Multiagent-based agile manufacturing: requirement-driven low cost production

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Overview of this presentation

- Introduction (scope of our research)
- Agile manufacturing
- Architecture
- Implementation
- Webinterface
- Result
- Conclusions

Manufacturing Challenges

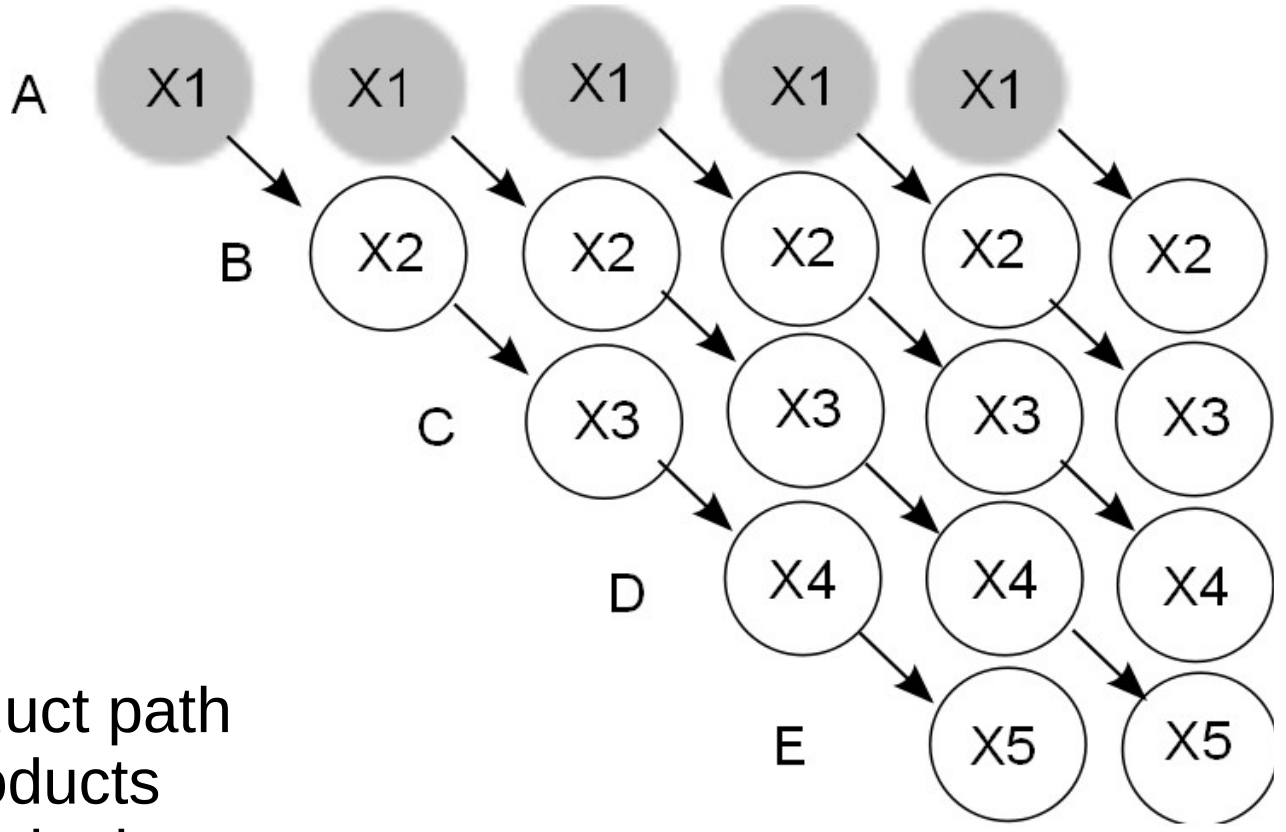
- Short time to market
- Customer specific products
- Small quantities

Grid production

- Based on a grid of versatile production platforms (called equiplets)
- Agile and scalable software infrastructure

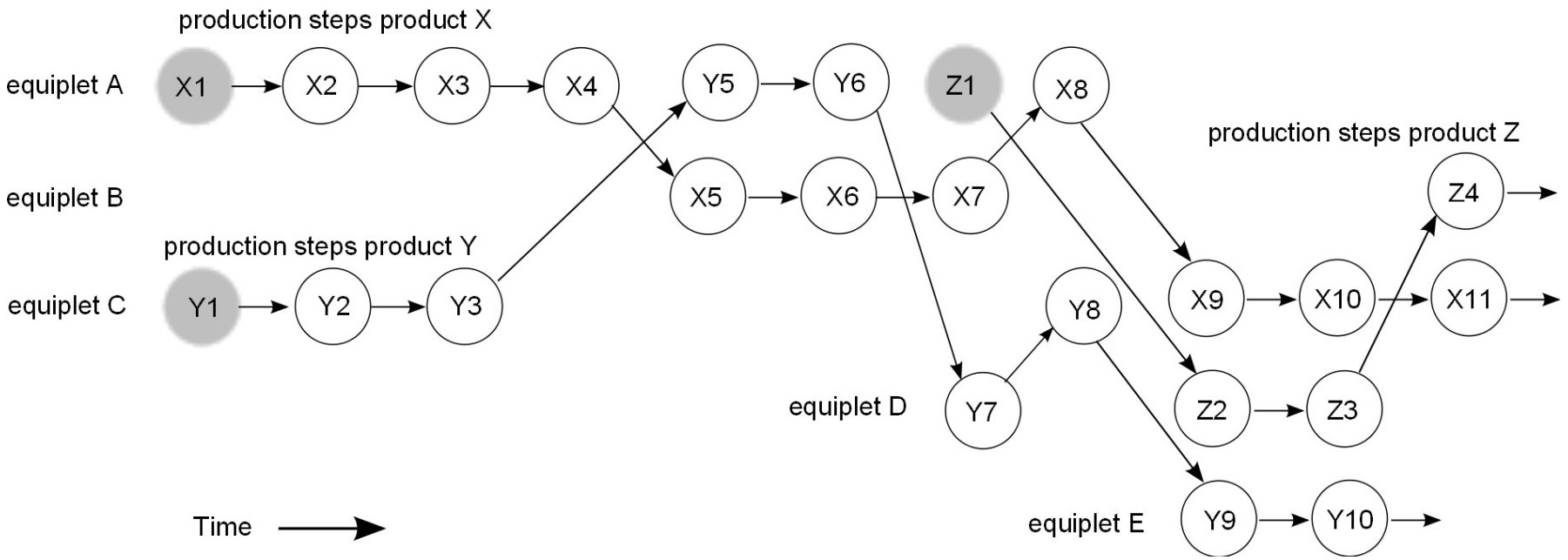
Equiplets with different frontends

Classic pipeline production



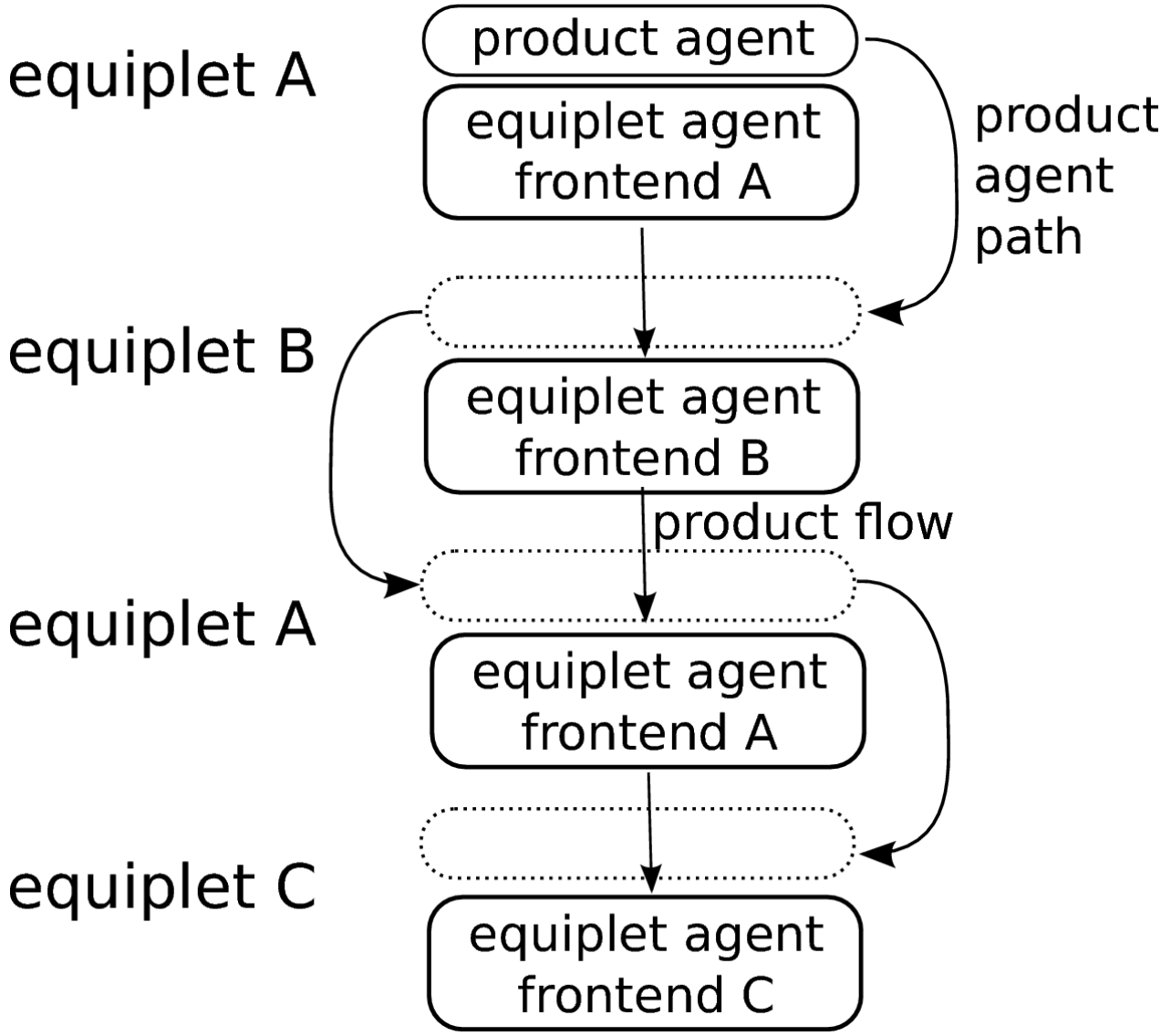
Fixed product path
Similar products
Huhge batch size

Grid production



Different product paths (product threads)
Different products (multi parallel production)
Small batches or single product manufacturing

Product agent and equiplet agents



Multiagent production

Equiplet agents have a frontend (thus a set op production steps)

Equiplet agents publish these production steps on a blackboard

Equiplet agents wait for product agents to arrive

Equiplet agents send production information to product agents when performing a production step

Software infrastructure solution

- Every product is (possibly) unique
- Every product has its production steps

- A product agent **represents the product** and knows **what** (production steps) to do
- An Equiplet agent **represents the equiplet** and knows **how** to do (certain production steps)

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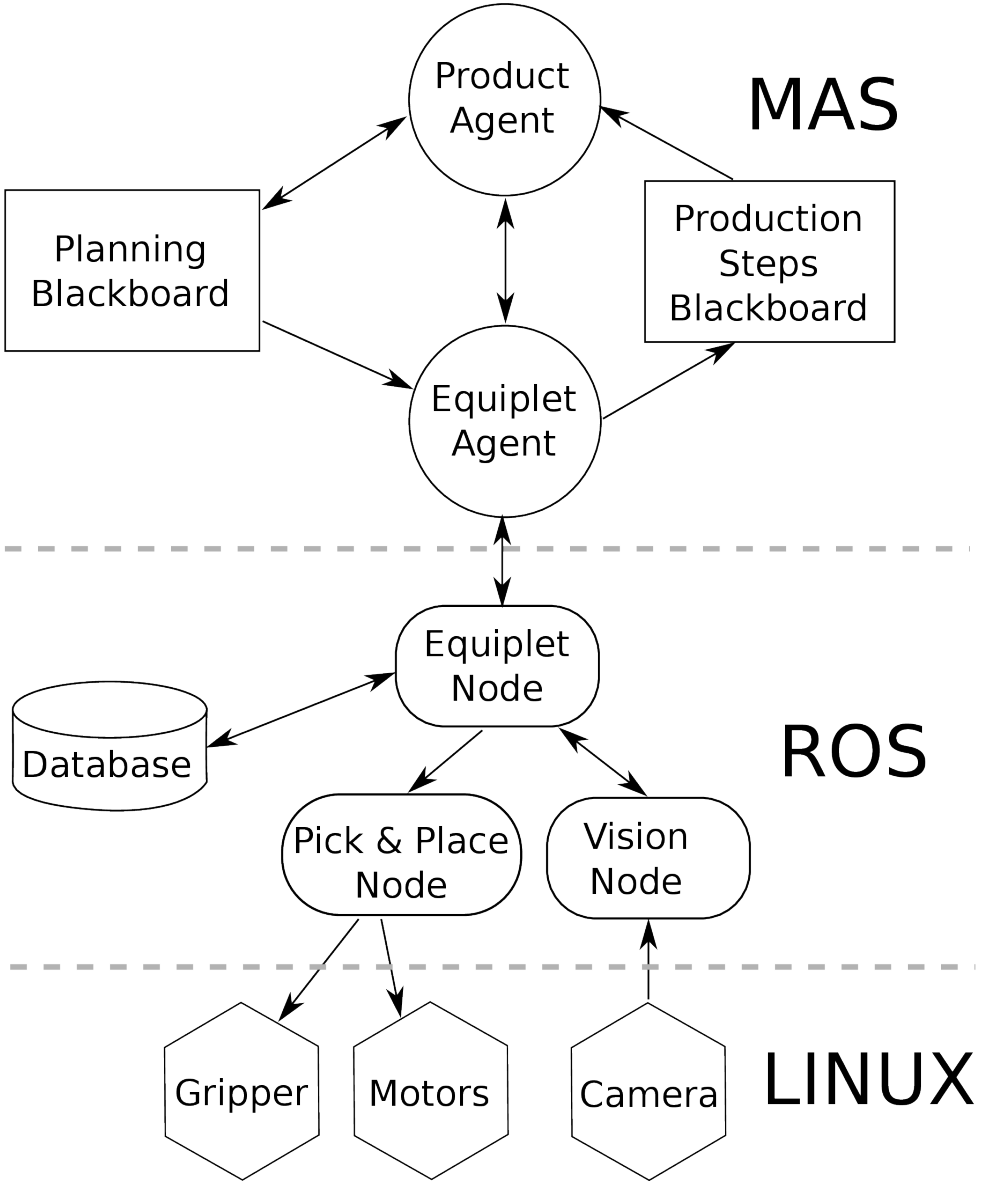
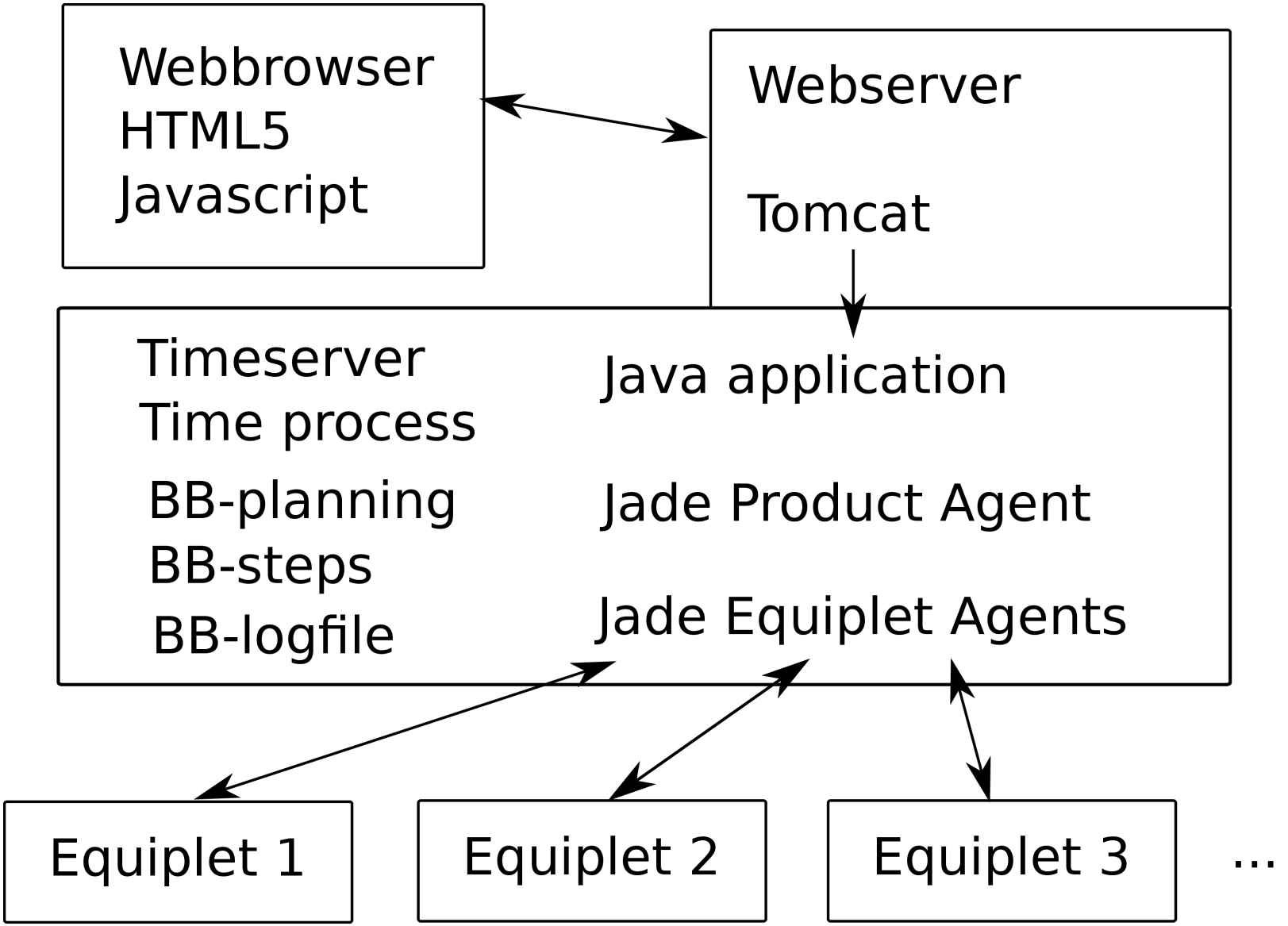
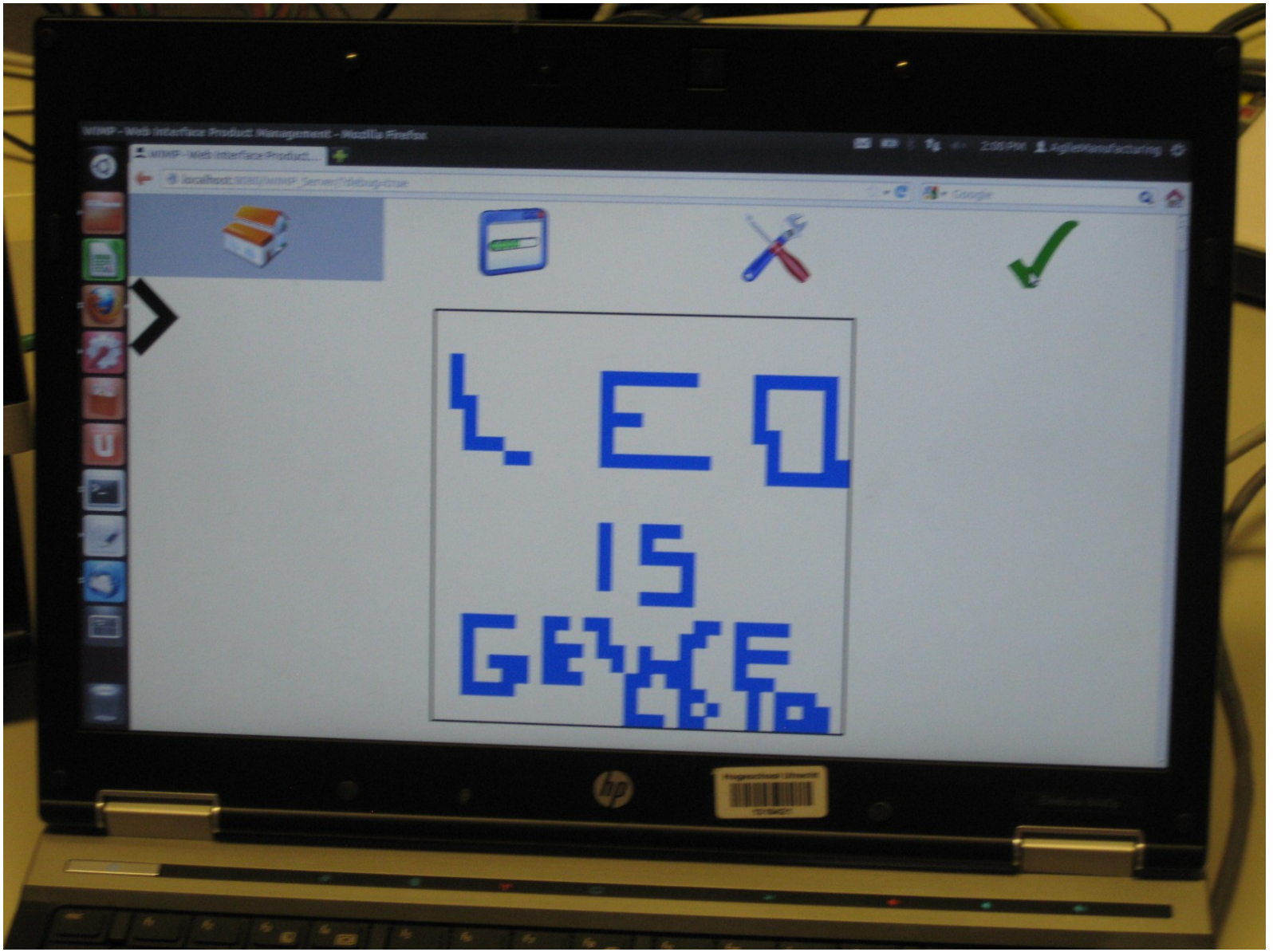
Architecture



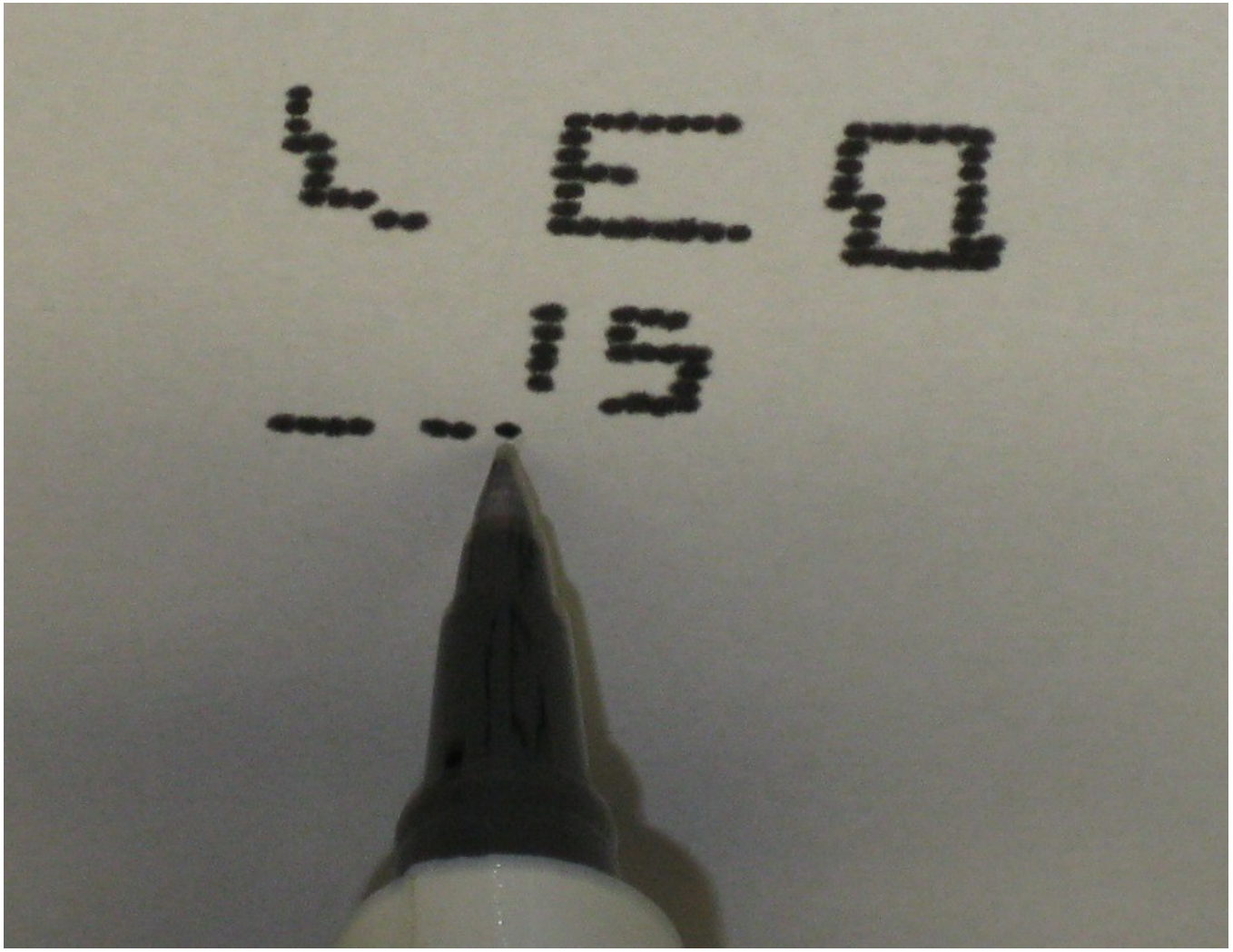
Implementation



Web interface



Result



Conclusion

The concept has been implemented in an experimental setup

Agent technology fits well to a distributed infrastructure

Concept can be the basis of product agents in the life cycle of a product

The product agent is a good candidate to represent the product in the Internet of Things

Thank you!
Questions?