

The System Anatomy

**An Alternative Foundation for
Complex Systems' Development**

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Outline

- **Motivation**
- **The System Anatomy**
- **Development approach**
- **Large scale agile development of SW**
- **Effects**

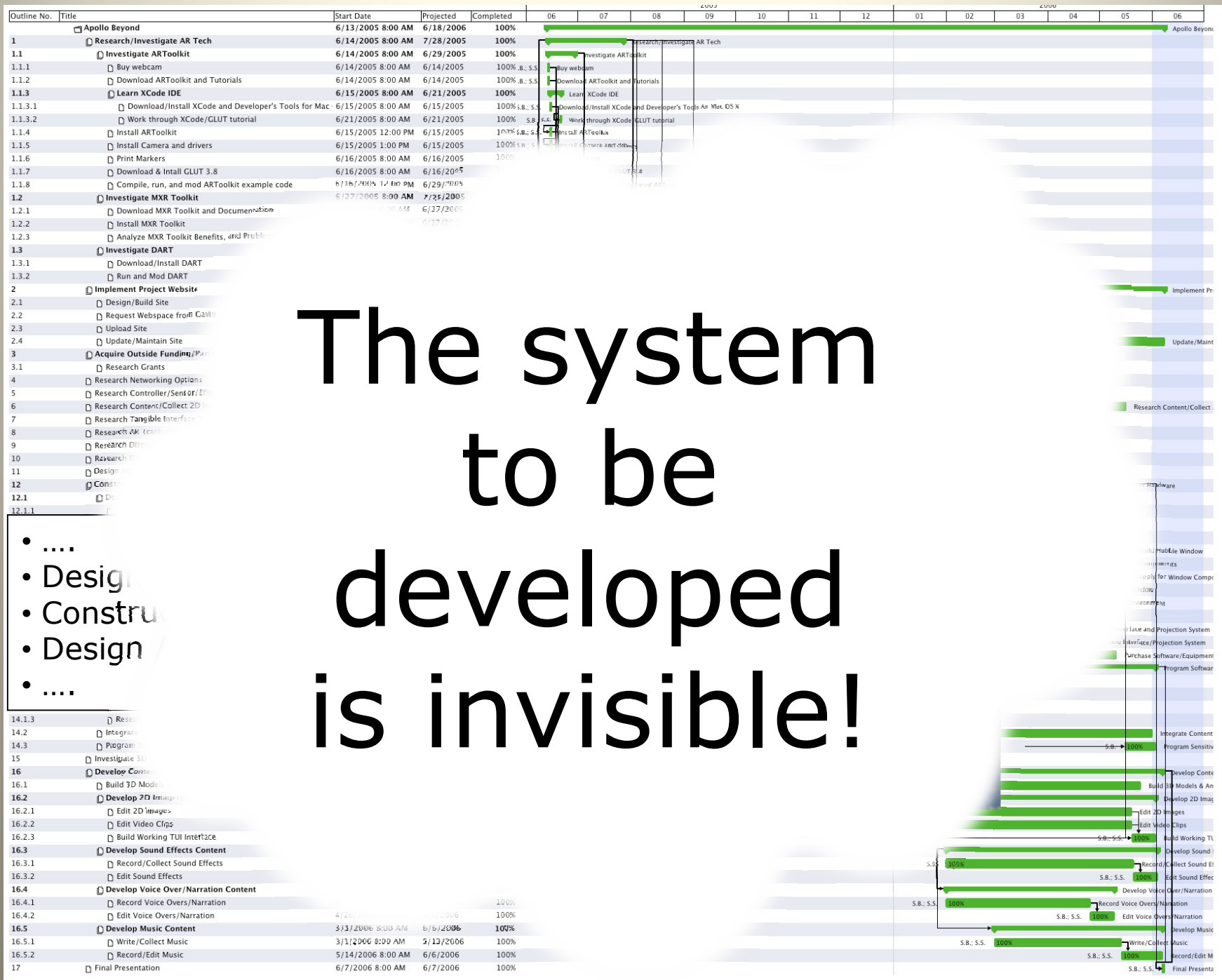
Motivation

Project failures

“About 20 percent of IT projects are canceled before completion and less than a third are finished on time and within budget with expected functionality” (Standish Group,2004)

“If failure teaches more than success, then the IT profession must be developing an army of brilliant project managers” (Nelson, 2007)

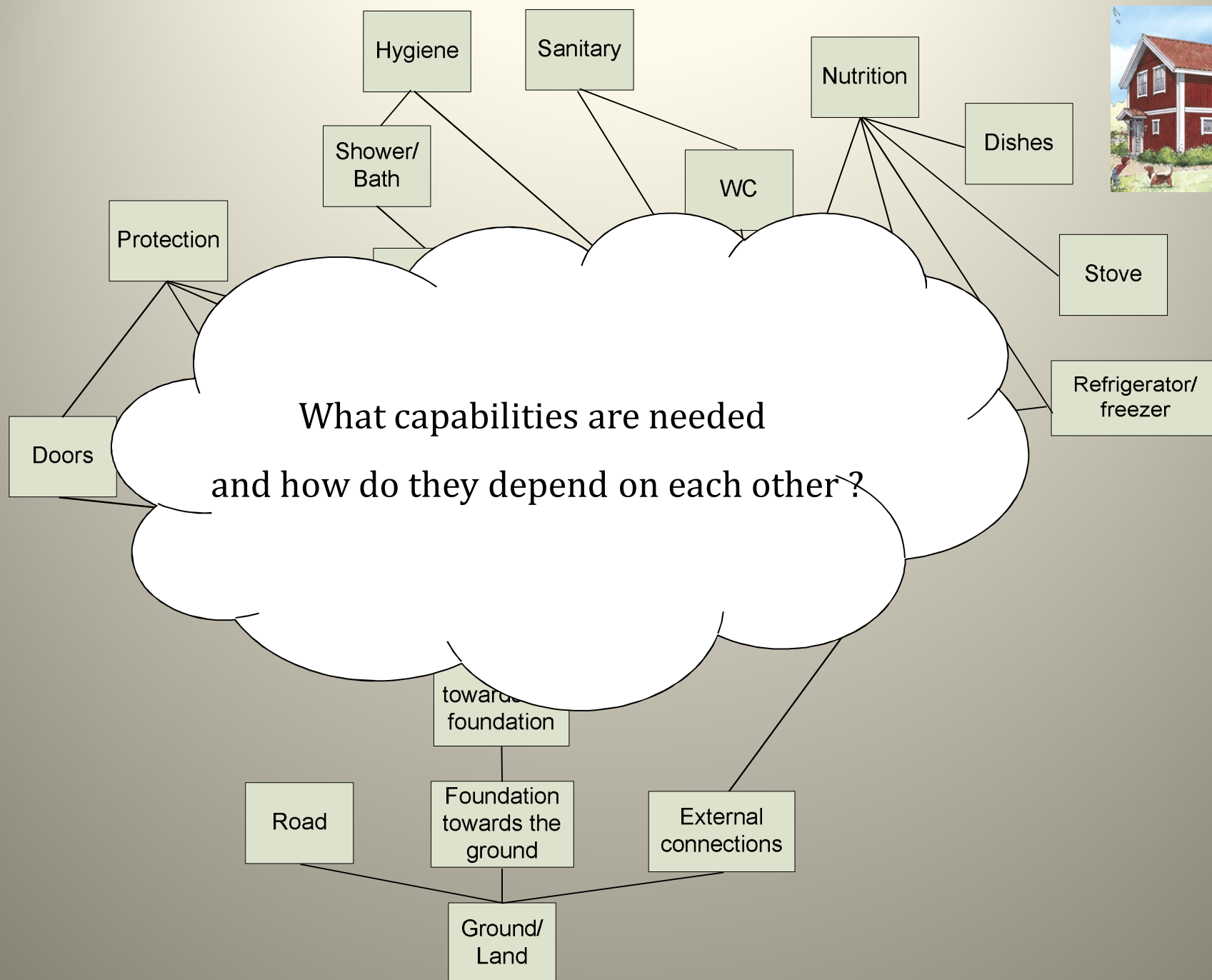
“Insanity: doing the same thing over and over again and expecting different results.” —Albert Einstein

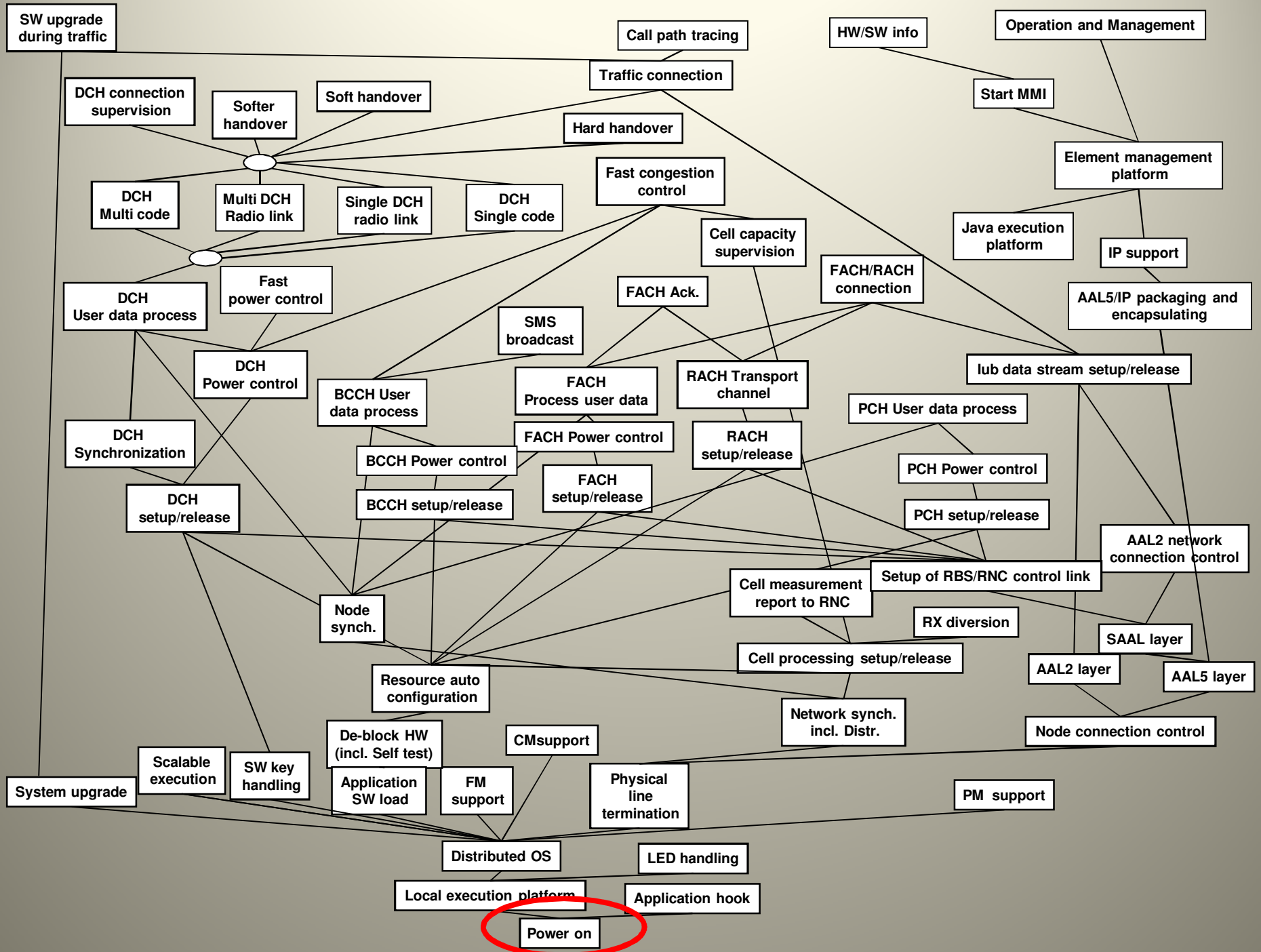


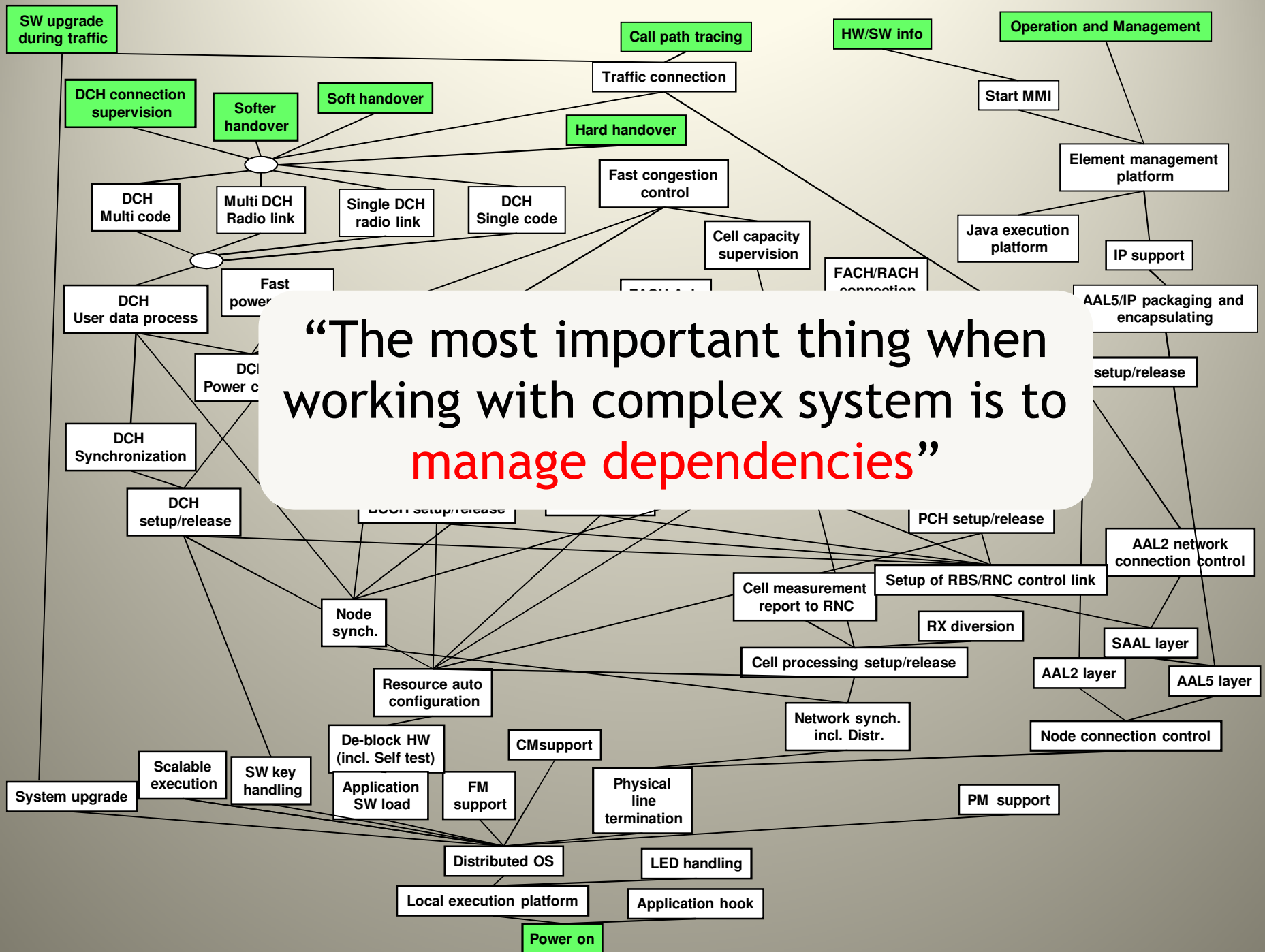


The System Anatomy

- dependencies between capabilities**







Anatomy properties ...

- **Purpose**
 - Provide a common understanding about the system
- **Gains**
 - Risk of a delayed or failed outcome of the project is reduced
- **Visualization of the target**
 - The system anatomy is a model of the finalized system
- **Capabilities**
 - The things in the anatomy should be read as capabilities
 - That which implements a capability is not shown

... anatomy properties

- **Dependencies**

- There is an inherent order in the system anatomy
- Thus, the anatomy illustrates dependencies (and independencies) among capabilities

- **Static**

- The system anatomy is at any moment a static image; it shows only related things. There is no sense of time in the anatomy

- **Social**

- The anatomy is developed by a group of people
- Thus, the anatomy is an informal, social accomplishment

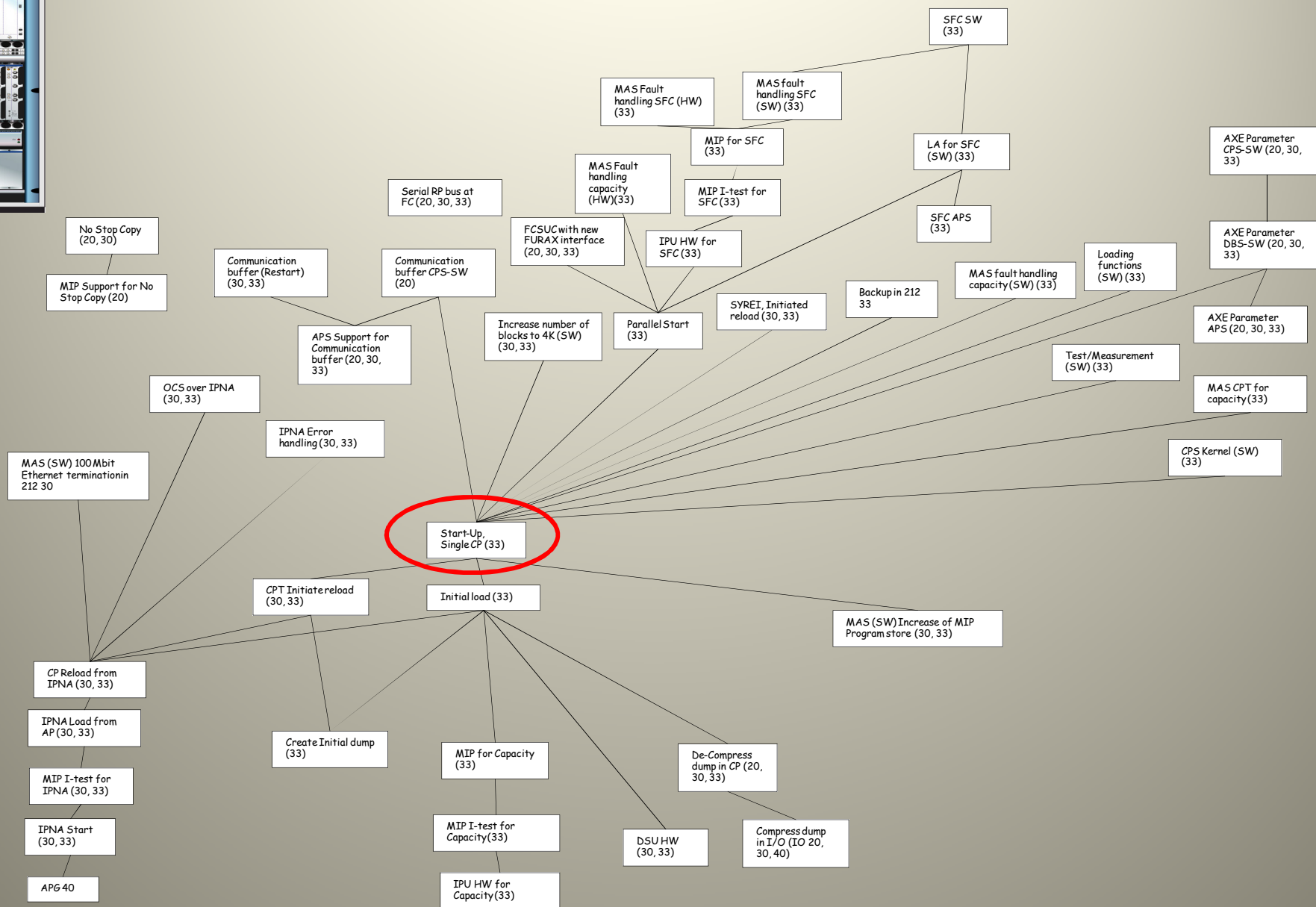
- **Foundation for development**

- Reusable

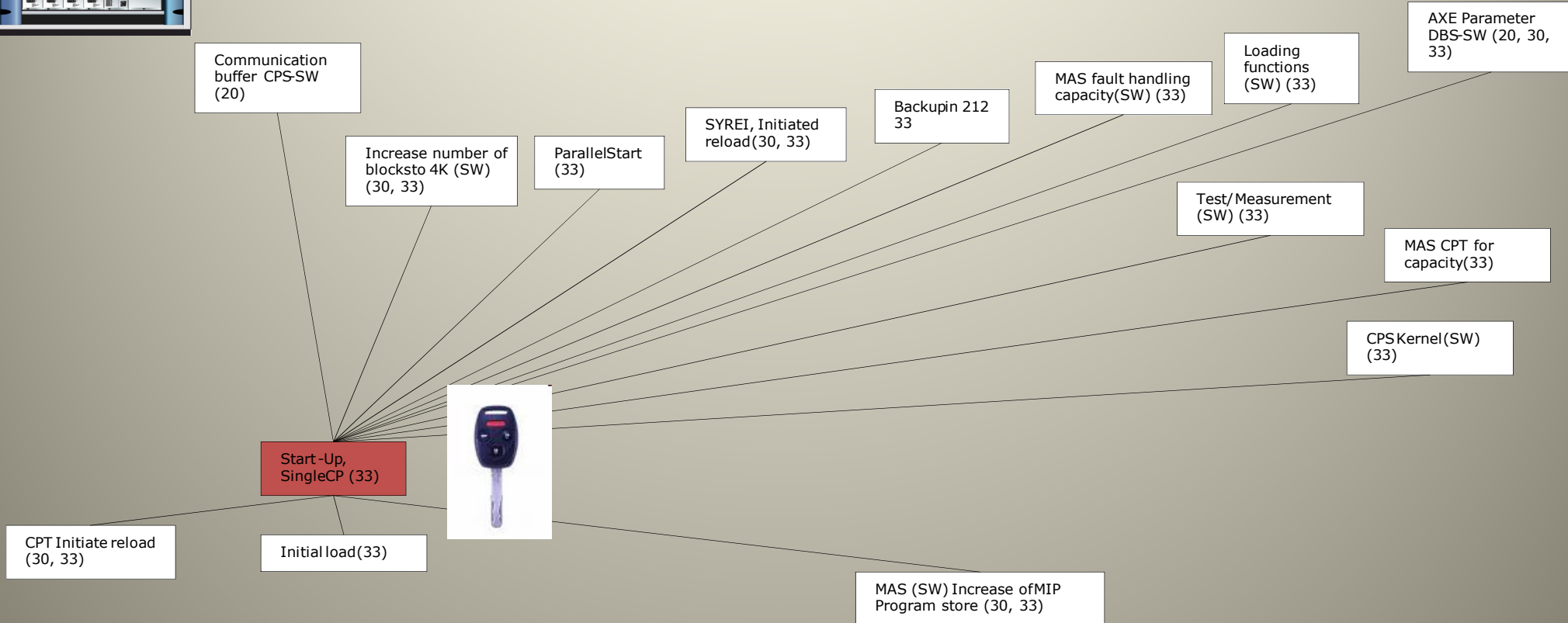
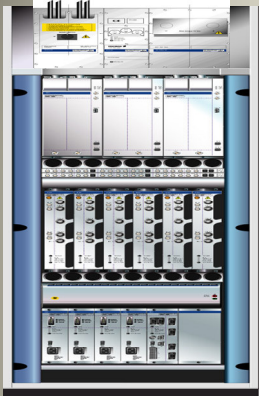
Development approach



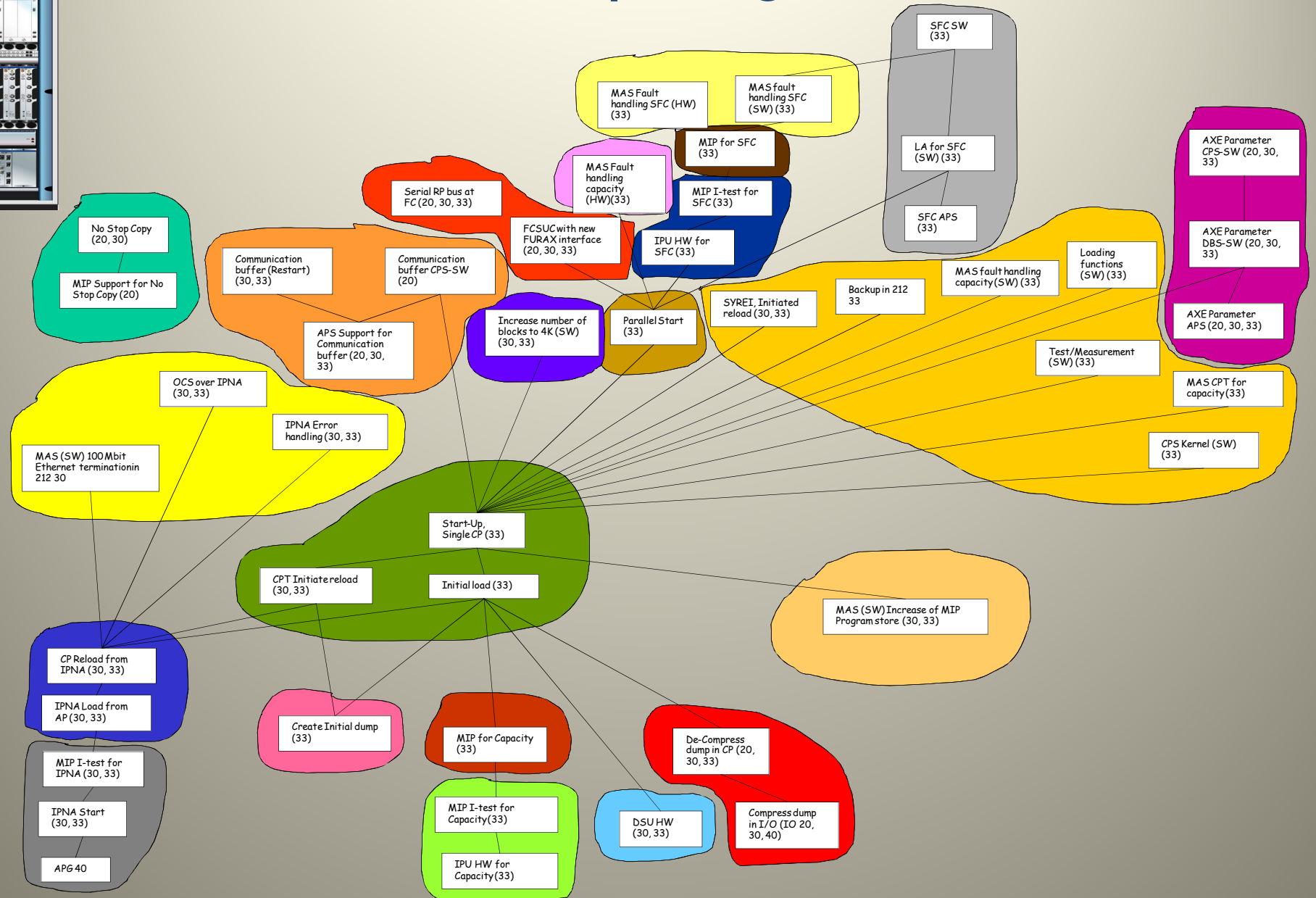
Anatomy



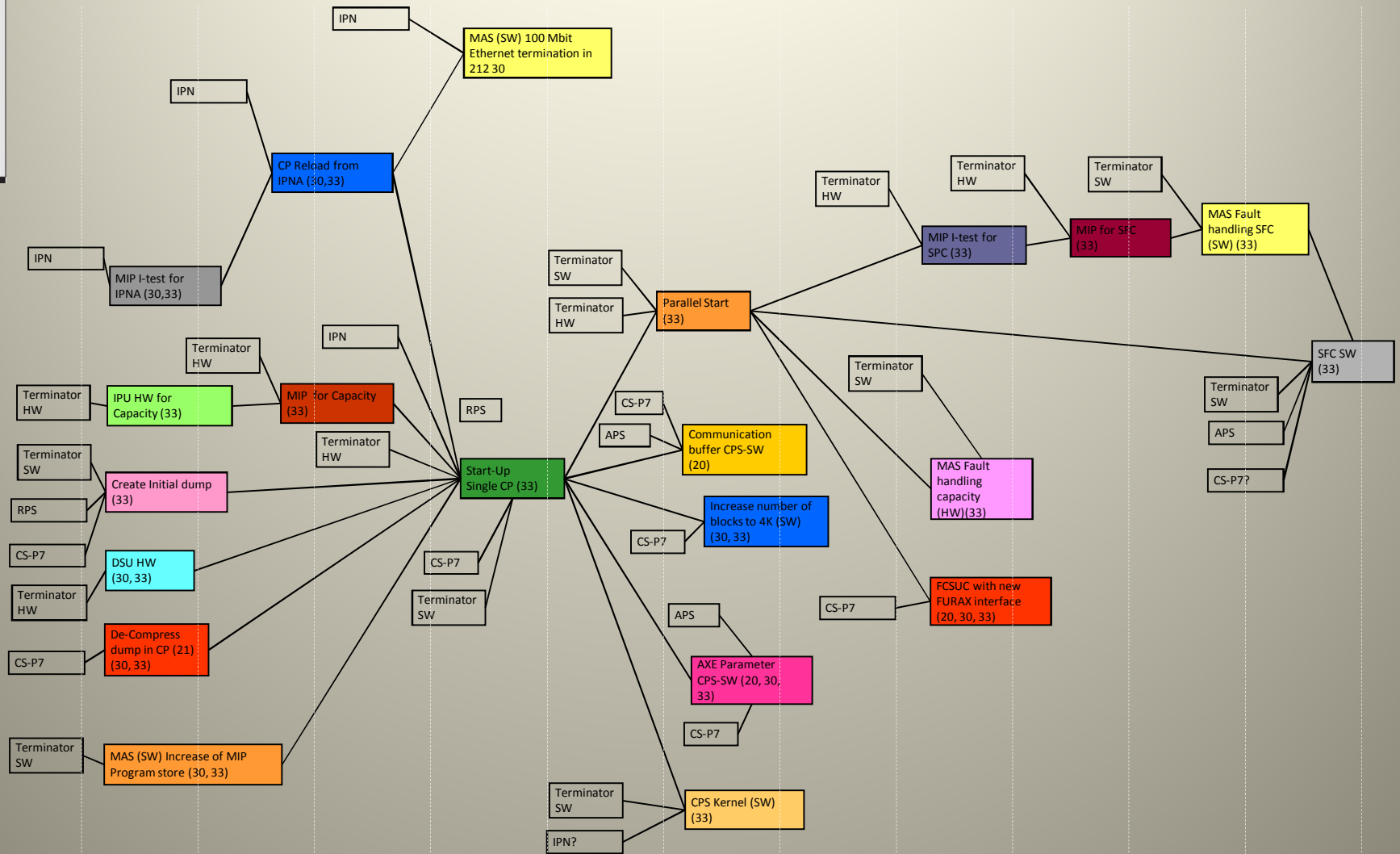
Anatomy



Work packages



Time plan



v13

v14

v15

v16

v17

v18

v19

v20

v21

v22

v23

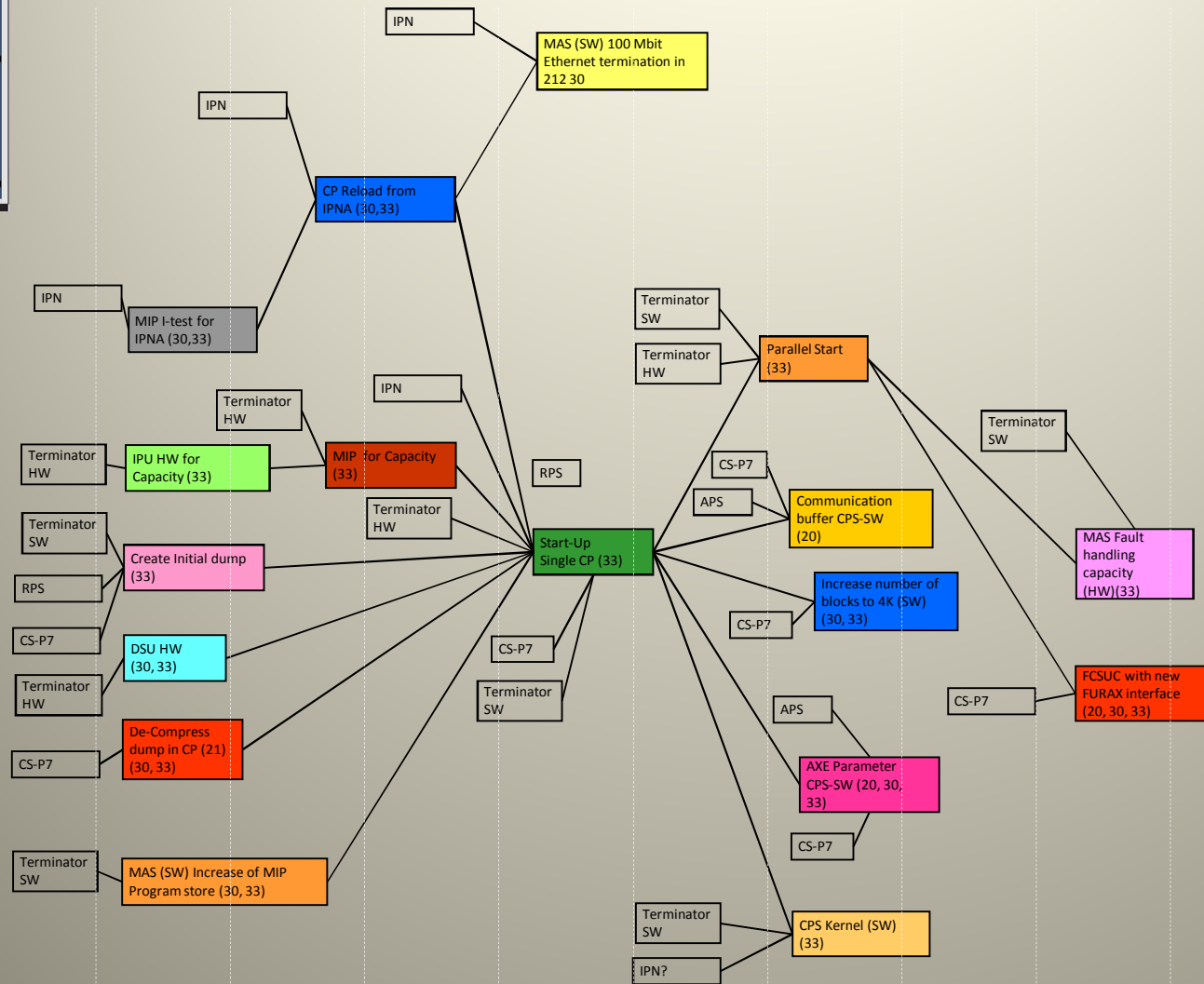
v24

v25

v26

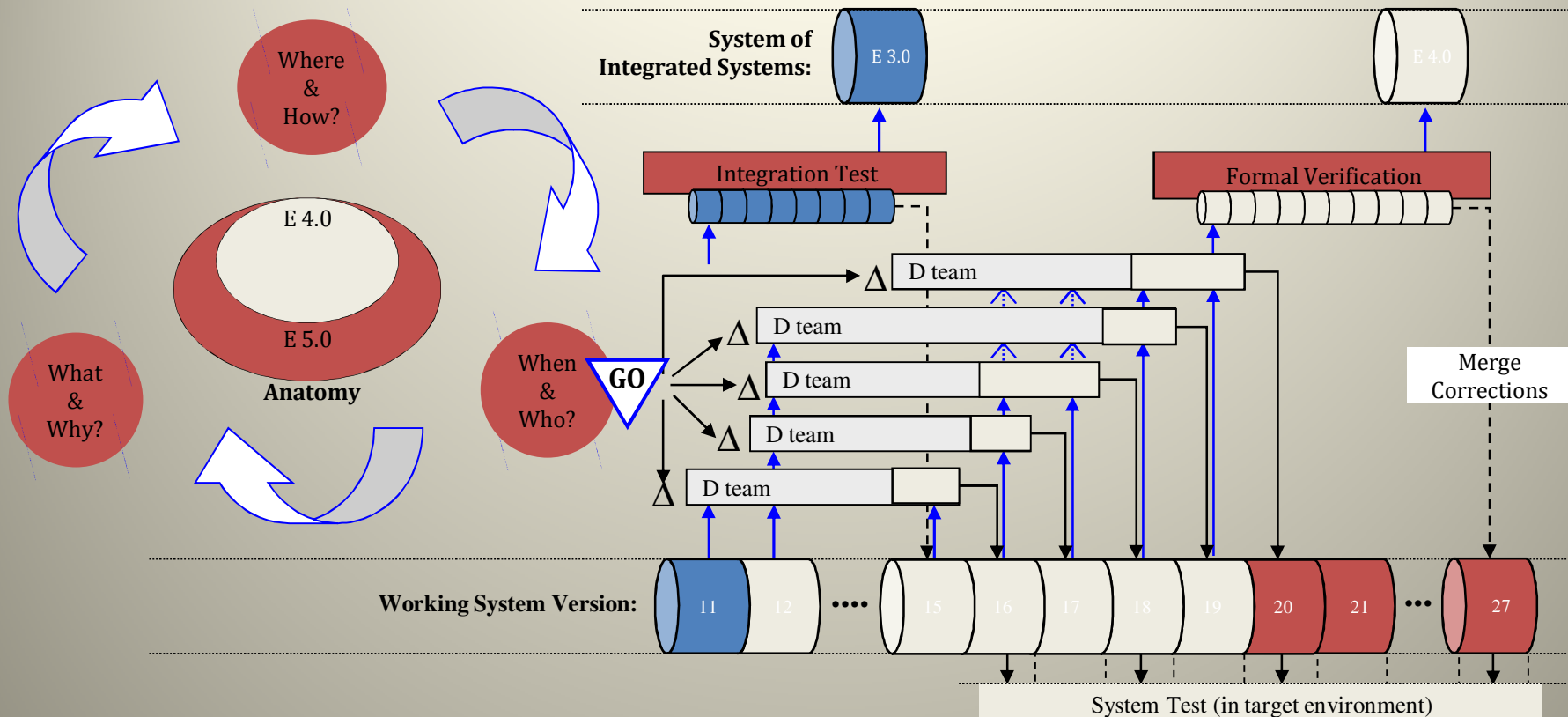


Time plan



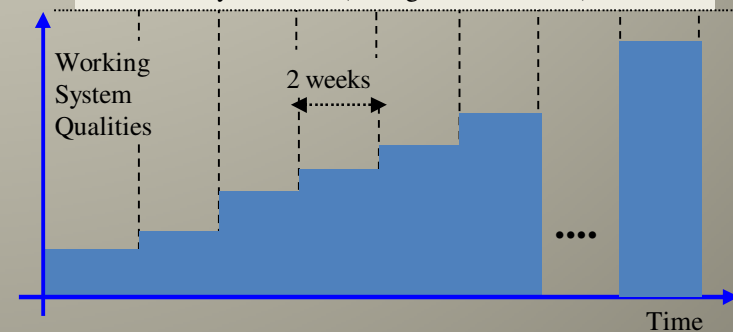
Large scale agile development of SW

The anatomy and agile development



Three Development Principles:

1. Work is divided into small verifiable steps
2. Teams have an end-to-end responsibility
3. Teams do verification before integration



Effects

System Engineering reconceptualized

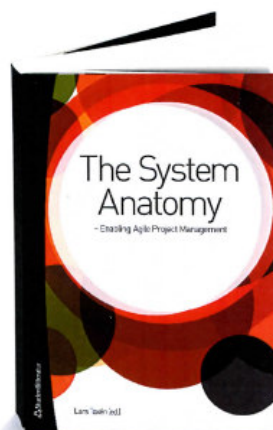
- **Human aspects up front**
 - Coordination, interpretation, common understanding
- **Focus on managing dependencies in the system**
 - Re-focus from activities, method and process to the system
- **Visualizations of the target**
 - An image that everyone can understand and agree upon
 - Particularly important for capabilities provided by SW
- **Visualization of progress**
 - More important to understand WHAT to deliver than HOW
 - Planning based on capability growth in the system
- **Enables parallel development**
- **Arena for collaboration**
- **Benefits increase with complexity of the system**

Wrapping up

- Alternative approach to system development
- Anatomies between groups differ
- Level of granularity
- Different opinions, common understanding
- Characteristics versus functions
- “Money-making” capabilities
- Dependencies over several capabilities
- Means for workshop
- Tools for managing the anatomy
- Complement, not replacement
- Research issue

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Enabling Agile Project Management



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TAXÉN, LARS (ED.)

This book takes an alternative approach to project management and the development of complex systems. Technology, methods and tools are still important, but human-centric aspects like common understanding, coordination, visualization, and reduction of complexity, needs to be brought to the fore-front. The core of the alternative approach is the system anatomy, a means that was conceived in the early 1990s at Ericsson, a world-leading supplier of telecommunication solutions. The anatomy has ever since been extensively used at Ericsson for managing extremely complex system development tasks.

The anatomy is a simple but powerful image showing the dependencies between capabilities in the system; from the most basic ones to "money-making"; thus representing a novel way of describing and discussing what a system is.

The book is a collection of chapters from authors that in one way or another have been working with the anatomy concept. The intended audience is both practitioners facing complex development tasks, and researchers who are interested in exploring new perspectives and theoretical frameworks for managing complexity in areas such as information system development, organizational sciences, project management and more.

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