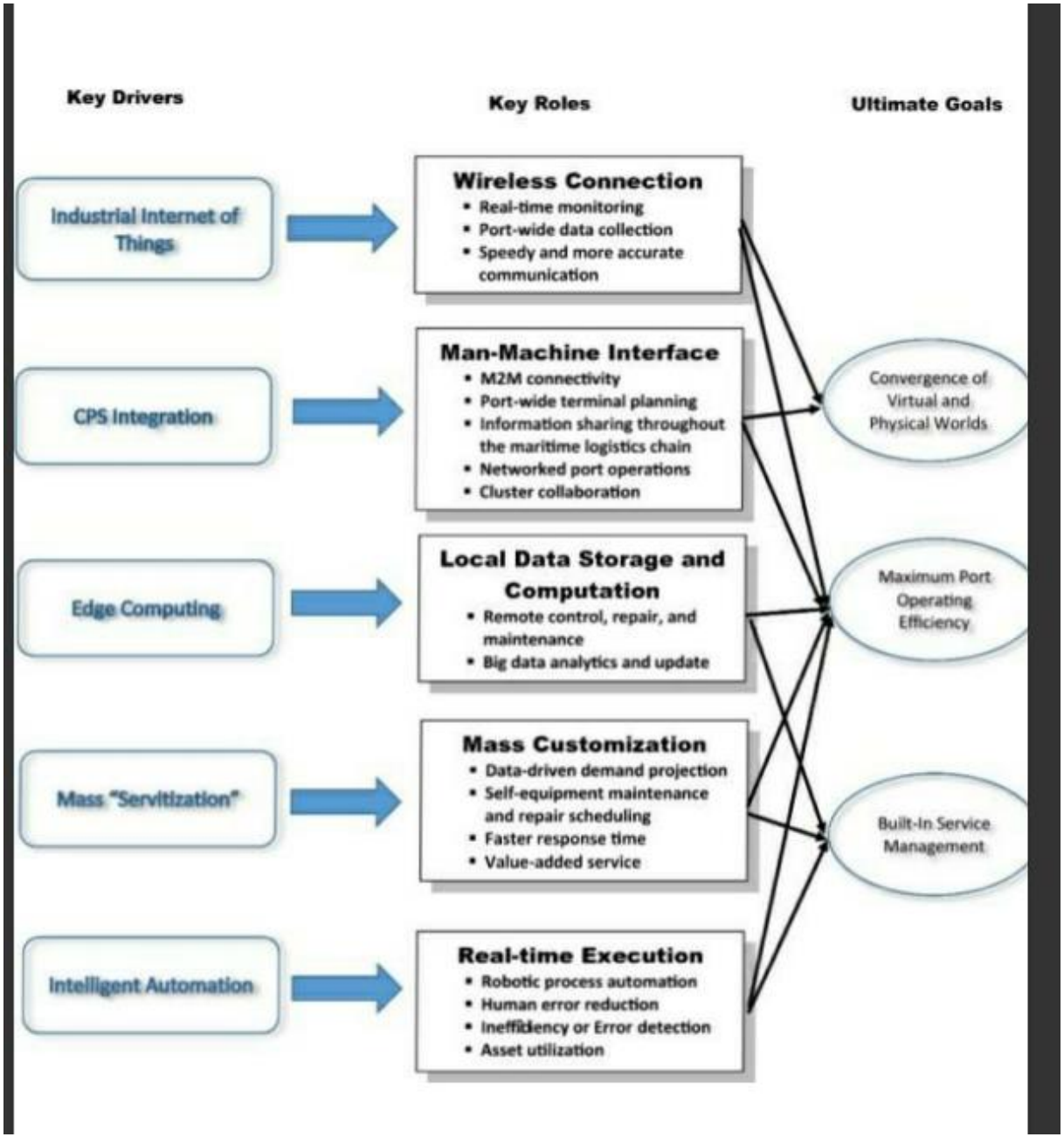
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	08 October 2022
Team ID	PNT2022TMID03208
Project Name	Project - Traffic and Capacity analytics for major ports
Maximum Marks	4 Marks

Technical Architecture:


Key Drivers
Key Roles
Ultimate Goals
Industrial Internet of Things
CPS Integration
Edge Computing
Mass "Servitization"
Intelligent Automation
Wireless Connection
Real-time monitoring
Port-wide data collection
Speedy and more accurate communication
Man-Machine Interface
M2M connectivity
Port-wide terminal planning
Information sharing throughout the maritime logistics chain
Networked port operations
Cluster collaboration
Local Data Storage and Computation
Remote control, repair, and maintenance
Big data analytics and update
Mass Customization
Data-driven demand projection
Self-equipment maintenance and repair scheduling
Faster response time
Value-added service
Real-time Execution
Robotic process automation
Human error reduction
Ineffidency or Error detection
Asset utilization
Convergence of Virtual and Physical Worlds
Maximum Port Operating Efficiency
Built-In Service Management

Port infrastructures and stake holders	Enabling Technologies	Smart port services	Smart port goals
• Road • Rail • Bridge • Terminal • Parking • Container • Warehouse • Port Authorities • Shipping Companies	• Sensors • RFID • IoT • Fog Computing • Cloud computing • Big Data Technologies	• Port Monitoring • Infrastructure Management • Real-Time Navigation • Energy Management • Data analysis and prediction • Emergency, Rescue & Security operations.	• Economic development • Energy - awareness • Efficient logistics operations.

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Table-1 : Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.

9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Django
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	3-tier, Micro- Services

S. No	Characteristics	Description	Technology
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	number of requests per sec, use of Cache