomacy of Artificial Intelligence

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STRATEGY (DRAFT)

To Develop Social Awareness towards Artificial Intelligence

- To increase the awareness of youth about the professions of future and to forward them towards these professions

- To increase awareness about Digital Transformation

- To develop forecasting approaches for sub-branches of such professions

Planning the Workforces and Professions of Future

- Detailed assessment of the workforce and professions of future towards finding out the skills required for these professions

- To determine the professions whose procedures and principles will change through the Digital Transformation and to plan alternative education and employment fields for the people who want to be qualified for this profession

- To develop the occupational skills of the people who will develop and support products/services by using the "Artificial Intelligence" which will be needed by the labor market in the near future.

Focusing on the Use of Artificial Intelligence in Defense and Security Fields

- To establish a center where institutions and individuals from all over the country can apply for the implementation of education and information activities towards "Artificial Intelligence" and "Open Data"

- As the center to be established will have a crucial importance for achieving the development in a better way, it shall be established as an institute where orienting and sector based trainings can be provided.

- To provide R&D funds and facilities for primary topics determined for researchers in this center which will be supported by the government or authorities.
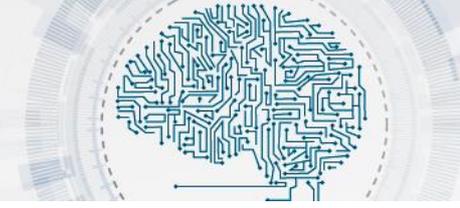
Focusing on Usage of Artificial Intelligence in Education

- To lead the establishment of "data collection policy" for the stakeholders (to determine the procedures for collecting, processing, storing and transferring data from various education stakeholders such as students, teachers, parents, school workers, administrators, employers etc.) in education

- To contribute the development of products which will support the teachers during the content preparation, process and evaluation studies during the teaching activities.

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(Biotechnology I Robotics I Artificial Intelligence I Nanotechnology I Space I Strategic Services) **BRAINS² TÜRKİYE**

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- To perform studies towards collecting data about the individual learning for personalization of education and to ensure the usage such data in the "teaching design" process, which is characterized through determining the teaching content, process and product

To Arrange Trainings to Train Experts in Artificial Intelligence

- To provide trainings in order to ensure development of products (for computer, electronics, machinery, biomedical engineers and information technology experts) by using Artificial Intelligence

- To provide trainings on topics (data labeling, data cleaning, sharing the data to support the studies when this data is required to be stored regularly on a platform determined by the government etc.) for training assistant and intermediate personnel required for the development of tools and materials which will be used by the specialists in the sub-fields of Artificial Intelligence.

- To create awareness among the researchers in universities about Artificial Intelligence applications

- To contribute arrangement of the curriculum to include sector-based use of Artificial Intelligence especially at the undergraduate degree of the universities.

- To provide trainings for researchers from different disciplines (health, law, education, history, fine arts etc.) to ensure them to use Artificial Intelligence technologies and outcomes in their researches.

- To arrange informative studies on Artificial Intelligence application areas

- To provide trainings for entrepreneurs about the "Machine Learning" and "Deep Learning"

Sectorial Review and Classification of Global Artificial Intelligence Market

- To divide the global Artificial Intelligence market into sectors, and to determine the market potential for the future through analyzing the related global markets and customers

- To analyze and classify sub/side-sectors of R&D, education, application, software, hardware, production, service etc. sectors in the Artificial Intelligence market.
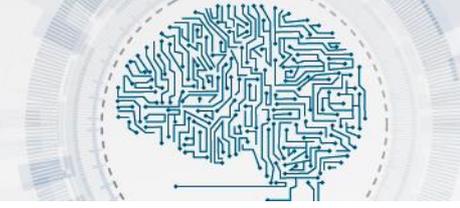
Analysis of Turkish Companies that will Lead the Sector and Product Matching

- To determine in which sectors of this market Turkey would be a significant actor

- To determine the leading companies for these sectors

- To determine the competent universities and institutions for R&D studies related to these sectors

- To determine the required certificates and processes for the market

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- To determine the products which can be produced by these companies

- To match the products and leading companies which are determined for these sectors

Informative Studies for Adaptation of the Artificial Intelligence in the Social Life and Industry

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** Right Persons

It is also very important for achieving the goal of this program to ask right questions as well as asking the right questions to the right people. It shall be ensured that the ecosystem shall include all stakeholders in order to analyze the global trends accurately and to determine the right options for Turkey. Therefore, it is a priority to ensure the inclusion of the representatives of the private sector, who create and experience this transformation, besides ensuring all stakeholders such as academicians, public and non-governmental organizations etc.
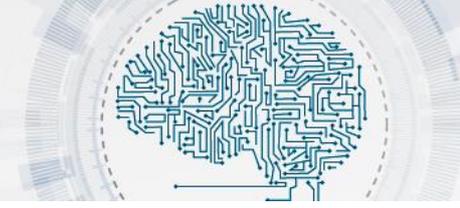
*** Right Questions

It is one of the most important steps of this Program to identify and ask the right questions. Targets of this program towards achieving "holistic and holistic results" and maintaining the focused approach, are highly dependent on asking the right questions.

- Does Turkey really need a Artificial Intelligence strategy? If so, why?

- What should be the scale of Turkey's Artificial Intelligence target? Should it compete globally or compete just with equivalent countries?

- How can we participate the international organizations' the policy building processes for AI and what kind of contributions can we provide?

- On which Artificial Intelligence areas should Turkey focus? To produce artificial intelligence software? To develop packages for existing software? To produce and commercialize processed data sets which are used in Artificial Intelligence education? etc.

- What should Turkey aim for raising its' labor force? Should our education system train engineers who produce Artificial Intelligence software? Should we train people towards the professions that will emerge through the new economic system with Artificial Intelligence?

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- If we will develop Artificial Intelligence, what should be done to establish the institutional infrastructures which are necessary to make the required data sets suitable for Machine Learning and to process these data sets in accordance with data privacy?

- What is the current situation of semiconductor manufacturing in Turkey as infrastructure products which is required to develop Artificial Intelligence?

- In which critical sectors the Artificial Intelligence would increase the efficiency exponentially? Which steps should be taken if production and development studies are initiated towards these sectors?

- Which export markets should be targeted if Turkey produces Artificial Intelligence products and services?

- How to deal with algorithmic prejudices and errors? Is there a model about these issues which can be presented by Turkey for the world?

- How Artificial Intelligence education would be delivered at universities? Through opening focused specific undergraduate departments or through adapting curriculum of computer departments in the relevant faculties?

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