

 **UMD ICADA**

 **UMD CHARIOT**

 **UMD REAP**


 **UMD VAST**

 **UMD BOC**

 **UMD PASSPORT**

 **CARDGATE**

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

 **UNIQUE  
MICRO  
DESIGN**  
*...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

# UMD Branding - Matrix

## TECHNOLOGY STACK

### APPLICATION PLATFORMS



### SERVICES



### HARDWARE



## SOLUTION STACK



# 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

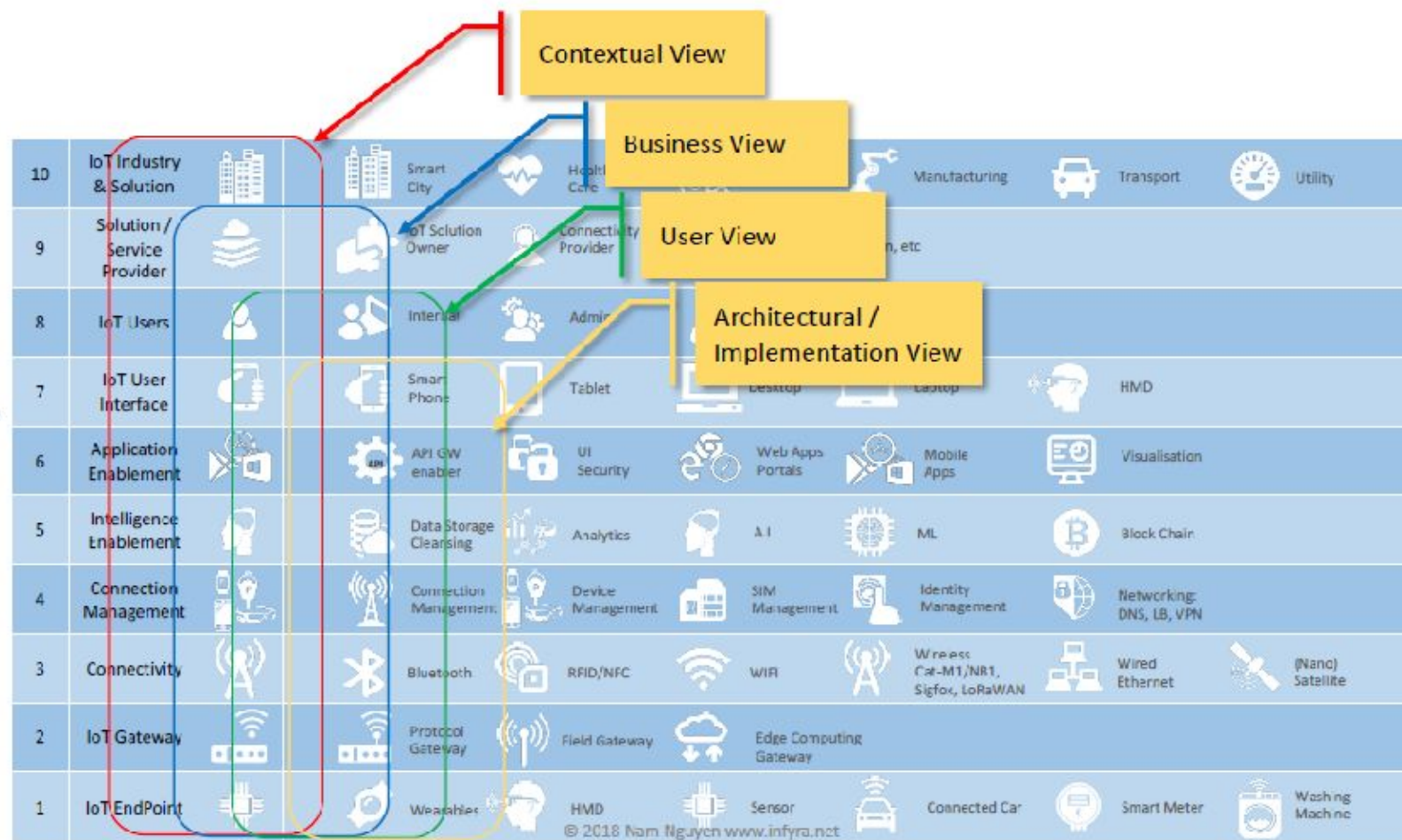
10	IoT Industry & Solution		Smart City	Health Care	Agriculture	Manufacturing	Transport	Utility
9	Solution / Service Provider		IoT Solution Owner	Connectivity Provider	Service Provider Eg. XaaS, GPS, Location, etc			
8	IoT Users		Internal	Admin	End User	Support		
7	IoT User Interface		Smart Phone	Tablet	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



# 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)

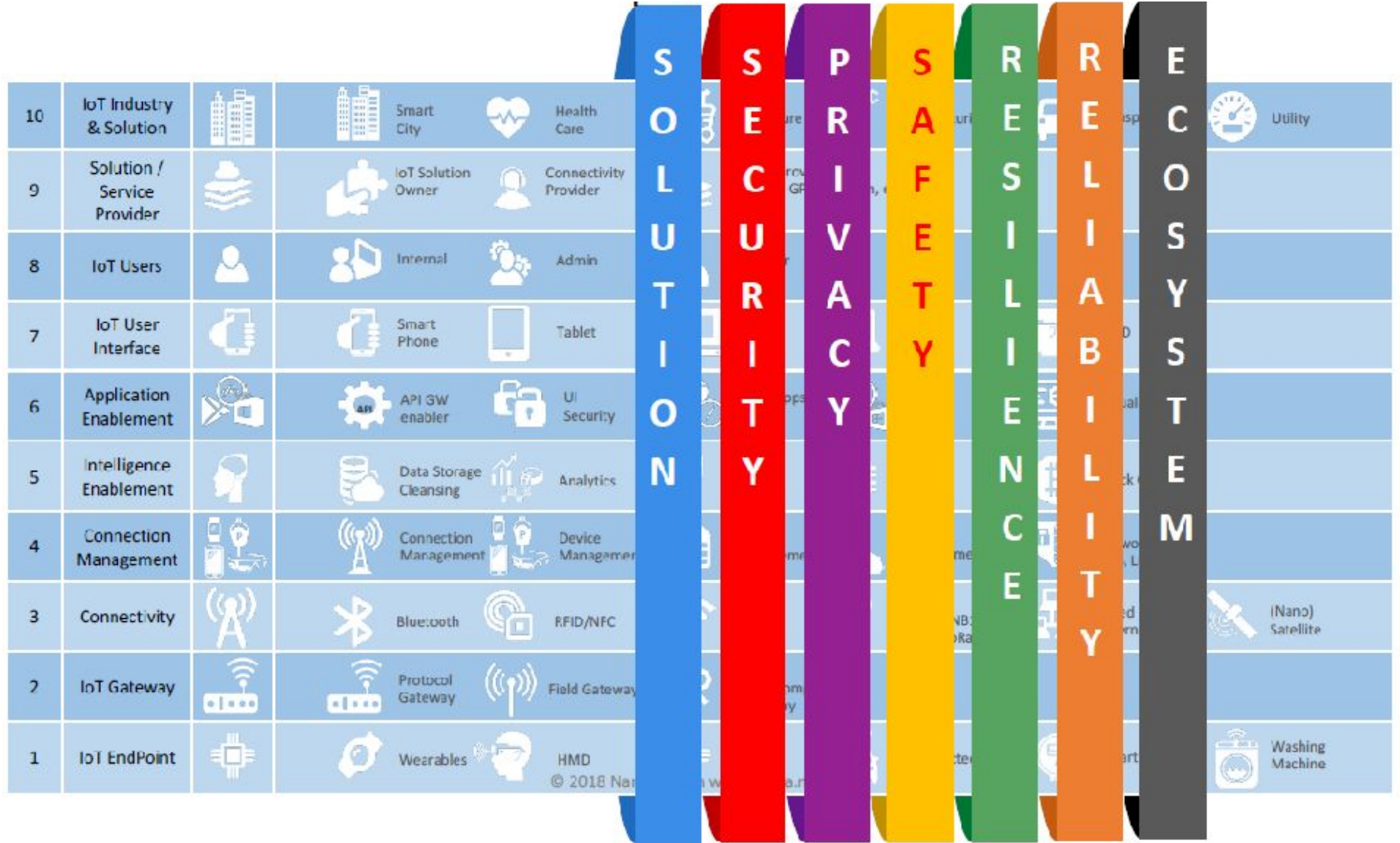


# IoT Reference Framework - Applications

The IoT Reference Framework can be used to understand:



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



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






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




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

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

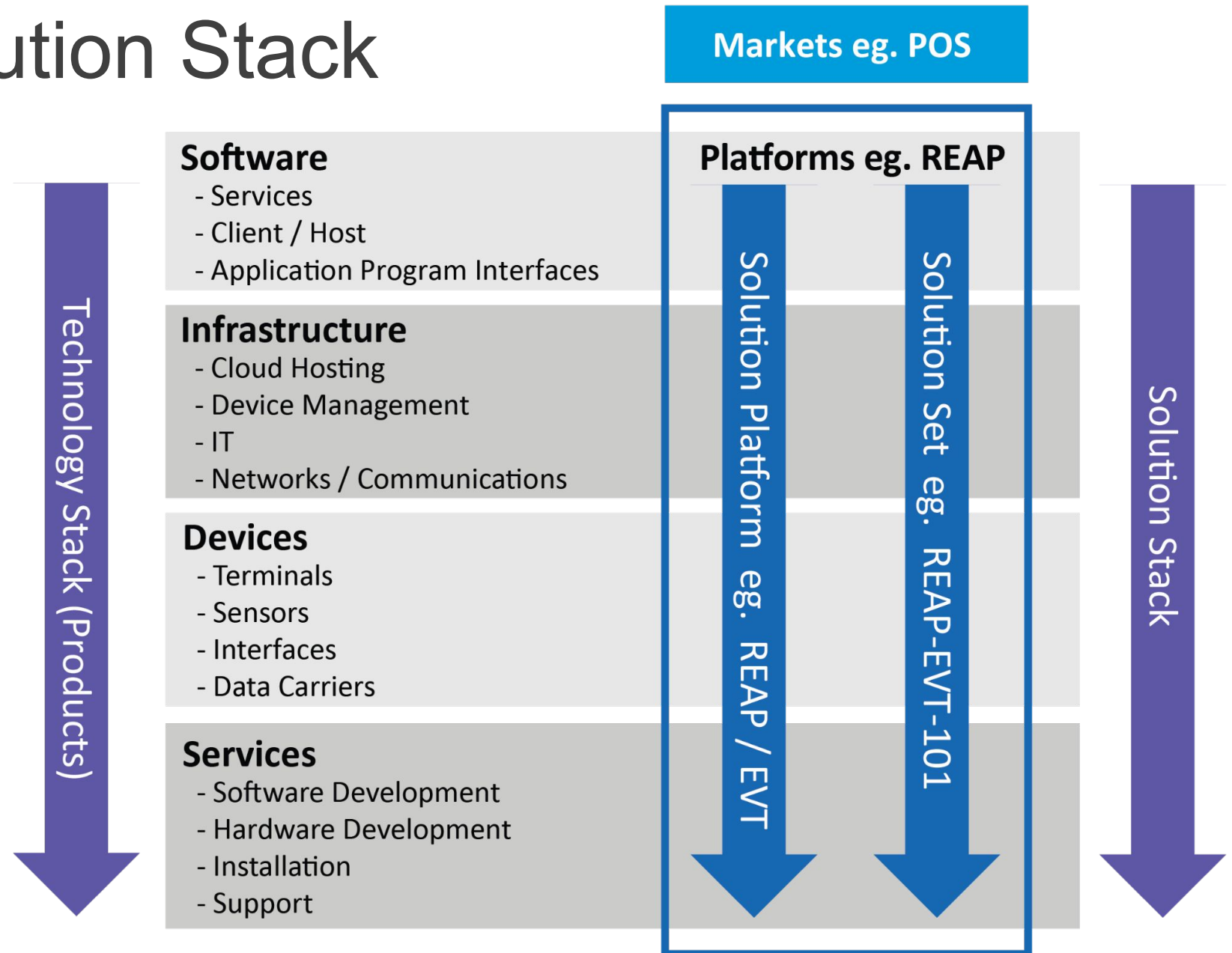
Framework Layer	UMD Technology Stack	Details
5 – Intelligence Enablement		<ul style="list-style-type: none"> <li>• Hexicore – is a cloud based software platform that provides Overall Equipment Effectiveness (OEE) data visualisation and analytics</li> <li>• Integrates with UMD ICADA IoT platform</li>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



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

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

# Technology/Solution Stack



# Our Technology Verticals

UMD\_Enterprise\_Systems.us

## Retail & Payment Technologies

### UMDREAP

- Retail Edgeware 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

### UMDVAST

- 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

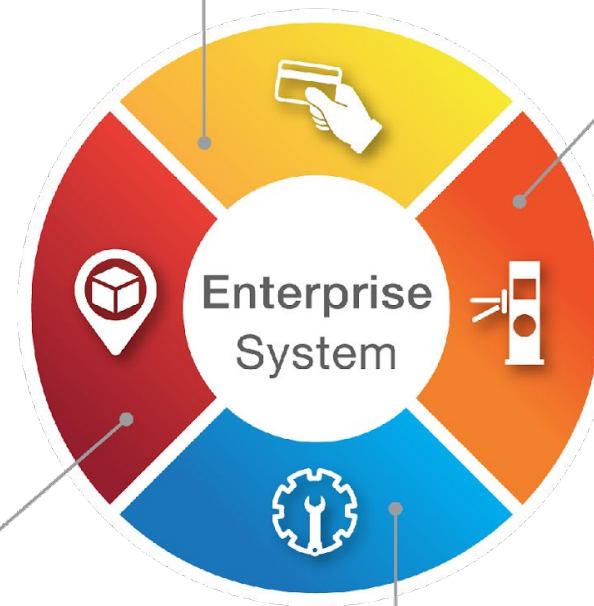
### UMDICADA

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










## Business Support Systems








### UMDBOC








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













Vertical (Market)	Platform	Solutions	Comments
1			UMD IoT Control & Data Acquisitions Platform
 <p>Data Capture Systems</p>			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 Healthcare

Vertical (Market)	Platform	Solutions	Comments
 <p>Retail &amp; 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
 <p>Patron Access &amp; Ticketing</p>			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
			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
 <p>Business Support Systems</p>			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

# Markets & Platform Framework

UMD – Engineering IoT Solutions →



Technology Verticals →



Vertical Platforms →



Market Segments →



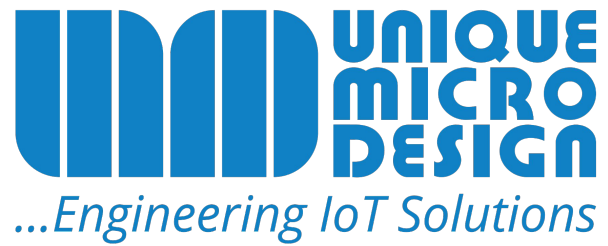
# Appendix - UMD Nomenclature

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



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