

ROBOTIC TECHNOLOGY – DRONE DELIVERY

Module Code: BMSW4003

SEBASTIAN MARIAN MATEI: 2111128

LOREDANA ANDREEA ZSOFI: 2111130

FLORENTA ALEXANDRA STAN: 1919632

MARINELA ROXANA LICA: 2115486

GEORGIANA ANDREEA MATAACHE: 2111127

LECTURER: AMITAVE BANIK



AMAZON PRIME AIR DELIVERY DRONES BACKGROUND

Loredana Andreea Zsofi – 2111130

DRONE DELIVERY BACKGROUND



- Who is Amazon Prime Air
- The founder
- How they start
- Interesting background facts

WHO IS AMAZON PRIME AIR?

- Prime Air is a drone delivery service.
- The service is also currently in development by Amazon.
- Was revealed in 2013 by the founder but approved for testing in the U.S. in March 2015.
- In 2019 Amazon Prime Air received an Airworthiness Certificate for their research of its MK27 drone.





THE FOUNDER

- Amazon Prime Air was founded by Jeff Bezos
- He is also the Founder of Blue Origin.
- He was born in Albuquerque and raised in Houston and Miami.

HOW THEY START



- Amazon prime air delivery drone has begun as a commercial in Cambridge.
- The first delivery took just 13 minutes from the customer placing the order.

INTERESTING BACKGROUND FACTS

- The Amazon Prime Air team worked with NASA and also Single European Sky ATM on trials.
- For additional safety they decided that the drones will fly at a low altitude somewhere below 400 feet.

THE CHALLENGES BEFORE THE INTRODUCTION OF MODERN TECHNOLOGY

amazon
Prime Air



➤ Florenta Alexandra Stan -1919632

WHAT ARE THE ADVANTAGES OF DRONE DELIVERIES?

- Prime Air – a future delivery system from Amazon designed to safely get packages to customers in 30 min or less.
- The packages are not confusing, they come correctly to the destination due to the system that the drones have.
- Amazon`s drone technology is a labor-saving / capital-using technology like drones.
- A drone flies above road delays such as construction, detours, accidents, traffic deviated roads, etc.

WHAT ARE THE DISADVANTAGES OF DRONE DELIVERIES?

- Drones are found operating in unauthorized airspace.
- Drones are shot down by civilians
- Drones have trouble operating in moderate rain or thunderstorm condition.
- Drones replace drivers.



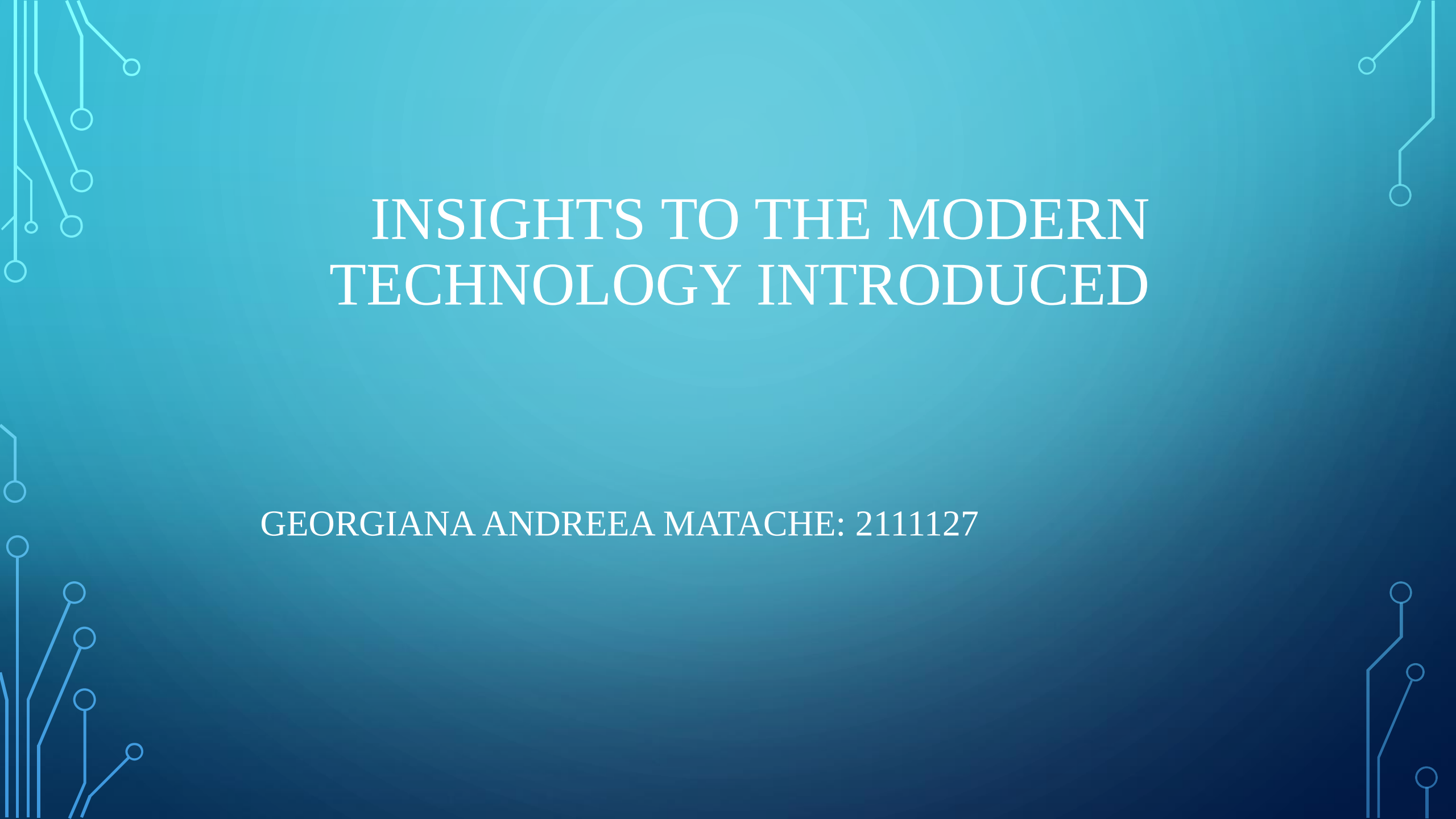
IS THIS NEW TECHNOLOGY PROFITABLE OR LOSS FOR THE COMPANY?

- Amazon's drone technology is a labor-saving/capital-using technology.
- Drones replace labor and trucks with more specialized capital.
- One drone operator will monitor multiple drones.
- The lifespan of drone is 5 years.

CONCLUSION

- Amazon is a resilient company
- Delivery by drones increases the number of buyers and brings a good profit to the company.
- Amazon gain a strong competitive advantage over online and physical retailers.



The background is a blue gradient. In the corners, there are white line-art illustrations of circuit boards or neural networks, with lines connecting to small circles.

INSIGHTS TO THE MODERN TECHNOLOGY INTRODUCED

GEORGIANA ANDREEA MATAACHE: 2111127

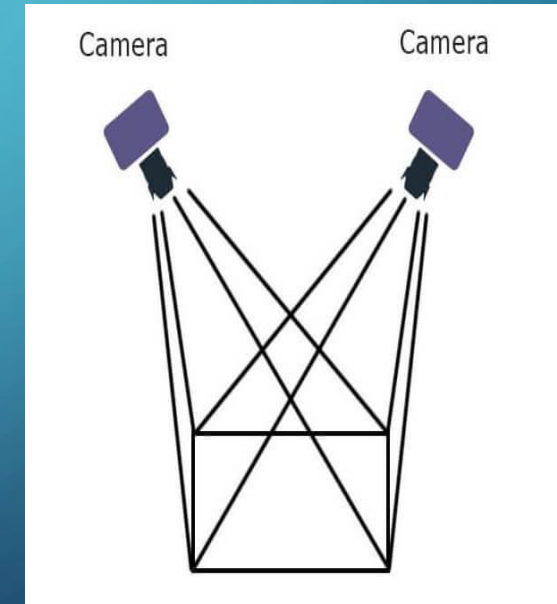
WHAT IS THE STEREO VISION SENSORS TECHNOLOGY?



- Computer vision implementation who use stereoscopic ranging techniques to change the image from 2D to 3D.
- Is a type of camera with two or more lenses with a separate image sensor.
- Is a type of camera that can simulate human binocular vision and have the ability to capture three-dimensional images.
- The distance between lenses is 6.35 cm with a longer base line for more extreme three-dimensionality.

HOW DOES STEREO VISION SENSORS WORK?

- The two cameras capture two images in the same time and after the images are analyzed to see the differences.
- The corners are easy to find in one image.
- The differences between the images helps to get the depth of the point which enables projecting it in a 3D world used for navigation.
- The cameras use 3D vision sensors which scan all angles and make a point cloud.



POSSIBLE APPLICATIONS OF STEREO VISION SENSORS TECHNOLOGY

- Industrial inspection for 3D objects;
- Autonomous vehicles, robotics;
- Transport;
- Medical;
- Scanning electron microscope.

PURPOSE OF STEREO VISION SENSORS AT AMAZON PRIME AIR- DRONE DELIVERY

- The stereo vision helps the drone to analyse the footage for different threats: humans or animals.
- The drone can see the difference between a lawn and a swimming pool.
- To minimize the risk of sending the parcel unsafe to the customer.
- To avoid any obstacles until the destination.



IMPACT OF THE TECHNOLOGY INTRODUCED

MARINELA ROXANA LICA - 2115486



POSITIVE IMPACTS

- Can quickly deliver products to a different location
- Drones conserve energy
- A safer delivery system
- A higher level of efficiency
- Drones could reduce consumption levels
- Drone delivery saves time



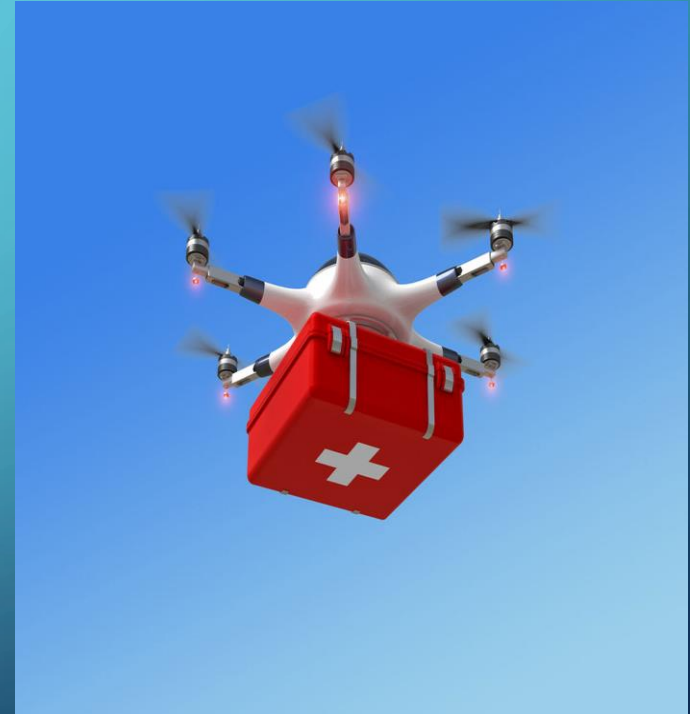
NEGATIVE IMPACTS

- Drones are expensive device
- Battery problems during transport
- Risk of defects during in operations
- Drones could be stolen
- Drone delivery can reduce staffing
- Weather dependent



HOW DO CUSTOMERS FEEL ABOUT THIS TECHNOLOGY?

- People used this technology in a pandemic period for delivering medical supplies
- Is used by customers who care about the environment
- Many customers consider this transport to be “A magical experience “
- The customers think that the use of drones requires close monitoring



- Some customers consider drone delivery beneficial especially in food delivery
- Customers consider it a beautiful idea especially for unsafe roads
- The customers supported the use of the drones for military and police applications
- Customers would use drone delivery in search and rescue, crime prevention, disaster response



A decorative graphic on the left side of the slide, consisting of a series of vertical and diagonal lines of varying lengths, some ending in small circles, resembling a circuit board or a stylized tree structure.

LESSONS DRAWN FROM THE CASE STUDY

SEBASTIAN MARIAN MATEI - 211128

LESSONS LEARNED FROM THE CASE STUDY

- Development of this technology will allow the drones to save people's time.
- Camera that uses stereo vision sensors.
- Drones got a very light but powerful and fast engine.
- Most of them are made of thermoplastics as they are cheaper to rebuild in case of a crash.



LESSONS LEARNED FROM THE CASE STUDY

- Best battery for a drone it's called Grepow because of it's energy and very light.
- Lots of sensors as it drives itself, autopilot.
- Design: Quadcopter & Octocopter.



LESSONS LEARNED FROM THE CASE STUDY

- Transport packages, medical supplies, food, or other goods.
- Shooting movies, sports.
- Amazon delivery drones can deliver packages that weigh up to 30kg.
- The longest time a drone can fly is 25minutes.
- Drones can fly up to 62mph(100km/h).

LESSONS LEARNED FROM GROUP WORK

- Organisation skills;
- Communication;
- Teamwork;
- Problem solving;
- Research skills;
- Decision making.

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