MAY 17 - 19, 2022

MANDALAY BAY | **LAS VEGAS, NV**

RFID/IoT for Warehouse and Inventory Management

Targeting the Correct RFID/IoT Technology for the Right Project

Presenter: Samad Rostampour
Professor, Vanier College and IT director @ IoT Lab, Université du Québec à Montréal (UQAM)
With the **collaboration of Ygal Bendavid**
director @IoT Lab, Université du Québec à Montréal (UQAM)

RFID JOURNAL LIVE!

MAY 17-19, 2022

MANDALAY BAY, LAS VEGAS

ABOUT ATTEND EXHIBIT EXPO CONFERENCE CONTENT TRAVEL

Search ...

- SPEAKERS
- KEYNOTES
- INDUSTRY TRACKS
- BATTERY-FREE BLUETOOTH TAGGING WORKSHOP
- FAST-TRACK RFID TRAINING
- CO-LOCATED EVENTS
- 2022 PRESENTATIONS

Standard rates end 5/13/22 – Register now!

2 DA

35 INUTE(S)

40 SECOND(S)

REGISTER!

HEALTH & SAFETY

AGENDA AT A GLANCE

2022 BROCHURE

Register Now

Exhibit /Inquire

Your Presenter

Samad Rostampour

- Professor @ Computer Science Department, Vanier College, Montreal
- IT Director, IoT lab., UQAM University, Montreal(https://labiot.uqam.ca/)
- Judge @RFID Journal Award

Today's Program

- 10:45 AM - 11:30 AM: RFID/IoT in Warehouse & Inventory Management Basics
- 11:30 AM - 12:15 PM : Linking RFID to Inventory-Management Best Practices
- 12:15 -13h00 PM : Lunch time
- **1:00 PM - 1:45 PM: Targeting the Correct RFID Technology for the Right Project**
- 1:45 PM - 2:30 PM : Key Steps in Building an Inventory-Management RFID Solution: Build Your Own RFID Portal
- 2:30 -2h45 PM : Break time
- 2:45 PM - 3:30 PM: Designing Your RFID Solution
- 3:30 PM - 4:15 PM: Building Your RFID Business Case

Objective of the presentation

- **Define the RFID/IoT strategy & select the right project**
- Use a Methodological approach to solve problems & identify opportunities
- Target the appropriate RFID/IoT technology for your specific case

Main Idea of the presentation

But there is more than one way…

& more than one right solution for the right RFID/IoT project…

LABO IOT Internet des Objets ESG UQÀM

RFID JOURNAL LIVE! 20 YRS 2003 - 2022

MAY 17 - 19, 2022


& the right solution for the right RFID/IoT project…

1-Define the RFID/IoT strategy

Vision & orientation

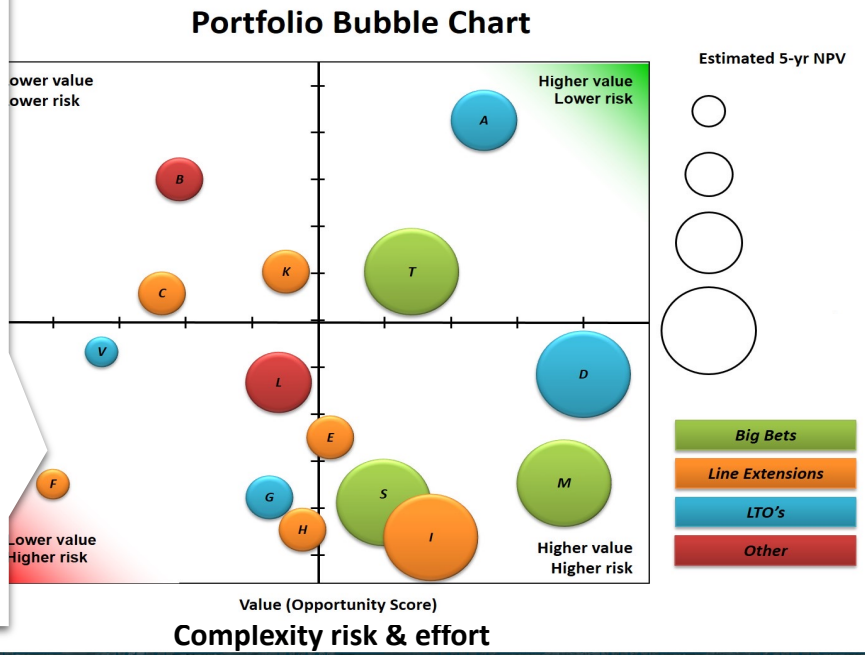
- How **effective** and **efficient** are the existing operations & business processes?
- What are the Strategic-Tactical-Operational **goals** of my warehouse/inventory project?
- How can RFID **help me** reach these goals?

"A vision without a plan is an hallucination"

Select the right RFID project

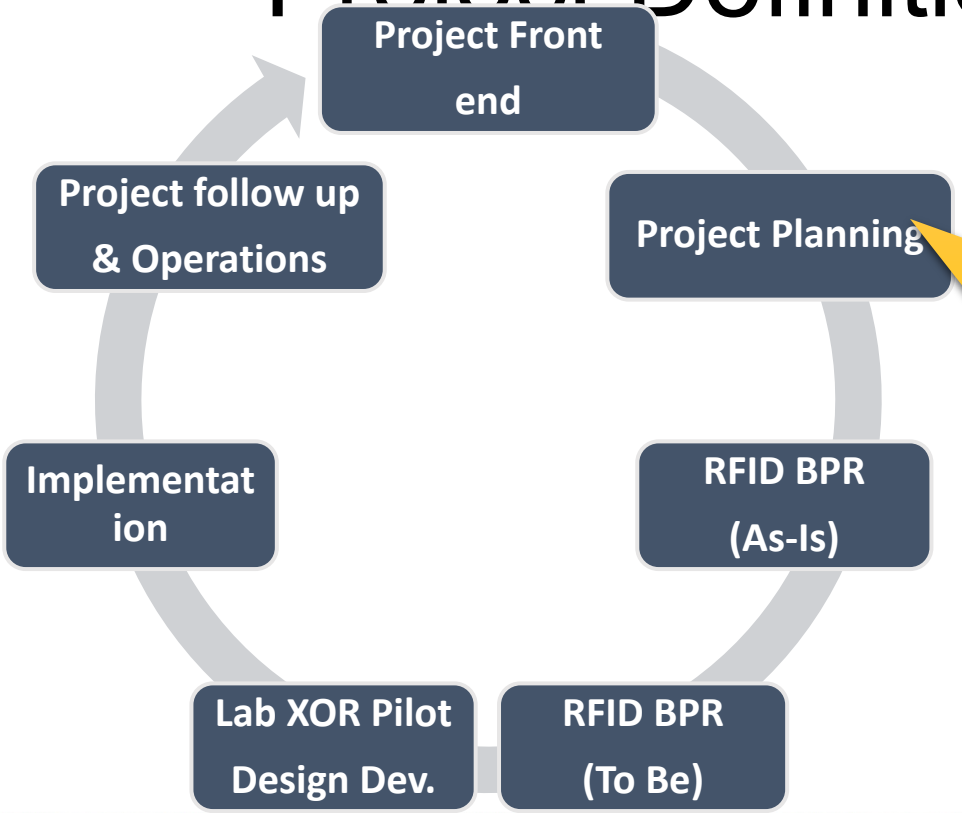
Project Portfolio Management

- Strategies
- Resource allocation (based on priorities)
- Financials Methods (yes but….)
- Bubble diagrams or portfolio maps
  - Classification XY, E.g. P(technical success) and benefits (NPV))
- Scoring Models
  - Selected criteria's
- Check-lists
  - Yes-No; Go-Kill points (Stage gate)



Project Definition and planning

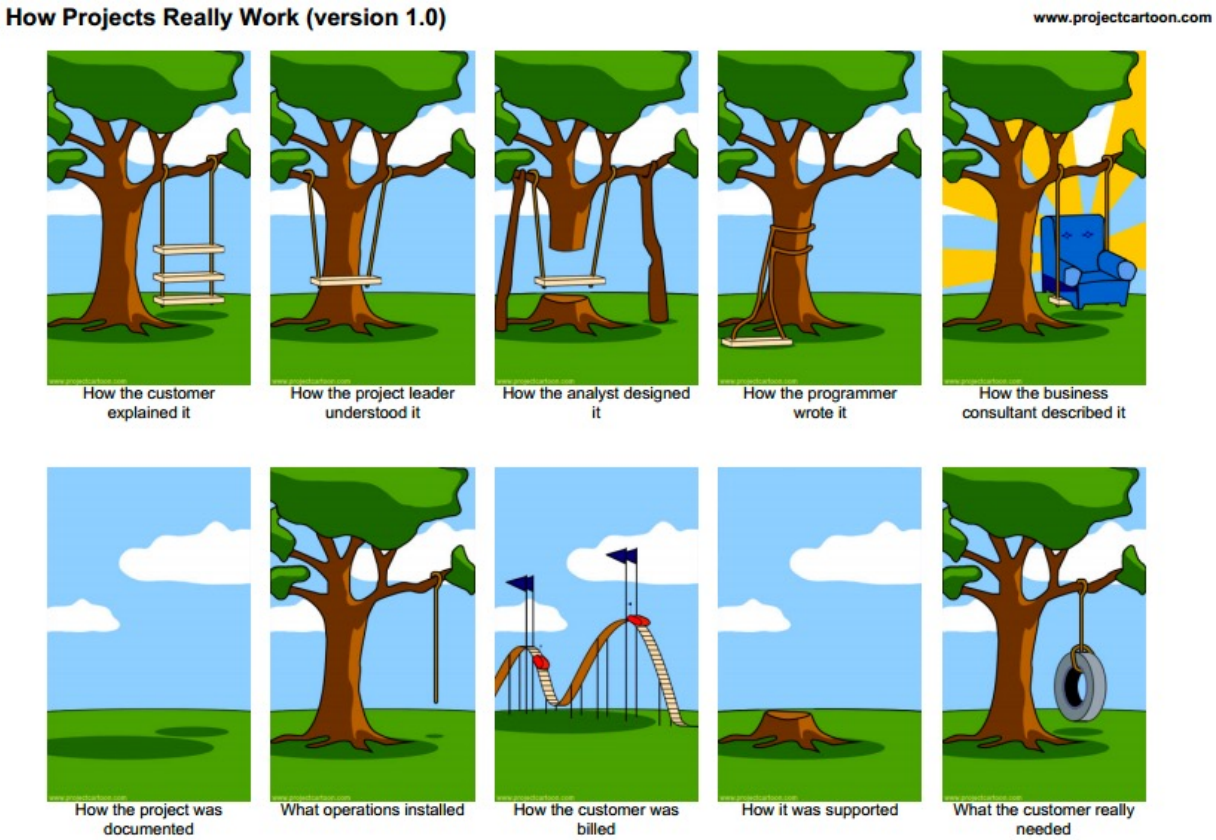
RFID Project life cycle



- **Project Definition/requirements**
- Project initial planning & comm.
- High level Business case / value
- Project / Pilot site pre-selection
- Team building & Education

It all starts with requirement management

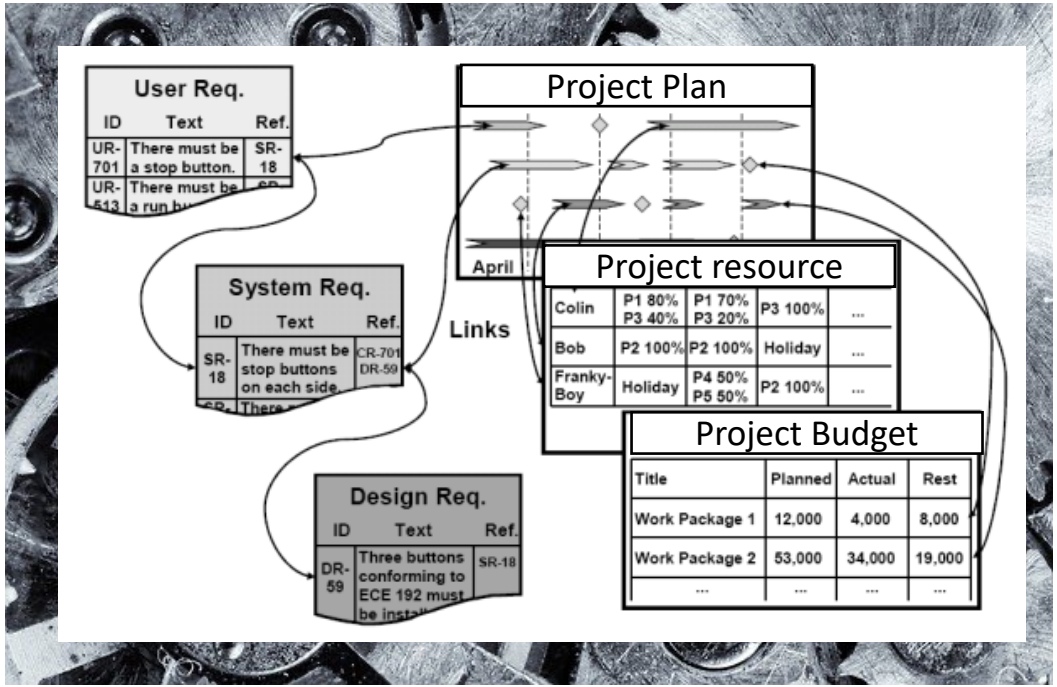
Poorly expressed requirement can be devastating; - domino effect that leads to time-consuming rework, inadequate deliveries and budget overruns



Moving from idea to projects

Supporting the writing of an RFID-IoT project proposal

"(…) link user requirements to system requirements and system requirements to design requirements (…) to work packages, to resources and budgets, to milestones and deliverables"…



Hood et al., 2008 - Requirement management, chap 6, Project Management interface

Objective of the presentation

- Define the RFID/IoT strategy & select the right project
- **Use a Methodological approach to solve problems & identify opportunities**
- Target the appropriate RFID/IoT technology for your specific case

Use a Methodological approach

To solve problems & identify opportunities

- Set of **practices, procedures & rules** used in the inquiry/investigation of RFID potential
- With the **goal to understand** different situations & **acquiring new knowledge**
- Based on gathering observable, empirical & **measurable evidence** in your warehouse!
- It is not a formula!

Pics: Pixabay

Use a Methodological approach

To solve problems & identify opportunities

Do not envision an RFID project as a technological project!

Define:
- Goals for process improvement
- Customer requirements
- Project scope
- The problem/opportunity

✓

Measure:
- Identify appropriate performance measures
- Collect data
- Evaluate current process performance

✓

Analyze:
- Develop and test theories related to root causes of problems
- Identify cause-and-effect relationships

✓

Improve:
- Develop, evaluate, and implement solutions to reduce gap between desired process performance and current performance

✓

Control:
- Monitor process to sustain improved performance
- Ensure that problems do not resurface

Methodology

Defining the problem – the classics errors!

1. Our problem is that we want to improve ….
2. Our problem is that we want to implement RFID for
3. Our prob

Its not about WHAT you want to do, but WHY you wan to do it

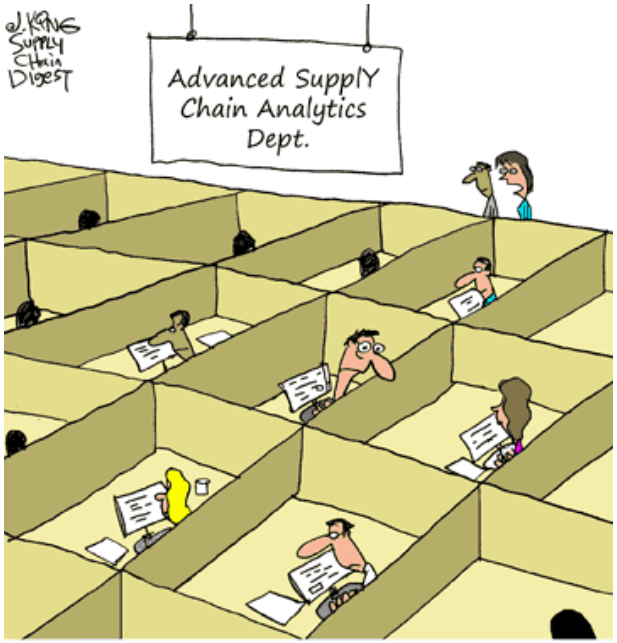
"So…. How can we blame procurement?"

Methodology

Defining the problem – the classics errors!

Defining the problem/opportunities & envisioning solutions shouldn't be an endless process…

It has to be managed as a project! By **projects managers**! For/with **operations managers**!



"They've supposedly been close to a breakthrough on inventory optimization for 5 years now."

Use a Methodological approach

To solve problems & identify opportunities

Define:
- Goals for process improvement
- Customer requirements
- Project scope
- The problem/opportunity

✓

Measure:
- Identify appropriate performance measures
- Collect data
- Evaluate current process performance

✓

Analyze:
- Develop and test theories related to root causes of problems
- Identify cause-and-effect relationships

✓

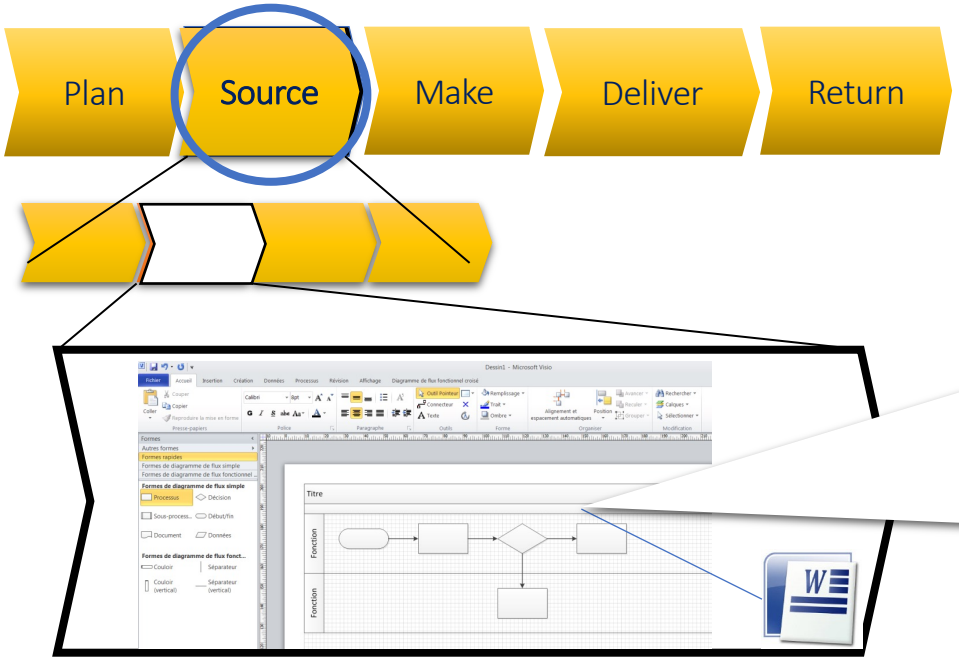
Improve:
- Develop, evaluate, and implement solutions to reduce gap between desired process performance and current performance

✓

Control:
- Monitor process to sustain improved performance
- Ensure that problems do not resurface

Methodology

Data gathering : a process perspective



- Use Process Modeling Methods & standards
- Concentrate on core processes (Receive, put away, pick, …)
- Use KPIs to assess/ measure your processes

Use a Methodological approach

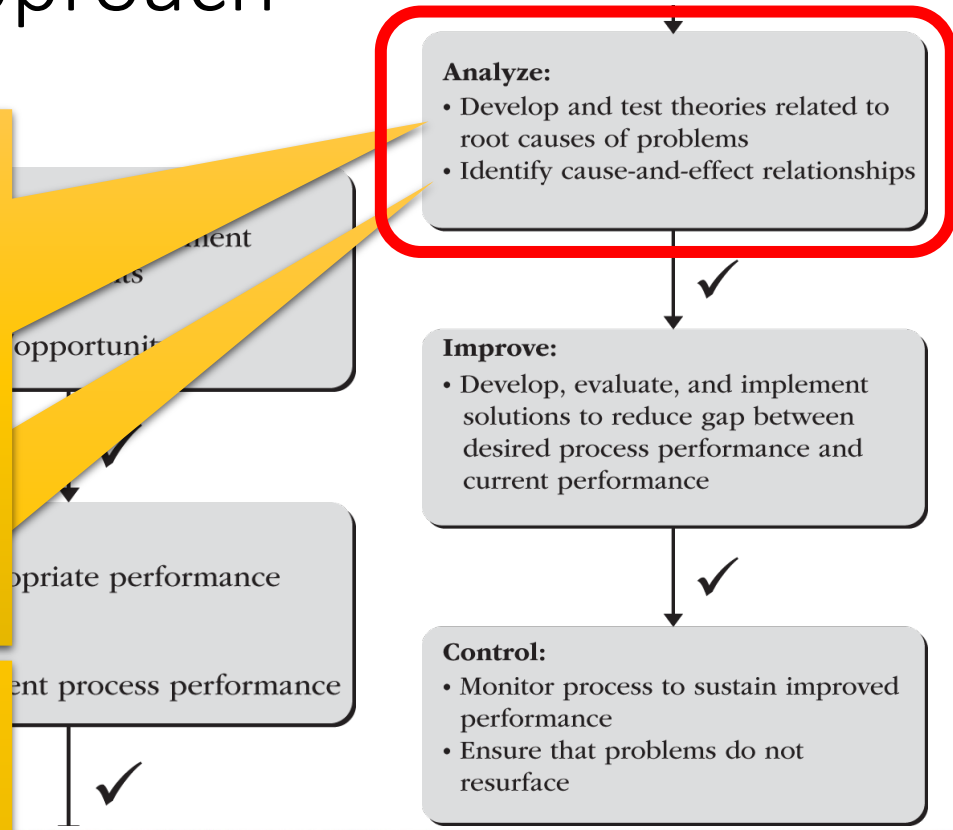
Data gathering and analysis

Operations Management perspective

- Employee surveys
- Plant tour/audits
- Value chain
- Business Processes mapping
- Issues Trees - Root cause analysis
- ABC)Pareto analysis
- Org. Charts

Technical perspective

- Site Survey
- IT Infrastructure/system maps
- IT portfolio assessment
- Wireless Network evaluation



An example

I have a problem !!!!

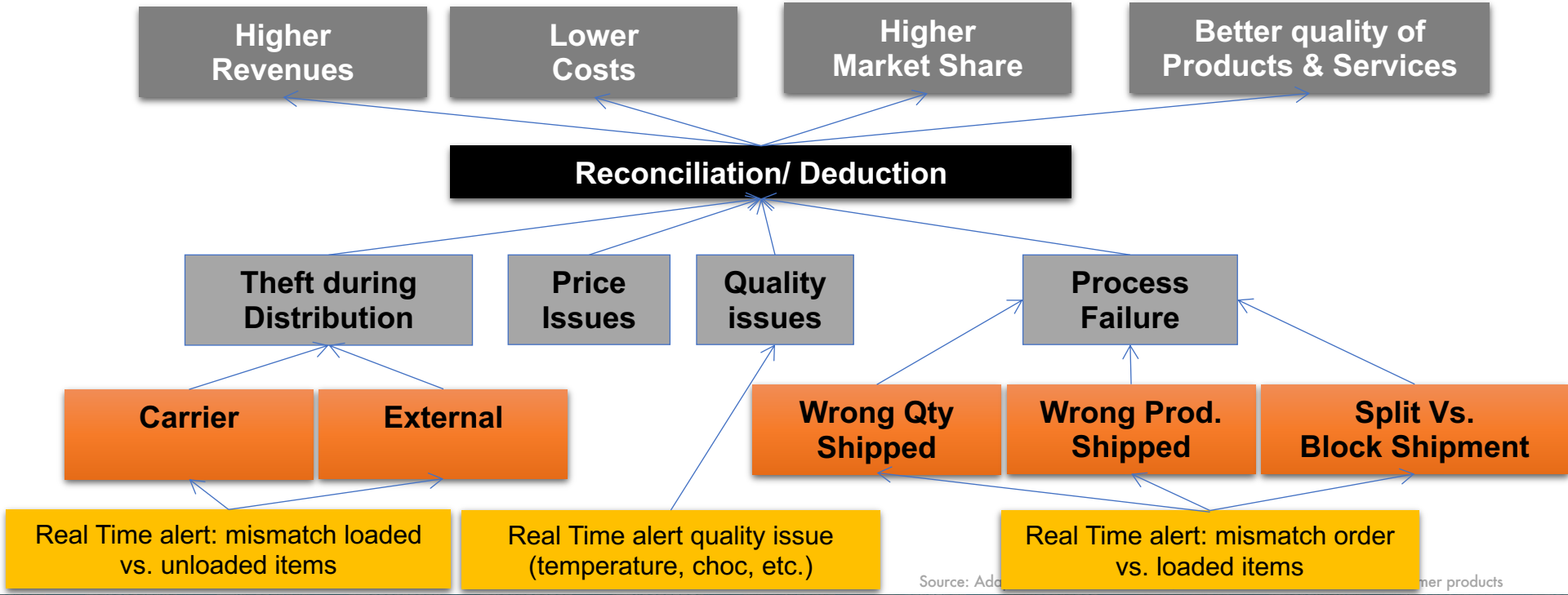
son Retamal de Pixabay

age par Free-Photos de Pixabay

"We often face some problems when it's time to make the reconciliation between the products shipped by the supplier and the ones received at the warehouse. .."

Methodology & Tools

Analyzing the problem

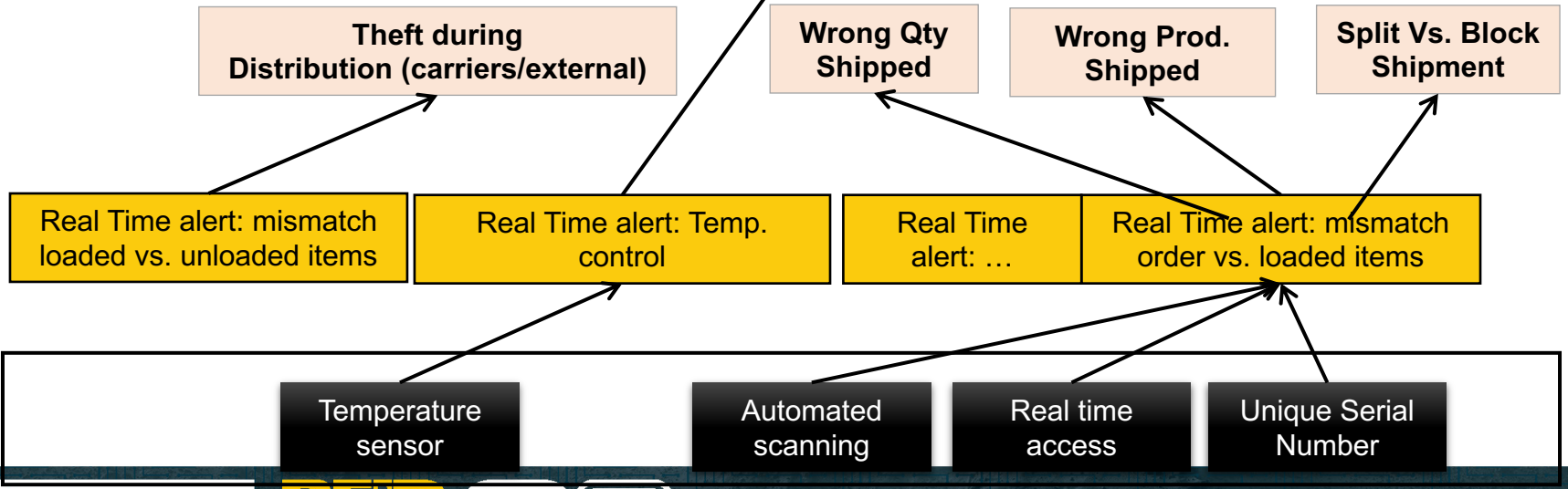


Source: Ado mer products

Methodology & Tools

Analyzing the problem

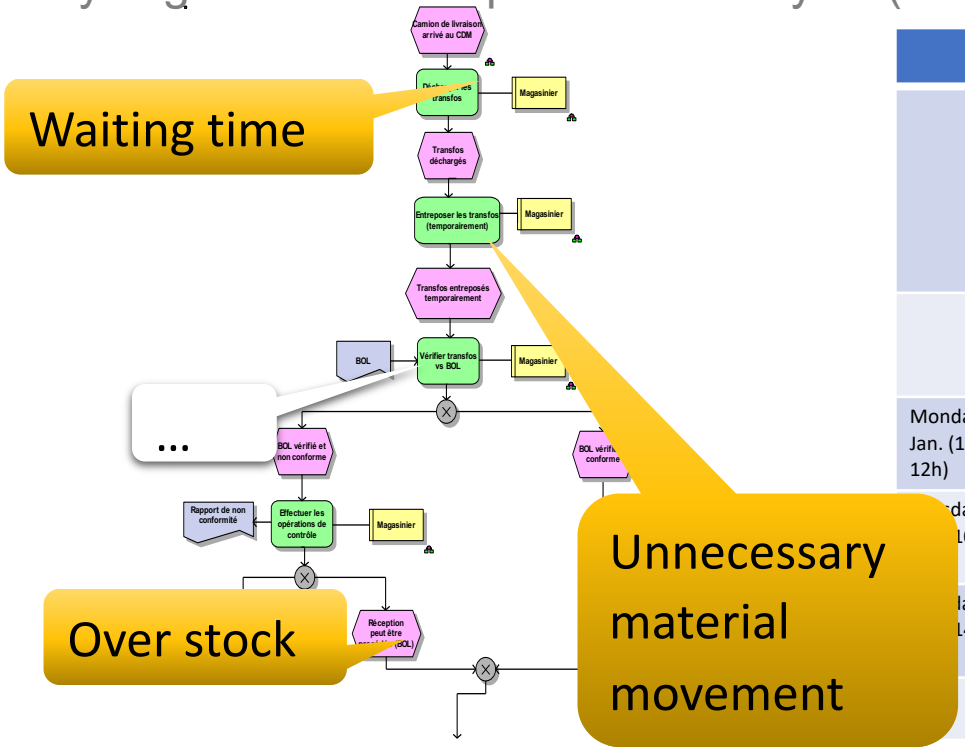
As we define & analyse the problems, we already anticipate the requirements for selecting the technology….



Source: Adapted from EPC Global US, 2005 - EPC Value Model for Consumer products

Methodology

Analysing -Process Map & value analysis (and waste)

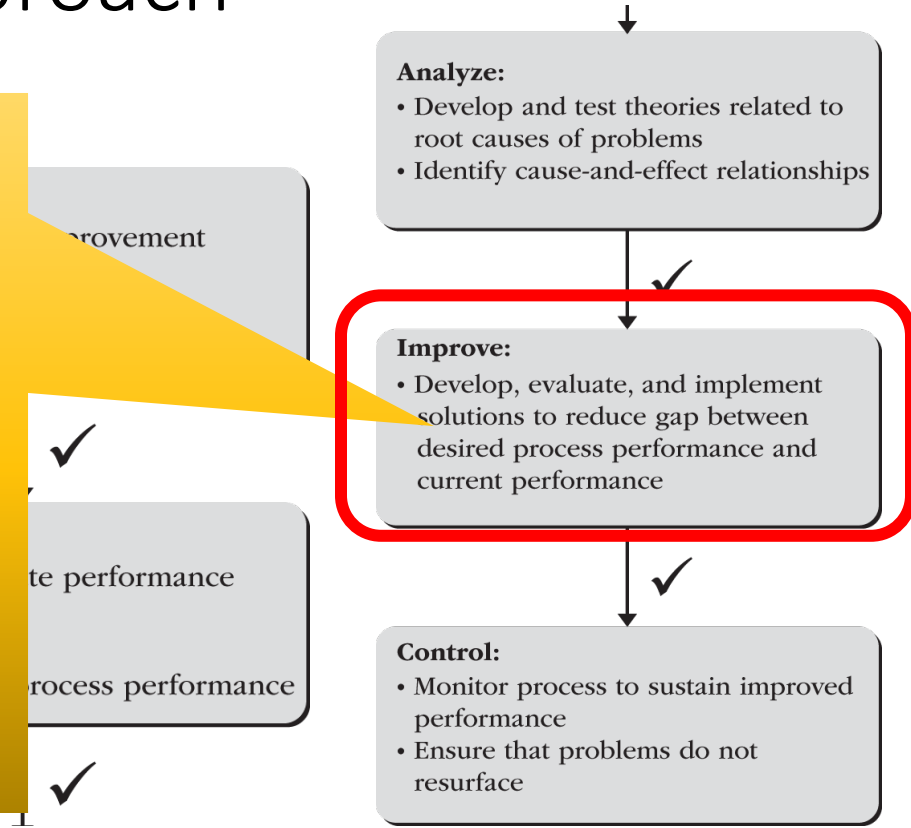


	Reduce the amount of late orders delivery								
	Added value			Non added value (but necessary)			Non added value		
	A1	A2	An	A1	A2	An	A1	A2	An
Monday 17 Jan. (10h-12h)									
day 25 10h-									
lay 25 14h-									

Use a Methodological approach

Select- solution

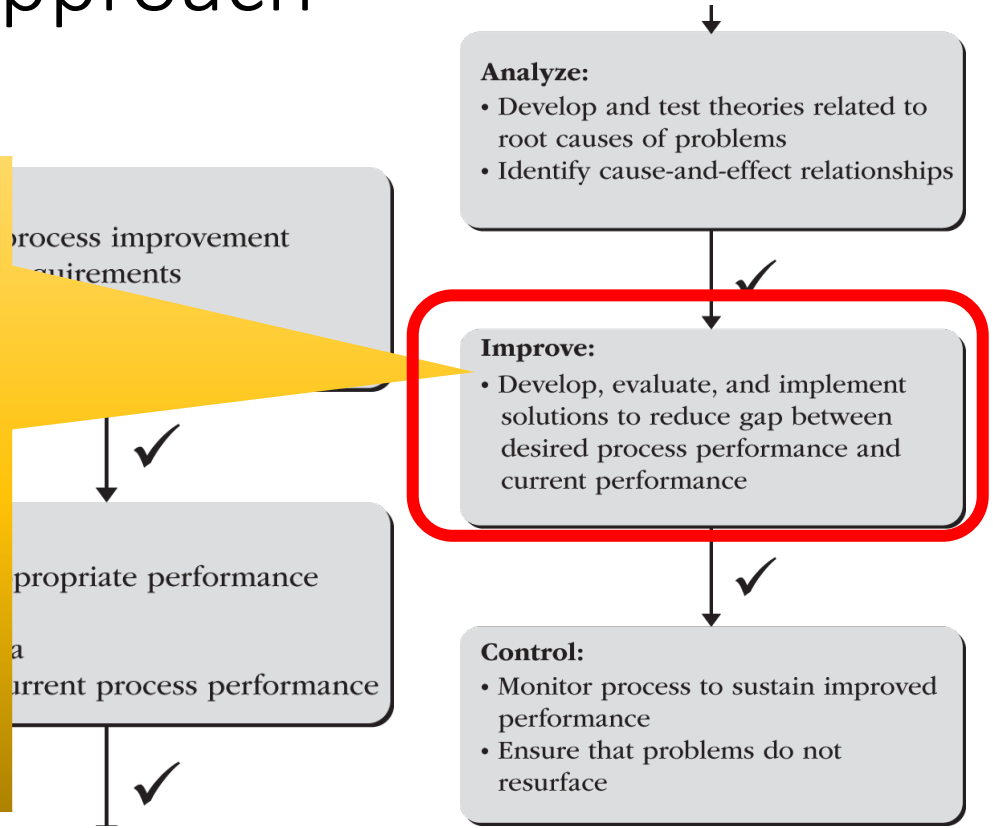
- Market browsing/ Identification of existing solutions/vendors
- **Conference/exhibition (RFID Journal Live ☺)**
- **RFID Journal awards**
- Benchmarking analysis
- RFI / RFQ/RFP/…
- **Computer simulation**
- **Laboratory experiments/ Pilot**
- **…**



Use a Methodological approach

Managing the project - implementing

- IT Project management guidelines & methodologies (e.g. PMBOK, APMBOK)
- Agile project management methodologies
- ERP/IOS implementation methodologies methodologies (BPR)
- Laboratory experiments
- Pilot project



Use a Methodological approach

Cost Impacts and pay off Analysis

1. ABC: Activity-Based Costing
2. BSC: Balanced ScoreCard
3. SCOR: Supply Chain Operation Reference Model
4. GSCF framework
5. ASLOG audit
6. EFQM: Excellence Model
7. …

Analyze:
- Develop and test theories related to root causes of problems
- Identify cause-and-effect relationships

Improve:
- Develop, evaluate, and implement solutions to reduce gap between desired process performance and current performance

Control:
- Monitor process to sustain improved performance
- Ensure that problems do not resurface

Objective of the presentation

- Define the RFID/IoT strategy & select the right project
- Use a Methodological approach to solve problems & identify opportunities
- **Target the appropriate RFID/IoT technology for your specific case**

Select the appropriate RFID-IoT tech.

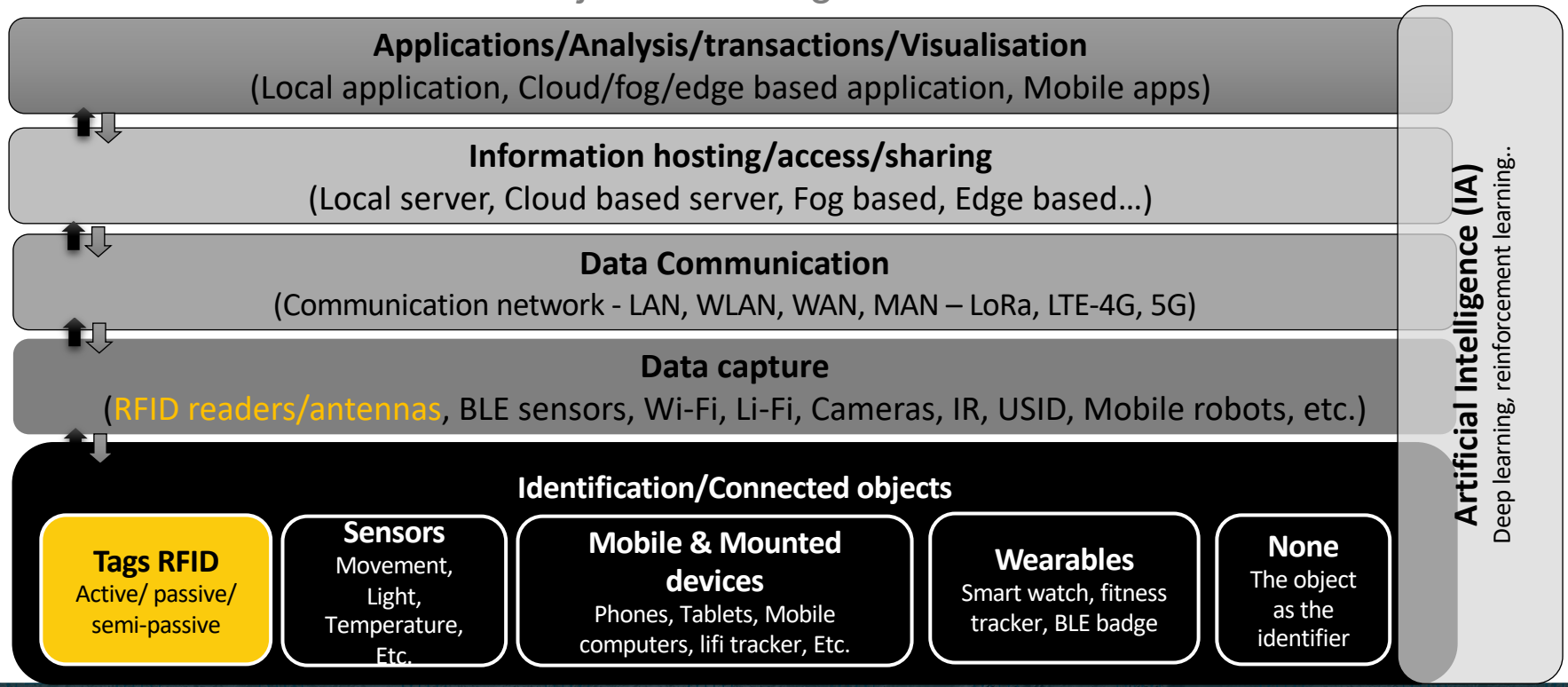
for your specific case?

Image par Gerd Altmann de Pixabay

IoT Infrastructure

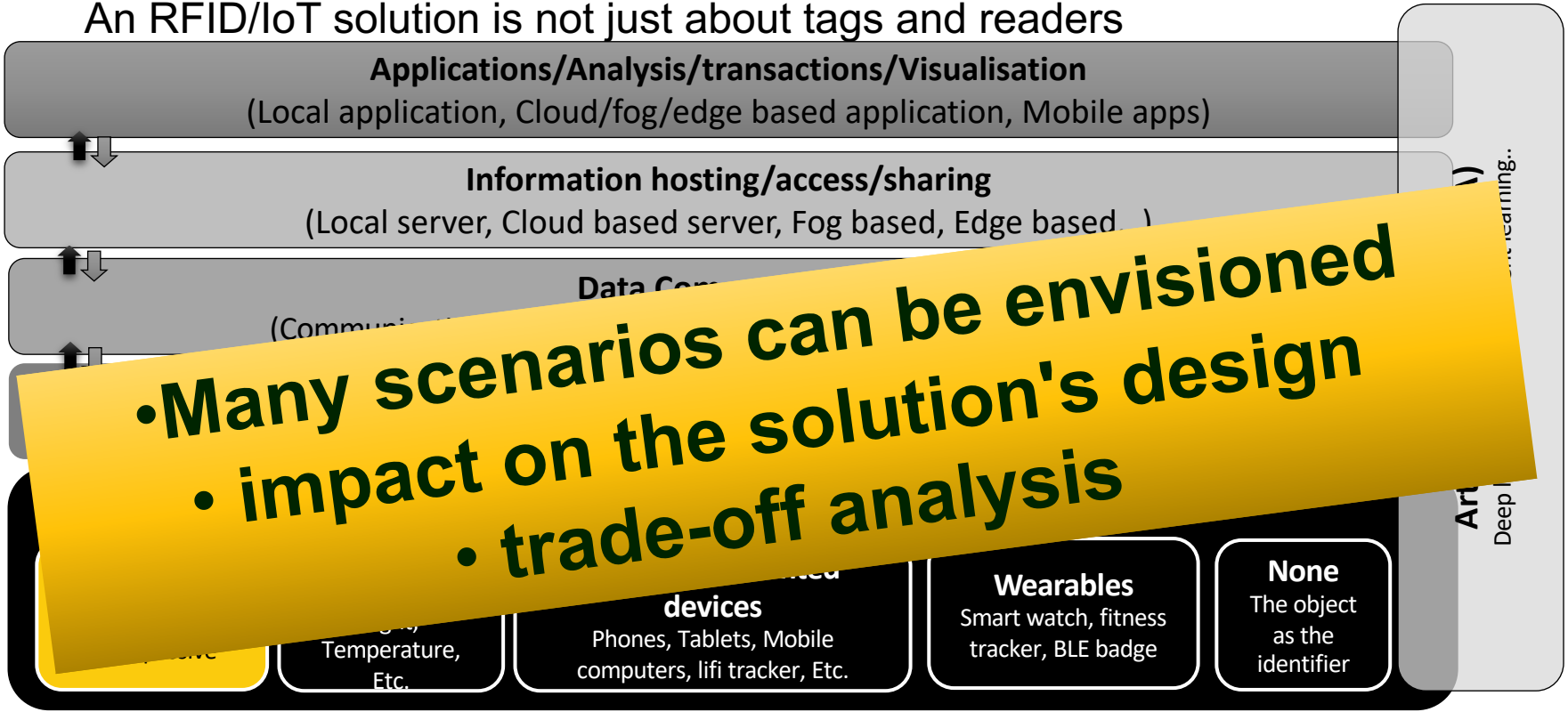
Sources: Bendavid Y. Laboratoire IoT https://labiot.uqam.ca/

An RFID/IoT solution is not just about tags and readers



IoT Infrastructure

An RFID/IoT solution is not just about tags and readers



- Many scenarios can be envisioned
- impact on the solution's design
- trade-off analysis

Select the appropriate RFID tech. for your specific case?

The technology will support your case – **Requirement management**

- Passive RFID (LF, HF, UHF)
- Semi Passive RFID (BAP)
- Active RFID (proprietary 433Mhz, UWB, RFID/IR, RFID/WIFI)
- Hybrid solutions
- BLE solutions (RSSI, AoA)
- LiFi
- Robots
- Drones
- …

Select the appropriate RFID tech.

Some questions for the design of the "to Be" business & technological Scenarios

- **Which application / business process(es)?**
  - **Which** products? **What** level of tagging?
  - **What** functionalities are required for the tags/readers?
  - **What** is the level of process automation? **Automated? Semi-automated?**
  - **Where** will items need to be identified?
  - **How Many** products (tags) at a time?
  - **What** is the speed (reading, commissioning tags, etc.)?
  - **What** is the reading/writing distance?
  - **What** is the required precision and accuracy?
  - **What** is the required latency? Do you need real time ?
  - **What** is the required level of Security ?
  - **With** who to share the info? **Why?**
  - etc

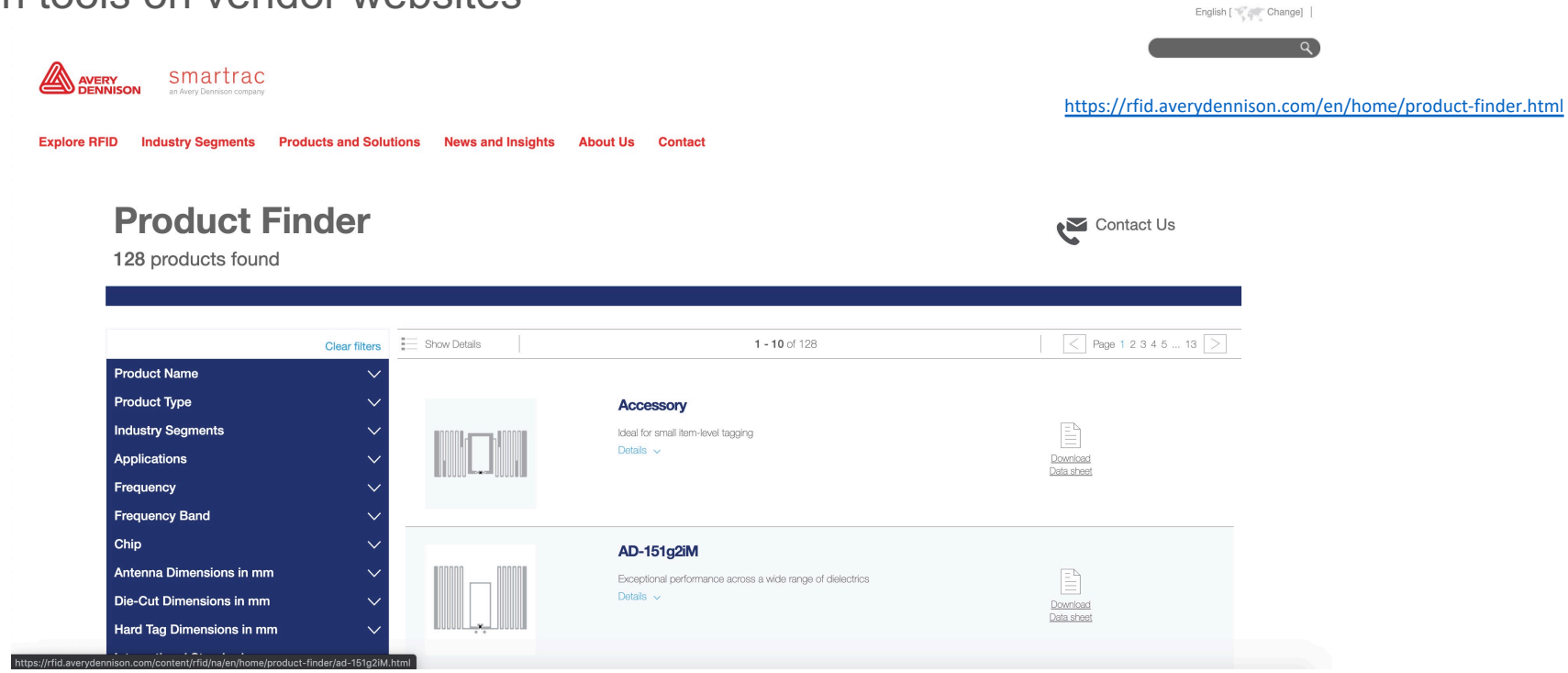
Select the appropriate RFID tech.

Some questions you should ask

- **Business requirements**
- **Technological requirements**
- **Project management constraints**

Select the appropriate RFID tech.

Selection tools on vendor websites

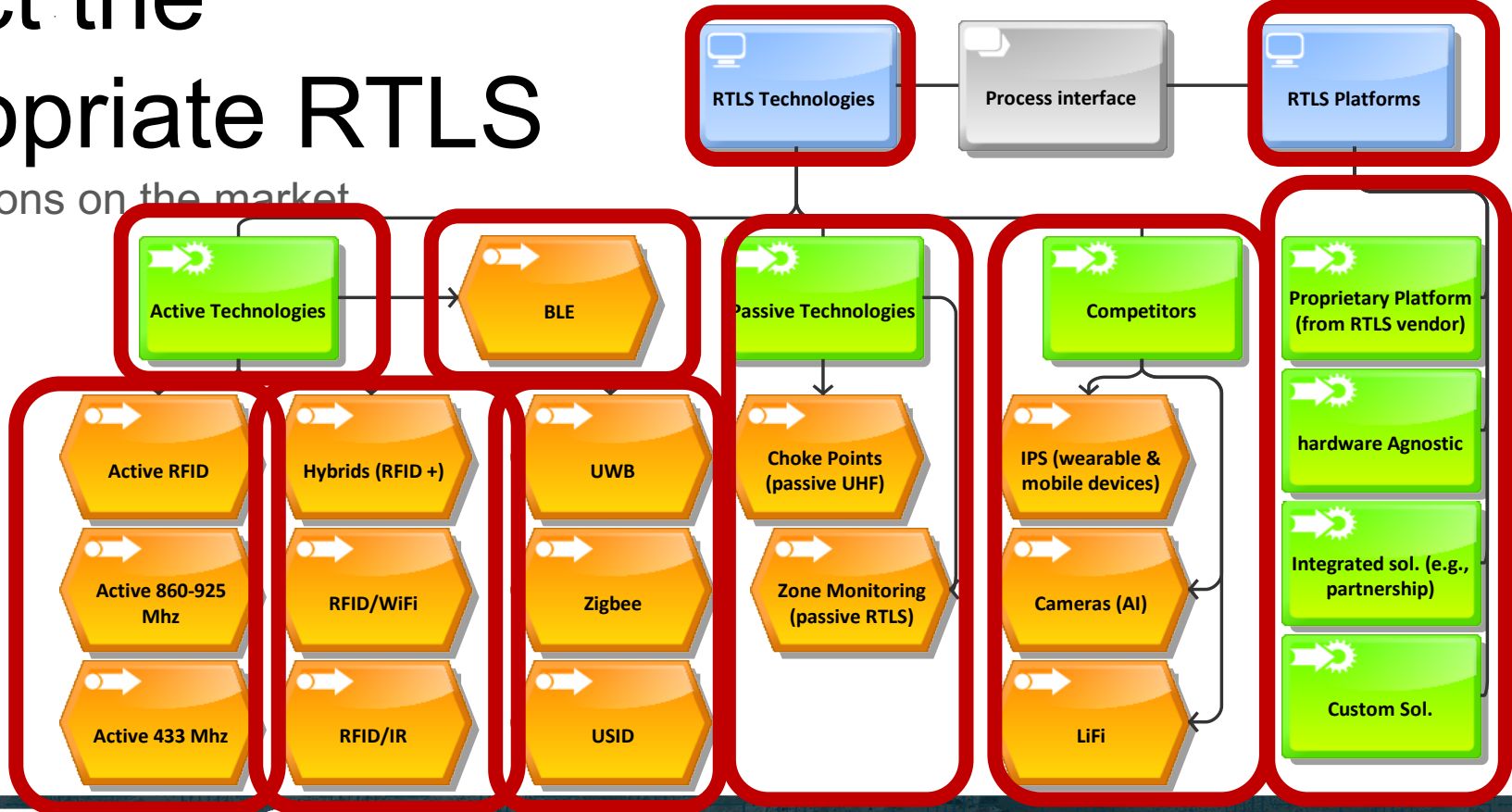


https://rfid.averydennison.com/en/home/product-finder.html

Select the appropriate RTLS

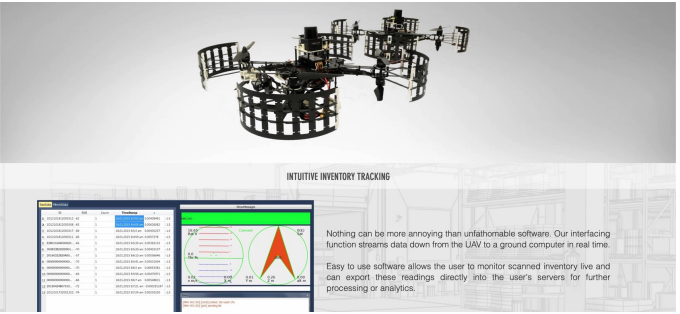
various options on the market

Source : Bendavid Y.
Lab. IoT ESG UQAM
https://labiot.uqam.ca/



Looking at (relatively) emerging solutions…

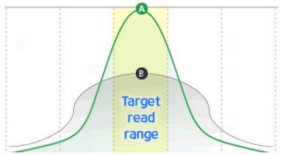
https://www.media.mit.edu/posts/rfly-in-the-news/



https://www.rfidjournal.com/rfid-reading-drone-tested-in-asia-warehouses

RFID JOURNAL

Which one do you prefer
Tag Ⓐ or Ⓑ?



SEND IT YOUR WAY

Newsletter Options

- ☐ General Interest (Thursdays)
- ☐ Europe RFID News
- ☐ Health Care RFID News
- ☐ Manufacturing RFID News
- ☐ Retail Apparel RFID News
- ☑ RFID Journal Event Updates
- ☐ RFID Journal Partner Updates

*Email

Search Results

drone Search

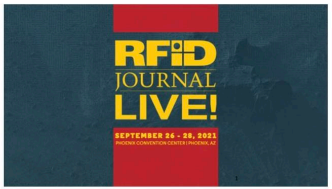
Sort By: ○ Relevance ◉ Date Descending ○ Date Ascending

Your search for ***DRONE*** returned approximately 192 results.

Viewing Results: 1 - 10

How to Take Inventory With Drones

A California Polytechnic State University (Cal Poly) research project has found that an RFID-enabled unmanned aerial vehicle (UAV), or drone, […]

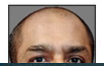


Auterion, Maxon Partner on Drones for Enterprise, Government Use

Jun 4, 2021 ▸ by Rich Handley

The companies will explore long-term opportunities around propulsion systems, autopilot communication, data sharing and real-time monitoring.

Digital Technologies Are Key to Governing Robots and Drones



LABO IOT Internet des Objets ESG UQÀM

RFID JOURNAL LIVE! 20 YRS 2003 - 2022

MAY 17 - 19, 2022

Look at (relatively) new solutions…

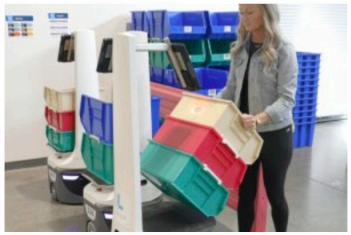
INSIDElogistics

Robotics

Cobot market set for annual growth rates of 20 to 30 percent

April 18, 2022

Maya Xiao, senior analyst at Interact Analysis, discusses how the collaborative robot market is performing as we come out of Covid



Robotics

100,000 mobile robots shipped In 2021

March 24, 2022

The labour shortage and strong e-commerce growth have accelerated manufacturing and logistics companies' plans to automate

Automation

Robots as a service growing in popularity

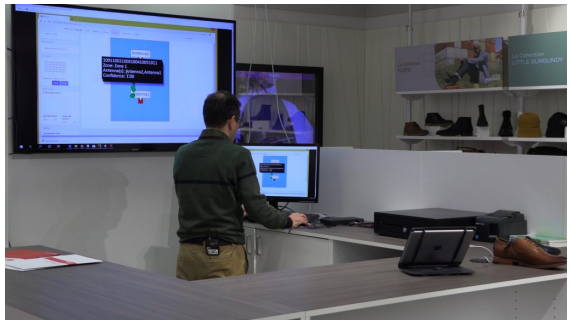
March 10, 2022

Market share already at eight percent, IDTechEx says

https://www.insidelogistics.ca/topic/robotics/

(relativelly) new ones?

Passive RTLS (RF Controls)



Passive RTLS @ the IoT lab. using **RF Controls** antennas and **Avery Dennison** Tags https://labiot.uqam.ca/projets/

Evaluating different options & Selecting the right technologies - *Build your scenarios (an example for receiving)*

What type of tags?

What type of readers?

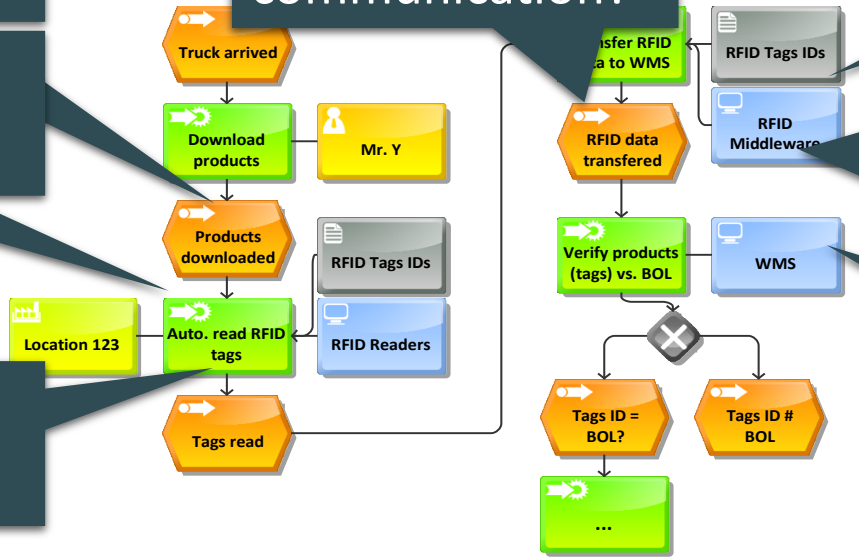
What type of feed back devices?

What type of communication?

What type of data formats?

What type of Middleware platform?

What type of integration?



THANK YOU

RFID JOURNAL LIVE!

20 YRS

2003 - 2022

THANK YOU