Augmented Reality Smart Glasses

Use cases as per industry

Avisk
Let's Simplify

Why AR Glasses

- Remote Locations
- Advancing Safe work,
- It is Reliable,
- It is Affordable &
- Organisation is Environmentally responsible

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Uniqueness

Heads up Display with Hands free operations.	4K Camera / Head Tracking/ Voice Controlled.	Integrated speaker with noise-cancelling microphones.
Barcode scanning.	Multiple Mounting options.	Touch Pad and Button manoeuvring.
GPS / Bluetooth/ Wi-Fi connectivity.	Light weight from 70 grams to 380 grams.	6-8 hours battery life/ Wireless

Industry Verticals

Manufacturing	Aviation	Solar and Renewables	Logistics	Ports and Shipping
	Healthcare	Power and Utilities	Constructions	Industry Agnostics

Manufacturing

More effective, on-the-job training

- Has the ability to generate a semi-immersive training environment for workers.

- When used with digital twin technology, AR shortens the learning curve for less experienced workers learning how to maintain or repair equipment.

- AR allows employees to train using a realistic and dynamic simulation.

- Employees can view step-by-step instructions and visual aids overlaid on the equipment they need to assemble and operate.

Mentoring

- Employees can receive one-on-one or one-to-many mentorship from subject matter experts no matter where they are.

- The employee and mentor(s) can talk back and forth by using a wearable, such as a headset with a bi-directional camera, microphone, and speaker.

- The mentor(s) can see from the employee's and coach's point of view in real time.

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Guidance

- Remote assistance and support are made easier.

- Geometric identifiers can be overlaid on real-world items using augmented reality. Employees can see these marks and follow them to execute difficult jobs by viewing actual items through a wearable device.

- Text annotations and complex routines can be added to provide more guidance.

- Employees require less troubleshooting and are more efficient in completing their work while using remote support. Repairs, instals, and assembly may be completed precisely and rapidly.

Maintenance

- When combined with real-time sensor data and analytics, augments preventative maintenance skills, avoiding equipment failure and costly shutdowns.

- On a screen, the technology can overlay maintenance and asset status information.

- Employee can observe real-time condition based information and probable locations of failure just by glancing at a piece of equipment through the camera.

- Employee can also view trend data to track changes over time and maintenance history to determine when a piece of equipment needs to be serviced.

- Follow standard maintenance checklist SOP that is voice command based.

Product Development

- Product development is a collaborative and risky process.

- Enables product creators, executives, and employees to collaborate to ensure that any manufacturing process or quality issues are identified before the product reaches the consumer.

- Product developers can use AR to produce 3-D models of new items and integrate them into the assembly line.

- Employees can use this virtual model to test the quality of a new product before it is released.

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Quality Assurance

- QA inspectors must rely on written documentation or manually log findings. However, this creates potential for error, allowing flaws to slip undetected.

- When coupled with your quality management system (QMS), can improve the QA process by allowing inspectors to pull up checklists, use AR overlays to discover faults, call other technicians, and rapidly publish their results.

Safety

- Factory worker safety and the physical risks that are involved in manufacturing.

- Smart glasses, obviously, allow a hands free operation which improves worker safety and being a monocular ensure surrounding safety.
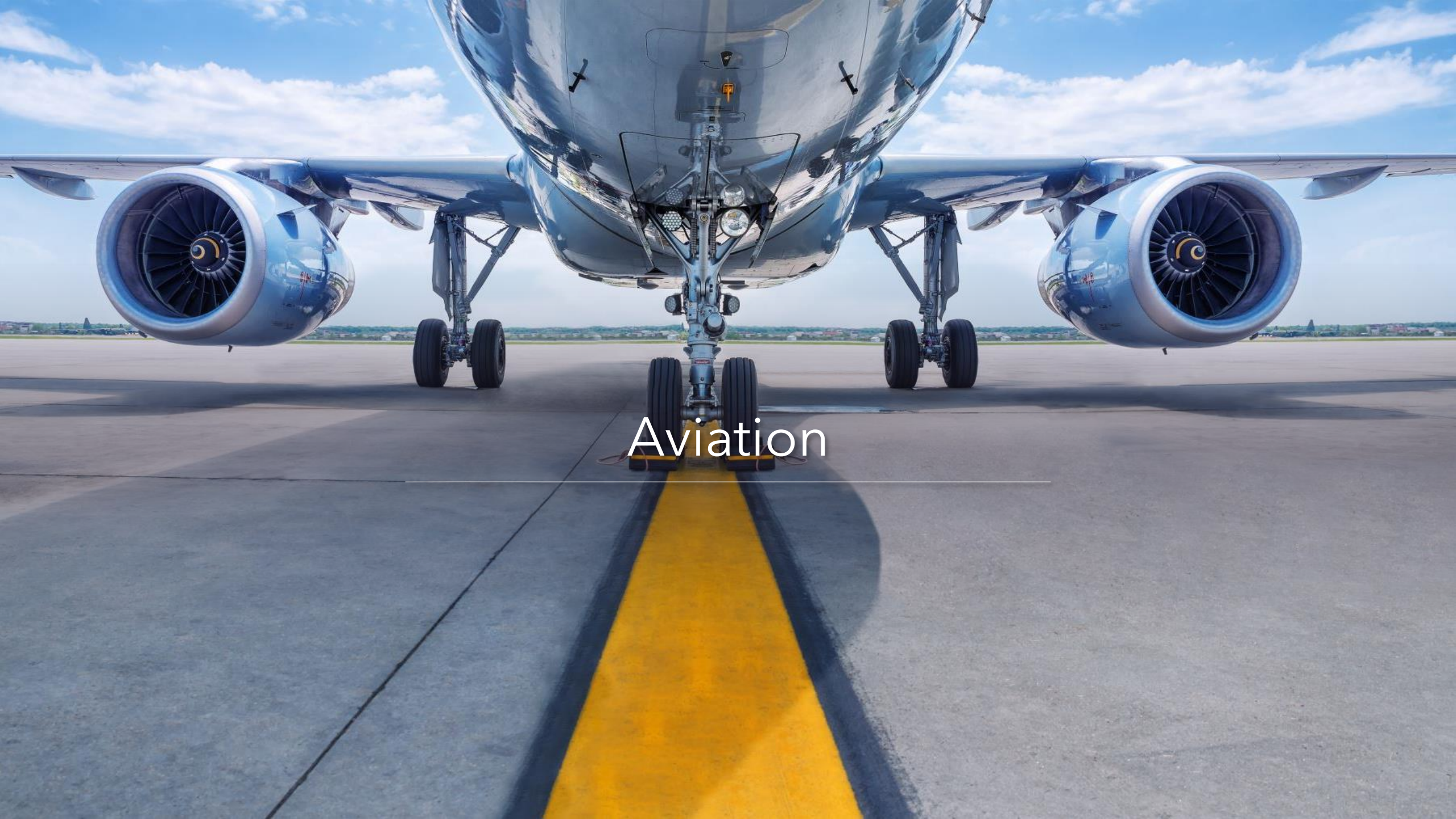
Aviation

Ground Handling Operations

- To manage Inflight meals and follow process flow

- Baggage and cargo containers handling process.

- The team on ground is using smart glass to reduce loading time, average time saved is around 10+ minutes per flight.

- Use of Scanning feature for visual markers (QR) with real-time loading instructions and placement location, flight number.

Aircraft assembly process

- Improve the efficiency of aircraft assembling, and Airbus is one of the first to try this technology out.

- Simplify the process of cabin seats assembling

- With the help of overlayed contextual instructions, the worker can place seat markers six times faster (500% improvement) and leave no room for mistakes.

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Communicate in real-time

Time wasted sending documents, photos, and data can hinder important repairs, approvals, and collaboration, which results in increased costs and missed opportunities.

Wearable solution allows us to eliminate delays in communication creating big ROI.

Engineers and technicians can communicate live, while working hands-free and heads-up.

General Electric Aviation harvesting big returns on investment and improving overall performance.

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Flight Operation

- As a pilot, you have to pay a lot of attention to dozens of metrics, so your hands and eyes are always busy.

- The AR application displays essential flight information (altitude, speed, time, etc.) via AR Smart Glasses.

- Aero Glass& Aribus is using wearable augmented reality headsets that provide extensive cockpit information for the pilot.

On-site aviation technician

- TAE Aerospace uses wearable technology to allow an on-site aviation technician to collaborate with product expert remotely.

- Its technicians are on call 24 hours per day, providing assistance to airline operators, private pilots.

- In place of traditional printouts of cockpits or engine components, mechanics in training can walk inside of an actual virtual engine or cockpit and learn how to work on them.

Aircraft Maintenance

- Guide the user to an aircraft component

- View the maintenance activity step by step

- Remote Assistance with AR

- Guide to components in stock

- To display inputs and materials needed to perform the task

- Mechanic training and "Paperless" environment

As a result of combining technologies such as 3D scanning, sensors, and other features that offer real-time details, the aircraft maintenance can become incredibly successful, while improving safety.

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Training

Aircraft inspection

- Airlines and ground handlers can learn and improve their aircraft inspection skills through virtual reality training.

- Trainees can learn about various conditions of aircraft inspection on all types of aircraft, minimizing the possibility of failures during operation.

- Team members are able to perform visual inspections of virtual aircraft on an apron or cargo bay with the headset that puts them on visual airside.

Training

Cabin crew

- Cabin crew members can get virtual training to be prepared for difficult real-life situations like medical emergencies, crashes, and hijackings in place of classroom training.

- In virtual training, cabin crew members can make mistakes, learn from them, and improve their performance on the job.

Training

Flight deck

- Flight deck crews can use the VR part task trainers to get familiar with the cockpit and learn the necessary skills to react quickly and handle even the most challenging situations.

- With head-mounted displays (HMDs) and virtual environments, pilots can become familiar with cockpit controls and different scenarios they may face in the air.

Training

Mechanic training

- It can be used for training in order to train not only the steps of executing a task, but also to bring the experience of motor training to the user.

- Reduced cost for training.

- Ease of implementing new modules: repair, component replacement, activity in the cockpit and troubleshooting.

Solar & Renewable

Value

- **Training**

AR device with remote mentor solutions to: capture images and videos, playback training videos, refer to manuals, and more. training time could be cut by up to 50%

- **Productivity**

Through remote mentor and visual assist capabilities damage assessment time was reduced by 3 to 6 hours and data accuracy improved by 50 percent

- **Safety**

Ability to access critical data points through backend systems completely hands free brings safety and efficiency to the way your field teams work.

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Use cases for Renewable Vertical

- Powerful AR tools assist workers in finding and identifying components, various locations and wires using their voice.

- AR allows technicians to scan and identify faulty components & machinery and provides guidance in repairing them

- AR headsets for junior workers who receive remote on-site guidance from more experienced colleagues and get the support they need in their operations

- AR glasses superimposing digital instructions that is heads-up display enhance the speed of assembly & Installation

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Addressing issues in Renewable Plant

Problem Statement	The Solution	Element of Smart Glass	Remarks
Visual inspection	Offers more accurate physical inspection	Camera	Camera types depending on required visuals
Documenting operation and maintenance reports	Immediate report preparation on the solar filed visits and survey	Microphone, camera, and other components in smart glasses	Accuracy might be less due to a limitation in a speech to text
Dust accumulation	Offers high-resolution images of the PV module	Camera, computing technologies	Less scope for integrating computing facilities
Noise issue in electrical components	Detects the noise levels in the electrical Components	Microphone	Noise separation issues

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Addressing issues in Renewable Plant

Problem Statement	The Solution	Element of Smart Glass	Remarks
Number of components	Identify the quantity of equipment available in the solar field	Camera	Enhancing the AR smart glass with image analysing Techniques
Location identification	Enables the wearer position in existing fields, also allows identifying the location services of illegally installed solar sites	GPS	Accuracy in location detection service
Temperature effect	Offers the thermal image capture Facility	Camera	Integration of thermal cameras
Moisture conditions and its effect on PV module	Offers the high-resolution PV module image capture facility	Camera, light sensor	Enhancing the AR smart glass with image analysing techniques

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How to enhance Productivity

- **Interactive and cost-effective solution**
- augmented reality technology simplifies troubleshooting and speeds up the service and repair
- **Site Inspection**
- need constant monitoring and maintenance to ensure that they are working at optimum efficiency
- **Increased work safety**
- the fieldworker works hands-free, the safety of workers is improved

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How to enhance Productivity

- **Fast and accessible visual assessments**

different images can be captured with a device that are superimposed in the real environment

- **Project Planning**

project supervisors have unlimited access to data and materials

- **Increases Expert Accessibility**

with video conferencing, remote experts can see what the worker is seeing in real time

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Case Study- Vestas Wind Systems

Problem

- Retiring workforce and transforming paper-based processes to meet the needs and expectations of younger workers.

Solution

- Helped Vestas' sprawling network of field technicians and engineers access key knowledge resources, including experienced remote workers.

The Results

- Improved knowledge sharing and training

- Increased accessibility to information

- Accelerated onboarding

- Enabled remote mentoring

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Case Study- SpringCity Energy

Smart Glasses to perform on-site inspection and maintenance including work instructions, remote technical support and on-the-job training to service solar and renewable energy.

Smart glasses-based work instructions, Spring City eliminated the need for paper-based instructions, improved maintenance checks (no maintenance checks missed or overlooked) and increased productive output by 40%

Home

...nted Reality and Warehouse

Aisle **17** | Shelf **3**

Item 1

Logistics, Warehouse, Ports

Information Layering – 4 basic process

An in-built camera on a mobile device or a head-mounted display (HMD) is used to take a snapshot of the surroundings in the first step.

In order to identify the scene, an AR system scans the collected surroundings in order to determine whether predetermined content should be displayed. Visual markers or tracking methods, such as GPS, sensors, and so on, can be used to identify a process.

As part of the third procedure, the AR system searches a connected database in search of content to add to the scene.

Scene visualisation is the process through which an AR system creates an image that mixes a captured object or surroundings with virtual information.

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Completeness Checks

- To ensure effective pickups, augmented reality is deployed. By scanning cargo barcodes, a device with AR capabilities can rapidly determine if the load is complete.

- The validation process necessitates manual barcode scanning and can be negated

- Wearable AR gadgets, on the other hand, allow you to determine the volume of freight items by employing unique scanners and sensors.

- AR systems are also utilised to identify damage and prevent errors by scanning the cargo.

Last-Mile Delivery

- According to most transportation companies, the last mile delivery step is an inefficient and expensive one.

- Truck drivers spend about 50% of all work time not driving., Instead, they locate boxes to prepare their vehicle for the next delivery.

- Drivers can use AR devices to find a box they need. This will enable them to find the box and obtain all the necessary information such as the type of good, weight, and address. This will make the search process easier and faster.

- Drivers can close the door with an eye movement or by using a voice command with AR. This allows companies to reduce the percentage of damaged freight.

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Cargo Loading

- AR is utilised to speed up the truck loading procedure. This can be accomplished by successfully replacing printed cargo lists and load instructions with electronic versions.

- It can indicate which loader the pallet should take next, where it can be found, and where it should be placed in the loading truck or container.

- Consider it a space calculator that can supplement subjective human estimation.

- AR systems can instantly direct you to the precise position of a particular item in the vehicle.

Easing of Traffic Jam

- Companies can utilise augmented reality driver assistance programmes to provide information to cargo drivers in real time.

International Trade

- The AR system is used to guarantee that the consignment follows all applicable international import and export restrictions.

- AR devices aid in the verification of trade documentation by scanning trade documents or cargo for important terms and recommending adjustments or corrections for commodity code classification.

- Following a shipment, the system can go a step further to avoid port and storage delays by translating the scanned papers in real-time.

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Assembly and Repair

Aside from shipping, some logistics businesses offer additional services such as assembly and part maintenance. Such expertise necessitates extensive staff training. And even the smallest mistake when installing such components might be costly.

- AR devices are utilised to monitor the assembly process utilising advanced image recognition skills to verify that logistics suppliers meet high assembly requirements.

- Utilising picture recognition technologies, AR technology can assist technical personnel in detecting defects and faults.

- It can also give users thorough instructions on how to use AR smart glasses to diagnose and resolve these issues.

- This will reduce the amount of time required mending and keep error rates to a minimal.

For Warehouse and 3PL

- Warehousing operations like packing, storage, and put-aways form around 20% of all logistics expenses.

- AR smart glasses-based pick by vision to warehouse operations.

- Using these AR smart devices, employees have access to a digital pick list and can plan their routes instantly, thereby cutting down on travel time.

- Smart glasses use barcode scanning to determine whether the employee is at the right location and allow them to efficiently find items on shelves.

Efficient Training and Learning Process

- This solution helps rookies understand all of the features of logistics functions and processes in a user-friendly way.

- With AR, new workers are able to produce high-quality, efficient work.

- With AR devices, new workers are completely guided, so supervisory assistance is greatly reduced. Senior staff or supervisors are therefore not burdened with as much work.

- Augmented reality guidance systems provide training instructions in real-time, which assists trainees in correcting errors in real-time. The AR training system is therefore replacing traditional manual training systems.

Ports and Shipping

Simulation and Training

- Training and simulation can be transformed with AR.

- The immersive and interactive nature of virtual reality helps employees learn faster as they can visualize the content.

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Ship Building

- The virtual reality technology enables engineers and designers to design engine parts by rendering them in 3D and CAD based models.

- By wearing AR glasses, engineers and designers can walk around the projected ship model.

- Provides real-time solutions to possible engineering issues.

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Remote Maintenance

- Complex problems that arise on the voyage can be solved using augmented reality.

- With Bluetooth and Wi-Fi enabled smart glasses, experts on the shore can communicate in real time.

- Experts can gain a detailed understanding of the problem and provide advice on how to resolve it

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Ship Inspections

- A regular inspection of a ship is necessary to ensure its machinery and equipment are functioning properly.

- AR based device will make it possible for ship inspectors to view ships for on-site machining, shaft straightening, and commissioning of new buildings.

- A camera mounted on the device allows them to take pictures of ship systems and equipment to check for any malfunctions.

Operational Management and Maintenance

- AR will provide Fleet management teams with real-time visualization of operation and productivity data such as the movements of fleets, detailed information about routes, and much more.

- The maintenance engineers can also view engine areas remotely for purposes of maintenance through remote access.

- The AR system will allow them to view the entire ship in 3D for the purpose of maintaining specific parts of the vessel.

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Training and Simulation

- In the shipping sector, augmented reality is essential for training.

- High degree of virtualization ensures real-life immersive experiences in digital environments.

- Through training, augmented reality-based simulations enable shipping workers to operate in complex and risky environments.

AR Assessment

- Augmented reality (AR) is set to provide immersive user experience in shipping industry for maritime applications.

- Virginia-based Huntington Ingalls is using augmented reality based tablets for shipbuilding. The tablets enables ship workers to see through ship's hardware, designs and other critical data in real time scenarios on the go. The AR based tablets provides shipyard workers with training videos, safety films and other instructions necessary for building digital ships.

- Augmented Reality solutions are making it possible for ships to have features such as onboard real time visualizations for pilot assistance and is also aiding real time simulations for autonomous ships.

- Augmented reality will be deployed on board ships to enhance navigational safety on ship bridges. The technology is being considered by bridge system suppliers for providing enhanced visibility and to enable collaborative work among bridge teams.

- Wärtsilä is leveraging Augmented Reality to support repair and maintenance operations on ships in dry docks or in voyage.

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Healthcare

Education and Guidance

- When a physician is performing patient rounds or surgery, remote expert colleagues, residents, or students can see and hear what they are seeing and hearing and provide input. It is also suitable for grand rounds.

- A faraway category-expert physician, on the other hand, can advise an attending resident who is treating a patient.

- Remote guidance can also be used to assist a technician in the repair and maintenance of capital medical equipment and IT infrastructure.

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Augmented Surgery

- Surgeons can gain real-time access to potentially life-saving patient data. They can now use this information in either intricate or simple methods.

- Surgeons can utilise augmented reality to investigate the anatomy of their patients. They can use an AR headset to enter their MRI and CT scan results. Before going into surgery, overlay specific patient anatomy on top of their body.

- The procedure will make it easier for doctors to see muscles, bones, and internal organs. Surgeons can save time by performing accurate and low-risk procedures with AR.

Virtual Collaboration Between Physicians

- AR glasses can come to your aid, If the primary surgeon is unavailable and a specialist on hand possesses AR tools, the expert can follow instructions and provide assistance.

- Doctors can employ augmented reality in collaborative surgeries and even hold successful meetings on any medical topic using augmented reality video conferencing.

- It might be a life-saving situation, with specialists situated distant from the facility assisting.

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Telehealth

- Telemedicine is the new normal for medical practitioners, enabling positive outcomes while saving time and money. Telemedicine allow you to safely administer to patients without compromising the quality of care.

- Caregivers can instantly share medical expertise with other practitioners around the globe, providing life-saving guidance from anywhere.

- Send and receive live expert medical feedback without jeopardizing the level of patient care.

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Common Use cases

- Hands-free documentation: Using smart glasses, clinicians can easily capture and store key patient data without the need for manual data entry.

- Telemedicine: Assessment and prescription at a distance means reduced wait times for patients and lowered risk for healthcare providers.

- EMR management: Automatic data recording means less time spent converting physical files to EMR-compliant formats.

- Rapid diagnostics: Access to second opinions – from human colleagues or AI algorithms – can significantly improve diagnostic accuracy and speed.

- Live broadcasting: Connected AR devices allow healthcare professionals to livestream and record key medical procedures for later training or assessment. Tools such as Vuzix smart glasses have already been used in situ to assist with surgeries such as knee replacement.

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Power and Utilities

Effective Remote Assistance

- AR is also being used in remote consultation. The system enables company professionals to guide inexperienced field workers in real time, considerably cutting subject matter expert costs (SME).

- When necessary, SME can guide junior workers by using AR technology, providing them eyes, ears, and hands on the ground.

- This programme enables firms to retain highly experienced retired or aged personnel in the workforce by allowing them to work remotely.

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Faster Specialists Training

- Employee training is one of the most exciting options that it has to offer.

- AR improves learning processes by incorporating virtual things into the surrounding environment, such as photos and movies.

- This enables utility staff to acquire what they need immediately in front of their eyes, allowing for a greater grasp of the equipment and operational operations.

- AR can greatly improve energy and utility businesses' training programmes while also preparing a highly trained workforce.

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Higher Operational Safety

- AR helps to improve operational safety. Employees can use AR equipment to model underground assets and heavy equipment in order to predict possible problems.

- Because of the use of connected AR glasses, which field professionals wear while performing their jobs, hazards of defective equipment can be discovered and addressed.

- The implementation of safety rules can be viewed in real time on the ground utilising AR technology, enhancing productivity and job safety.

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Trench Inspection

- By adopting a perspective that shows the infrastructure overlaid on the real environment, the risk of accidently destroying underground infrastructure can be lowered by being able to visualise trenches in a 3d space (as opposed to 2d).

- A shovel excavator operator, for example, can utilise an augmented reality gadget to help them determine where to dig.

- The ease of surveying unique objects are performed better than that of traditional surveying approaches.

- AR can assist users in performing tasks in a more simple and straightforward manner.

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Documenting and Identifying Vegetation

- To avoid interruption with their service, electrical utilities must clear vegetation off their lines. This can range from downed power lines to clogged sewers.

- The field technician can scan an environment using augmented reality, have image recognition recognise vegetation, and then begin to construct both a 2d and 3d map of the vegetation data. And all of this might be done in the background.

- Quickly a large area of vegetation could be mapped with a fleet of technicians using headsets.

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Underground Inspection

- It is vital to precisely locate assets and complete tasks such as excavation and other maintenance activities safely while replacing an underground gas/water pipeline.

- Using AR, information about the subterranean pipeline and its related assets can be displayed in the form of a 3D model with precise GPS coordinates.

- Field technicians may visually identify an asset through rendering (the shape and colour of the asset), search up previous repair or replacement history, and gain the essential insights, eliminating any obstacles or rework and therefore enhancing job quality.

Asset Inspection

- Field technicians can use AR glasses to do inspections more quickly by eliminating the need to transition between the work and paper-based or tablet-based information.

- Field technicians can evaluate the asset using a VR Drone as well.

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Constructions

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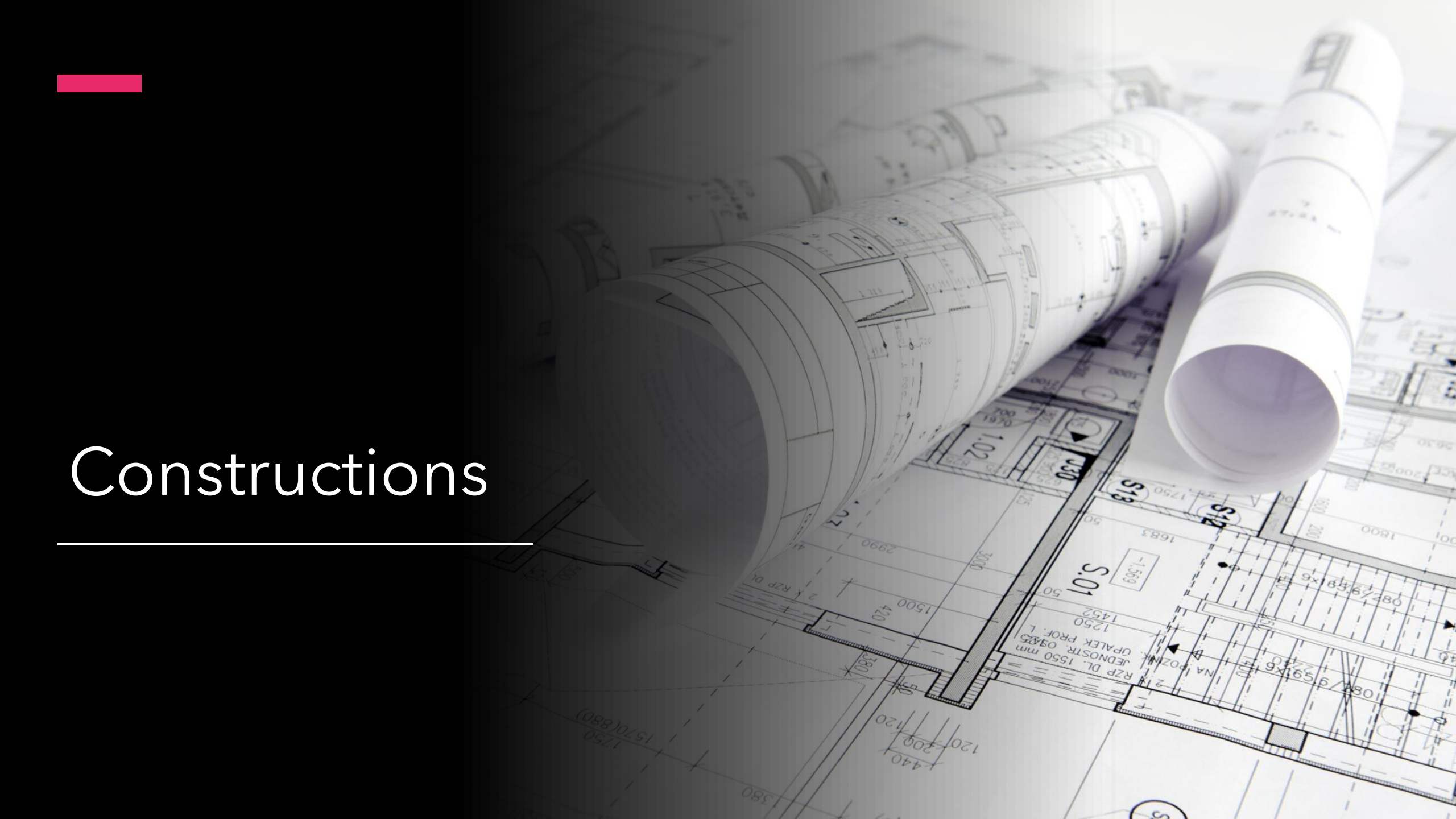
Project presentation

Features and aspects to a building plan, giving stakeholders a greater knowledge of the project.

Display 3D models and even conduct tours, providing clients a clear picture of what a structure will look like before it is finished.

Progress capture

Used to track and document project progress.

These apps use your device to determine where you are in the floorplan and take photos at each capture point automatically.

This assures that team members collect in the same exact spot across time, improving progress capture efficiency and accuracy.

Better collaboration

Improve remote collaboration by allowing teams to exchange 3D photos and videos with team members who aren't on-site.

Stakeholders may see images or videos in greater detail, allowing them to spot flaws or issues without having to physically visit the building.

Construction training

- Training individuals how to utilise complex equipment or heavy machinery, AR can help educators by providing life-like demos that allow personnel to view the equipment in operation before arriving on the job site.

- Firms can also utilise augmented reality to demonstrate dangerous materials or circumstances to team members without exposing them to the real thing.

- All these are hand free with heads up display

Enhanced safety and inspection

- In the construction sector, safety is a prevalent issue.

- Wearables, such as the smart glasses, are utilised as safety equipment and for augmented reality inspection tasks.

- Transforms jobsite operations to help construction inspectors save time, decrease costs, and increase safety.

- An inspector can precisely align and compare the as-built buildings to the BIM model. An inspector can take images or collect notes from a specific site on the fly.

- On-site, complex areas and critical issues become easier to recognise, identify, and share in real time.

Measuring Accurately

- Wearables can measure a space's physical elements, including depth, height, and width.

- By incorporating BIM with augmented reality, companies can use models to accurately determine the dimensions and comprehensively view how the project will appear.

- Determining labour hours and materials needed will be more efficient by using augmented reality because it provides more accurate measurements.

On Job Site Revision

- The ability to see how elements fit on the site is one of the main advantage.

- Project managers can visualise how everything fits on-site to scale before ordering materials or estimating the quantity of personnel required for installation.

- When wearing wearables on-site, workers will be able to tap and automatically measure constructed items, comparing them to the set measurements from a model.

- On-site revision allows for the discovery of architectural discrepancies as well as the avoidance of significant expenditures and delays by promptly adapting to changes.

Use cases for Industry Agnostics

Inspections, Walkthroughs and Audits

Remote Support / Training

Any type of Checklist based processes

Knowledge repository – Shared server

Drones – Heads up display with Remote visibility.

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Thank you - Jayant

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Which use cases you relate the most?

Connect with us and any doubts

Email
jayant@dxsolutionadvisor.com

Connect with us and any doubts

Mobile
+91 9820984660

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