Understand The Difference

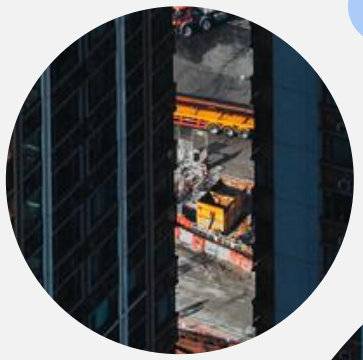
AGV VS AMR

Syed Ahmad Alsagoff

1816833

Agenda

- Automated vs Autonomous
- Path Planning
- Flexibility & Versatility
- Scalability
- Redeployability
- Intelligence
- Usability

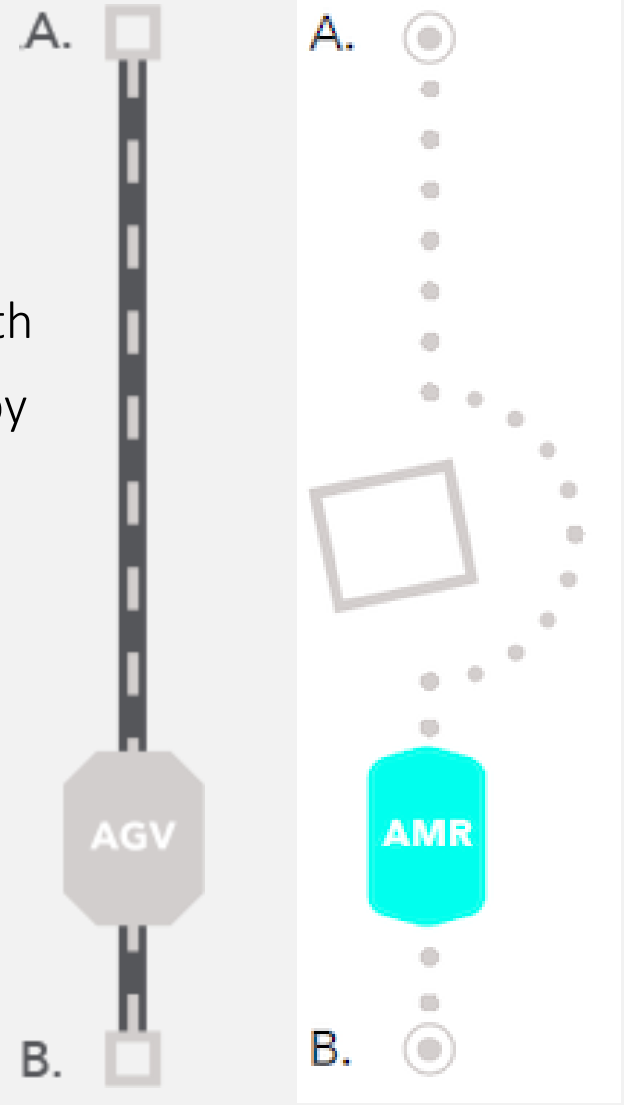


Automated vs Autonomous

Let’s dive in

Automated

- Computer-controlled
- Performs a pre-defined set of tasks or follows a pre-defined path
- The specific path is pre-defined by humans before



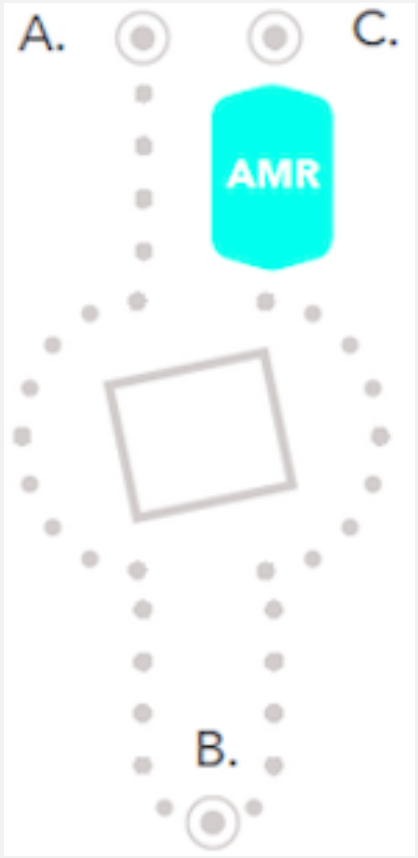
Autonomous

- Controlled by Artificial Intelligence to make decisions when faced with obstacles
- Able to learn as they encounter new situations


Path Planning
How to get from Point A to Point B

AGV

- Rely on guidance devices such as magnetic tape, beacons, barcodes or predefined laser paths
- Lasers and sensors detect obstacles in its path and trigger the vehicle to stop automatically



AMR

- Operation occurs without direct driver input or pre-configured scripts to control the steering, acceleration, and braking
- Utilizes laser-based perception and navigation algorithms to dynamically navigate the environment
- Machine learning capabilities enable the robot to become more efficient and accurate as it encounters new situations.

Flexibility & Versatility

Reaction to different applications

Flexibility & Versatility

AGV

- Fixed
- Follows a predefines path using lasers, beacons or magnetic tape
- Multiple AGV units are required for different applications.
- Ongoing infrastructure maintenance is required.
- Minor debris in the laser's field of view prevents the vehicle from moving until obstacle is manually removed by human personnel.

AMR

- Implementation is easy and highly scalable due to the lack of external infrastructure for navigation
- 1 AMR unit can be used for multiple applications
- Parameters can be customized to navigate through aisleways, personnel zones, and narrow corridors.
- Human interaction is not required during navigation


Redeployability

Redeployability

AMR

- Setup time is minimal and can be completed by the customer with a centrally controlled fleet manager
- Units can be shared and utilized among multiple facilities
- AMRs can become a shared resource; therefore, less units are required for purchase.

AGV

- Equivalent to installing an AGV system for the first time
- Changes are rigid and costly
- Multiple systems are required in total

Scalability

Let’s dive in

Scalability

AGV

- Can be added to facility if layout adheres to AGV infrastructure requirements.
- Resources are required for facility planning, infrastructure innovations, maintenance and line training.
- Facility layout must be designed to accommodate equipment.

AMR

- Additional AMRs can be deployed in less than a day as they operate from a centrally controlled map, shared among the fleet.
- Infrastructure renovations, facility planning, or additional training are not required.
- AMR customers do not need to outsource work to 3rd party vendors for changes or additional implementation.

Intelligence

Let’s dive in

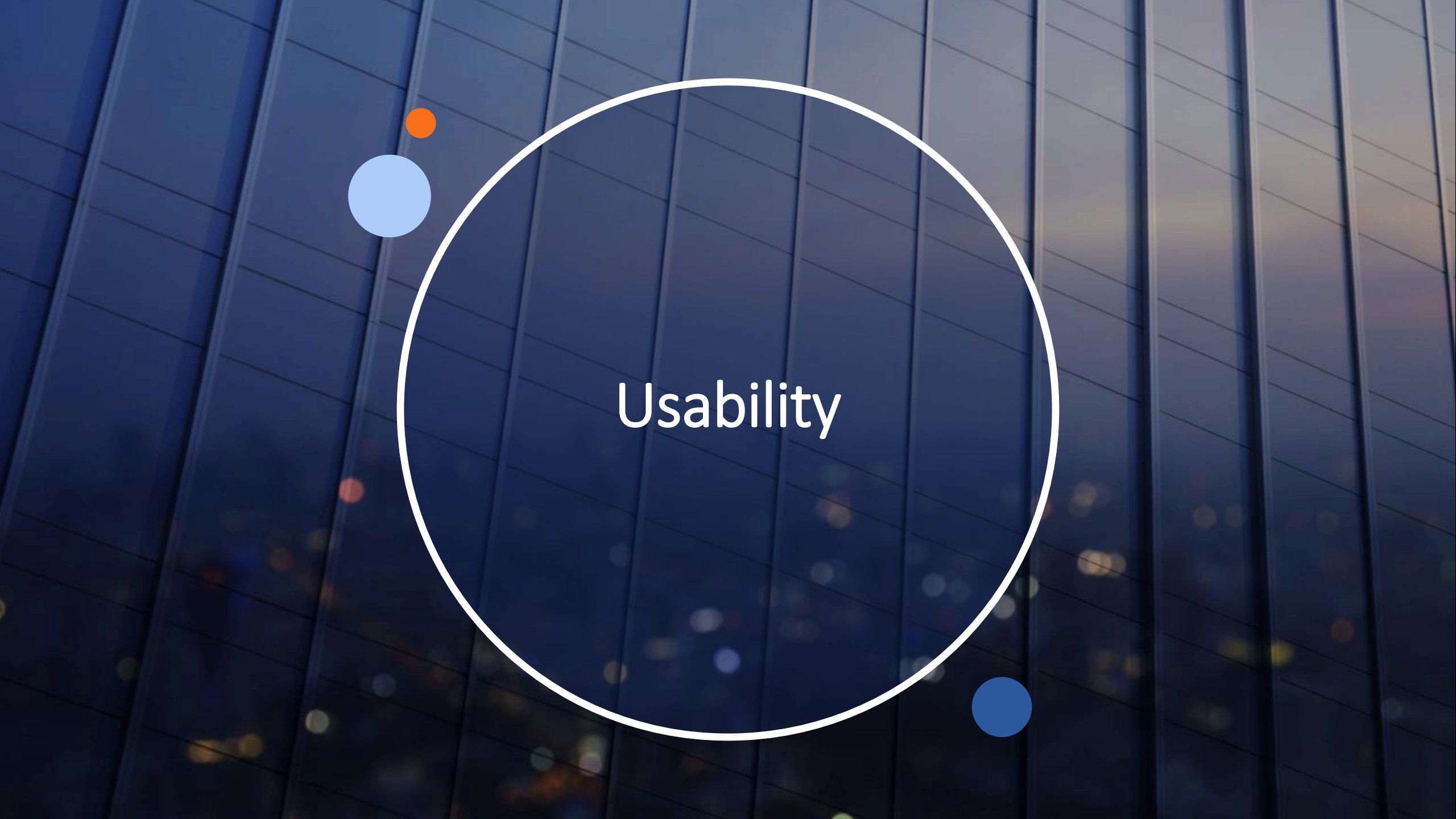
Intelligence

AGV

- Intelligence is not required
- Lack of data collection leads to lack of insight in to real-time KPIs or vehicle performance
- Standard stack lights and sounds are unchanging, despite changes in environment.
- AGVs are unable to back up or take alternate routes.
- AGVs cannot easily integrate with other solutions.

AMR

- Onboard intelligence
- Machine learning collects data and updates the fleet's shared map with learned parameters.
- AMRs learn which routes are the fastest and take optimal paths, even within unpredictable environments.
- Plant personnel can safely and collaboratively interact with AMRs.


Usability

Usability

AGV

- AGVs are designed to do simple tasks, yet setup and operation is cumbersome, complex, and costly.
- AGVs require trained expertise by certified personnel or engineers.
- Changes to the system require facility infrastructure updates and additional staff training.

AMR

- Implementation includes mapping facility
- System is set up by the customer and is done so with a point and click interface.
- Updates to robot or access zones can be made by plant personnel.
- Changes in production lines or distribution layouts are easily implemented.

Conclusion

AMRs are a much more flexible robots to be utilized however the simplicity of an AGV leads to less computational power and a much reduced cost.

We can conclude that AGVs are the best cost effective options for simple repetitive tasks whereas AMRs are more suitable for complex tasks that involve other robots or human involvement