# EPC Global Architecture implementation for retail inventory management

## Diogo Correia

1. **Introduction**
   1. **Background and Motivation**•
   2. **Scope**
   3. **Outline**
2. **Basic principles of RFID**
   1. **History of RFID**
   2. **RFID System**
   3. **Tag**

**Passive, Active, Semi-active; Near-field (Inductive coupling), Far-field (Backscatter coupling)**

* 1. **Antenna**

**Overview and Information on UHF RFID Antennas and Considerations**

* 1. **Reader**
  2. **Software and Communication Infrastructure**
  3. **Technologies**

**LF, HF, UHF, Microwave; Material types properties (lucent, absorbent, opaque)**

* 1. **Advantages and Limitations**

1. **GS1 EPCglobal Architecture Framework**
   1. **Overview**

**Activities, Standards, Goals**

* 1. **Global Standardization**

**Importance, Efforts**•, **Current Problems**•

* 1. **GS1** **and** **EPCglobal**•

**History, Origins, Context**

* 1. **Foundations and Technical Principles**

**EPC Uniqueness, Identifiers, Decentralized Implementation, Issuing Organization, …**

* 1. **Dissertation Context**

**What is relevant to the dissertation from the architecture framework, Roles, Interfaces and Standards used and why other things were left out, Outline of what will explained next**

* 1. **Tag Data Standard (TDS)**

**C1G2 and ISO/IEC18000-6 Type C, Tag memory, EPC Structure, coding schemes and representations, GS1 keys relation, encoding of User memory and TID. Talk about Tag Data Translation (TDT). EPC interoperability with barcode.**

* 1. **Identification Keys in Transport and Logistics**
  2. **Filtering & Collection**
  3. **ALE**
  4. **EPCIS Capture Application**
  5. **EPCIS Capture and Query Interfaces**
  6. **EPCIS Repository**
  7. **Core Business Vocabulary**
  8. **Practical Context**

**Nespresso supply-chain example and vision in the context of the EPCglobal framework, how it would work and advantages**

1. **Requirements and Development Options**
   1. **System Requirements**
   2. **Manufacturers and development solutions**

**Comparative analysis**

* 1. **Our choice**

**Justification; bit of detail.**

1. **System Architecture and Development**
   1. **Overall architecture**
   2. **Hello World**

**UHF Evaluation: Programs developed to evaluate the system, serialize and deserialize EPCs, Writing valid EPCs**

* 1. **Cloud and Modern Service Development**

**Explain Linux containers, Docker and modern service development and deployment**

* 1. **RFID Serialization Plan**
  2. **Identification Keys**
  3. **Reader**
  4. **Middleware**
  5. **Capture application**
  6. **EPCIS repository**
  7. **Management application**

1. **Test and evaluation**
   1. **Laboratory tests**

**Put and take**

* 1. **Range of operation tests**
  2. **Operational tests**

**Real case**

1. **Conclusion and Future Work**
   1. **Retell the story from motivation to results**
   2. **Main achievements**
   3. **Future Work**