# TrakChain – High-resolution Traceability Systems

The global economy depends on a wide range of supply chains that transfer goods from producers to consumers. **Supply chain management (SCM)** solutions focus on the planning and execution of the chains, integrated with the companies' **enterprise systems (ERP)**. Its ultimate goal is to make the right amount of products arrive to the destination, in the least time and with the least cost. The main obstacle to their effectiveness is **outdated and imprecise information**.

Traceability

RFID technology allows automated data capture about physical goods using tags in the products and an infrastructure of readers. With it, higher resolution traceability systems can be built that give more answers: **Where are the goods? Where have they been? What is their state? How many goods are at a location?**

Integration is ensured by the hardware and software standards from *GS1 Electronic Product Code* (EPC), namely *Discovery Services* and *Information Services*. The major technical challenges are **scale** – *the management of data sets on a world scale* – and **security** – *the definition and enforcement of highly dynamic data sharing policies.*
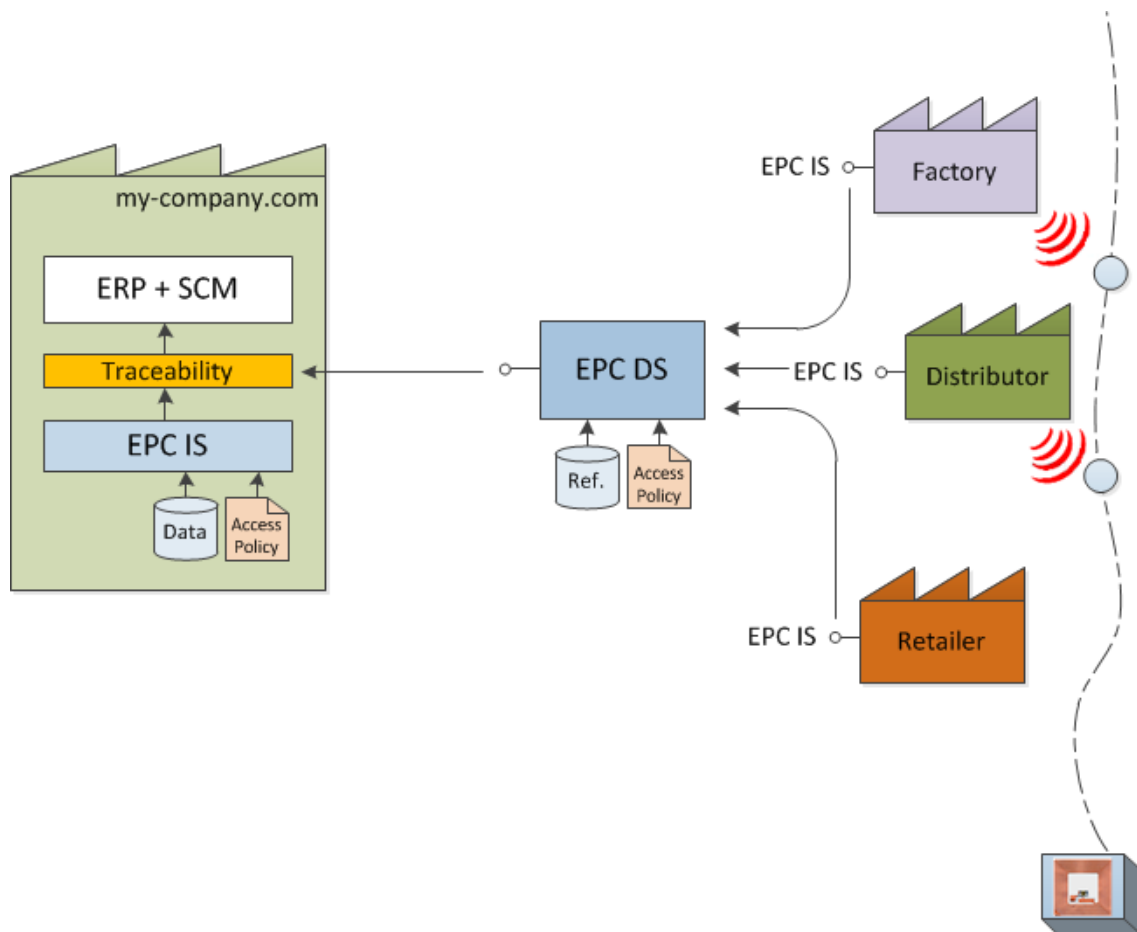
Data relevant for the project

TrakChain is an assessment framework that contains a set of tools to estimate and measure the computational and communicational effort of operating traceability networks. Starting from the business queries, it can estimate response times, validate functionalities, define and test security policies.

The TrakChain project is a part of Miguel L. Pardal's PhD, started in 2008, advised by Prof. José Alves Marques (Técnico Lisboa) and by Prof. Sanjay Sarma (Massachusetts Inst. of Tech., USA). The research is aligned with GS1 normalization efforts.

With just a few statistics it can analyze and compare alternatives that can improve your business, follow legal requirements and respond to new opportunities. It can also use detailed scenario descriptions for deeper analysis.

Informational entity	Examples of data relevant to the research
Product	- Distribution of products by category - Number of items for each type of product - Time in the chain - Incoming/outgoing quantities per location per day - …
Supplier	- Suppliers by product category - Middle-men (chain length) - Transportation - Frequency and size of orders - …
Customer	- Customers by product category - Rate of consumption and seasonality - Frequency of orders - …
Information Systems	- Stock management and update needs - Production planning and change response needs - Recall, pedigree,　bill-of-materials, asset management, etc. – When? How often? Which granularity? - …

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