

 **UMD ICADA**

 **UMD CHARIOT**

 **UMD REAP**

 **UMD VAST**

 **UMD BOC**

 **UMD PASSPORT**

 **CARDGATE**

 **UNIQUE
MICRO
DESIGN**
...Engineering IoT Solutions

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MICRO
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...Engineering IoT Solutions

UMD Full-Stack IoT Solutions

Introduction

UMD-FULL-STACK-IoT-Intro

Introduction

- This document provide an overview of *UMD framework* for the development of *UMD Full-Stack IoT Solutions* (UMD Solutions).
- Its purpose is to demonstrate the relationship between *UMD Technology Stack* of system components to *UMD Solution Stack* to address vertical markets.
- By definition, the *UMD Technology Stack* are the core components, systems and software that is used to build *UMD Solution Stack*.
- The following provides details on
 - UMD Branding
 - Summary of Technology Stack components
 - Summary of Solution Stack
 - UMD terminology

TECHNOLOGY STACK

APPLICATION PLATFORMS

 **UMD CHART IOT**

 **UMD VAST.NG**

 **CARDGATE**

INFINITEE
SOFTWARE 

 **IRONBOLT**



SERVICES

 **UMD WEB.SERVICE**

 **myUMD**

HARDWARE

 **RACE**

SOLUTION STACK

 **UMD ICADA**

 **UMD ICADA**

 **ICADA RFID**

 **ICADA RATS**

 **ICADA OEE**

 **UMD AGRICADA**

 **UMD HICADA**

 **UMD TXP**

 **UMD PASSPORT**

 **UMD REAP**

 **REAP SMART.STOCK**

 **REAP SMART.SHELF**

 **REAP EVT**

 **UMD VAST**

 **VAST PAX**

 **VAST MOBILE**

 **VAST EVT**

 **VAST CASHLESS**

 **UMD BOC**

 **BOC ENTERPRISE**

 **BOC SMART.ASSET**

 **BOC SOS**

 **CARDGATE**

 **CARDGATE SPS**

 **CARDGATE TOP.UP**



























































IoT Reference Framework

- UMD Uses the following *IoT Reference Framework* to provide standard industry definition of various technology layers to provide a full-stack IoT solution.
- This model was adopted by the *IoT Alliance Australia*, of which UMD is a member.





IoT Reference Framework – Overview

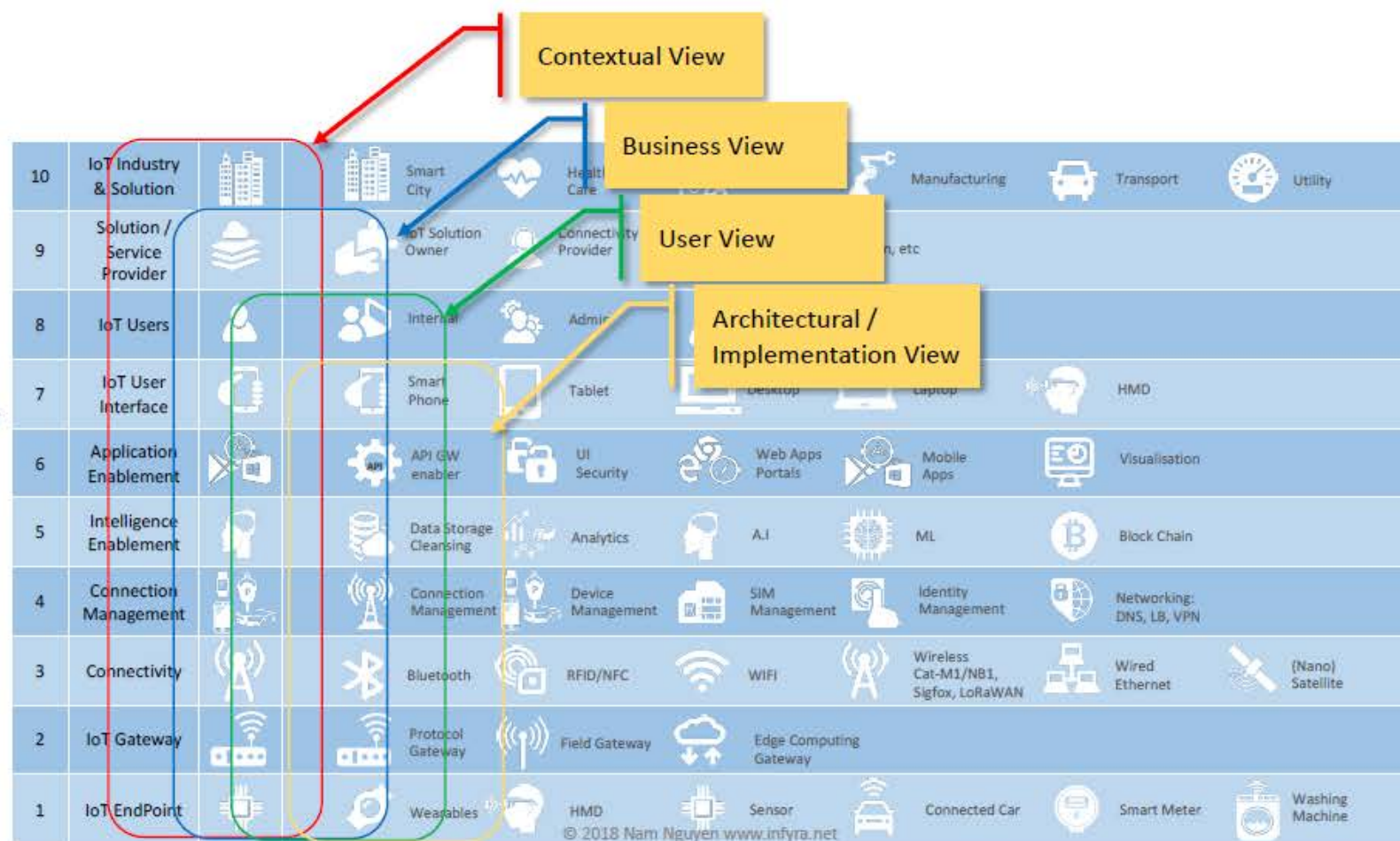
10	IoT Industry & Solution		 Smart City	 Health Care	 Agriculture	 Manufacturing	 Transport	 Utility
9	Solution / Service Provider		 IoT Solution Owner	 Connectivity Provider	 Service Provider Eg. XaaS, GPS, Location, etc			
8	IoT Users		 Internal	 Admin	 End User	 Support		
7	IoT User Interface		 Smart Phone	 Tablet	 Desktop	 Laptop	 HMD	
6	Application Enablement		 API GW enabler	 UI Security	 Web Apps Portals	 Mobile Apps	 Visualisation	
5	Intelligence Enablement		 Data Storage Cleansing	 Analytics	 A.I	 ML	 Block Chain	
4	Connection Management		 Connection Management	 Device Management	 SIM Management	 Identity Management	 Networking: DNS, LB, VPN	
3	Connectivity		 Bluetooth	 RFID/NFC	 WIFI	 Wireless Cat-M1/NB1, Sigfox, LoRaWAN	 Wired Ethernet	 (Nano) Satellite
2	IoT Gateway		 Protocol Gateway	 Field Gateway	 Edge Computing Gateway			
1	IoT EndPoint		 Wearables	 HMD	 Sensor	 Connected Car	 Smart Meter	 Washing Machine

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IoT Reference Framework – Views

The IoT Reference Framework shows

- Contextual View
 - Industries, markets, solution, revenue, value-chain
 - security, risks, regulations,
- Business View
 - Stakeholders, processes, policies, industry and regulatory compliance
- User View
 - Organisations, consumers, governments, communities
- Architectural View
 - Solution, architecture, network, system, sub-system (each layer), component (detailed view)



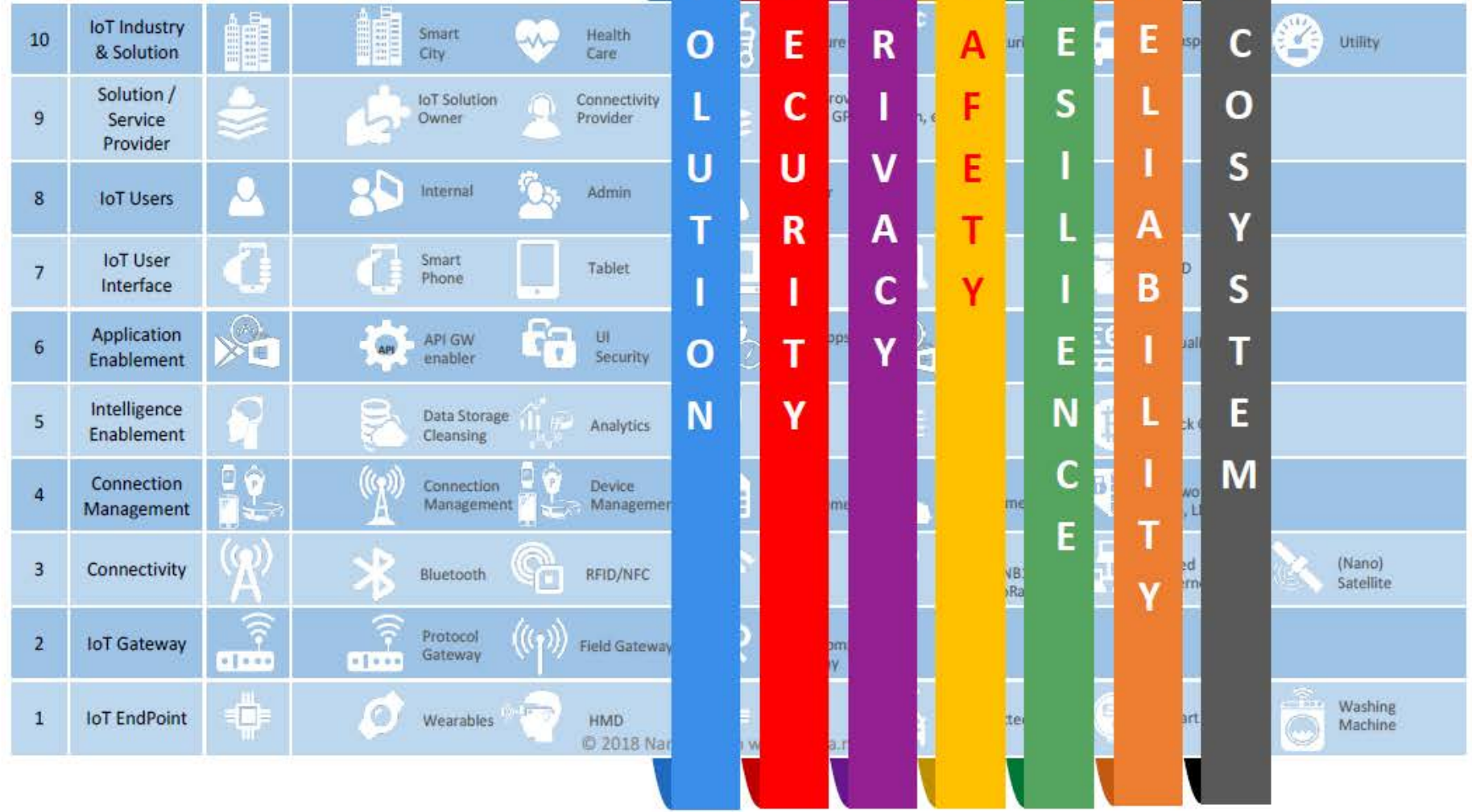


IoT Reference Framework – Applications



The IoT Reference Framework can be used to understand:



- the solution;
- security;
- privacy;
- safety;
- resilience;
- reliability;
- the ecosystem;
- and more






from and end-to-end perspective across the entire IoT solution.









Framework Layer	UMD Technology Stack	Details
0 – Services (UMD Added)	<ul style="list-style-type: none"> • Systems Engineering Services • Engineering Design Services • Software Engineering Services • Project Management Services • Manufacturing & Assembly Services • Deployment & Installation Services • Aftersales Support • Service, Repairs and Maintenance 	
1 – IoT Endpoints	Data Carriers Supports	<ul style="list-style-type: none"> • Barcodes (1D and 2D) • RFID Passive (LF, HF & UHF) • RFID Active (BLE, Wifi, ISM)
	Interfaces	<ul style="list-style-type: none"> • Digital • Analogue • Sensors




Framework Layer	UMD Technology Stack	Details
1 – IoT Endpoints (Cont.)	UMD Devices 	<ul style="list-style-type: none"> • UMD Design, Manufactured or Assembled devices • Microcontrollers • IoT devices and Interfaces • Supporting peripherals
		<ul style="list-style-type: none"> • UMD Has an extensive range of Vendor relationships to source equipment to match customers exact needs.

Framework Layer	UMD Technology Stack	Details
2 – IoT Gateways	UMD RACE 	<ul style="list-style-type: none"> • RFID Advance Controller for Embedded applications. • Is an architectural industrial computing platform designed for collecting and visualisation of RFID and other data.
	UMD CONTROLLER 	<ul style="list-style-type: none"> • UMD Model 800 – DIN Controller / Gateway • UMD Model MP3060 – RFID Micro-RACE Controller and Gateways
	Vendor Gateways	<ul style="list-style-type: none"> • Industrial Edge Computing Devices • Wireless Gateways

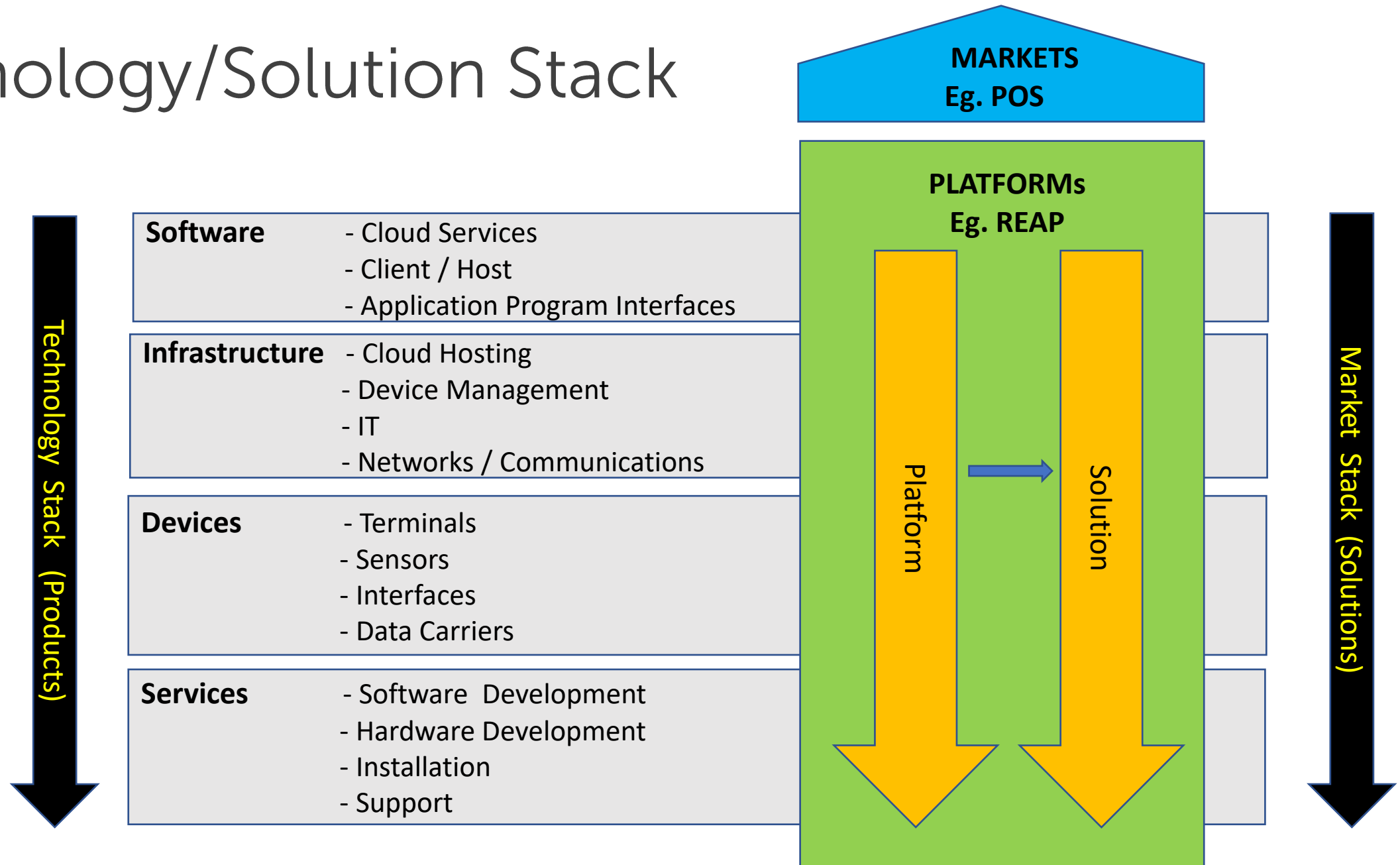
Framework Layer	UMD Technology Stack	Details
3 – Connectivity	Connectivity Supported	<ul style="list-style-type: none"> • WWAN – Cellular, Sigfox, Satellite • WLAN – Wifi, LoRa • WPAN – Bluetooth, BLE • LAN – Ethernet
4 – Connectivity Management	 UMDCHARIOT /TMS	<ul style="list-style-type: none"> • UMD Terminal Management Services is use to manage UMD IoT Edge Devices
		<ul style="list-style-type: none"> • SOTI – device management platform for mobile and fixed devices (eg. Kiosk)
		<ul style="list-style-type: none"> • IVANTI (formally Wavelink) • Wireless network management platform
		<ul style="list-style-type: none"> • Infinitee (Software) Device Manager (IDM) • Manages mobile app updates • Device Tracking (GPS) • Secure instant messaging
		<ul style="list-style-type: none"> • UMD Single Sign-on Platform

Framework Layer	UMD Technology Stack	Details
5 – Intelligence Enablement		<ul style="list-style-type: none"> Hexicore – is a cloud based software platform that provides Overall Equipment Effectiveness (OEE) data visualisation and analytics Integrates with UMD ICADA IoT platform
		<ul style="list-style-type: none"> Infinitee Software – analytic and reporting modules provides custom reports, data visualisation and events triggers
		<ul style="list-style-type: none"> IronBolt – is a specialised Enterprise Integration Platform as a Service (EIPaaS) developed for application embedded analytics

Framework Layer	UMD Technology Stack	Details
6 – Application Enablement (platforms)		<ul style="list-style-type: none"> • UMD CharIoT – is a cloud based software platform designed to provide both - • IoT brokerages services and • Gateway connections to Application Services
		<ul style="list-style-type: none"> • UMD VAST – is a cloud based ticket lifecycle management platform designed to manage - • The issuance and redemption of tickets • Attachment of value such as Vouchers and Cashless to tickets or tokens
		<ul style="list-style-type: none"> • UMD Cardgate – is a cloud based payment service provider used to process credit card transactions

Framework Layer	UMD Technology Stack	Details
6 – Application Enablement (platforms) Cont.		<ul style="list-style-type: none"> Infinitee Software Application Platform (ISAP) is a platform used to create various cloud based software for Business Support Systems
		<ul style="list-style-type: none"> IronBolt – is a specialised Enterprise Integration Platform as a Service (EIPaaS) developed for application embedded analytics
9 – Service Providers		<ul style="list-style-type: none"> UMD Web Services provide secure locally hosted managed services PCI/DSS Audited

Technology/Solution Stack



Our Technology Verticals

Retail & Payment Technologies



- Retail Edgware Application Platform
- Adds enhanced functionality: RFID, IoT, redemptions, loyalty, cashless, payments, kiosk, and mobility using lightweight infrastructure
- Interfaces to POS in agnostic way with no software changes
- Manages and report inventory data

Patron Access & Ticketing



- Patron access control for venues, events, attractions and stadiums
- Supports fixed and mobile validators
- Ticket lifecycle management
- Extends ticket functionality to enhance the customer experience

Data Capture Systems

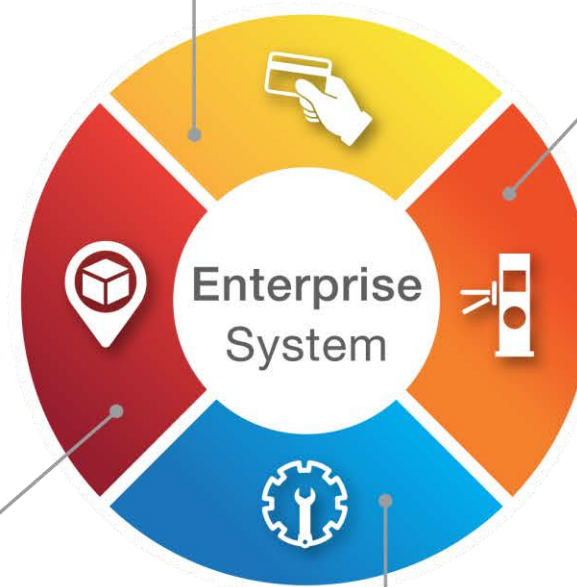











- IoT Control and Data Acquisition
- Adds eyes and ears to manufacturing, logistics and warehousing
- Production, inventory and asset tracking








Business Support Systems














- Business Operations Central
- Business Support Software
- Scalable and modular cloud based solutions






Vertical (Market)	Platform	Solutions	Comments
<div>1</div> <div>  <p>Data Capture Systems</p> </div>			UMD IoT Control & Data Acquisitions Platform
			Sub-platform of ICADA Industrial ICADA
			ICADA for RFID General Tracking Solutions
			ICADA for RFID Returnable Asset Tracking System
			IDCA for Overall Equipment Effectiveness
			Sub-platform of ICADA IOT platform for Agriculture
			Sub-platform of ICADA IoT platform for Healthcare

Vertical (Market)	Platform	Solutions	Comments
 <p>Retail & Payment Tech</p>			UMD Token Exchange Platform. Used to add and redeem tickets, vouchers, cashless to any token
			UMD's Retail Edgware Application Platform
			REAP based solution for Electronic Voucher Terminal. Manages vouchers and redemption at POS. Uses TXP
			REAP based solution for Smart-Stock. Adds RFID Inventory Monitoring with no software changes
			REAP based solution for Smart-Shelves Specifically monitors RFID inventory via smart-shelves

Vertical (Market)	Platform	Solutions	Comments
			UMD Venues, Attractions, Stadia and Ticketing platform used to manage entries and ticket tokens for events
			UMD VAST based solution for Patron Access Control (PAX), connects and controls access entry turnstiles
			UMD VAST based solution for controlled access entry via mobile devices
			UMD VAST for Cashless can attach any Voucher or Cashless to any tickets
		VAST-IPAS	UMD Integrated POS and Access System combines ticket sales with VAST

Vertical (Market)	Platform	Solutions	Comments
			UMD Business Operations Central is a cloud based platform for developing business software applications
			UMD BOC based solution for Enterprises providing fully integrated business solutions for SME
			UMD BOC based solutions for Smart Assets provides RFID/Barcode based asset management solution
			UMD BOC based solutions for Security Operations System for security management that also links to staff mobile devices

Vertical (Market)	Platform	Solutions	Comments
			UMD PASSPORT is a platform for Airlines & Airports to enhance their customer experience
		Disrupted Flights	UMD Disrupted Flights automates the management of disrupted flights using Passenger boarding passes.
		Virtual Lounge	UMD Virtual Lounges enables Airlines to manage Virtual Lounges using Passengers boarding passes
		Service-Plus	UMD Service Plus enables Airlines and staff to directly attached vouchers to Passengers boarding passes for service rectifications
		Loyalty Plus	UMD Loyalty Plus enable Airlines loyalty card holders to directly redeem points directly in Retail stores

Framework Summary & Markets

UMD – Engineering IoT Solutions →



Technology Verticals →



Vertical Platforms →

Solutions for Market Segments →



Appendix - UMD Nomenclature

- The following table relates the IoTAA Reference Framework to UMD's naming conventions.

IoTAA Framework Layer	UMD Naming Convention (Prefix Codes)	Details
1 – IoT End Points	SE-xxxx	• Sensors
	HW-xxxx	• Hardware
	ID-xxxx	• Data Carriers (Barcode/RFD/NFC)
	IF-xxxx	• Interface
2 – IoT Gateways	SY-xxxx	• Gateways & Systems (combination of hardware & software)
3 – Connectivity		• LAN, WLAN, WWAN, BT2, BT4 (BLE) SFX, LoRa etc
4 – Connection Management	DM-xxxx	• Device Management
5 – Intelligent Enablement	AP-xxxx	• Application Platform
	AS-xxxx	• Application Services – connects to Platforms (AP)
	MA-xxxx	• Mobile Applications
	API-xxxx	• Application Program Interface Specification

IoTAA Framework Layer	UMD Naming Convention (Prefix Codes)	Details
7 – IoT User Interface	UI-xxxx	<ul style="list-style-type: none"> User Interface specification
	CI-xxxx	<ul style="list-style-type: none"> UI Console Interface specification (support / admin)
8 – IoT User		<ul style="list-style-type: none"> Internal, Admin, End User, Support
9 – Solution/Service Provider	UMD	<ul style="list-style-type: none"> Unique Micro Design
10 – IoT & Solutions	VP-xxxx	<ul style="list-style-type: none"> Vertical Platform – are Platforms to address specific verticals but are general in nature Eg. VP-UMD-ICADA
	SP-xxxx	<ul style="list-style-type: none"> Solution Platforms are sub-platforms of Vertical Platforms (VP) that provide specific solutions Eg. SP-ICADA-RFID
	SS-xxxx	<ul style="list-style-type: none"> Solution Sets are complete solutions, derived from Solution Platforms, with complete bill of materials and pricing, that define a specific deliverable solution Eg. SS-ICADA-RFID-101

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