

Accelerating lead times and inventory with Knowledge Graphs at Nokia and RFS.



Markus Freudenberg, Data & Knowledge Engineer @ eccenca.

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Gartner Cool Vendor in Intelligent Supply Chain Execution Technologies 2018.
Top10 GDPR Solution Provider 2019.

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AGENDA.

- 1. RADIO FREQUENCY SYSTEMS (RFS):**
Key figures and digitization challenges
- 2. FIRST THINGS FIRST:**
Building the knowledge graph foundation for future success
- 3. INTEGRATING SUPPLY CHAINS:**
Work with ASCM
- 4. STEPS INTO THE FUTURE:**
Turning data to money

KEY FIGURES

BUSINESS UNITS

4

- Cables
- Antennas & Filters
- Microwave Antennas Solutions
- Broadcast & Defense

REGIONS

4

- NAR
- EMEA
- APAC
- LATAM

35+

sales and technical support
offices in more than

20 countries

8

manufacturing facilities to
serve the world

Australia, Brazil, China, France,
Germany, India,
United Kingdom and the US

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Read: disparate systems with lots of data

KEY CHALLENGES & SHORTCOMINGS

- Every location had a unique data model for their products
- No comparability between products, warehouses and production data

Resulting in

- No streamlined procurement, production planning, inventory and sales activities
- No knowledge transfer about Best Practices
- High inventory stock and restricted revenue streams

»Our vision is a digital, agile supply chain that connects suppliers and customers through manufacturing by means of seamless data integration and e2e digitization of operations.«

**Thomas Gaal,
Director Digital Transformation RFS**



2018

Linking all product data in an eccenca knowledge graph



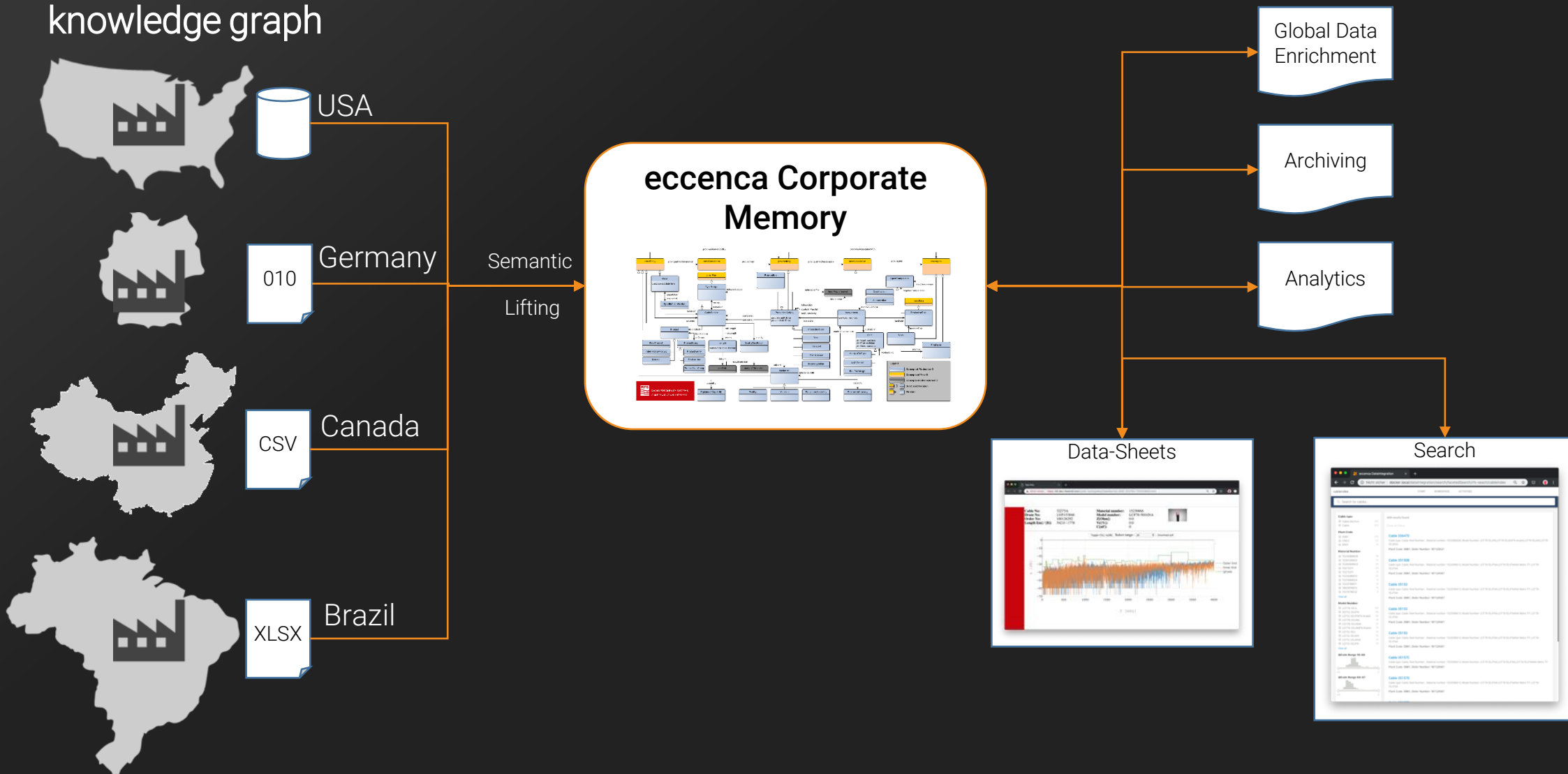
DIGITAL TWIN PRODUCT

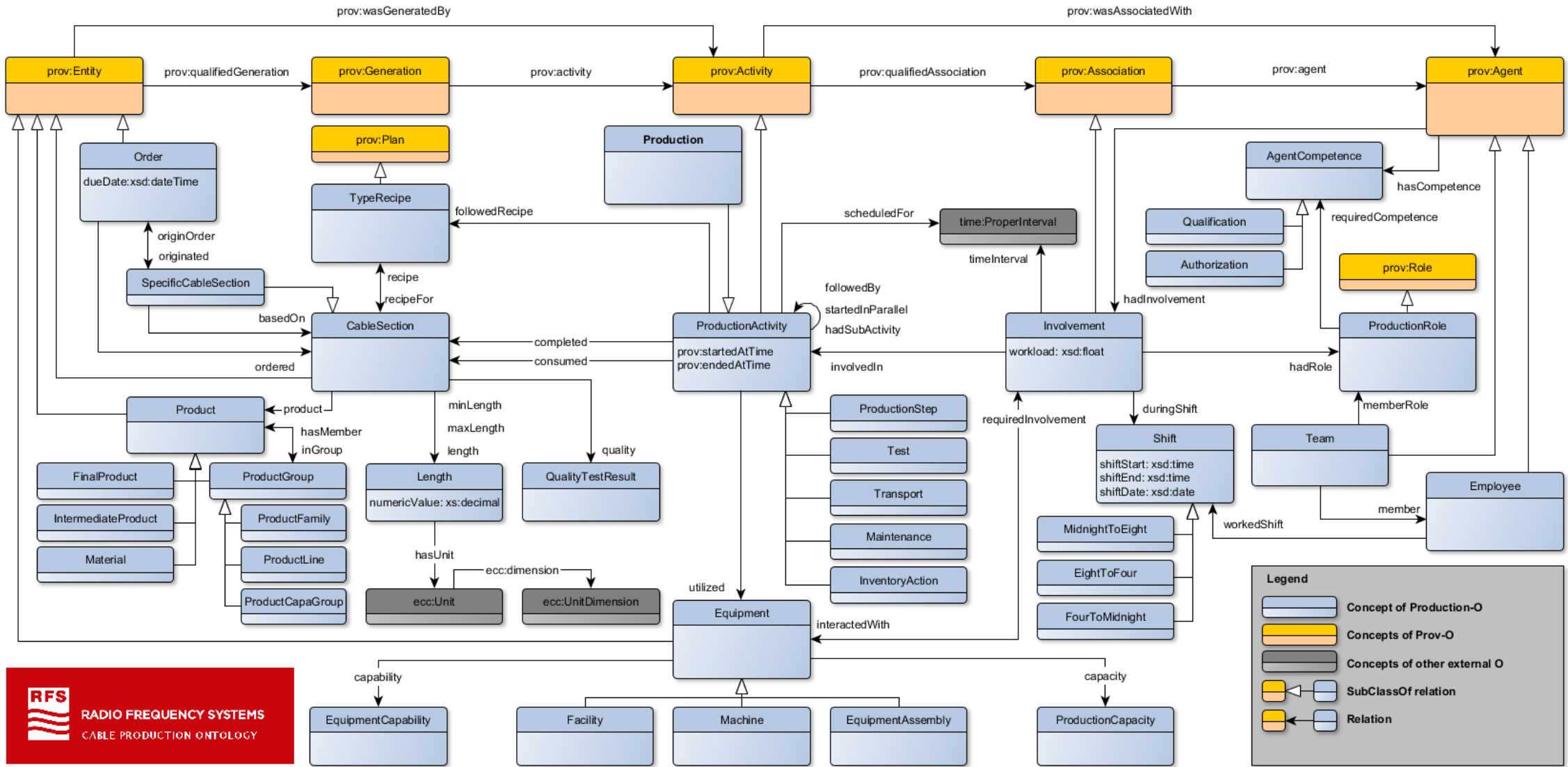
Objectives

Global, virtual warehouse of inventory
Standardized performance test characteristics

2018

Linking all product data in an eccenca knowledge graph





2018

Linking all product data in an eccenca knowledge graph

12%
Inventory reduction within 3 months

50%
Lead-time reduction

200%
ROI within first six months



DIGITAL TWIN PRODUCT

Results

Improved Order To Delivery global cross-fulfillment

New business process capability Global S&OP inventory netting

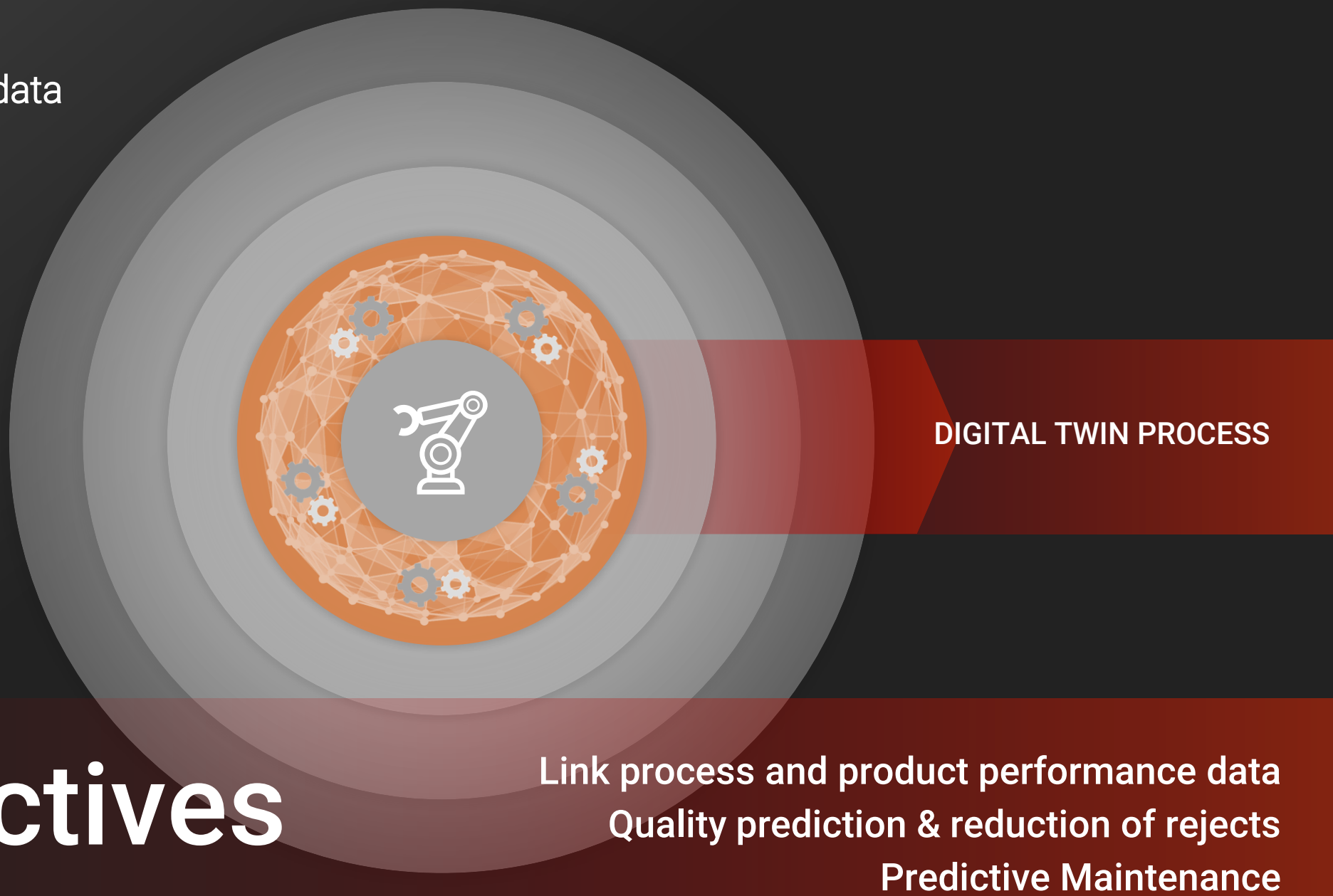
*»We've enabled **data agility** by creating a **semantic data architecture** embedded in our enterprise IT architecture. We **reduced 20 man-months** of transactional effort in internal processes, and are in discussion with suppliers and customers to **collaborate with exchanging data** thus moving away from EDI and supply portals.«*



Thomas Gaal,
Director Digital Transformation RFS

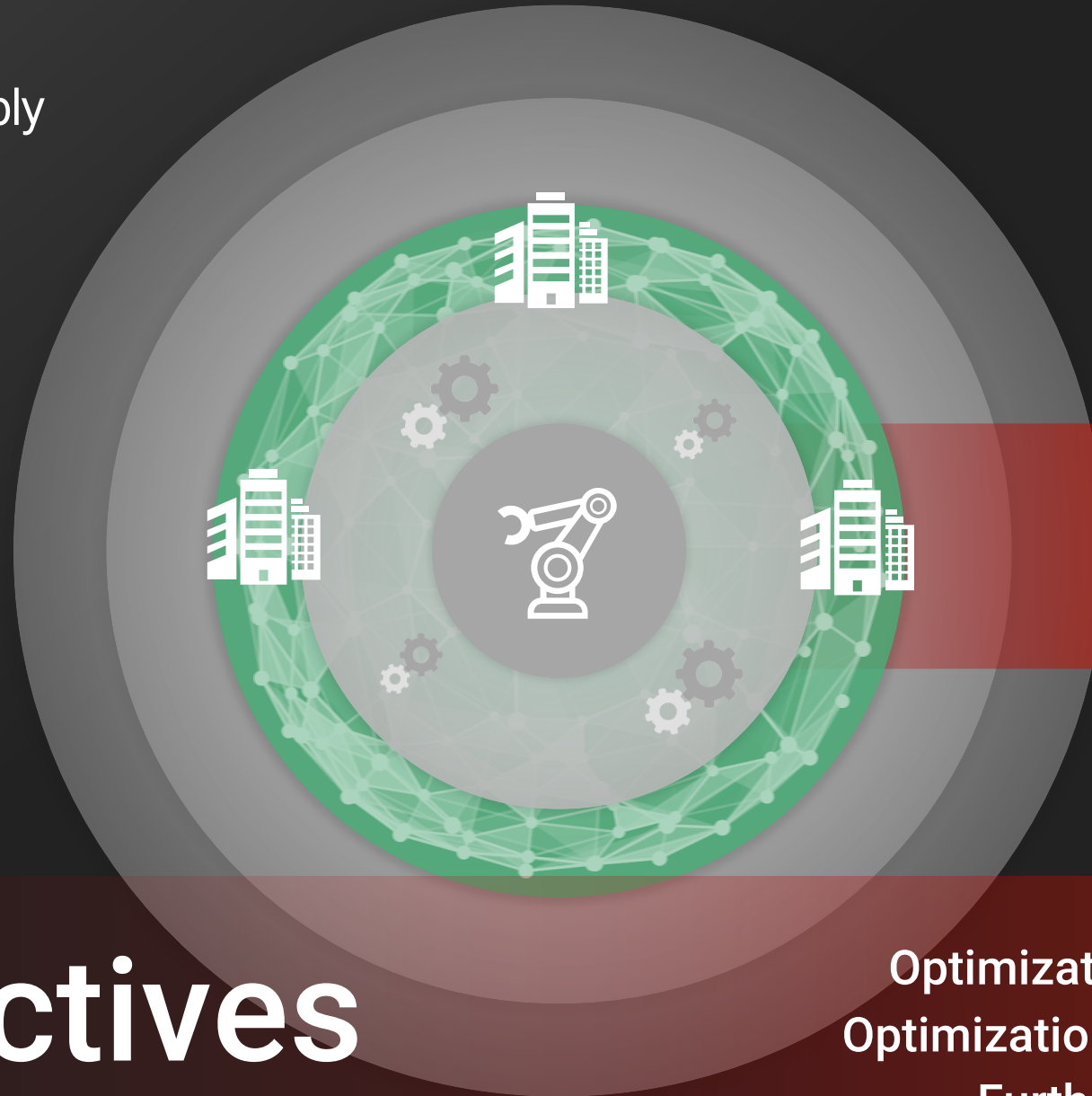
2019

Leveraging IoT data
for production
optimization



2020

Optimizing Supply Chain



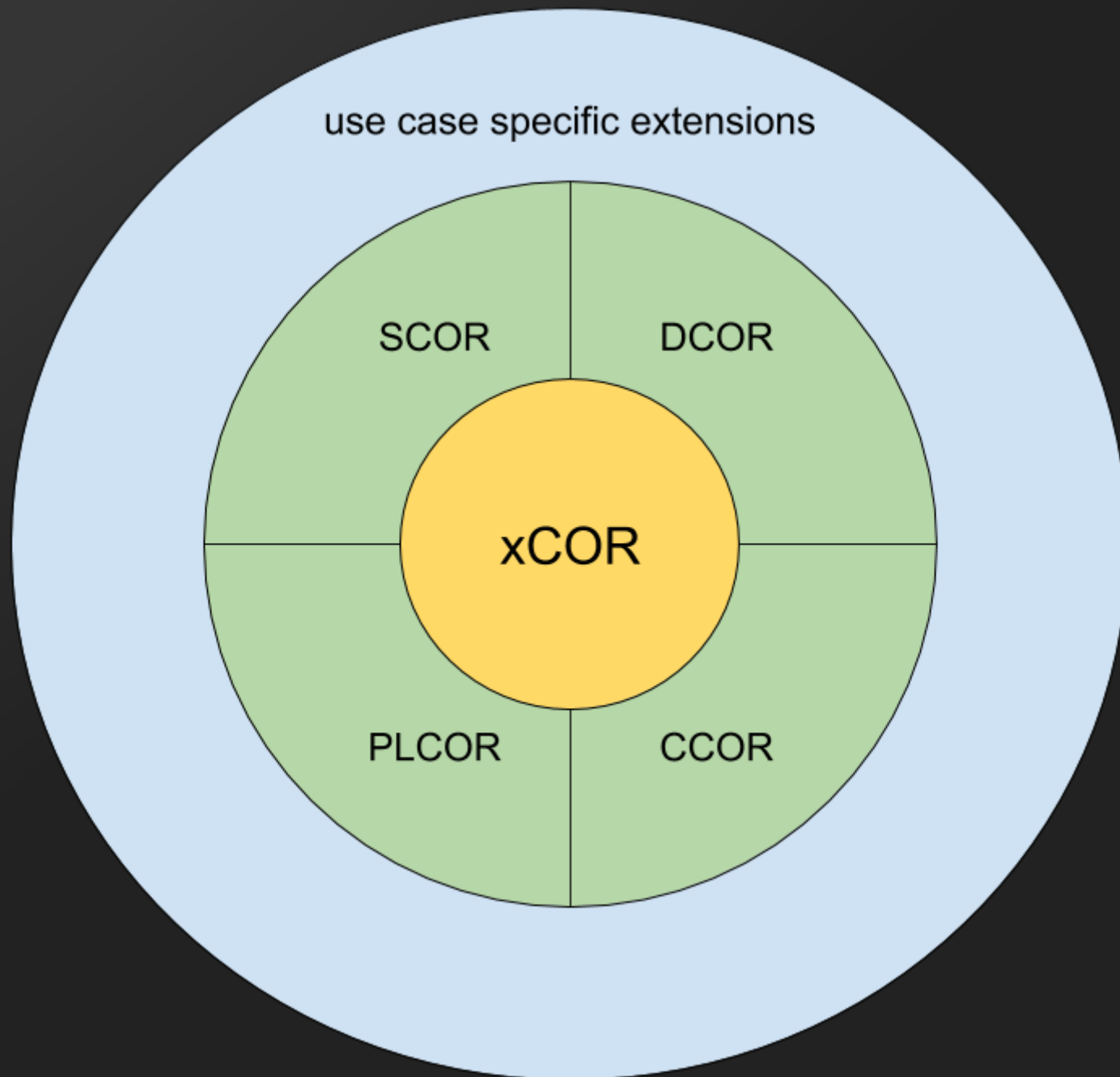
DIGITAL TWIN PARTNERS

Objectives

- Optimization of supplier contracts
- Optimization of plant load balancing
- Further reduction of lead-time

Supply Chain Integration using SCOR

- Supply Chain Operations Reference model
- Under the patronage of the Association for Supply Chain Management
- Create an ontology reflecting the collected and combined knowledge
- Abstracting an upper level ontology – xCOR
 - Covering all sub domains (SCOR, DCOR, CCOR, PLCOR)
- Integration of multiple existing taxonomies (Processes, Metrics, etc.)
- Portraying implicit knowledge, introducing additional (Agents, Events, Units, etc.)



Supply Chain Integration using xCOR/SCOR

- Capable of answering typical SCOR queries
 - Suitable metrics for a given SC process
 - Validating a given process chain
 - Best practices for specific metric short fall
- Providing additional support for new concepts
 - Which event class may influence a given SC Process and its resulting metrics
 - Linking plans to a specific process, involved agents, etc.
 - Pointing out internal guidelines, statutes or other types of policies observed or otherwise relevant.

Supply Chain Extension using xCOR/SCOR

- Covering typical and pressing use cases
 - 3 / 4 way matches
 - Mapping disparate and intricate data to calculate high-level KPIs
 - Demand Driven Material Requirement Planning
 - Increasing visibility along the supply chain
 - Gaining high-level insights based on data of different departments, customers, suppliers, supplier-suppliers ...
 - Automating process validation, policy adherence, supporting audits

Coordinating RFS production worldwide

- RFS plans to add their supplier and distributors to their production management.
- Currently, every plant has its own contracts and delivery schedules with suppliers.
 - Missing opportunities in MRP (discounts, continuous replenishment, trust)
 - Ordering from different suppliers in small batches
- Need for aligning their global demand and procurement processes based on **unified and shared** information landscape (model + graph + understanding)
 - Establishing a global procurement process
 - A globally coordinated production process (load balancing)
 - Basing these processes on shared product descriptions, global requirements planning data (same format, same schema)

Coordinating RFS production worldwide

- Streamlining processes that have a direct effect on their entire supply chain
 - On time material delivery / availability -> through balanced stock management
 - Optimized contracts
 - faster delivery of finished goods
 - (Semi-) automated product and process validation

2020

Data-driven services and
value propositions



**NEW BUSINESS
OPPORTUNITIES**

Objectives

- Availability driven pricing (premium-price delivery)
- Quality data as an asset for upselling
- Increased conversion with new services (track & trace)

SUMMARY

DIGITAL TRANSFORMATION
IS ALL ABOUT LINKED,
SMART DATA.

eccenca @ SEMANTiCS.

Booth

Visit us at booth 7.

TALKS

Tuesday

- Product Demo: 10:30 am | Session 1.6
- Knowledge Graphs for GDPR Management: 10:30 am | Session 1.5

Wednesday

- Knowledge Graphs for Smart Supply Chains: 11:45 am, Session 5.1
- Knowledge Graph driven Business Digital Twins: 3 pm, Session 6.1
- Knowledge Graphs for Smart Textile Innovation: 3 pm, Session 6.3

Thank you.



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