

**10 VIEWS
IN 1 DAY**

**SWISSED14 PRESENTATION
MARCEL FRIKART
FRIKART ENGINEERING GMBH**



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PRESENTER

Marcel Frikart, 37, Berne/Switzerland

Founder & CEO of FRIKART Engineering GmbH

Dipl. El.-Ing. FH

Systems Engineer / Project Leader

INCOSE GfSE/SSSE WG co-chair “systems of moderate complexity” (MkS)

15 years of experience in the development of safety critical systems

Medical Device Industry

MOTIVATION

**“DON'T GIVE
ENGINEERS
TIME!”**

Peter Hoffmann
Former Chief Systems Methodologist at IBM Rational
IBM Rational Harmony Deskbook

FOCUS

Showing the benefit of a one day systems architecting investment for a client in the machine industry

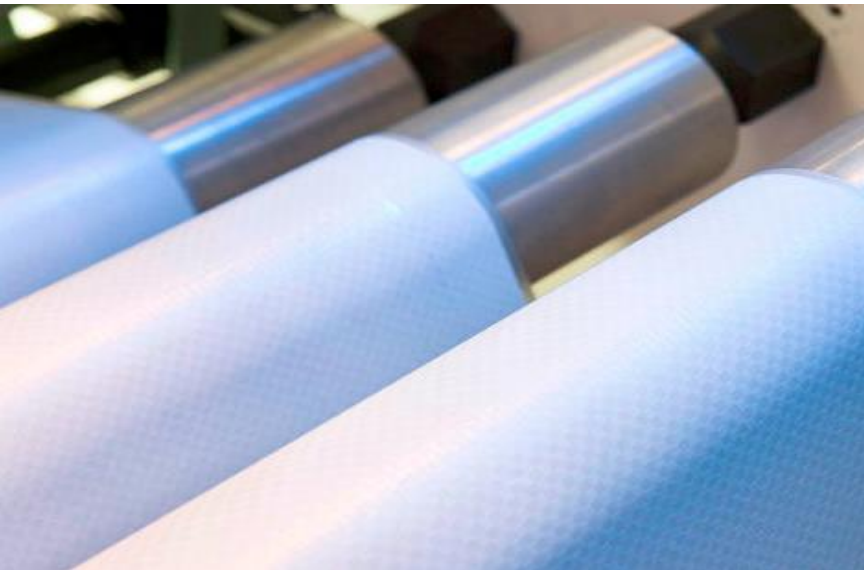
- Support the client's quotation and feasibility phase of a new, special packaging machine design
- Providing diagrams for project communication
- Systems architecture to validate existing draft system design and cost estimations

Case study for a pragmatic hands-on systems engineering approach for KMUs (no SE role, low budget, no time, technol. expertise, limited method skills)

- Introducing holistic systems engineering thinking
- Structured analysis and systems architecting prior to design
- Modelling with UML/SysML with a suitable tool

PROJECT

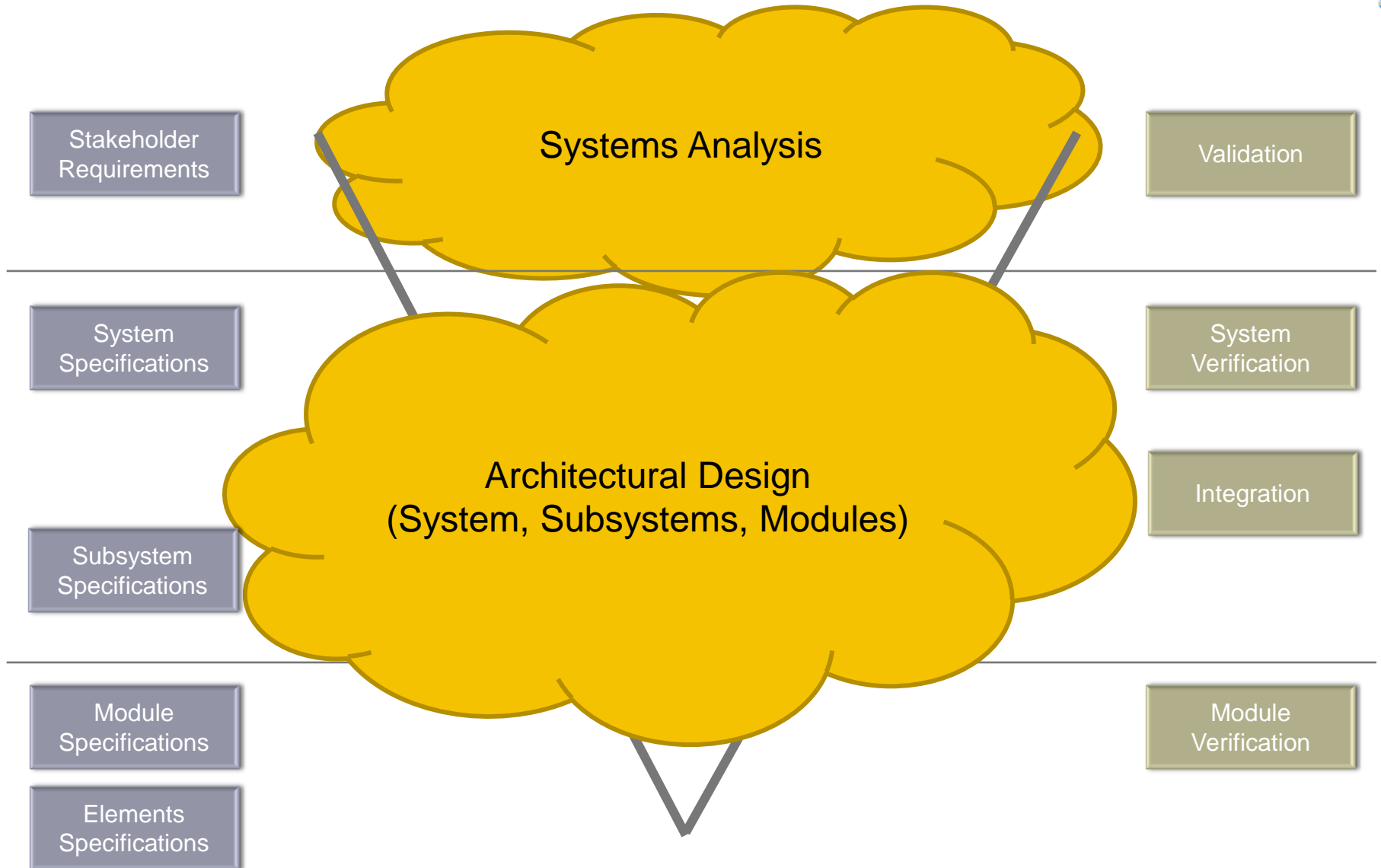
Client: machine / plant engineering company, ~40 employees, develop and manufacture highly specialized machines and facilities for customers across different industries



Project: new packaging machine, 0-Series = 5 pcs

Draft construction available, functional modules identified, feasibility proven, focus on technology, detail design, mechanical aspects

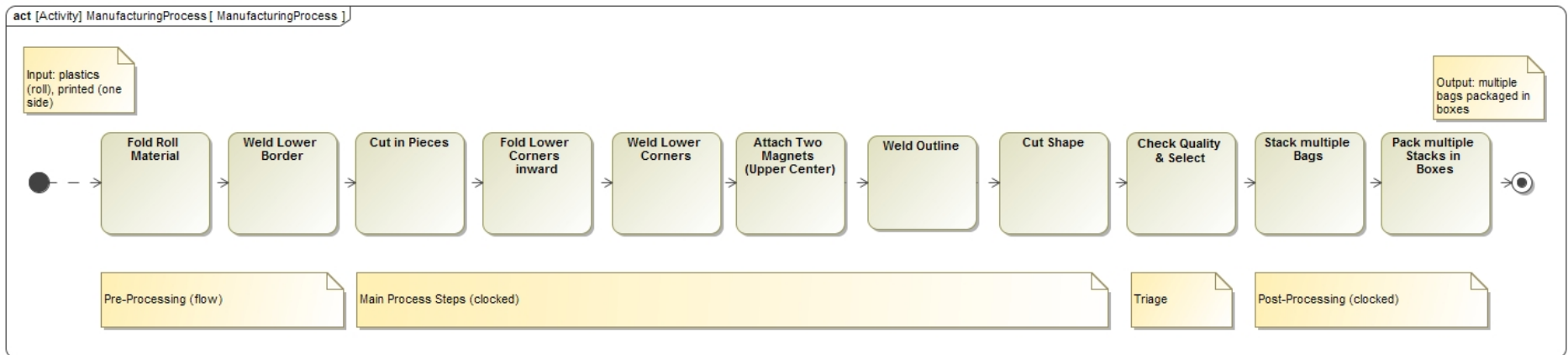
V MODEL



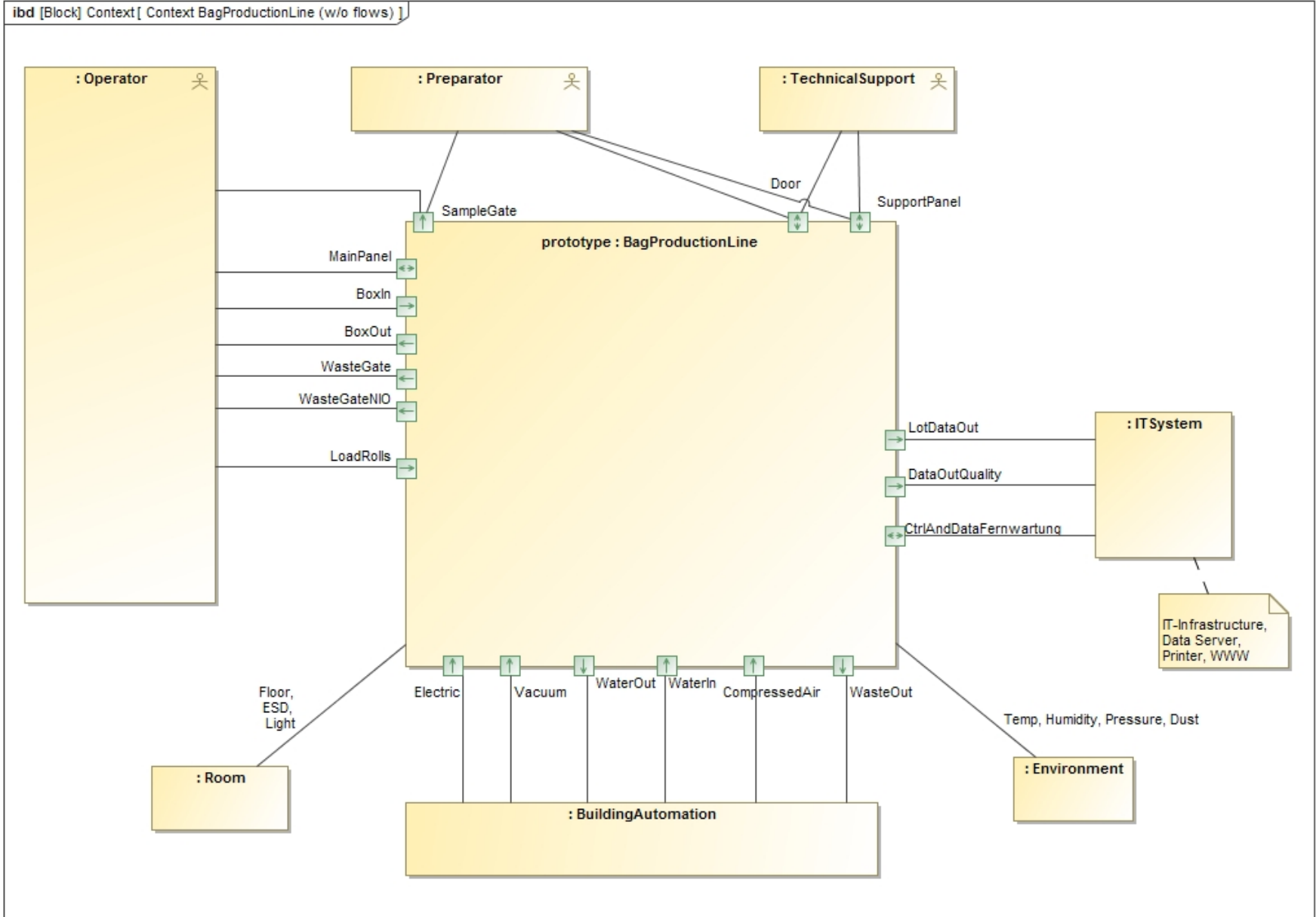
PRODUCTION OUTPUT



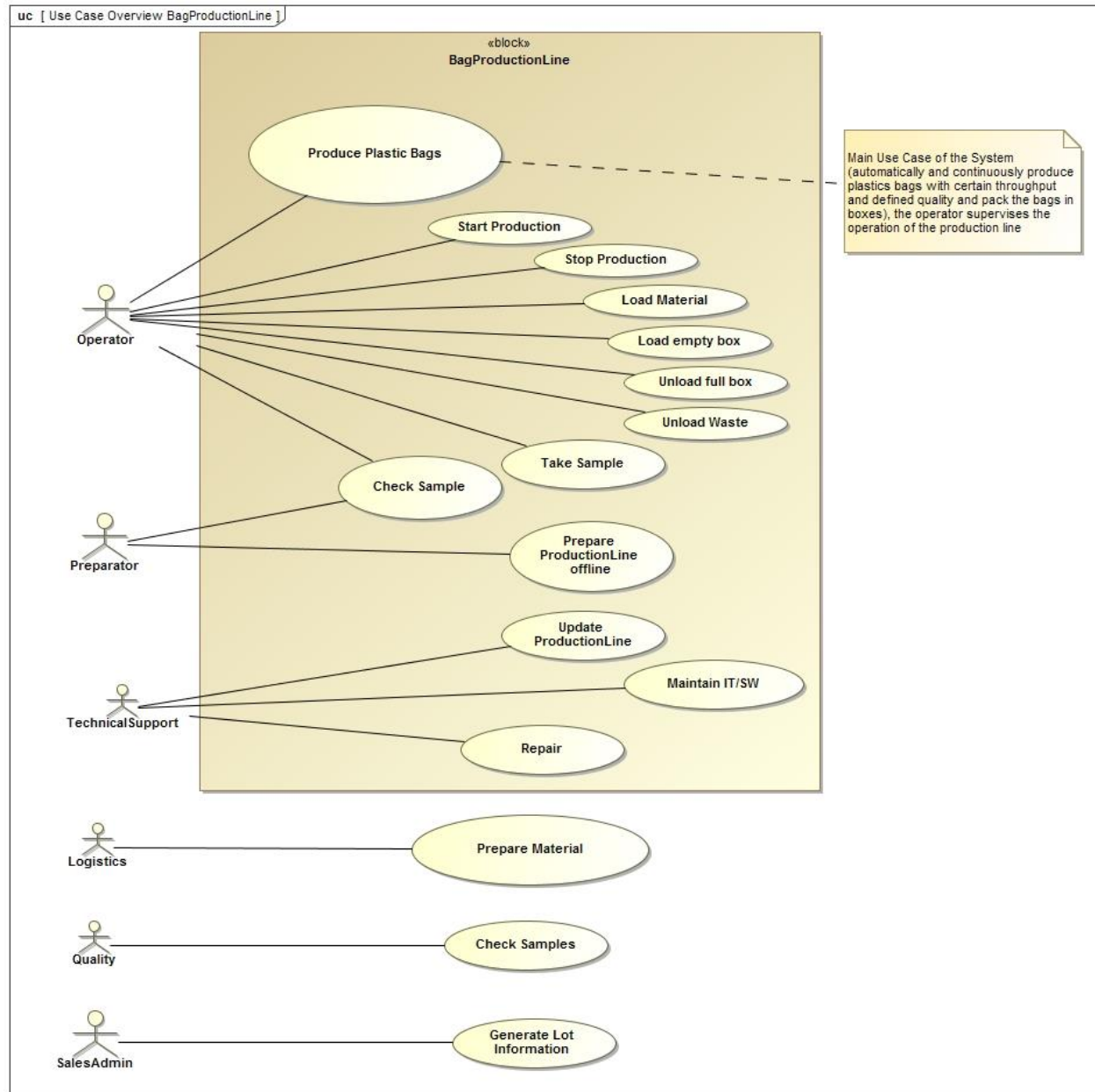
[1] PROCESS/WORKFLOW



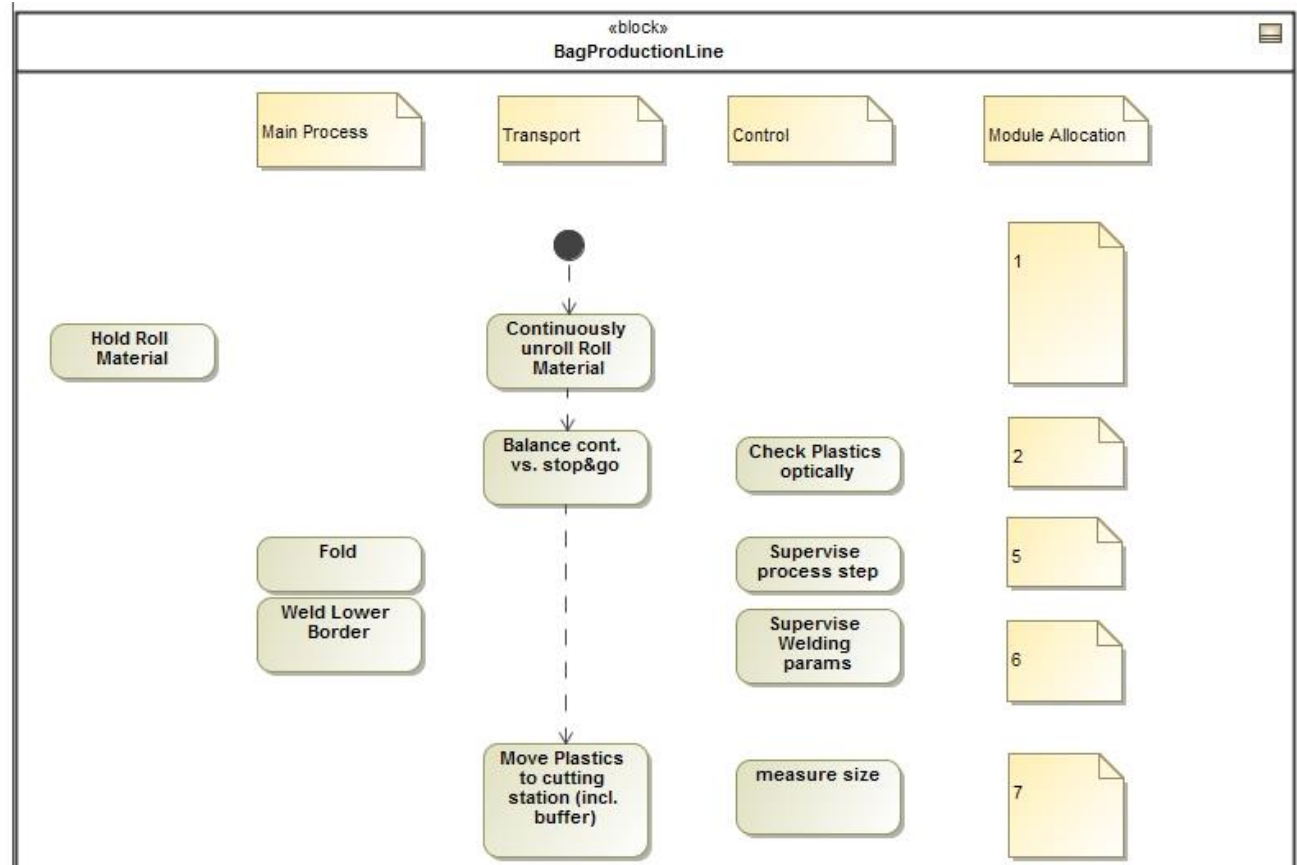
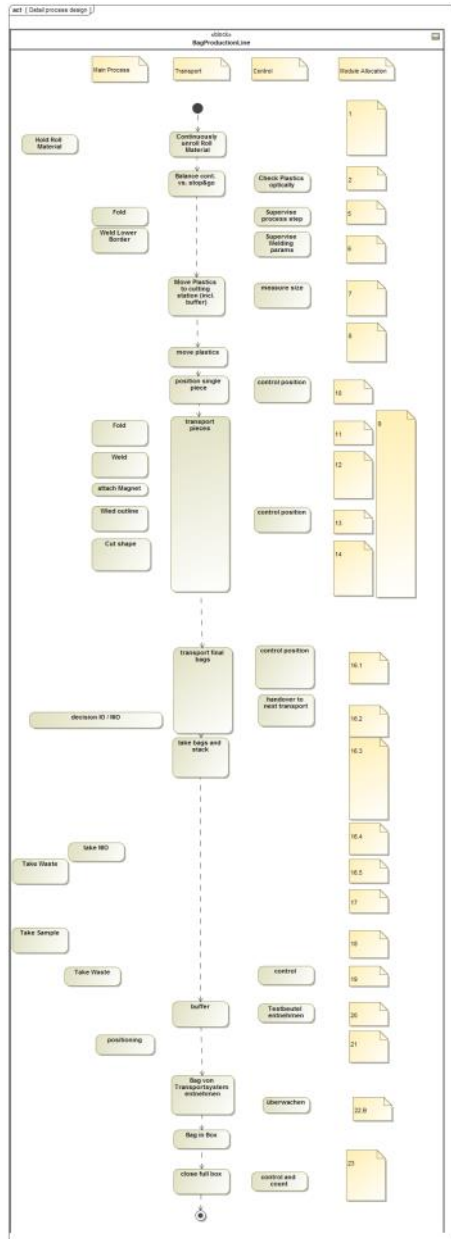
[2] SYSTEM CONTEXT



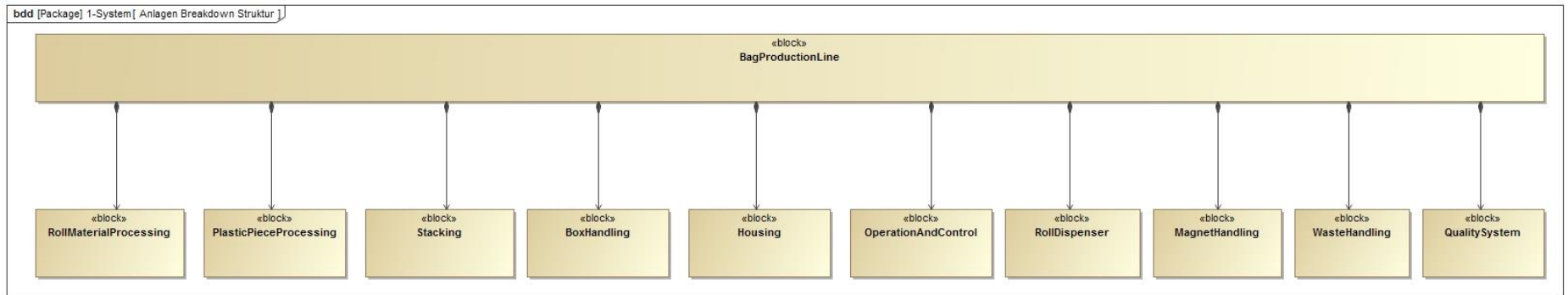
[3] USE CASE OVERVIEW



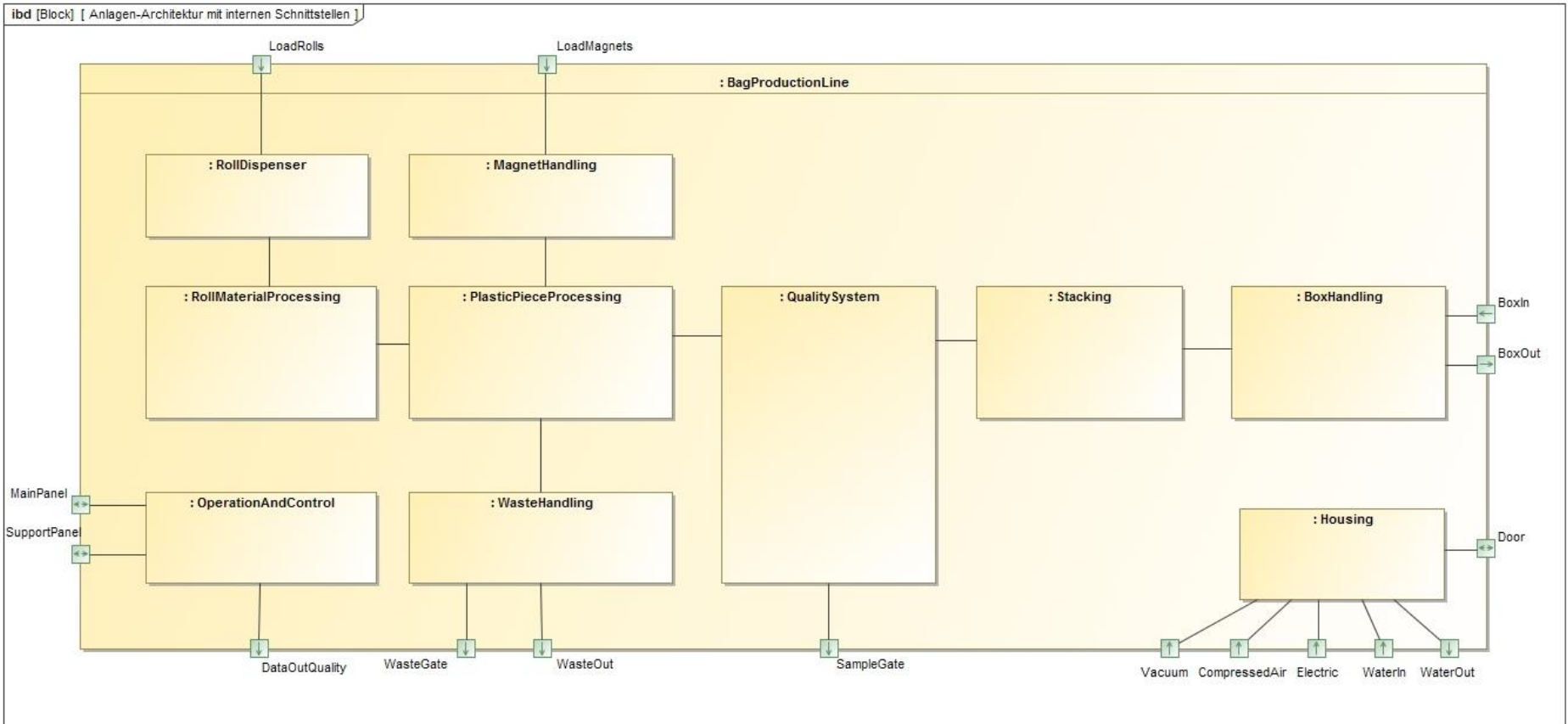
[4] DETAIL FLOW MAIN UC



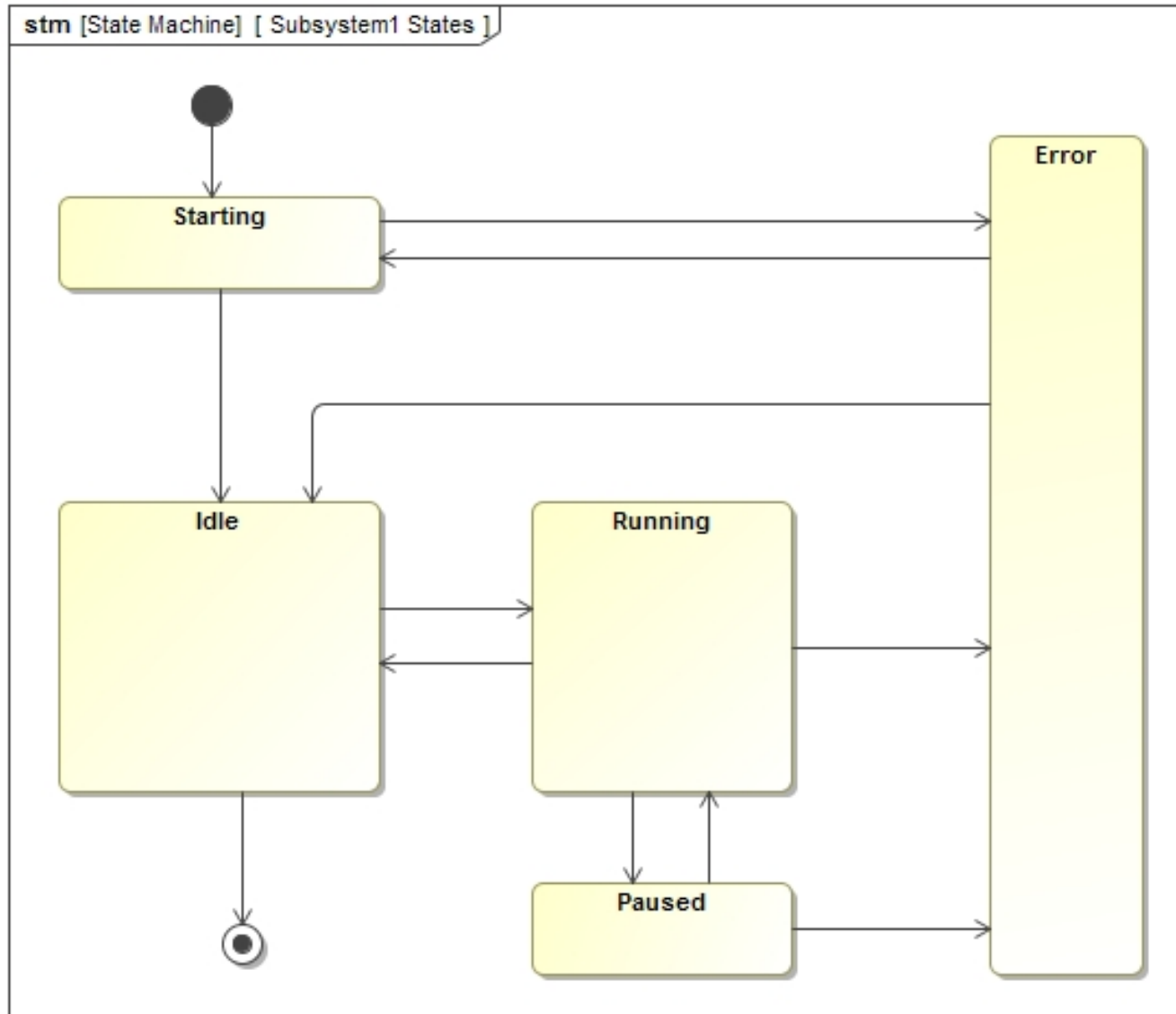
[5] SYSTEM BREAKDOWN STRUCTURE



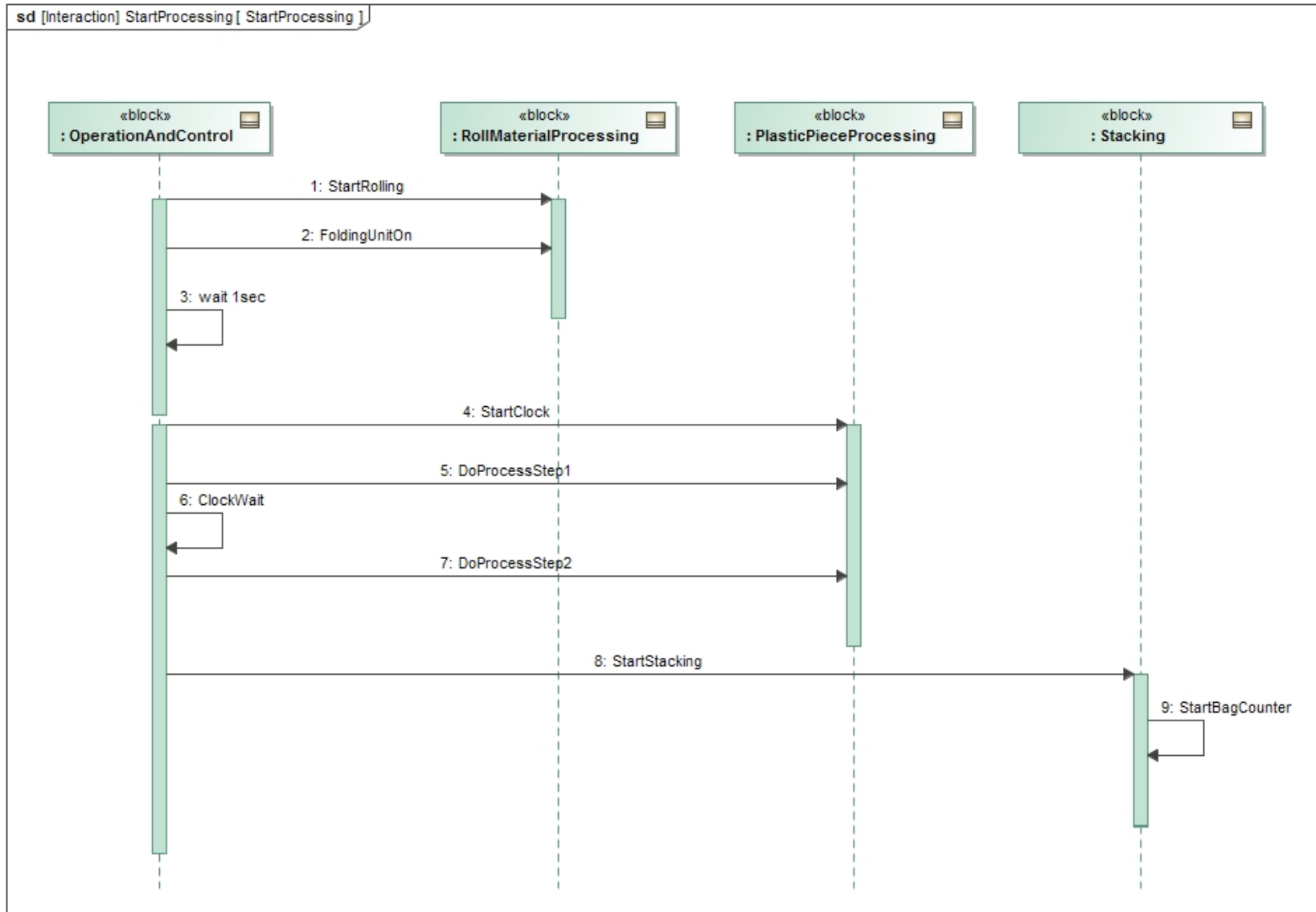
[6] SYSTEM ARCHITECTURE



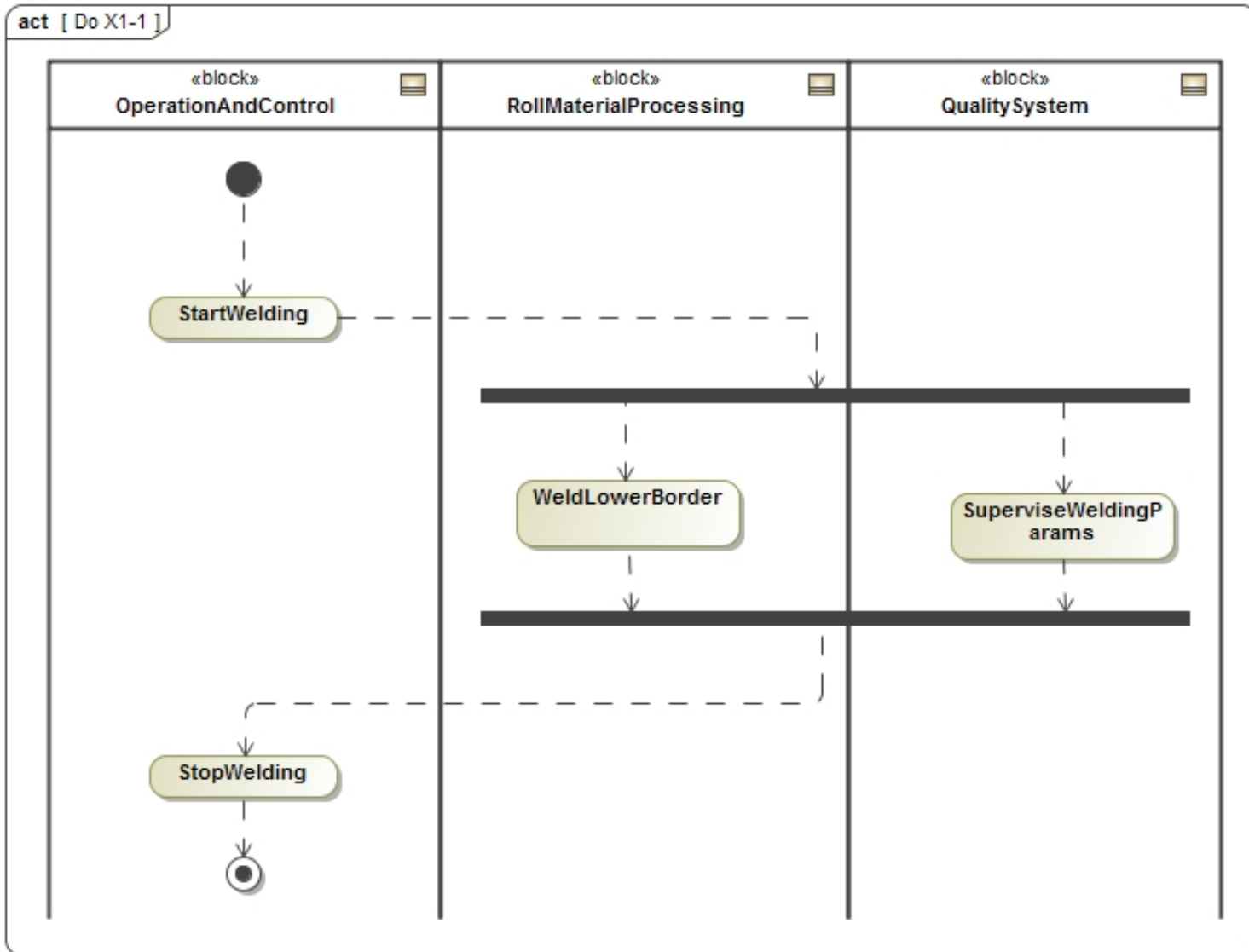
[7.1] SYSTEM BEHAVIOUR (STATES)



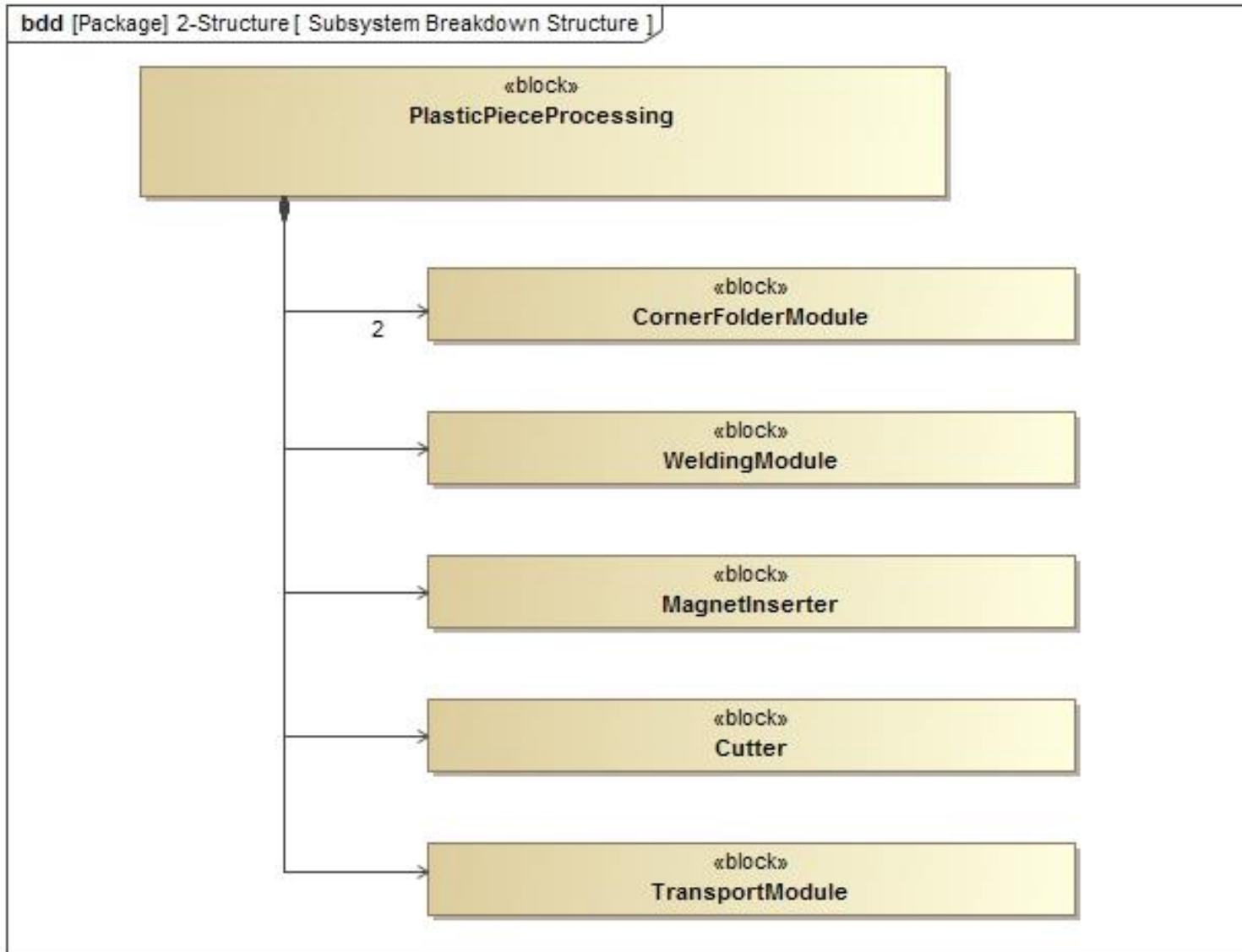
[7.2] SYSTEM BEHAVIOUR (INTERACTIONS)



[7.3] SYSTEM BEHAVIOUR (FLOWS)



[8] SUBSYSTEM BREAKDOWN STRUCTURE



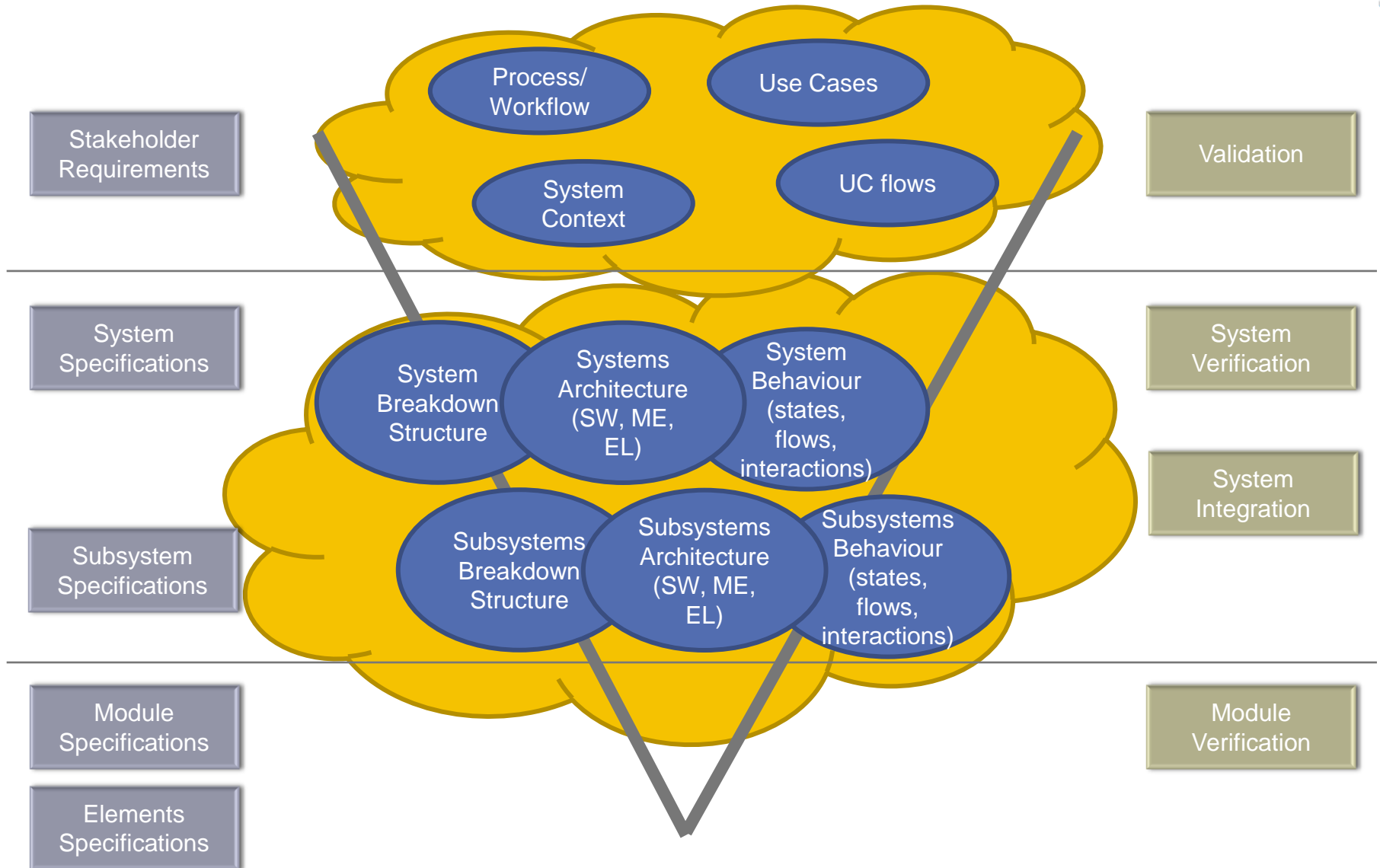
[9] SUBSYSTEM ARCHITECTURE

- **Several diagrams per module and specific aspects**
 - Mechanical
 - Electrical
 - Software (signals, data)

[10] SUBSYSTEM BEHAVIOUR

- **Several diagrams to model different aspects**
 - States
 - Flows
 - Interactions

V MODEL



SUMMARY

- **“SE Throughput/Capacity”**: 1 view per hour !
- **Good output if you can focus on content and not on processes, methodologies and tools**
- **Results**
 - 80% of systems analysis completed
 - 50% of systems architecture completed
 - 0% of translation and hand-off to SW/HW/ME
- **No interface / flow specs, behaviour model to build yet, no functional architecture**
- **Good enough as initial draft for the client’s first quote estimation and further feasibility work**

CONCLUSION

- **Jump-start with modelling – don't deal with tools and methodologies on your first SE day**
- **Guidance**
 - “Mut zur Lücke” [“braving the gap”]
 - No 100% SysML conformity demanded
 - Very small teams (1-3)
 - model with time/budget restriction: “1 view / hour”
- **agile, incremental, iterative systems development**

THANK YOU

**Questions?
Remarks?
Discussion...**

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