EPC Global Architecture implementation for retail inventory management

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1. Introduction
   1.1. Background and Motivation•
   1.2. Scope
   1.3. Outline

1. Basic principles of RFID
   1.1. History of RFID
   1.2. RFID System
   1.3. Tag
   Passive, Active, Semi-active; Near-field (Inductive coupling), Far-field (Backscatter coupling)
   1.4. Antenna
   Overview and Information on UHF RFID Antennas and Considerations
   1.5. Reader
   1.6. Software and Communication Infrastructure
   1.7. Technologies
   LF, HF, UHF, Microwave; Material types properties (lucent, absorbent, opaque)
   1.8. Advantages and Limitations

2. GS1 EPCglobal Architecture Framework
   2.1. Overview
   Activities, Standards, Goals
   2.2. Global Standardization
   Importance, Efforts•, Current Problems•
   2.3. GS1 and EPCglobal•
   History, Origins, Context
   2.4. Foundations and Technical Principles
   EPC Uniqueness, Identifiers, Decentralized Implementation, Issuing Organization, …
   2.5. 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
   2.6. 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.
   2.7. Identification Keys in Transport and Logistics
   2.8. Filtering & Collection
   2.9. ALE
   2.10. EPCIS Capture Application
   2.11. EPCIS Capture and Query Interfaces
   2.12. EPCIS Repository
   2.13. Core Business Vocabulary
   2.14. Practical Context
   Nespresso supply-chain example and vision in the context of the EPCglobal framework, how it would work and advantages

3. Requirements and Development Options
   - 3.1. System Requirements
   - 3.2. Manufacturers and development solutions
     Comparative analysis
   - 3.3. Our choice
     Justification; bit of detail.
4. System Architecture and Development
   - 4.1. Overall architecture
   - 4.2. Hello World
     UHF Evaluation: Programs developed to evaluate the system, serialize and deserialize EPCs, Writing valid EPCs
   - 4.3. Cloud and Modern Service Development
     Explain Linux containers, Docker and modern service development and deployment
   - 4.4. RFID Serialization Plan
   - 4.5. Identification Keys
   - 4.6. Reader
   - 4.7. Middleware
   - 4.8. Capture application
   - 4.9. EPCIS repository
   - 4.10. Management application
5. Test and evaluation
   - 5.1. Laboratory tests
     Put and take
   - 5.2. Range of operation tests
   - 5.3. Operational tests
     Real case
6. Conclusion and Future Work
   - 6.1. Retell the story from motivation to results
   - 6.2. Main achievements
   - 6.3. Future Work