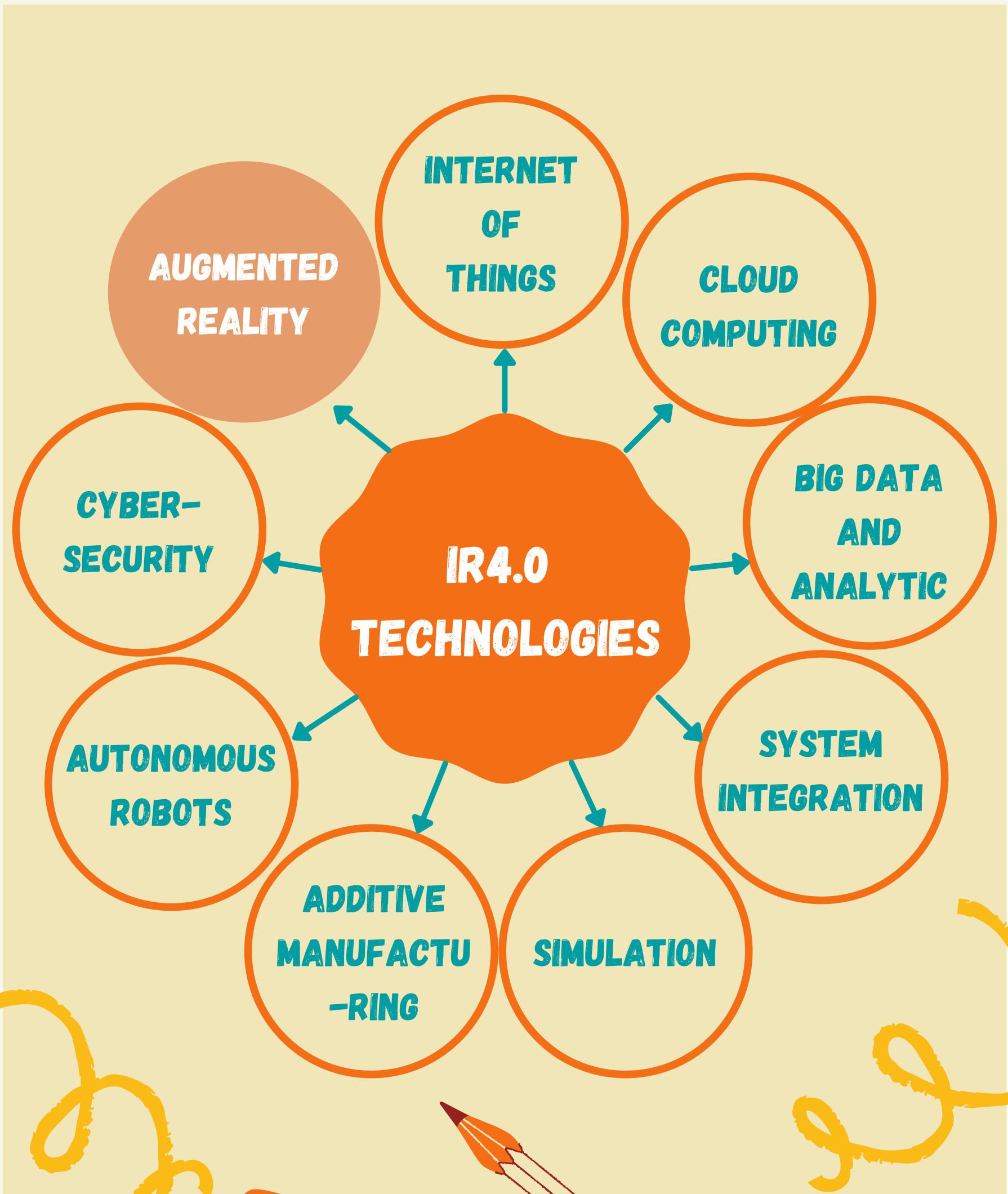# FOURTH INDUSTRIAL REVOLUTION (IR4.0)

What is IR4.0?
- Industry 4.0 refers to a new phase in the Industrial Revolution that focuses heavily on interconnectivity, automation, machine learning, and real-time data.
- The Industry 4.0 paradigm encourages physical objects, such as sensors, gadgets, and enterprise assets, to be connected to one another and to the Internet.

IR4.0 TECHNOLOGIES

- AUGMENTED REALITY
- INTERNET OF THINGS
- CLOUD COMPUTING
- BIG DATA AND ANALYTIC
- SYSTEM INTEGRATION
- SIMULATION
- ADDITIVE MANUFACTU-RING
- AUTONOMOUS ROBOTS
- CYBER-SECURITY

AUGMENTED REALITY

Augmented reality (AR) is a type of interactive, reality-based display environment that takes the capabilities of computer generated display, sound, text and effects to enhance the user's real-world experience.

- AR is one of the biggest technology trends right now, and it's only going to get bigger as AR ready smartphones and other devices become more accessible around the world.
- AR let us see the real-life environment right in front of us with a digital augmentation overlaid on it.
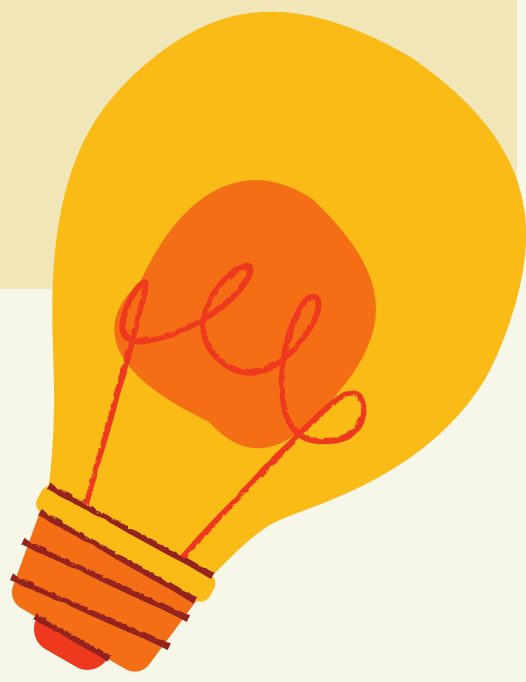
APPLICATIONS

Sephora
- try on different makeup looks, check out full face looks, and learn how to do your makeup with virtual tutorials.
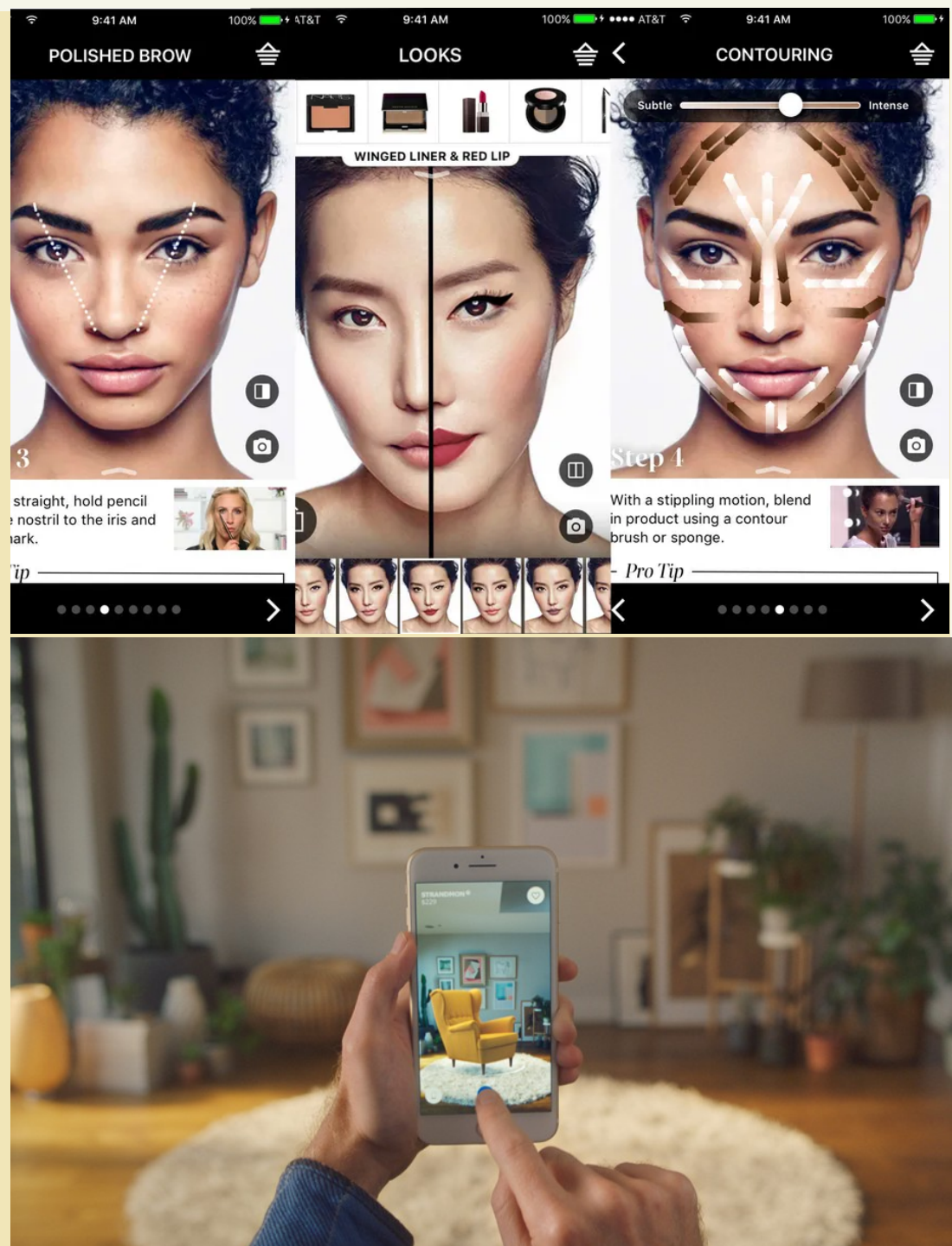
IKEA
- automatically scales products, based on room dimensions, with 98% accuracy.
- users must point the device to the desired spot in a room, then drag and drop the selected product onto the space

Tap Painter / Dulux Visualiser
- allows you to determine which color you should paint your walls.
- can choose different colors for different walls to see the finished look.

TYPES OF AR

MARKER-BASED AR
- detects the object in front of the camera and provides information about the object on the screen.
- the recognition of the object is based on the marker where it replaces the marker with a 3D version of the corresponding object.
- the user can view the object in more detail and from various angles.

SUPERIMPOSITION AR
- recognizes an object in the physical world and enhances it in some way to provide an alternate view.
- include recreating a portion of the object or the whole thing in its entirety.

MARKERLESS AR
- more versatile than marker-based AR as it allows the user to decide where to put the virtual object.
- relies on the device's hardware (camera, GPS, digital compass, and accelerometer) to gather the information
- don't need a physical marker to trigger the digital content.
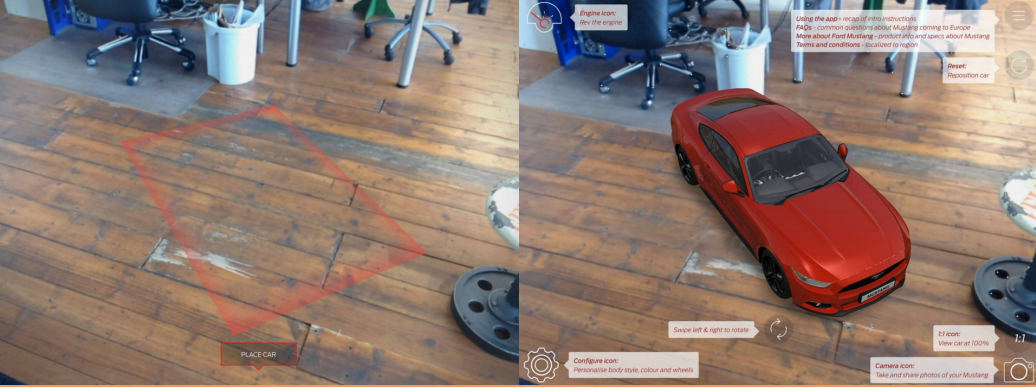
PROJECTION-BASED AR
- do not need a mobile device to display the content.
- light projects the digital graphics onto an object or surface to create an interactive experience for the user (holograms).
- can be used to show a prototype or mockup of a new product
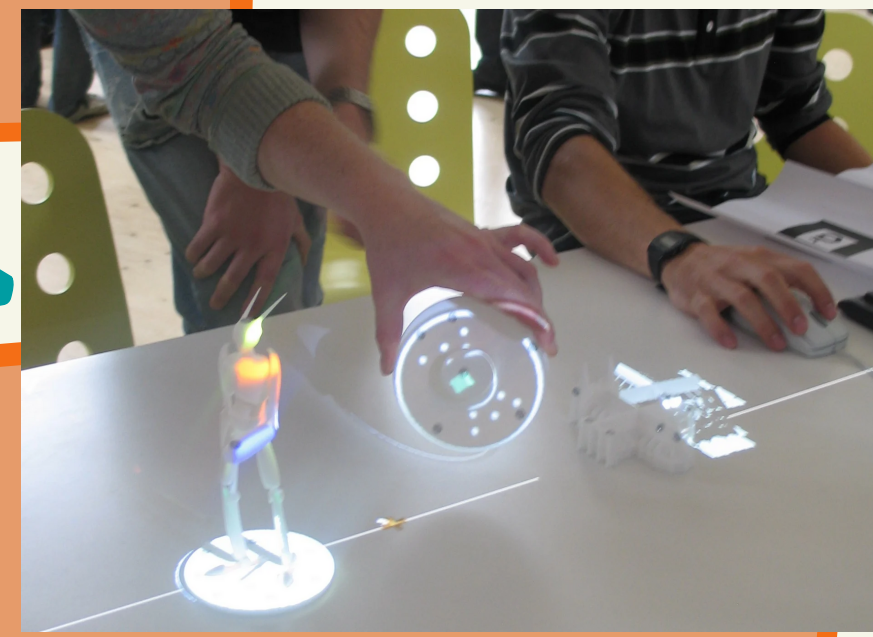
LOCATION-BASED AR
- ties digital content and the experience it creates to a specific place.
- The objects are mapped out so that when a user's location matches the predetermined spot it is displayed on the screen.
- Example : Pokemon Go

OUTLINING AR
- recognizes boundaries and lines to help in situations when the human eye can't.
- uses object recognition to understand a user's immediate surroundings.
- Example : driving in low light conditions or seeing the structure of a building from the outside.
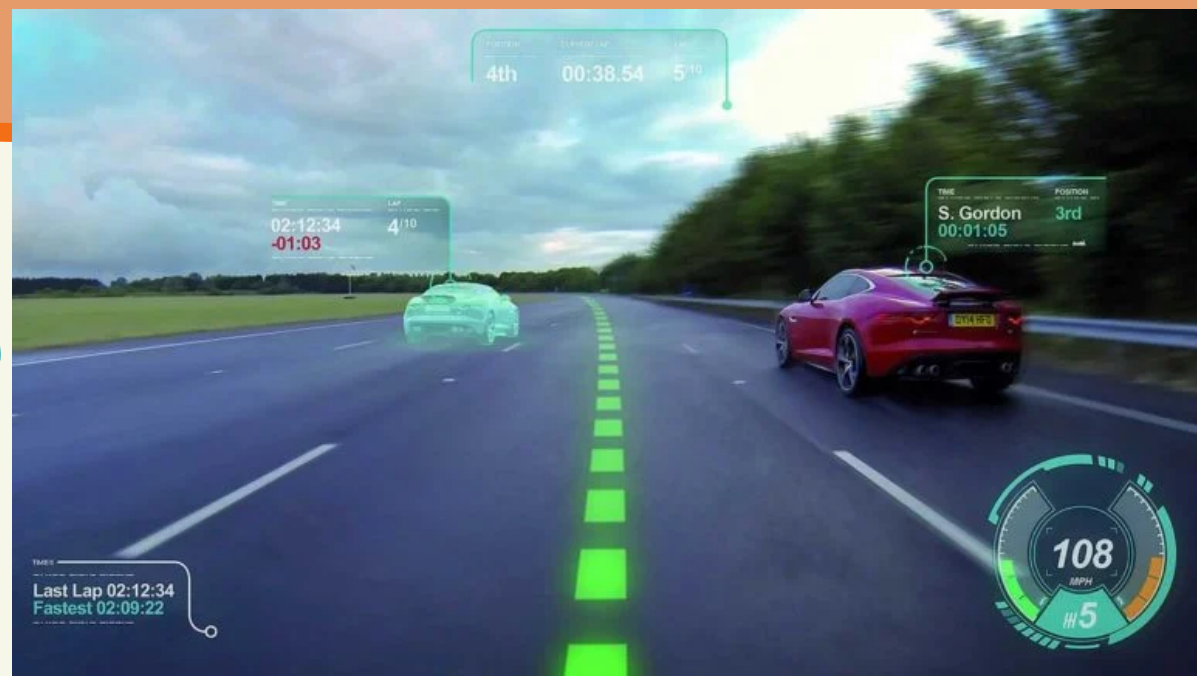
HOW DOES AR HELPS HUMAN LIFE?

EDUCATION
- easy access to learning materials anytime and anywhere
- engage students and spruce up their interest and immersive practical learning

E-COMMERCE
- personalizes the shopping experience and provides self-service store navigation
- engages customer by turning every type of marketing into experiential marketing

TOURISM
- educate tourists and improve their experience by fascinating them with interesting stories and letting them dive in depth of history and science.
- break the communication barrier

CONSTRUCTION
- real-time visualization of projects and greater implementation of building information modeling (BIM)
- better collaboration, communication and projects can be delivered on time within budget

REFERENCES

- Types of AR (1)
- Types of AR (2)
- Types of AR (3)
- Applications (Sephora)
- Applications (IKEA)
- Applications (Dulux Visualiser)
- Education
- E-commerce
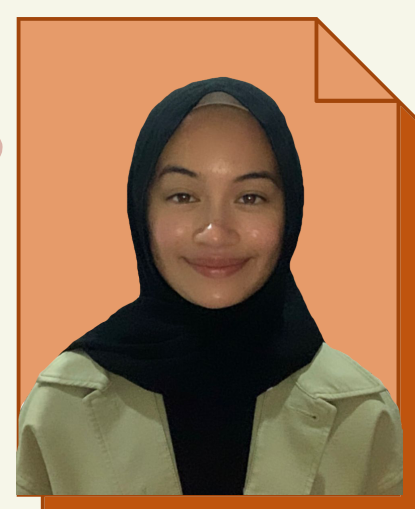- Tourism
- Construction

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