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PLE of Experimentation Systems – A First Approach

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Agenda

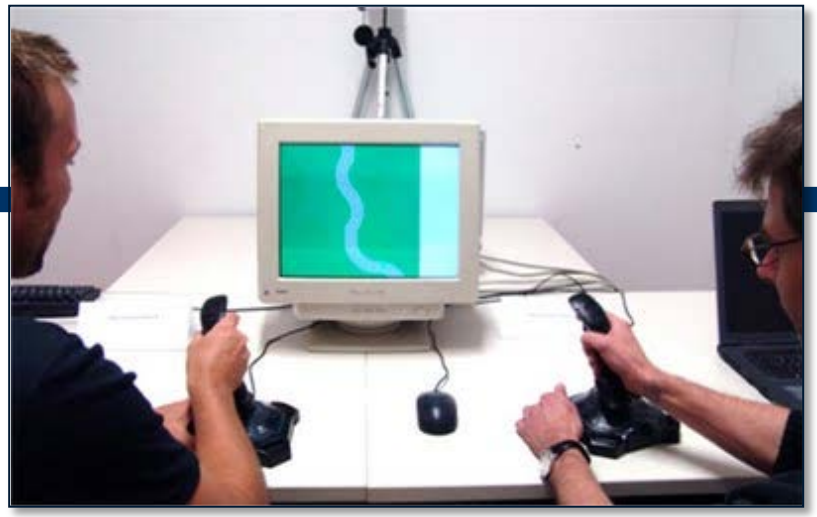
- **Introduction**
  - general problem & case study
- **Approach & Results**
  - migration
  - feature integration
  - variability model / architecture (Case Study)
- **Future Work**
  - whats next…

Introduction

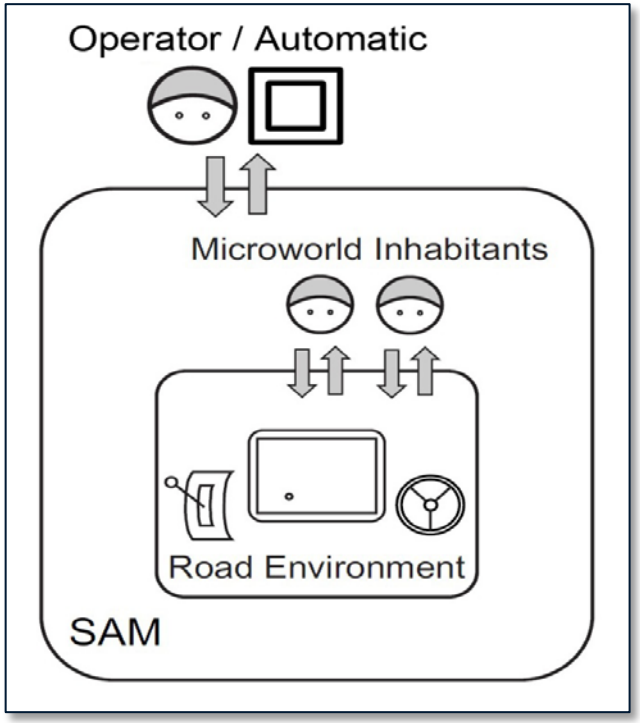
- **Engineering Psychology**
  - researches human-machine-interaction
    - e.g. interface design for flight operators, ...
  - relies on empirical research (i.e. experiments)
    - often using experimentation systems

- **SW-based Experimentation Systems**
  - created for certain research objective
    - reuse for other (similar) reserach objectives is expensive
  - other, more reusable systems often focus on fundamental research objectives

Case Study: ALS



- **ATEO Lab System (ALS)**
  - used for researching the **Division of Labor** between **Developers** and **Operators**
  - implements a supervised, cooperative **tracking simulation**
  - implemented in Smalltalk over **several years**



Case Study: Problems

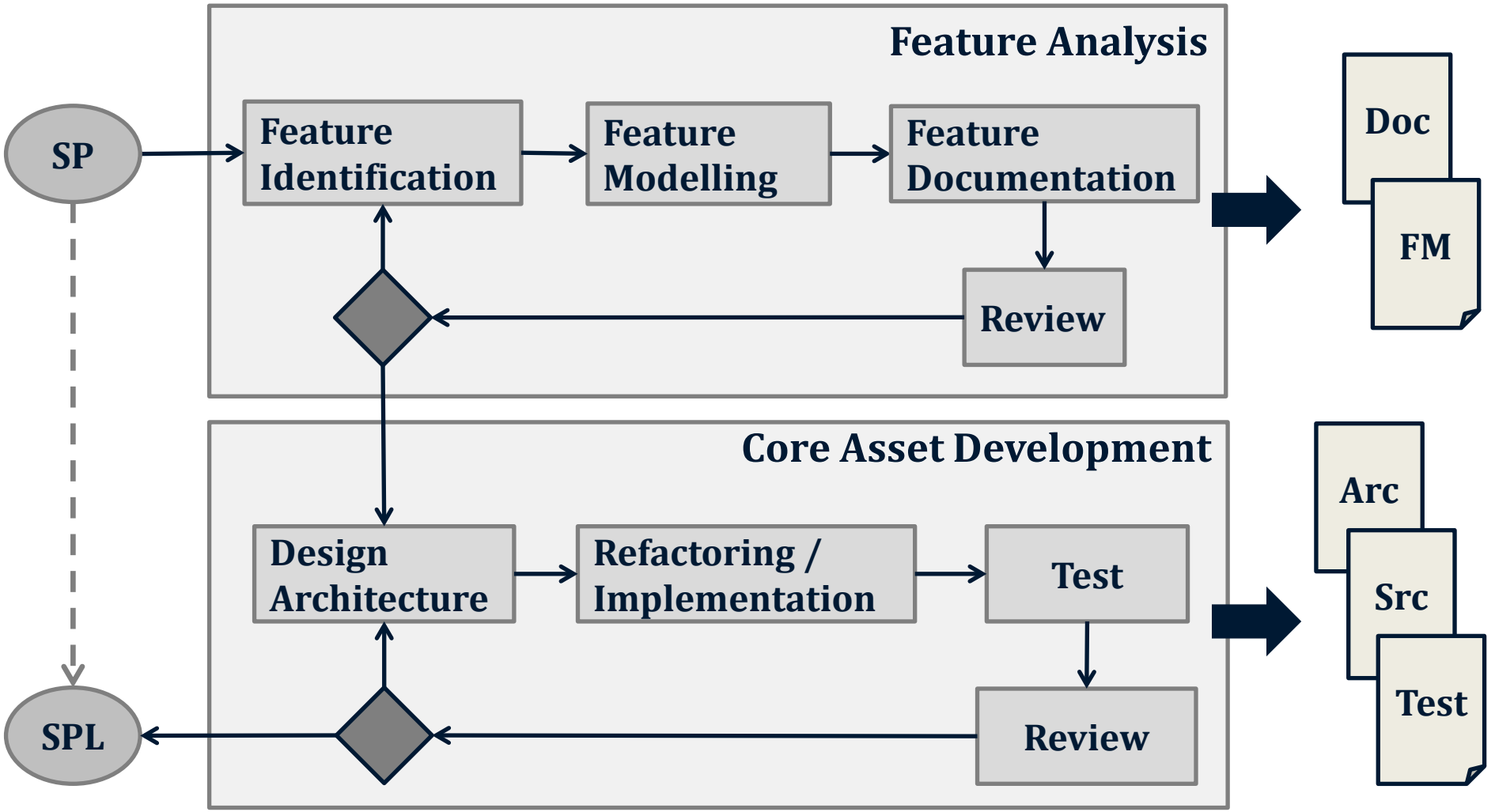
- **no design for change**
  - ALS was developed for **specific research objections**
  - **no focus on**
    - reusability,
    - extendability,
    - changeability

- **consequence:** expensive changes
  - adapting to **new/changing requirements** is **difficult**
  - almost **no configuration** via **user** possible
  - even **small changes** require a **software developer**

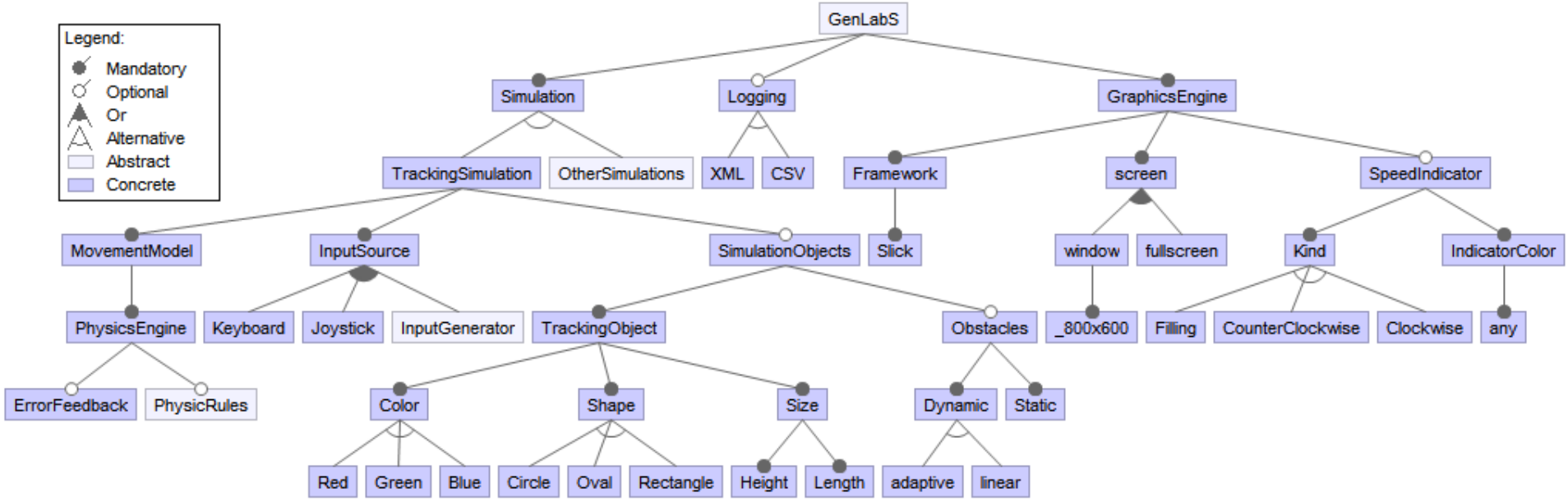
Goals

- **Configurable Experimentation System**
  - supporting a broader bandwith of research questions (than ALS) via **configuration**
- **Maintainable Experimentation System**
  - **minimizing** the software development effort for new/changing requirements
- **Reusable Experimentation System**
  - designing general components independently as possible (e.g. Object Store)

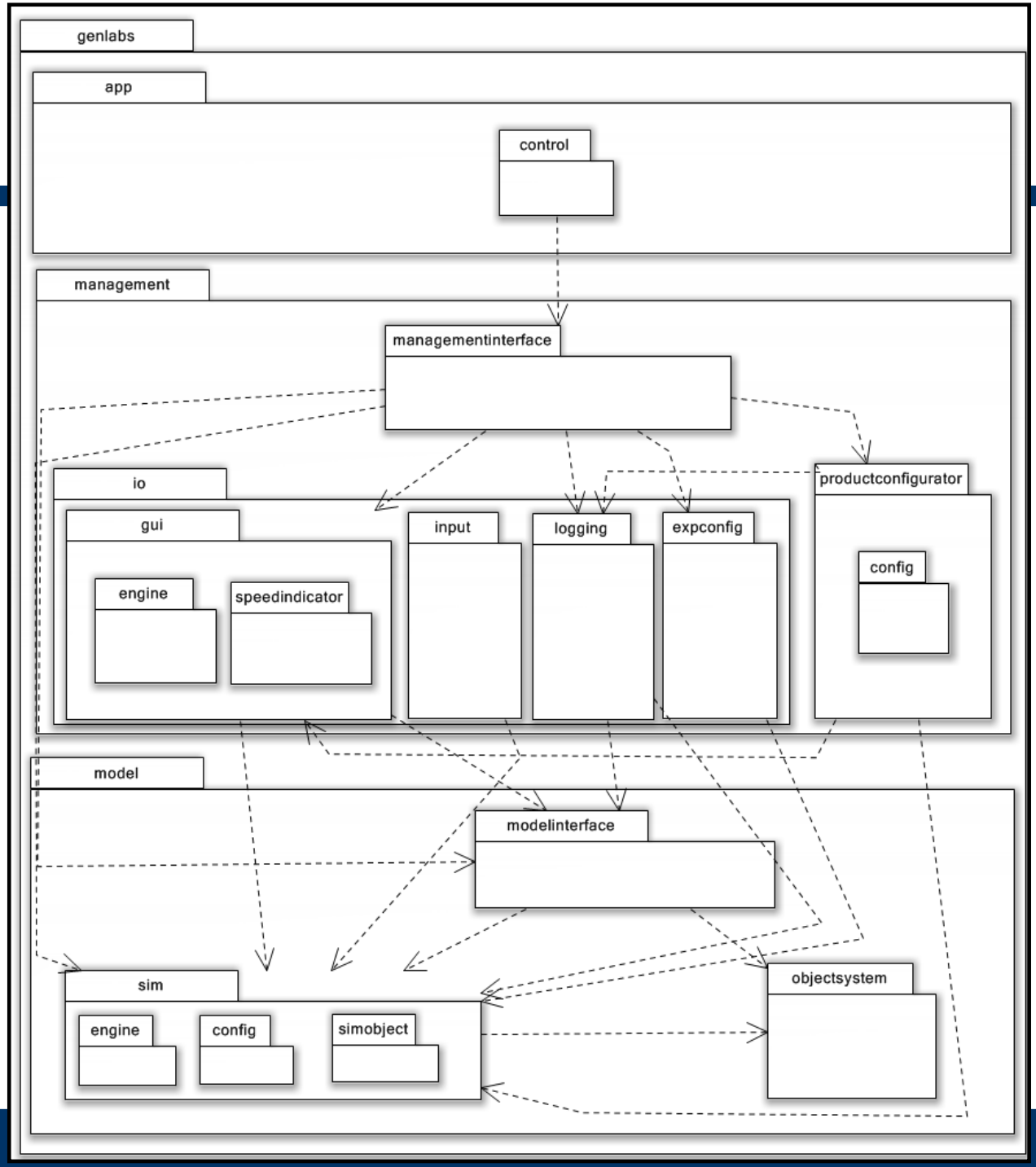
Migration Approach



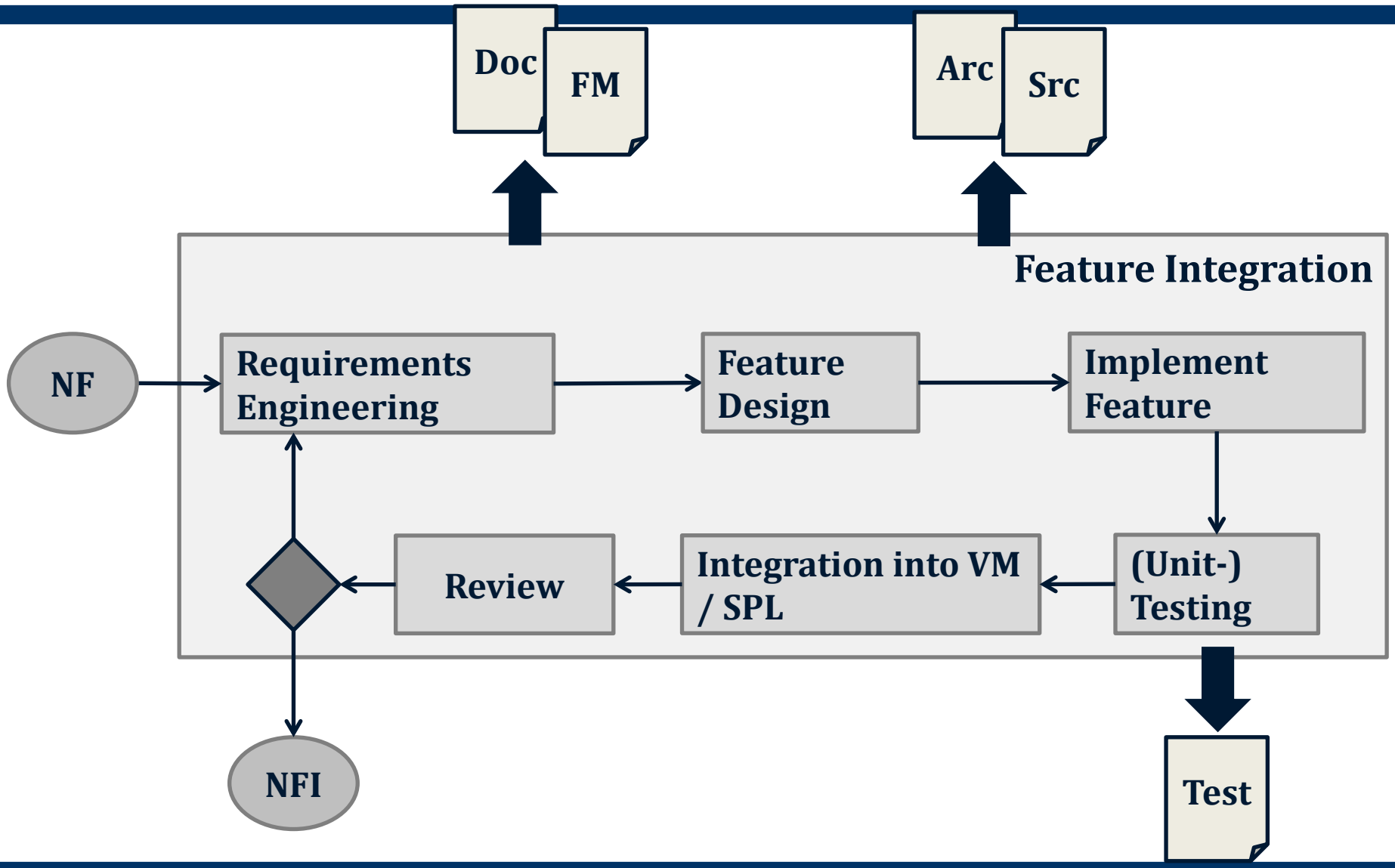
Feature Model: GenLabS



Architecture of GenLabS



Integration Approach



Summary

- **Problem**
  - unflexible experimentation system
  - minimal configuration possible
- **Approach**
  - migrate single product to a SPL
  - integrate new features
- **Result**
  - a family of experimentation systems (SPL)
  - configurable, maintainable, reusable

Future Work

- Refining the product **derivation process**
  - creating tool support for IT-novices
- A more general approach to **simulation objects**
  - Object creation via configuration
- Approach for **Testing** PLEs / GenLabS
  - reseraching fitting methods / technics for dealing with the complexity of features

THAT‘S IT!

Questions?

Hints?

Additions?