RFID JOURNAL

DIGITAL SUMMIT

MAY 10 - 13, 2021

RFID and IoT in Logistics

RTLS in 2021: Where Do We Stand?

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Réseau Innovation 4.0 Network

CRI²GS Centre sur l'intelligence² en gestion de systèmes complexes

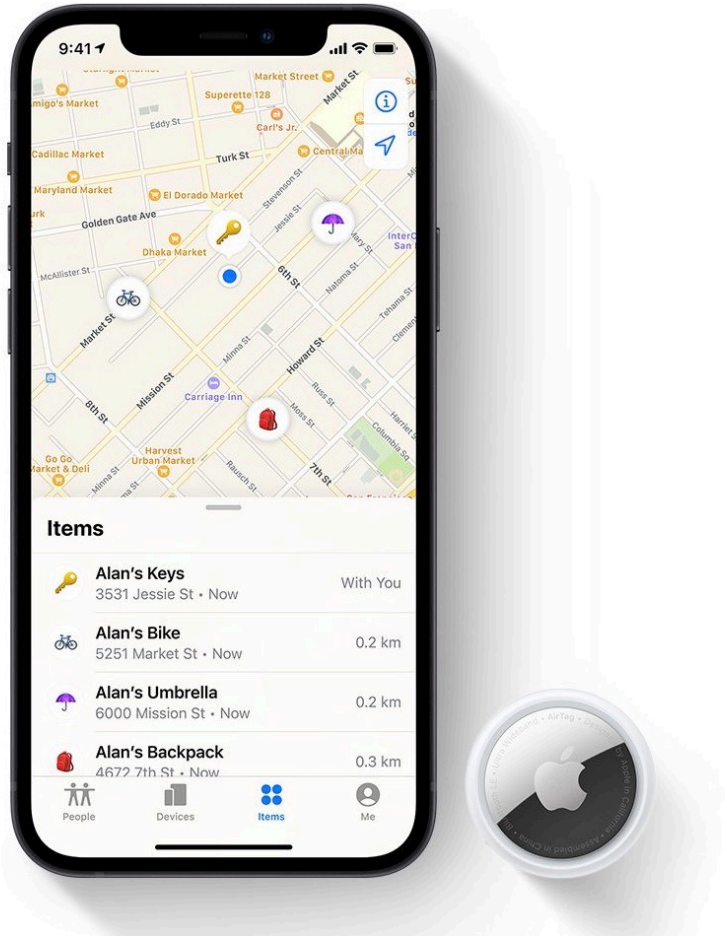
HumanIA

LATECE

Everybody is jumping in the game

- “Precision Findings’

Ping it. Find it…



Lose your knack for losing things.

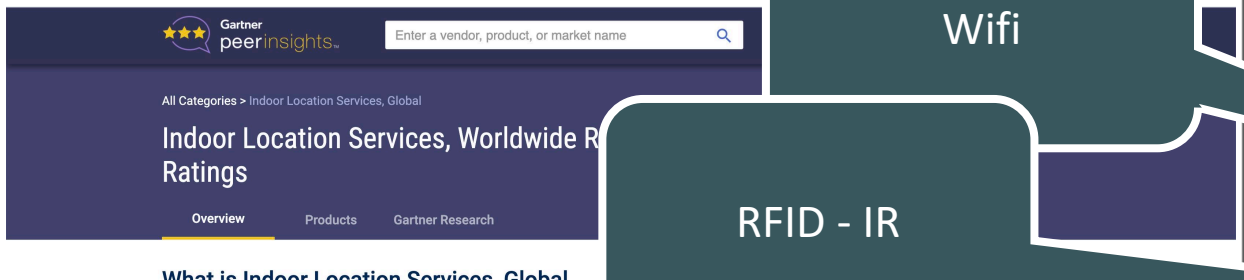
AirTag is an easy way to keep track of your stuff. Attach one to your keys, slip another one in your backpack. And just like that, they’re on your radar in the Find My app. AirTag has your back.

Learn more about the Find My app ›

https://www.apple.com/ca/shop/buy-airtag/airtag

The RTLS Portfolio

Some of the vendors



...

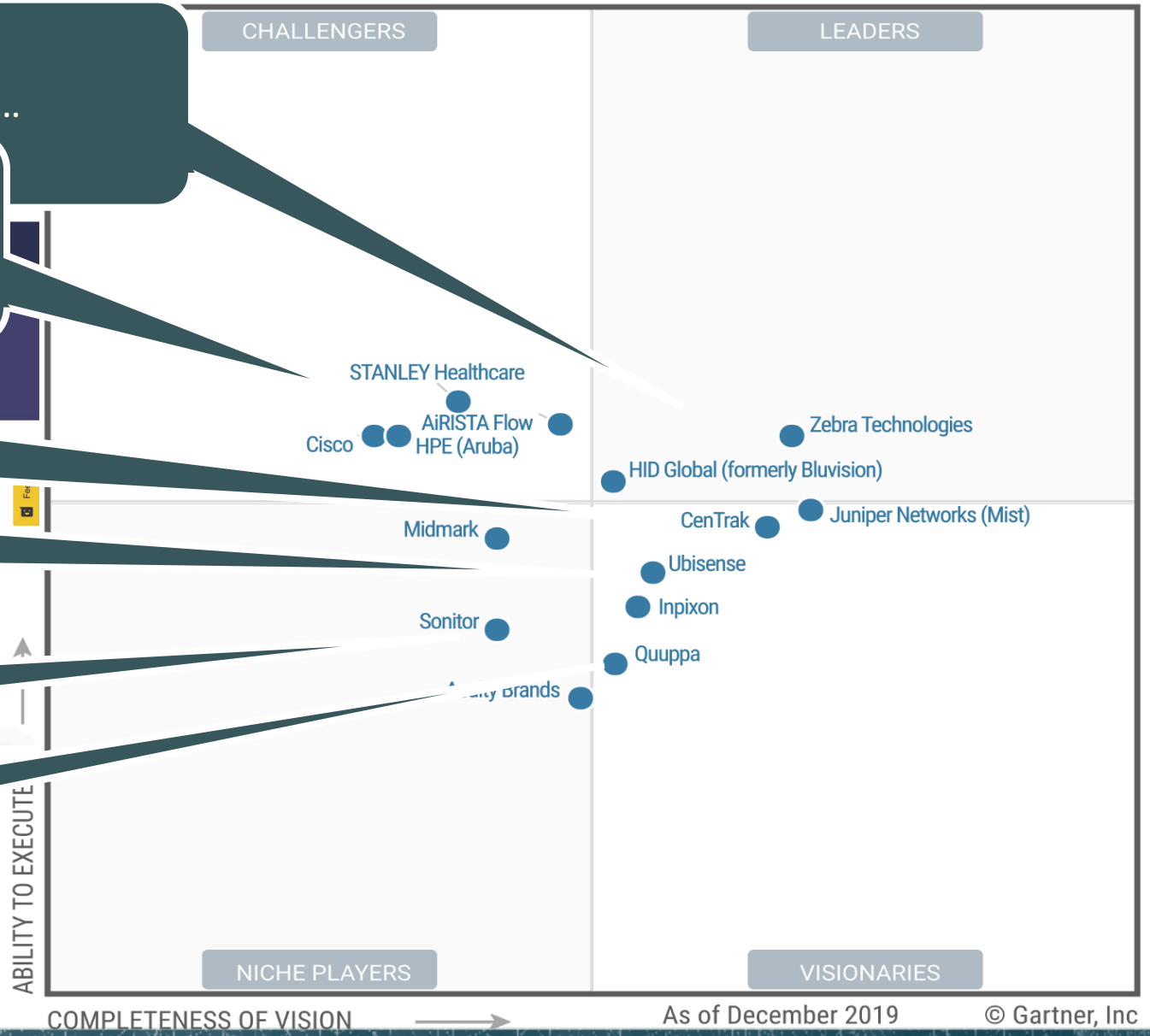
Wifi

RFID - IR

UWB

USID

BLE



Gartner Magic Quadrant for indoor RTLS

See Also: https://www.gartner.com/reviews/market/indoor-location-services

A first search…

- **Multi-sector**
  - Hospitals stay in the race
  - Industry X.0, smart building, logistics, …
- **Multi-application**
  - Locating is the beginning
- **Multi technology**
  - & Multi-sub technologies/techniques
  - Passive RTLS going forward
- **Adapted for Covid-19 context**
  - Social distancing Apps
  - X Tracing

Search Results

RTLS Search

Sort By: Relevance Date Descending Date Ascending

Your search for *RTLS* returned approximately 1544 results.

Viewing Results: 1 - 10

UWB Alliance Teams with RTLS Open Standards Org Omlox

Feb 22, 2021 by Claire Swedberg

The joint liaison agreement is aimed at promoting more open standards for UWB and RTLS technologies, as well as easing regulatory demands for UWB power and outdoor use in industrial and other settings.

Webinar Report: How to Implement Smarter Medical Applications with RFID and RTLS

Dec 14, 2020 by Rich Handley

View the PDFs and recordings from RFID Journal's recent online event.

How to Implement Smarter Medical Applications with RFID & RTLS

Delivering seamless modern health care has its challenges, especially during a pandemic. Manual processes and lack of digitization can hinder [...]

Lighting Company Builds RTLS Into Its Automation System

Dec 2, 2020 by Claire Swedberg

A system from Cooper Lighting Solutions provides BLE-based data, with Vizzia software for asset and people management via light fixtures, in order to provide indoor locating without a reader infrastructure or batteries.

How to Implement Smarter Medical Applications with RFID & RTLS

Nov 4, 2020 by Mark Roberti

Delivering seamless modern health care has its challenges, especially during a pandemic. Manual processes and lack of digitization can hinder [...]

RTLS Manages Social Distancing at the Pool

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https://www.rfidjournal.com/

RTLS in 2021: Where Do We Stand?

A glimpse on the technology

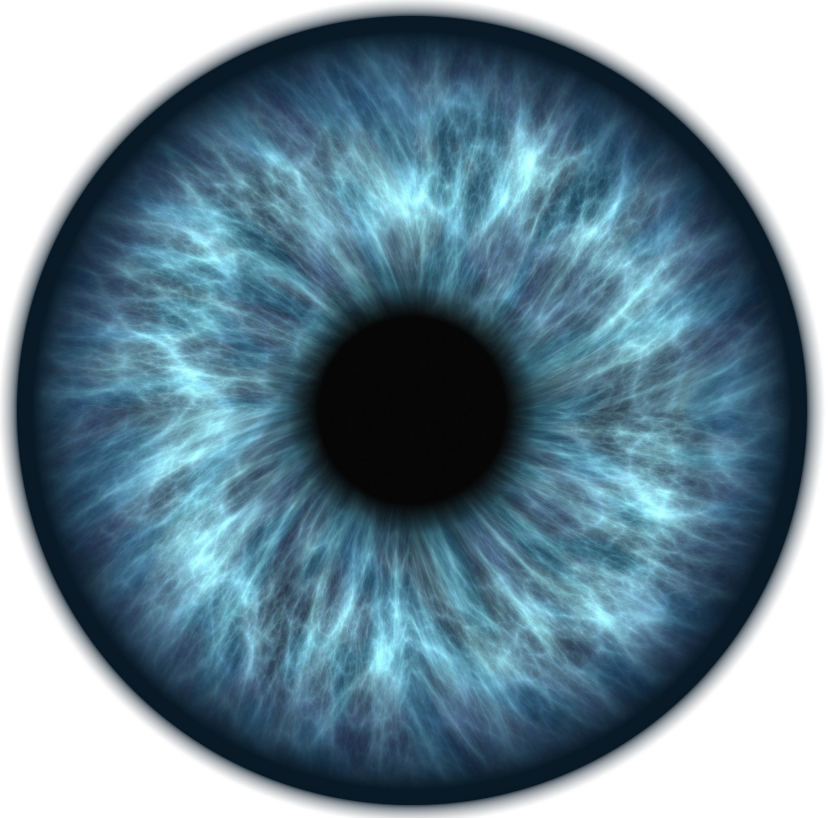
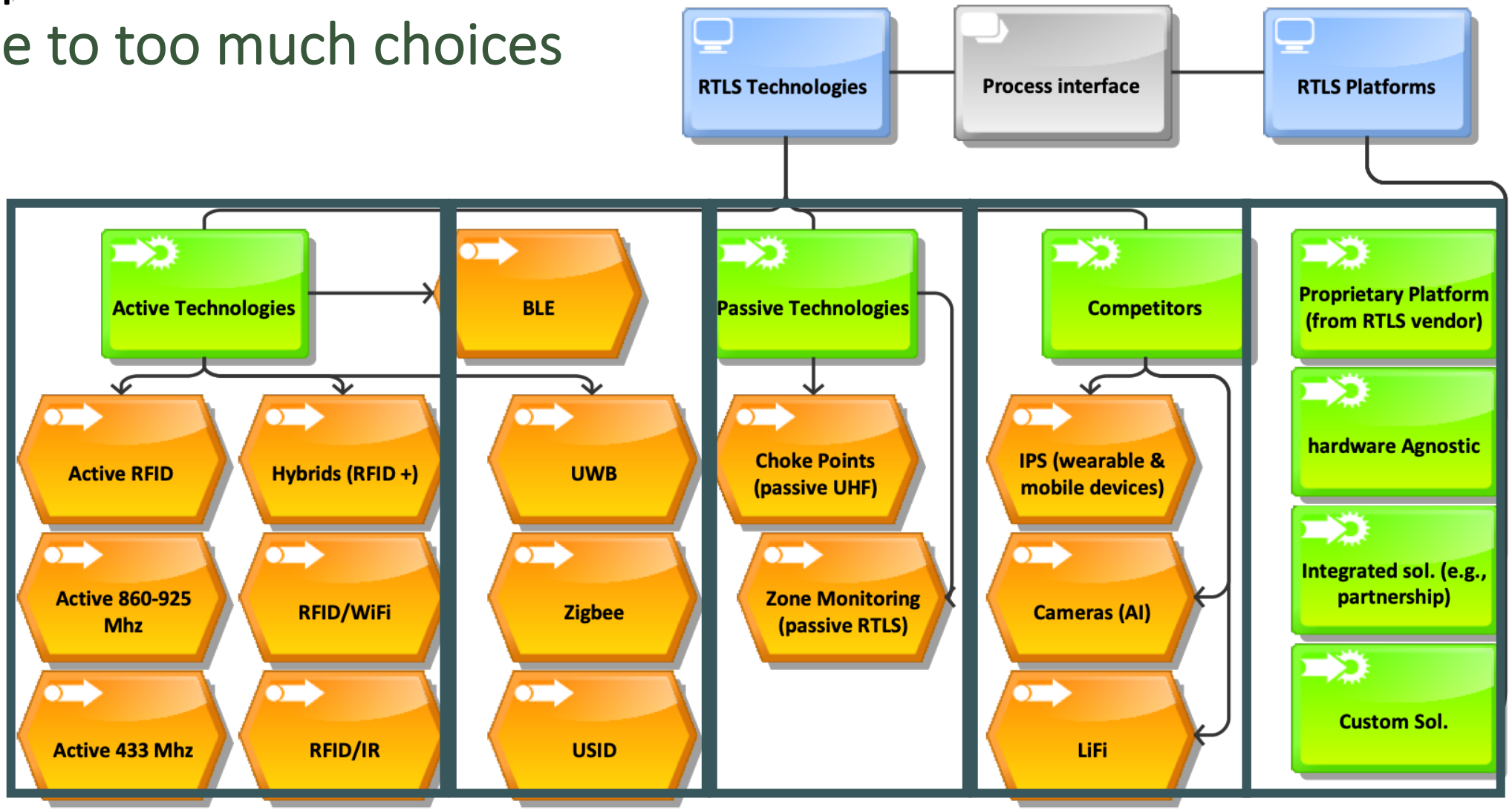


Image par Pete 😀 de Pixabay

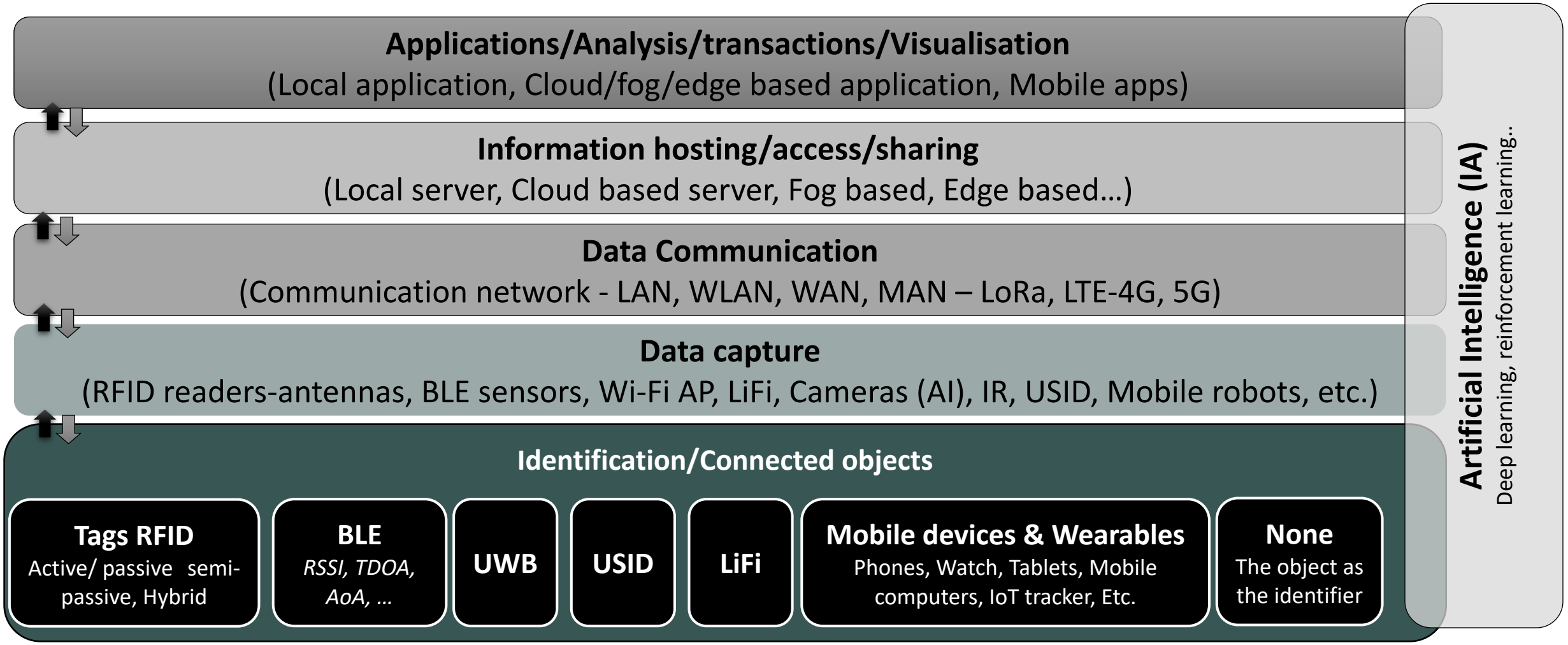
The (non) problem of RTLS

From no choice to too much choices



Sources: Bendavid Y. (2020). Laboratoire IoT https://labiot.uqam.ca/

RTLS In the IoT infrastructure



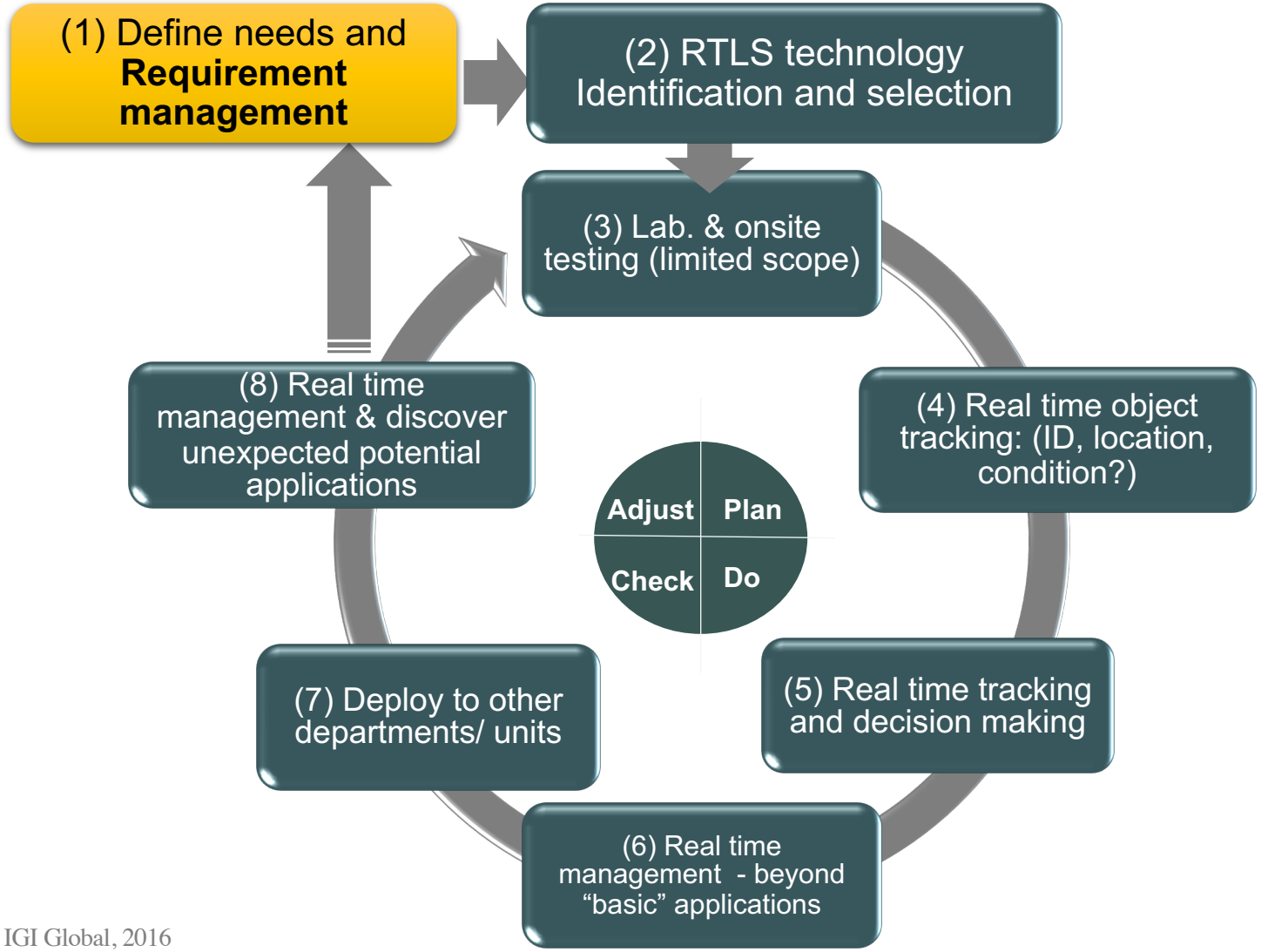
Source: Bendavid Y. & S. Rostampour (2020)- Laboratoire IoT https://labiot.uqam.ca/

RTLS in 2021: Where Do We Stand?

So…where should we start?

Planning your Project

"From (near) real time tracking to operations management and business intelligence"



Source – Adapted from Bendavid Y. (2016). Selecting the Right RTLS in Hospitals. The Encyclopedia of E-Commerce Development, Implementation, and Management, IGI Global, 2016

RTLS in 2021: Where Do We Stand?

Some criteria to consider

RTLS comparison

Some criteria -among others

	TECHNOLOGIES											
	TYPE/FREQUENCY/METHOD											
Criteria												

RTLS comparison

Some criteria -among others

TECHNOLOGIES	Passive UHF RFID			Active RFID			BLE			UWB		…
TYPE/FREQUENCY/METHOD	Fixe	Transition	Zone	915 Mhz	433 Mhz	…	RSSI	AoA	…	TDoA	ToF	
TCO (Vs Price)												
Energy –Power source												
Coverage (FOV)												
Accuracy & Precision												
Latency (real time)												
Constraints -Interferences												
Tag performance- capabilities												
Ease of deployment & Scalability												
…												
Software tools, and services												

Passive RTLS comparison
From vendor documentation

	Vendor 1 Impinj xArray	Vendor 2 Zebra- ATR7000	Vendor 3 RF-Controls CS-490	Vendor 4 …
Coverage (sq.ft)	1,500	1,500	10,000	
Location accuracy (ft)	1-1.5	2	1.5 - 3	
Reading distance (ft)	+	++	+++	
Mounting height (ft)	15	12-18	25-50	
Power source	PoE	PoE+	PoE+	
Location	2D	3D	3D	
Platform\OS	ItemSence\Linux	CLAS\Linux	RFC-OS	
…				

RTLS in 2021: Where Do We Stand?

Some Use Cases

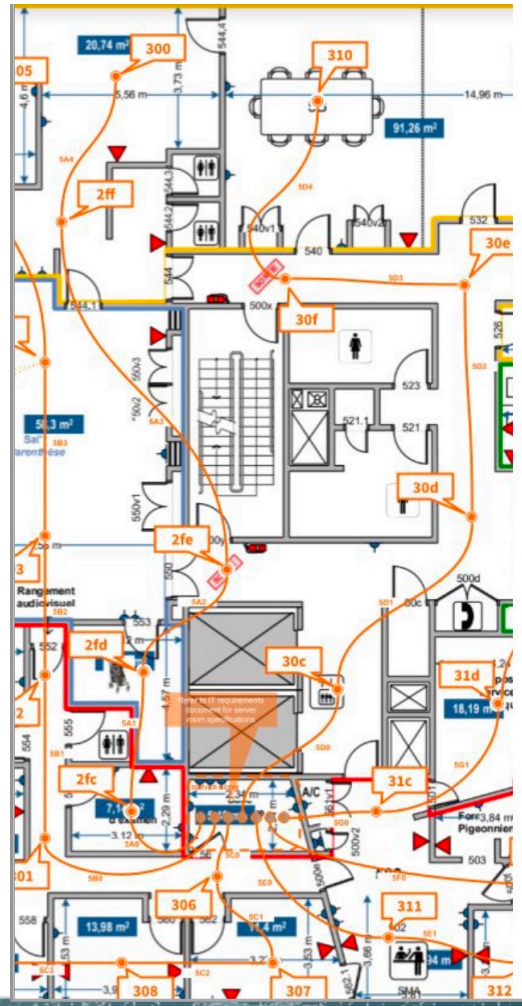
Image par Gerd Altmann de Pixabay

Case 1 – Building Management

Occupancy Analytics

- **Business problem:** Lack of knowledge of the use of spaces
- **Objective:** Improve the management of spaces (reorganize capacity, relocate, redistribute etc.)
- **Potential IoT technologies:** semi-manual or BLE, RFID, UWB etc.
- **KPIs -** Interpretation of sensor data (places, people & assets)
- **Limits of data use:** what do we do now?

Case 1: Occupancy Analytics
Using BLE



Sources: Bendavid Y. (2019). Laboratoire IoT https://labiot.uqam.ca/

Case 2: Retail Store – using DirAct Identifiers

Customer (carts) tracking

- **Business Problem:** no data on shelves visited by the customers
- **Objective of the project:** Increase visibility on customers path in the store
- **Specific constraints:** Possibility to use BLE customer's devices (cell phone, smart watch) - but…not so simple
- **Selected Technologies:** BLE (similar to social distancing logic)
- **KPIs:** upon the business case

Case 2: Retail Store

BLE Device-agnostic interaction…and location

Puck.js
BLE Beacon on the shelf
(unique INSTANCE_ID.)

Dashboard / Analyse du comportements des consommateurs

Full screen Share

Search KQL Last 15 minutes Show dates Refresh

+ Add filter

Popularité des rayons du Green UX Lab / Chariot 1 Last 5 months

filters	Popularité (en temps passé)	Popularité (en temps passé) percentages	Nearest rssi
Etagère Peau sensible	51,063	36.545%	-65.988
Etagère Super leaves	45,769	32.756%	-66.155
Etagère Blooming belly	42,893	30.698%	-66.139
Etagère Ménager - Animaux	1	0.001%	-65
Etagère Little burgundy	0	0%	
Etagère Pure Pure	0	0%	

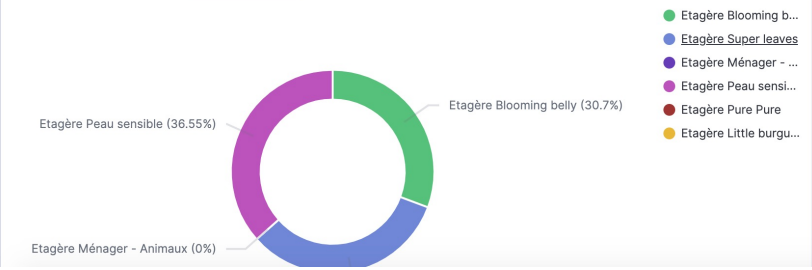
Export: Raw Formatted

Popularité des rayons du Green UX Lab / Chariot 2 Last 5 months

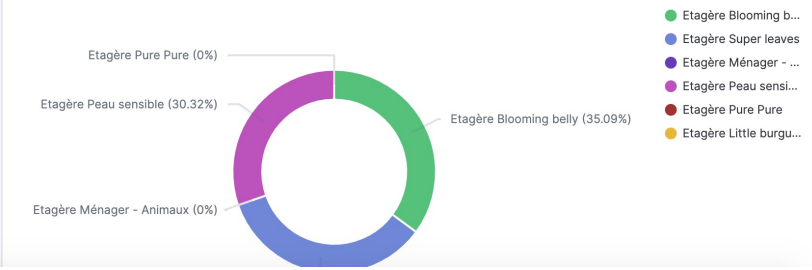
filters	Popularité (en temps passé)	Popularité (en temps passé) percentages	Nearest rssi
Etagère Blooming belly	40,741	35.092%	-63.482
Etagère Super leaves	40,153	34.586%	-63.532
Etagère Peau sensible	35,199	30.319%	-64.254
Etagère Pure Pure	2	0.002%	-67
Etagère Ménager - Animaux	2	0.002%	-67
Etagère Little burgundy	0	0%	

Export: Raw Formatted

Popularité étagères / Chariot 1 Last 5 months



Popularité étagères / Chariot 2 Last 5 months



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Project in progress with reeluActive https://reelyactive.com

Case 3: …
Using passive RFID RTLS

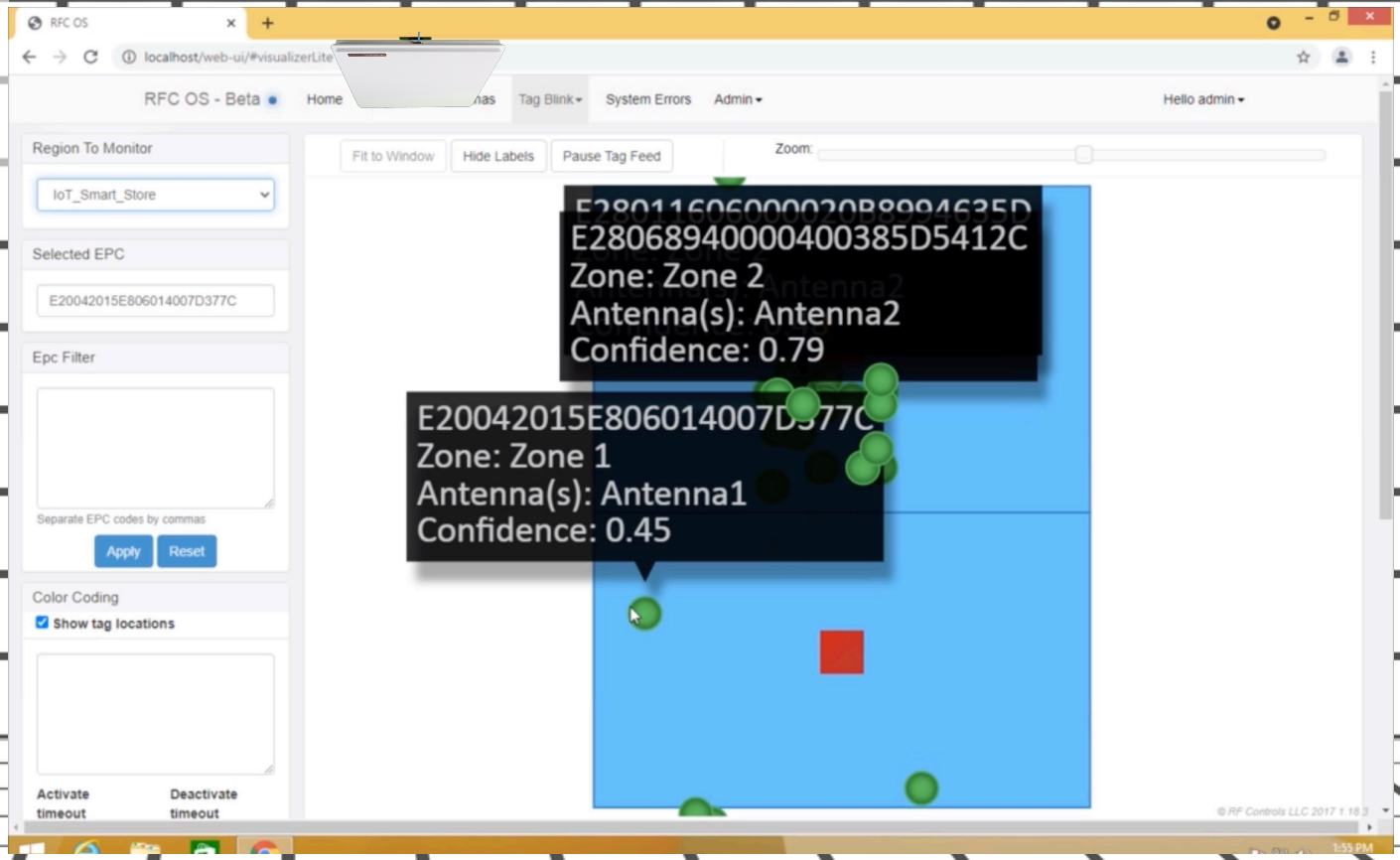

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Image par Gerd Altmann de Pixabay

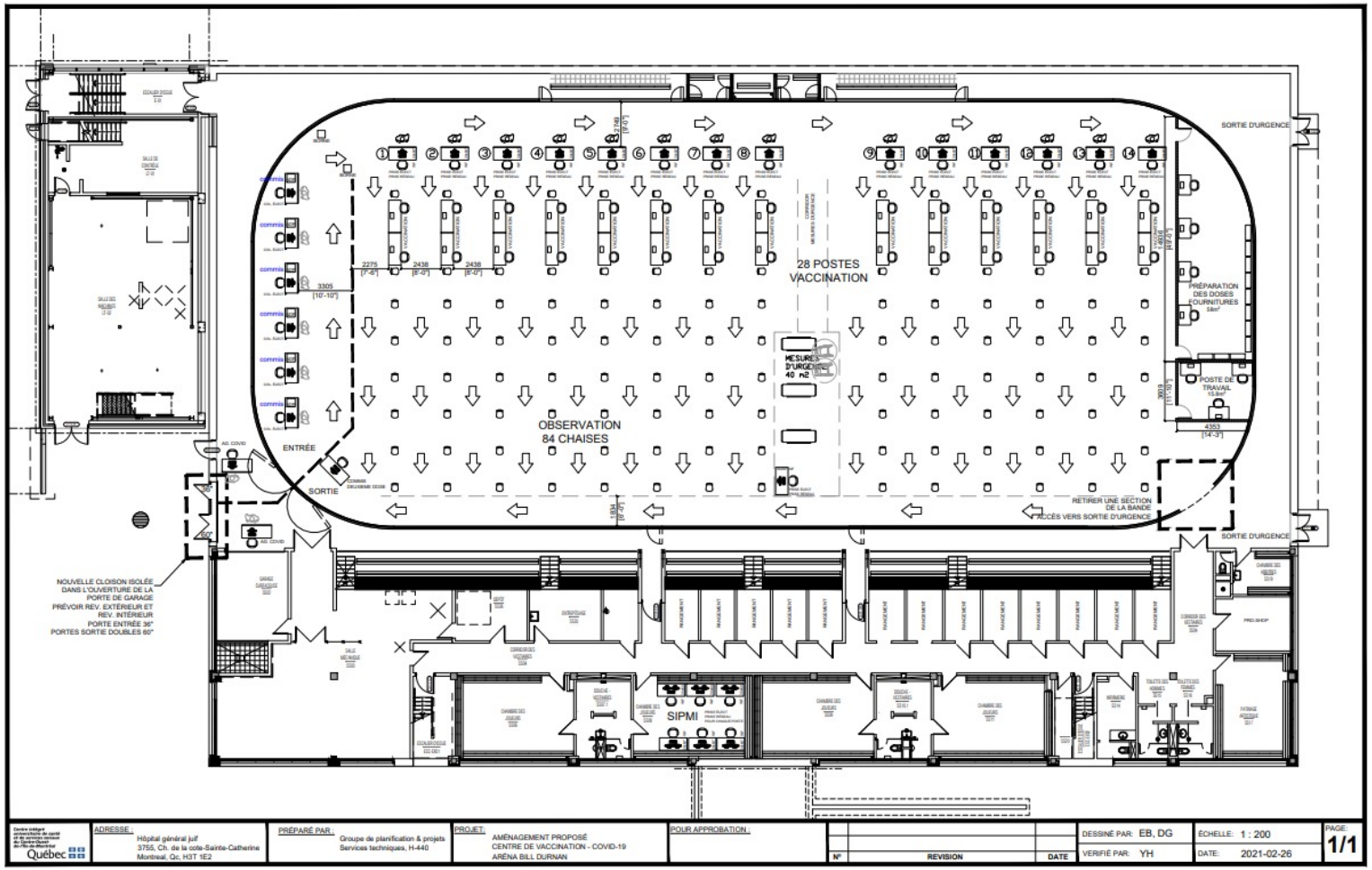
Pilot project with RF Controls

Case 3.1: Vaccination center
Flow Optimisation

- **Business Problem:** vaccination centers need to be developed in various non standard environments - - need to track patient flow
- **Objective of the project:** Set up safe, connected, efficient vaccinations centers ... And do it quickly
- **Technologies:** **passive RTLS** + simulation + IoT platform = DT
- **KPIs:** Nb. People vaccinated/day, average vaccination time (process) waiting time vs workstation specific KPIs…

Case 3.1: Covid vaccination center

Flow optimisation



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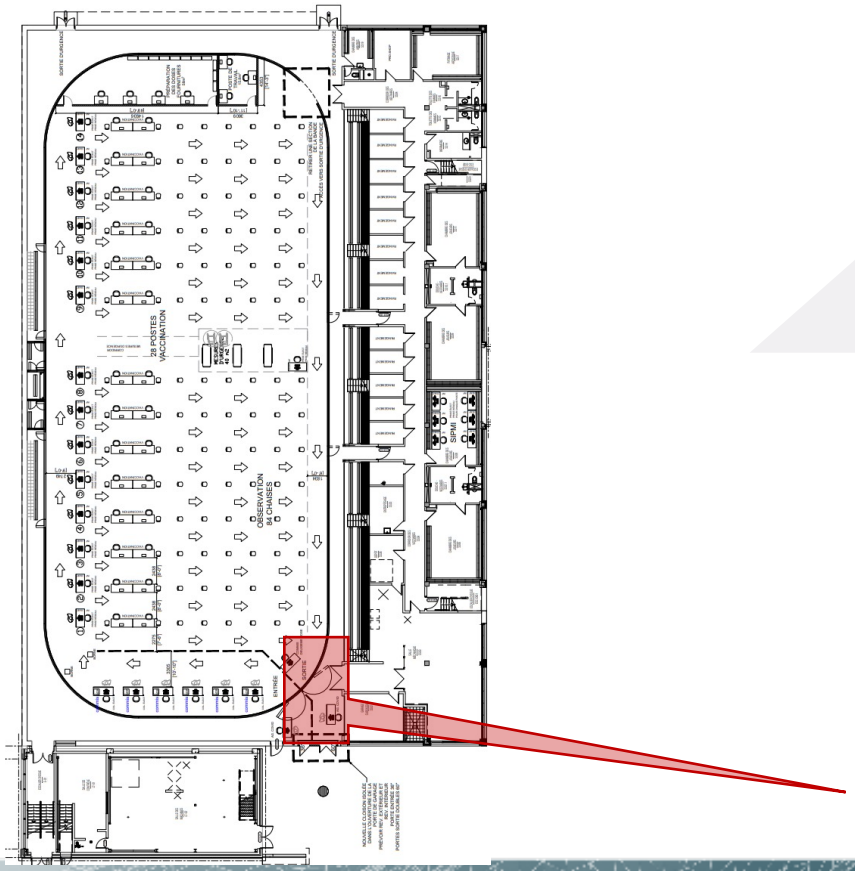
Pictures from Pixabay

Project in progress with the IoT Lab. (Student Wafdi, Mohamed Ali under the supervision of Dr. Y. Bendavid Dr. Y. Maizi with collaboration of Dr. Rostampour and the CIUSSS centre Ouest in Montréal) – with RF Controls

Case 3.1: Covid vaccination center

Using RTLS



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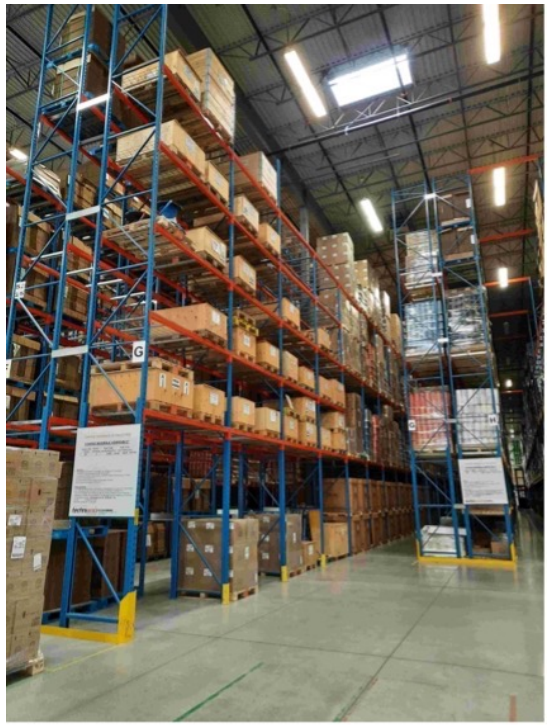
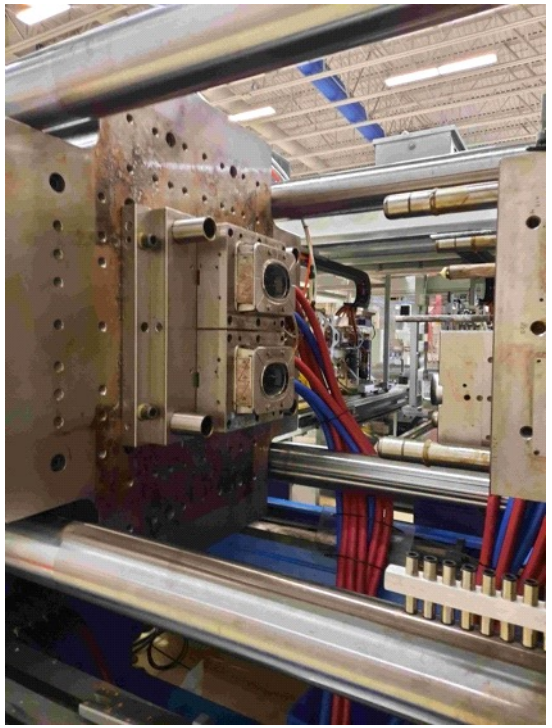
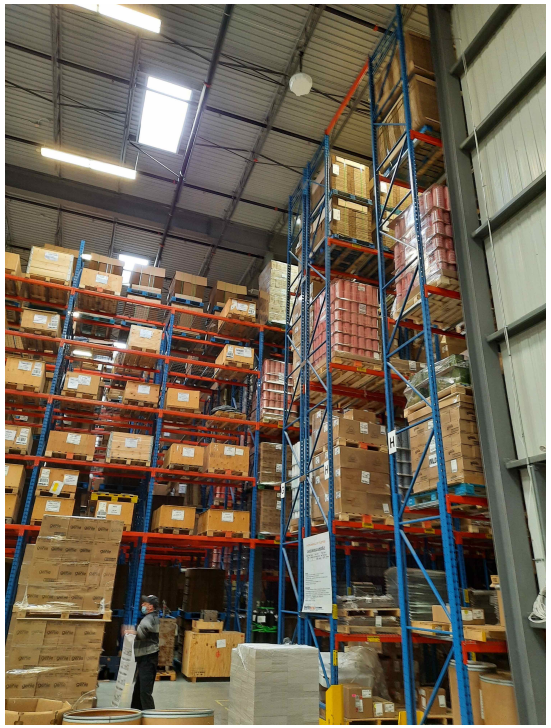
Case 3.2: Manufacturing center
Critical asset tracking

- **Business Problem:** critical assets (molds) misplaced/not found – delay in production
- **Objective of the project:** reduce searching time/ Increase visibility on critical assets
- **Specific constraints:** Wide warehouse, multi-shelve storage, high ceiling, long idle time between production
- **Selected Technologies:** Passive RTLS
- **KPIs:** searching time, cost related to re-planning, cost related to re-machining (if lost), etc.

Case 3.2: Mould tracking

Using passive RFID RTLS…in progress



Project in progress with the IoT Lab. Student Yacine Berrabah under the supervision of Dr. Y. Bendavid and Dr S. Rostampour - with Zebra RTLS technology -

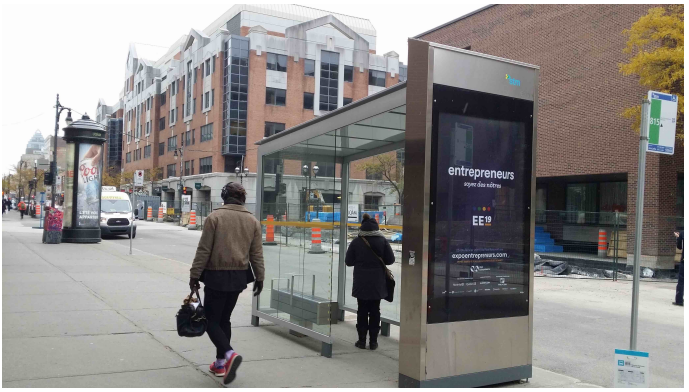
Case 4: Smart bus shelter

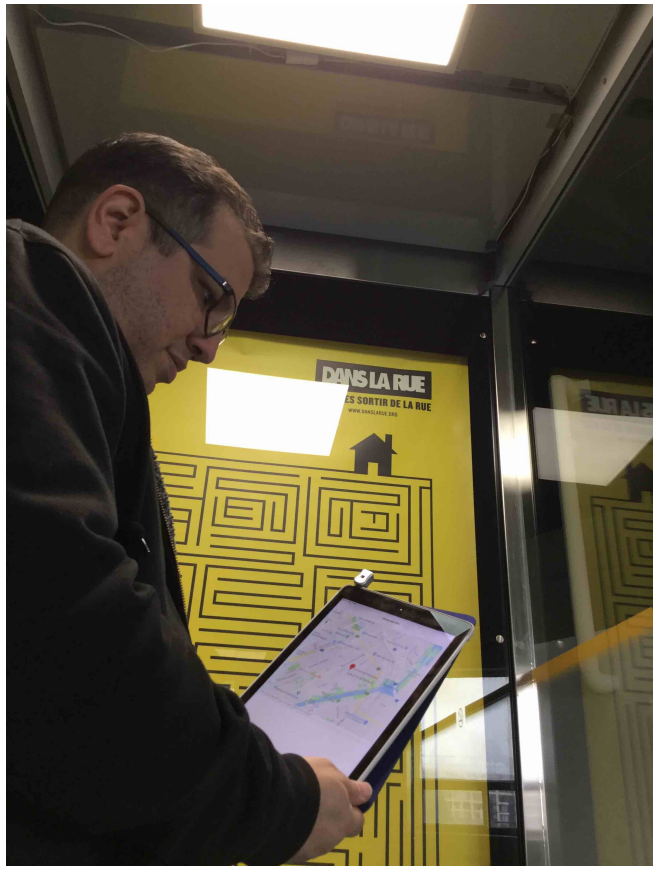
Passenger detection

- **Business Problem:** no information on people waiting for the bus
- **Objective of the project:** Have a real time visibility on people waiting in-out the bust shelter
- **Specific constraints:** Un-controlled environment, Un-controlled devices
- **Selected Technologies:** WIP
- **KPIs:** Upon the business case

Case 4: Smart bus shelter

Citizen detection…event the ones we don’t want!





Finally what companies want?
Visibility

- Capture data (events)
- Translate data into information's
- Access this information, accurate, precise, updated
- Analyze this information (actual and predictive)
- Take event-based decisions based on this information (*actionable insights*)
- Improve business process performance

Some Trends to watch

- **Multi Options**
  - Active hybrids options
  - Passive RTLS - Reliable technologies & Channel partners
  - BLE on the rise
  - UWB & precision
- **Platforms**
  - From data capture to integration and decision making
- **Computing paradigms**
  - Cloud
  - Edge
- **Integration to IoT platforms**
  - …+ …+…+ Protocols (e.g. MQTT, REST API)
- **Security and privacy**

THANK YOU

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