WINNER

	<AUPET>	<1>
Title of business idea	Artificial Vision for people with visual impairments	
Team members	Nurtilek Sagynbayev, Sayat Akhmejanov	
General description	The main idea is to create a device called AVision. This device is designed to improve the quality of life of people with visual impairments. The device is a glasses with built-in high-definition cameras, with which the environment around the blind is duplicated, then processed by a microcomputer and transmitted as signals to the pupil of the eye; a headset that alerts about what is around the blind or about the route data; GPS navigation system to determine the location; a gyroscope, to track turns of a person's head and determine its position in space. AVision model development will be carried out in several stages: - the device plays the role of an assistant for the blind to orient it in space. With this device, the blind can easily identify and circumvent obstacles, determine the shape and size of objects, fix the numbers of buses and city alarms; - AVision will be equipped with voice, face or object recognition algorithms using neural networks, which will help identify the person or object.	
Novelty of the idea	The novelty of the devices lies in the combination of some VR and AR technologies to help people with visual defects, does not require surgery. Our idea will be based on 3 rules and on 3 «no». We are trying to create a device that will be compact, functional and affordable for the whole world, i.e. no extra wires and control units, no overall dimensions and no high prices for this device.	
Customer segment	Pharmacies, Optical companies	

FINALISTS

	<AUPET>	<2>
Title of business idea	A SINGLE CENTER, ENGINEERING OUTSOURCING	
Team members	Assel Daribayeva, Duisenbek Inkar	
General description	Providing engineering outsourcing for small and medium-sized businesses, factories, institutions of Kazakhstan in the field of defense, aerospace and medical industry; Provision of export-oriented engineering services; Create a secure data channel for calculations and results; Creation of scientific-educational and material-technical base of personnel training for machine-building, space and other branches of Kazakhstan; Development of 3D modeling in different industries;	
Novelty of the idea	Mechanical engineering is an important component of the economy and security. Rapidly developing mechanical engineering in the world makes many manufacturers to improve their products in a short time and for minimal investment. Virtual product	

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	development takes these two factors into account. Every country that wants to establish itself in the world market of mechanical engineering, space technologies, robotics should pass, practically, the entire path of development on its own. This is due to the novelty of the project theme for Kazakhstan. It should also be noted that such a comprehensive work on the creation of the center is carried out in Kazakhstan for the first time and will give a huge impetus to the development of industry, science and education in engineering, space, aviation, defense, construction and robotics.
Customer segment	Aerospace, automotive, consumer pruducts, defence, electronics, energy, heavy equipment, machinery, medical, motorsports, packaging, rail, shipbuilding.

OTHER PARTICIPANTS

	<AUPET>	<3>
Title of business idea	Heat recovery boiler using heat pipe	
Team members	Adil Kairlin, Aigerim Yeleuova, Madiyar Kozgarayev	
General description	There is a need for heat recovery, which we propose to implement by installing a "heat recovery boiler" using heat pipes (HRBHP). The use of HP, in our case, allows the utilization of low-potential heat, which is difficult to implement with the help of other heat transfer devices. In HP, the heat from the cooled medium is taken away in the evaporation zone of the evaporating liquid and with the flow of the formed vapor is transferred to a considerable distance into the cooling zone, where it is transferred to the pipe wall during condensation. The resulting condensate returns again to the evaporation zone. The main advantages of heat pipes in comparison with conventional heat transfer devices are: - simplicity of construction; - absence of superchargers and, consequently, energy consumption for moving the coolant inside the HP - tightness, which allows using any, including aggressive, liquids as coolants; - high thermal conductivity. Project details. It is intended to create a boiler based on an electric boiler (EB) with the replacement of the thermal heating element on the heat pipe, which removes heat from the casing. The resulting installation will avoid costs for hot water (in the case of HWS substitution on the HRBHP) and electricity (in the case of replacing the EB with HRBHP). The developed product belongs to the market of production for technical purposes / group of household consumers of energy resources, individuals and legal entities.	
Novelty of the idea	Our offered product has no direct analogues. Unlike conventional electric boilers, ours uses low-grade heat, transforming it into useful heat	
Customer segment	Consumers are ordinary consumers of hot water, especially in places where there is no access to a centralized hot water supply	

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	<KazNU>	<4>
Title of business idea	«Qazaq Robot» model «Aisaule»	
Team members	Bekzat Amanov, Birlik Sagitzhanov, Bauyrzhan Ubaidullayev	
General description	Main mission of this robot is to provide disabled people with fixed salary, and with a fixed job. At this moment 10% of whole population amounts disabled people, it would seem that 10% is not so much, but if we say with specific words, this is 650 million people. If we take thought 18 million people live in Kazakhstan. Now let's compare that, isn't it spectacular? But with such a large number, we don't often see them. One of the reasons is their psychological state. It is difficult to realize their inferiority and they often go into themselves and quietly lose touch with society. Loss of communication with society can be called one of the main problems. As we know they have a lot of costs. They must undergo medical care, buy medicines, but for health reasons they cannot work on a par with ordinary people. Accordingly, we can not see them in the service sector, industry, trade and etc. Rather, we will meet them in the bazaars and markets begging. Most often, they are interrupted by non-regular earnings and are waiting for job creation for the disabled. Let's be honest, creating such jobs requires a lot of effort and a lot of time. Unfortunately, there are such places in Kazakhstan but they are very few and they are not everywhere. When creating such jobs, the state will bear the costs, and private companies are not always interested in this. Now specifically about and how we want to help to disabled people. There are many robots created for the disabled people. However, they all help them in everyday life, that is, with some kind of household chores. But they all help them in everyday life, in other words with some sort of household chores. Our robot was created completely for other purposes. The basic idea is to socialize a person with disabilities by employing a robot. So far as we have developed models for museums and restaurants. A person can be at home and control the robot at a great distance. Controlling a robot is not difficult at all, it's enough to have control skills in computer games. he robot will serve as a guide or waiter to ensure a stable income for a person with disabilities. But it's easy to say, and it's not so easy to do. We have come up with an approximate plan of our actions. First, we will teach a disabled person to conduct excursions and, if necessary, the skills to control the robot, then we give the robots to the museums for free. And then everything is simple, the robot will conduct tours and receive a salary. What are our advantages? We have two main advantages. The first is that you will not find such a robot anywhere, that is, there are no analogues. The second is its affordable price. We used low-cost tools for the design of the robot, we took into account the fact that not everyone can afford a high price. For example, many robots that were created specifically for the disabled are very, very expensive and they can afford only some, ours will be several times cheaper. We also took into account the	

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	interests of companies and organizations. To interest them we have developed a simple business scheme. The idea, as we said robots in museums, we give it away for free, and the company and the employee will initially divide the salary by 50 by 50 that is, if the person's salary is 60 000tg, then the first year the company will keep 30 000tg, with increasing experience, the employee will receive more and more until the final amount is reached. One of the major problems is the loss of a disabled person due to society. We have already mentioned this and this fact can not stay away. The screen is installed on our robot. On this screen, we plan to install Skype with the help of it a person will be able to see and communicate with people. Despite the distance, the presence effect will be created. Now let us answer your possible questions. What will happen if the robot is stolen? We have eliminated the possibility of theft, each robot will have its own number and only the current owner will have a password for management. In fact, even if a robot is stolen, no one can use it. Then the second question follows, can it be sold for parts? As we said at the beginning, the robot is assembled from inexpensive materials that do not represent material value, so that when disassembling and selling, there will not be a lot of money. Thus, it represents value only to the owner. Another question may arise about the management. What happens if there are technical problems? We cannot deny this fact, it is peculiar to the technician to break down but the robot will not be able to cause any harm to anyone. There are distance sensors on it, which will give the system a stop signal with any obstacle, so even intentionally, human will not cause any harm. And so, our project provides safety for our environment.
Novelty of the idea	Special, because people with disabilities will feel full and necessary
Customer segment	Mostly people with disabilities. We think that if these people are so lucky, then this is our victory, even though we will help them in this way, this is our responsibility.

<AUPET>	<5>
Title of business idea	Multi-bladed wind generator
Team members	Alina Fazylova, Baurzhan Biakhmetov, Galy Borashov
General description	The meaning of the design of a controlled multi-blade wind turbine is in a large range and versatility of use. Possibility to electrify small remote settlements from several houses where there is no possibility of the Central electrification on a number of economic and technical features.
Novelty of the idea	The novelty of the development lies in the safe closing of the blades in strong winds. Depreciation at the service life of the wind turbine in 20 years is 6.67% of the original cost. Payback within 12 years from the date of installation
Customer segment	Power supply of sparsely populated areas in isolated from large populated areas.

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	<AUPET >	<6>
Title of business idea	Automatic equipment for the pump	
Team members	Abu-Alim Ayazbay, Takhirzhan Oskenkempirov, Damir Galiev	
General description	The device is designed for water wells, in which water replenishment occurs more slowly than its pumping out. The purpose of the device: to provide automatic extraction of water, to protect the pump from the "dry run", with the ability to specify the required amount of pumped water, while it automatically turns the pump on and off until the specified amount of water is pumped out. A siren turns on for notification. The device is equipped with a wired / without wired water level sensor to monitor the level in the tank. Setting the amount of water is convenient for watering trees, for filling tanks of different sizes. This system is assembled and researched. Studies have shown that the use of such devices in wells extends the service life of nosos and solves problems with the optimization of the use of water resus	
Novelty of the idea	To date, there are no analogues of this system. The novelty of the system lies in optimizing the operation of the pumping system for individual consumption.	
Customer segment	Farmers, people living in a private house or people who have wells	

	<AUPET>	<7>
Title of business idea	Search Method Using Multiple of IEEE802.15.4. Embedded Devices	
Team members	Abitay Anuar, Nauryzbayev Yeldar, Utegenova Nuriya	
General description	The purpose of this project is to create a help center. The essence of this center is to create a device with a low energy consumption that will be used in the search for certain things. Internet of Things(IoT) which is the concept of everyday objects from industrial machines to wearable devices using built-in sensors to gather data and take action on that data across a network has been attracting attention many peoples nowadays. Recent advances in wireless communications and electronics have enabled the development of low-cost, low-power and multi-functional sensors that are small in size and communicate in short distances. Cheap and smart sensors can be networked through wireless link and deployed in large numbers provide opportunities for monitoring and protecting peoples. As an example of practical use of these sensors in IoT are in crime prevention system and monitoring system. For example, in a monitoring system, to monitor a patient, various sensor are used to collect datas and send them to a network. Hence, to operate for a long-term, these systems requires the protected person to always possesses a sensor that low-power consumption wireless communication standards. Among the wireless communication standards, IEEE 802.15.4 standard has a low power consumption and can operate for a long time. Therefore, a sensor that using this communication standard can be used in monitoring systems as it is	

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	expected to be capable to operate for a long time. On the other hand, numerous localization protocols in wireless sensor networks are based on Received Signal Strength Indicator(RSSI). Because of no absolute positioning, localization based on RSSI is has became popular. Furthermore, no extra hardware such as infra-red or ultrasonic is needed to measure RSSI which make it a low cost solueion. Eventhough using RSSI as a distance metric will result in errors in the measured values, resulting path-loss, fading, and shadowing effects, the correlation with distance make it a suitable medium to estimate a location.
Novelty of the idea	This is a new search technology. The most important indicator is versatility or the fact that it can be used in different areas, be it everyday life.
Customer segment	People of different ages, companies, ministries, etc.

	<AUPET>	<8>
Title of business idea	Generating electricity from vibrations	
Team members	Yerkebulan Nurgizat, Yerassyl Shakerov	
General description	Vibration can be obtained from ordinary life. Every day, even every minute, a lot of cars pass by the highway and they make noise and vibration. Moreover, the railway is very noisy and very cracking type of transport and the subway too, and even a crowd of people also emit noise and vibrations appear below. We want to make an device that can convert vibrations from cars, trains, and people into electricity. The energy from vibration will be much cheaper than solar and wind energies. Device will made from flexible waterproof material that, when pressed, bends about five millimeters. This, in turn, creates the energy that the mechanism converts into electricity. Accumulated watts are either stored in a lithium polymer battery, or immediately go to illuminate bus stops, shop windows and signage. The system is based on piezoelectric crystals, which generate a small amount of electricity during compression. They are often used to produce electrical signals and vice versa, but if they collect a large number of such crystals together, they can produce enough energy to power the lanterns, sensors and other useful equipment.	
Novelty of the idea	Vibration is everywhere. Automobile highway, railway, metro is even a place where there is a large crowd of people. Energy and vibrations are safe and free of harmful emissions. The device can be installed anywhere and regardless of the weather.	
Customer segment	Government, Shopping and entertainment centers, metro.	

	<AUPET>	<9>
Title of business idea	Educational practicing center for technical services	
Team members	Miras Kurishbayev, Anuar Abdu, Aizhan Murat	
General description	Our startup company has two main objectives: first, training people, second, providing technical services to different companies. Education, evolved; with online and live curricula and events that	

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	transform learning from an institutionalized, linear, means to an end. And we do it all by re-igniting the innate curiosity that lives in us all. If we talk about the first problem, we will teach people (whether it is programming, 3D modeling, science). Now the main problem is the lack of practice, because of the lack of practice, many people come to the workplace are lost. Here we connect our second task. The second task is to provide technical services to the company.For example some companies need to produce technical calculations or to create a 3D model, but they can't do that because there are no people with knowledge. Here they can contact us, and our qualified specialists and part-time teachers will help with this problem. This brings us together our two objectives. Under the full supervision of specialists(teachers), our students will help them and also gain experience and further employment
Novelty of the idea	We will become a bridge between the old and the new.
Customer segment	People of different ages, companies, ministries, etc.

<AUPET>	<10>
Title of business idea	3D Printer Based on Delta Robots
Team members	Aubakirov Arman,Toktanay Zhanibek, Bazarbay Didar
General description	This development is designed for both home and consumer segment. Delta robot-based project (rostock) most parts will be printed on a 3D printer so reduce the weight of the design and the price of it. Also, thanks to a very flexible design and precise mechanism, we can make it a manipulator for quick sorting of objects or a manipulator for soldering, etc . It will be mainly used in small and large enterprises.
Novelty of the idea	Wear resistance, low cost in production, multitasking.
Customer segment	Factories, Ministries, Universities

<AUPET>	<11>
Title of business idea	A Brigade of Multifunctional Rescue Robots for Special Missions
Team members	Abildin Askar, Toktarov Zhenis, Babazayev Dilshat
General description	At the moment there are such dangerous situations when a person on their own can not do anything. At this point, the brigade is involved. This project was inspired by the football team. The brigade will be in rotation 1-3-4-3. It will include 3 robot tanks that clear the way for the others. 3 support robots that operate in extreme conditions such as fire, debris, mudslides, etc. 1 robot dispatcher commanding a ground crew. 2 first aid operation robots and 2 robot transporter. The most important thing is a alying drone that is from a height and manages the entire operation.
Novelty of the idea	Such a team does not exist at the moment or has not yet been developed. The main advantages of this team is that using 11 multifunctional robots increases the efficiency as well as the success rate of the mission. Multifunctionality closes the weaknesses of each other. Rescue service, Protection services. First responders.

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Customer segment	The first models were prepared. The basic technology is thought over.

<AUPET> <12>

Title of business idea	Semiautomatic fire extinguishing robot
Team members	Seidegaliyev Toregali
General description	According to the civil defense reports of Kazakhstan for 2018, 16,619 natural and man-made incidents occurred. In which 3567 people suffered. 1034 people died. Our project is designed to reduce the number of victims in fires and disasters by holding clear people from dangerous areas. A robot of a special design, with small dimensions, special manipulators, with thermal protection will be able to work very efficiently, where a person can not.Also, it can be used in factories for flame control. Automated control allows you to keep the operator at a safe distance. To ensure the safety of the next generation, we will be able to use robots in schools, before the arrival of firefighters.
Novelty of the idea	The main advantage of our robot is small size, multifunctionality, as well as the use of the latest technology, and electric motor. The use of thermal imager, smoke sensors to detect the source of fire, and the use of fire extinguishing equipment.
Customer segment	Ministries, companies, universities, schools, absolutely any employer become a consumer of these services

<AUPET> <13>

Title of business idea	Solar panel tracker system
Team members	Khamitov Daniyar, Ikhsan Sabirzhan, Shakirov Miras
General description	This tracker system includes a GPS device allows you to determine the location of the installation and in real time to direct the solar panel on the movement of the sun. Thus, the consumer does not need the initial setup of the system as it provides automatic adjustment.
Novelty of the idea	The novelty of the development is the introduction of a GPS system to control the solar panel tracker system.
Customer segment	Administrative and state institutions. Private electricity companies.

<AUPET> <14>

Title of business idea	Aircraft with air filtration system
Team members	Akhatov Assan, Abil Kuanysh,Daliyev Askhat
General description	Excessive air pollution is a pressing problem in many countries. This project aims to reduce air pollution. The filtration system is installed directly on the aircraft and continuously performs air purification. The payback period is less than two years due to the possibility of mounting various advertising banners directly on the aircraft.

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Novelty of the idea	The novelty of the development is the way to pay back the filtration system, which in the future will be a solution to one of the global problems of environmental pollution.
Customer segment	Various companies interested in advertising their products.

	<AUPET>	<15>
Title of business idea	Ensure continuous access of organizations of Kazakhstan to modern high-precision software systems	
Team members	Alniyazov Alen, Abudaimov Nariman	
General description	The scientific and practical significance of the Project lies in the creation of a single center for computer engineering. The center will conduct continuing education courses for engineers, teachers, doctoral students and students. Thus, as a result of the project, a generation of highly qualified domestic engineers will be trained in the field of mechanical engineering, space technology and technology, construction and robotics. The novelty of the research topic. Engineering is an important component of the economy and security. The rapidly developing engineering industry in the world is forcing many manufacturers to improve their products in a short time and with minimal investment. Virtual product development allows you to take these two factors into account. Each country that wants to establish itself in the world market of mechanical engineering, space technology, and robotics must go almost the entire development path on its own. This determines the novelty of the Project theme for Kazakhstan. It should also be noted that such comprehensive work on the creation of the center is carried out in Kazakhstan for the first time and will give a huge impetus to the development of industry, science and education in mechanical engineering, space, aviation, defense industries, construction and robotics. Justification of the connection of the problem with the national priorities of socio-economic development. In the modern world, computer technologies are widely used to develop new products in industry, navigation, exploration of deposits and water resources, monitoring farmland, cartography, etc., which is very important for Kazakhstan, which has a huge territory. Therefore, the development of modern software packages and the provision of qualified outsourcing is one of the main priorities of the republic. Expected end results of the project: - a single center of engineering services; - material and technical base, constantly new versions of software systems; - heavy workload of the supercomputer; - Highly qualified specialists who have mastered the technology of virtual modeling. Expected socio-economic effect. The creation of a single engineering center will help engineers optimize their designs for a small amount, and successfully commercialize them.	

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	As a result of the implementation of the innovative Project with a small funding budget, scientific engineers will be able to receive an optimized model or prototype in a short time. The low cost of the services provided can attract private business to develop their own technologies and developments, which will allow to obtain economic benefits from the implementation of the Project. The creation of the center will help teachers of technical universities and internships to undergo advanced training for students. It will give powerful support to plants for the development of new designs, machines, parts, optimization of existing products, the introduction of new technologies. The main indicators of the socio-economic efficiency of the Project will be the number of patents, new competitive products of the mining, engineering, defense, energy sectors, shipbuilding, trained specialists in mechanical engineering, robotics, space industry, doctors, masters and bachelors with scientific and practical skills in designing, modeling and calculations, publications in leading scientific journals with non-zero impact factor. Analysis of the causes of the problem. The development of engineering is an indicator of the growth of the country's economy. Over the past 5 years, with the exception of 2015, mechanical engineering has shown positive dynamics. Despite the increase in production, Kazakhstani content remains low. This was also indicated by the chairman of the National Chamber of Entrepreneurs, T. Kulibayev in 2014: “Engineering is not in the best condition. We do not produce engines for the country, we do not produce electric motors, except for batteries and large-scale assembly, in fact, there is nothing. The problem with personnel, the basic production is weak: casting, forging, forges ... We record engineering in the gross volume, although almost all components are imported, there is a minimum of Kazakhstan value added. The problem is this. ” There are many examples of this, from assembling computers to assembling combines. There are very few actually produced products with 100% Kazakhstani content. There are many reasons for this, E.V. Chermoshchentseva in her article "Engineering of Kazakhstan: new vectors of development" identified 6 reasons: “... - technological lag of enterprises, low competitiveness of products; - lack of links with world manufacturers, access to design documentation; - a small amount of investment; - lack of inter-factory cooperation; high level of deterioration of equipment; - lack of qualified personnel; - low level of after-sales service of engineering products ... "
Novelty of the idea	The novelty of the research topic. Engineering is an important component of the economy and security. The rapidly developing engineering industry in the world is forcing many manufacturers to improve their products in a short time and with minimal investment.

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	Virtual product development allows you to take these two factors into account.
Customer segment	The main consumers will be construction companies, medical facilities, etc. Since 3D analysis and mathematical calculation are used to create drawings of buildings, and 3D printing is used to create gypsum and human organs like bones and dentures.

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