22ND NATIONAL & INTERNATIONAL HSSS CONFERENCE

SYSTEMIC ANALYSIS & ORGANIZATIONAL IMPROVEMENT

OF AN INNOVATION, TECHNOLOGY TRANSFER AND INTERNATIONAL COLLABORATION UNIT

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APPLIED SYSTEMIC MANAGEMENT IN THE AI ERA
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ORGANIZATIONAL CONTEXT

THE UNIT OPERATES AS AN INTERMEDIARY IN THE INNOVATION ECOSYSTEM

RESEARCH INSTITUTES

Scientific knowledge, research results, expertise and potential technologies.

BUSINESS & STARTUPS

Market needs, commercialization opportunities and innovation demand.

PUBLIC / EU ACTORS

Funding programmes, reporting obligations, policy priorities and deadlines.

INNOVATION, TECHNOLOGY TRANSFER AND INTERNATIONAL COLLABORATION UNIT

SWOT SNAPSHOT

S STRENGTHS

Expertise · networks · EU experience

W WEAKNESSES

Fragmented information · coordination pressure

O OPPORTUNITIES

Digital tools · AI support · stronger PM

T THREATS

Deadlines · workload · external uncertainty

TECHNOLOGY TRANSFER
FUNDING SUPPORT
BUSINESS DEVELOPMENT
COMMUNICATION
PROJECT DELIVERY
ADMINISTRATION

PROBLEM SITUATION

THE ORGANIZATIONAL PROBLEM IS A REINFORCING OVERLOAD CYCLE

THREE VISIBLE SYMPTOMS

01

INCREASED WORKLOAD

Decision delays and pressure on management.

02

FRAGMENTED INFORMATION

Coordination difficulties and unclear flows.

03

REWORK

New workload and delays in deliverables.

REINFORCING LOOP R1



THE PROBLEM IS NOT A SINGLE FAILURE; IT IS A SELF-REINFORCING PATTERN THAT REPRODUCES DELAYS AND WORKLOAD.

SYSTEMIC METHODOLOGICAL APPROACH

A MULTI-METHOD APPROACH LINKS DIAGNOSIS, STRUCTURAL REDESIGN, FEEDBACK ANALYSIS AND ACTION

SSM & CATWOE

Understand the messy human activity system and define the transformation.

DIAGNOSIS

→

DCSYM

Map current and proposed structures, communication flows and control points.

STRUCTURE

→

CLD

Reveal reinforcing and balancing feedback mechanisms behind delays and rework.

FEEDBACK

→

VENSIM

Translate feedback logic into a stock–flow model and test selected scenarios.

SIMULATION

→

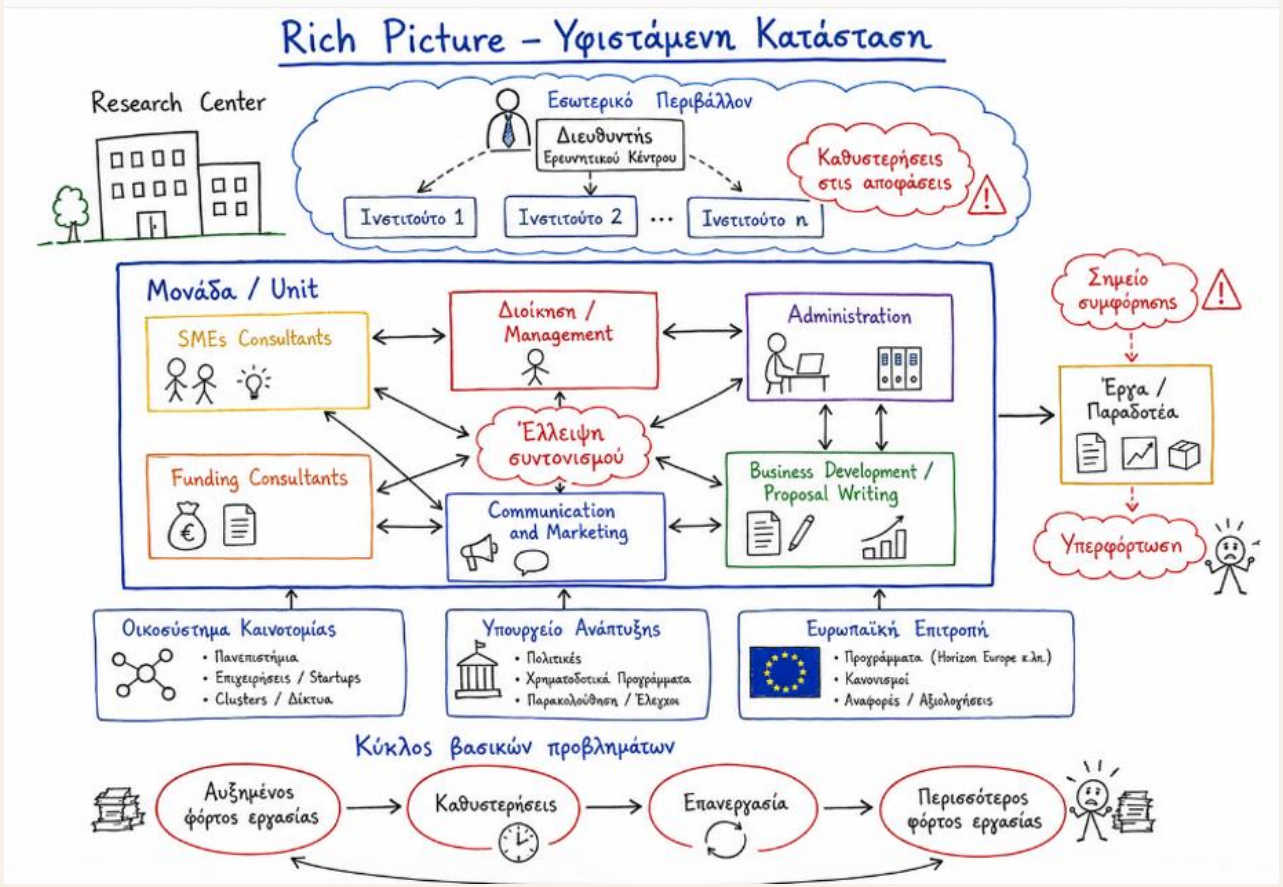
ACTION PLAN + AI

Convert findings into a feasible intervention and support monitoring with AI.

INTERVENTION

SSM: RICH PICTURE

THE VISUAL DIAGNOSIS SHOWS WHERE THE INTERVENTION MUST FOCUS



KEY INSIGHTS

DECISION BOTTLENECK

The director appears as a central approval node, creating dependency on one role.

FRAGMENTED FLOWS

Information circulates across teams, but not always through structured channels.

SYSTEM EFFECT

External pressure and rework reinforce workload, delays and repeated effort.

WORKLOAD | DELAYS | REWORK

CATWOE ANALYSIS AND ROOT DEFINITION

CATWOE DEFINES THE HUMAN ACTIVITY SYSTEM THROUGH BENEFICIARIES, ACTORS, TRANSFORMATION, WORLDVIEW, OWNER AND CONSTRAINTS

CUSTOMERS / BENEFICIARIES

Enterprises, research actors, public organizations and the wider innovation ecosystem that use the unit's services.

ACTORS / IMPLEMENTERS

Unit staff, consultants, communication, administration, business development and proposal teams.

TRANSFORMATION PROCESS

Research knowledge, market needs and funding opportunities are turned into innovation support and project deliverables.

WORLDVIEW

Linking research with the market strengthens innovation and social value through coordination and knowledge use.

OWNER / CONTROL

The research organization and unit management can approve changes, reallocate roles and adopt new processes.

ENVIRONMENTAL CONSTRAINTS

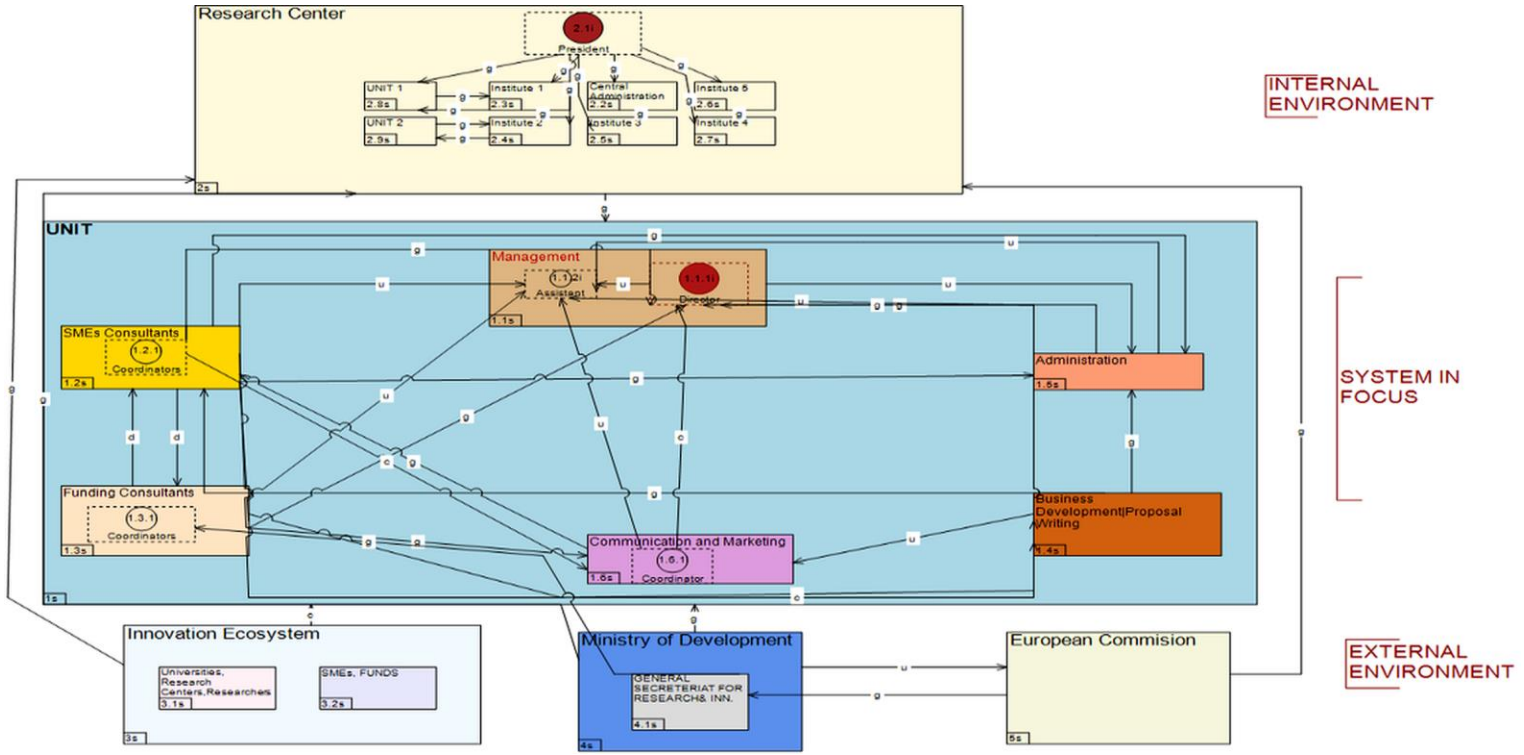
Funding requirements, institutional framework, project deadlines, resources and approval procedures.

ROOT DEFINITION

A HUMAN ACTIVITY SYSTEM THAT TRANSFORMS RESEARCH KNOWLEDGE, MARKET / INDUSTRY NEEDS AND FUNDING OPPORTUNITIES INTO INNOVATION SERVICES, COLLABORATIONS AND PROJECT DELIVERABLES, UNDER INSTITUTIONAL, RESOURCE AND TIME CONSTRAINTS.

DCSYM: CURRENT ORGANIZATIONAL STRUCTURE

THE CURRENT STRUCTURE SHOWS CENTRALIZATION AND FRAGMENTED COORDINATION



CURRENT STRUCTURE MAP

MAIN FINDINGS

CENTRALIZED CONTROL

Many communication and approval paths converge around management.

CROSS-FUNCTIONAL DEPENDENCY

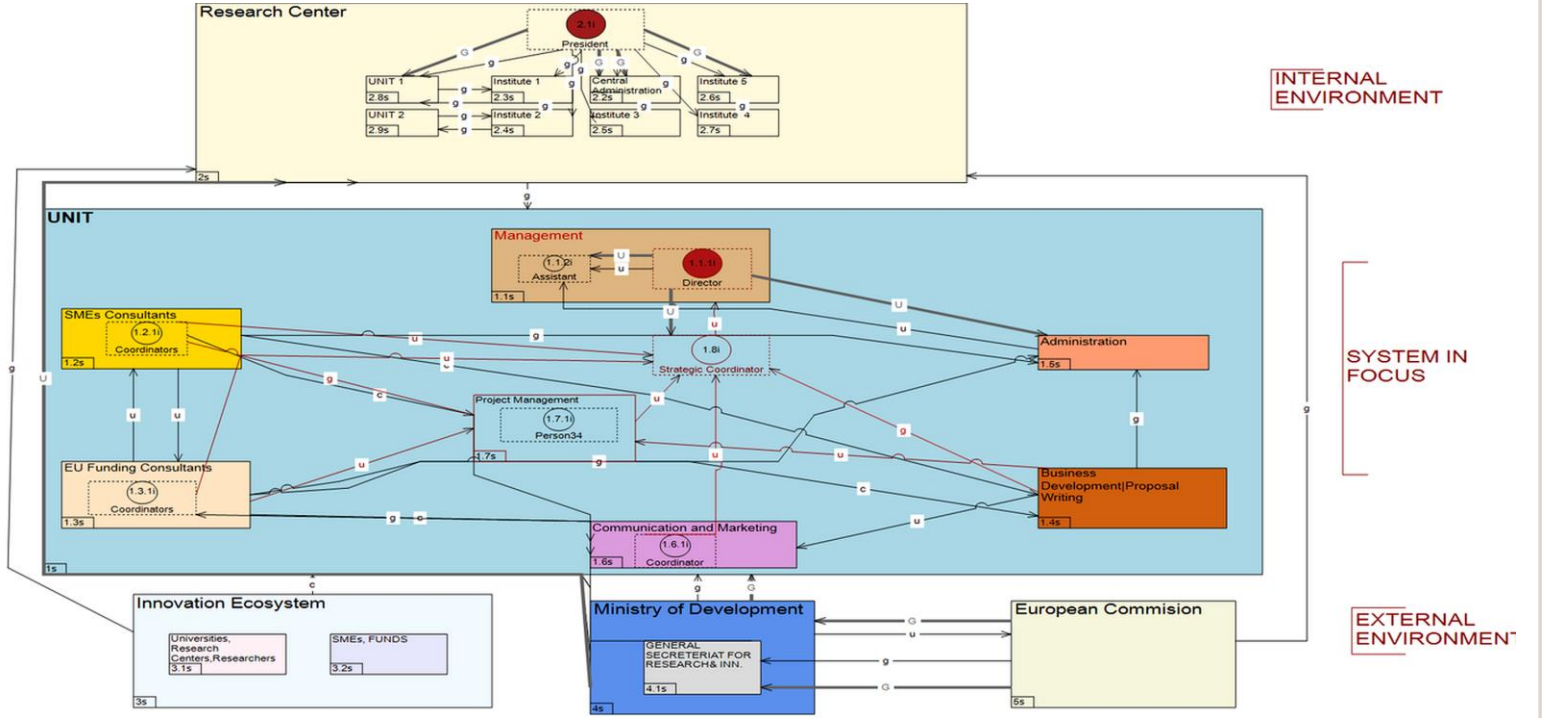
Operational collaboration depends heavily on informal links and mediation.

OBSERVED OUTCOME

The structure tends to generate delays, rework and reduced efficiency.

DCSYM: PROPOSED IMPROVEMENT

THE PROPOSED STRUCTURE INTRODUCES COORDINATION WITHOUT ADDING UNNECESSARY BUREAUCRACY



PROPOSED STRUCTURE MAP

KEY CHANGES

DECENTRALIZATION

Routine decisions move closer to the teams.

LINKING ROLE

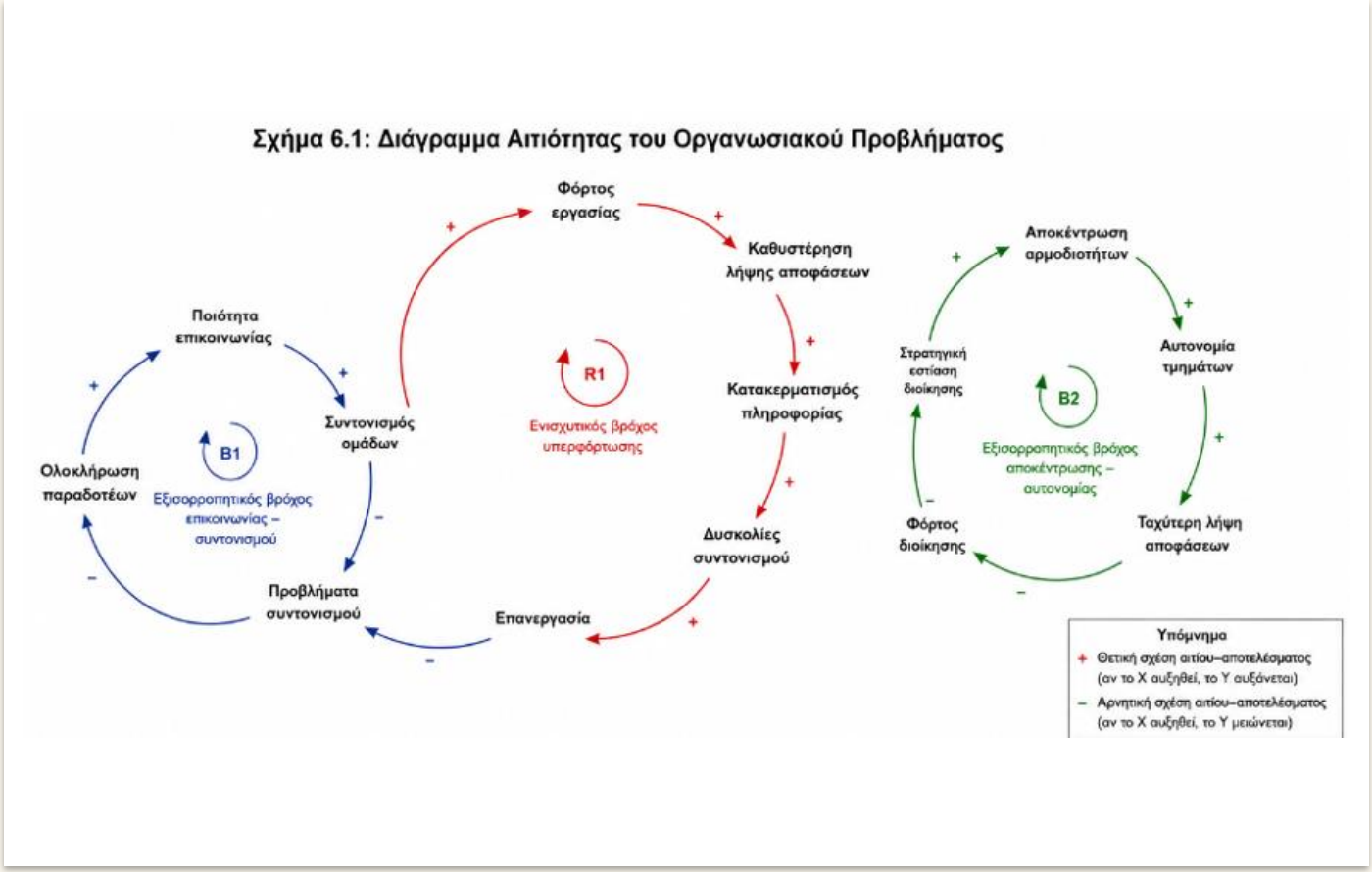
A Strategic Coordinator links teams, priorities and management.

PROJECT DISCIPLINE

Project management supports deadlines, deliverables and resource allocation.

CAUSAL LOOP ANALYSIS

THE CAUSAL STRUCTURE EXPLAINS HOW THE PROBLEM REPRODUCES ITSELF OVER TIME



R1: REINFORCING OVERLOAD LOOP

Workload increases delays; delays increase information fragmentation, coordination problems and rework.

B1: COMMUNICATION LOOP

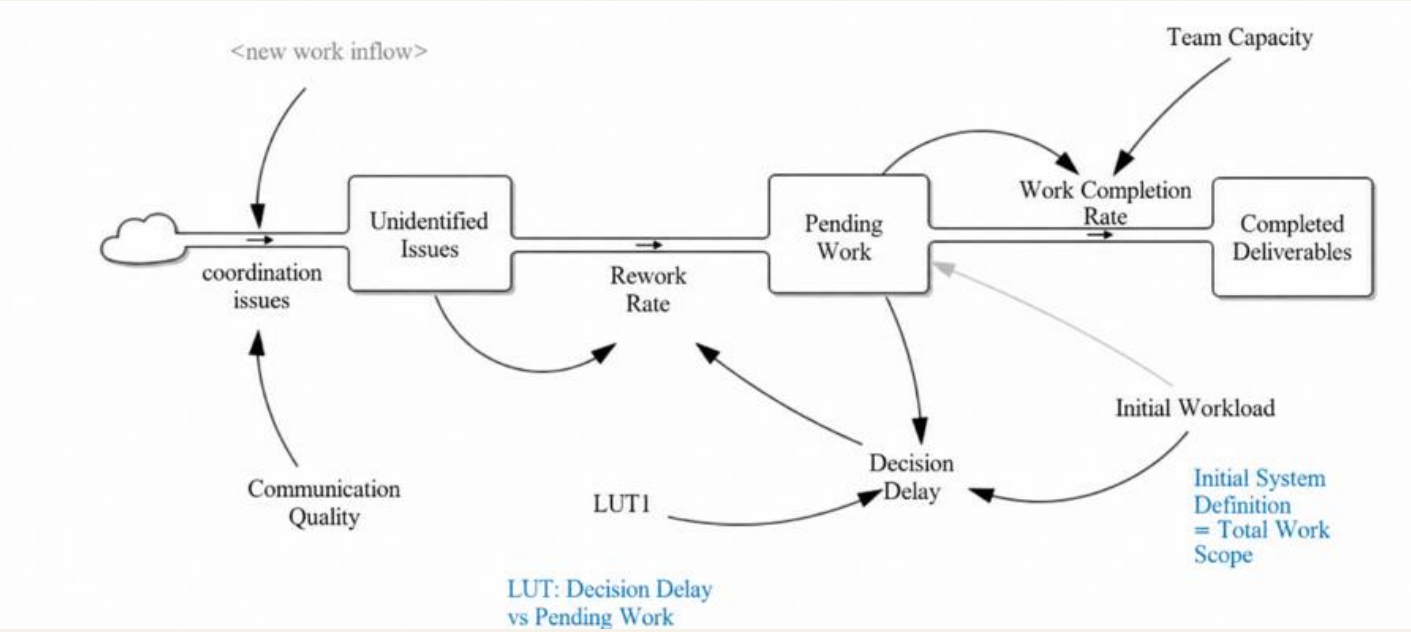
Higher communication quality improves coordination, reduces rework and supports deliverable completion.

B2: DECENTRALIZATION LOOP

Operational autonomy reduces management bottlenecks and shortens decision delays.

VENSIM MODEL: STOCKS, FLOWS AND VARIABLES

THE BASIC STOCK–FLOW STRUCTURE USED FOR THE SCENARIO ANALYSIS



WORK GENERATION

Coordination problems generate unidentified issues and rework.

WORK COMPLETION

Pending work becomes completed deliverables through the completion rate.

MINI FLOW

NEW WORK → ISSUES → PENDING → DONE

KEY PARAMETERS

TEAM CAPACITY | COMMUNICATION QUALITY
DECISION DELAY | REWORK RATE

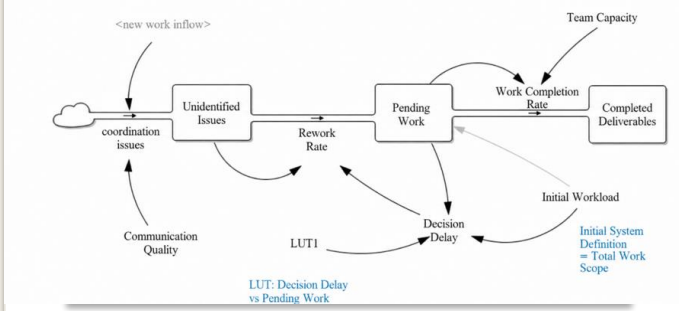
UNIDENTIFIED ISSUES | PENDING WORK | REWORK RATE | DECISION DELAY | COMPLETED DELIVERABLES | TEAM CAPACITY

SIMULATION SCENARIOS

THE SAME STOCK–FLOW MODEL IS USED IN ALL SCENARIOS; ONLY THE PARAMETER SETTINGS CHANGE

BASELINE

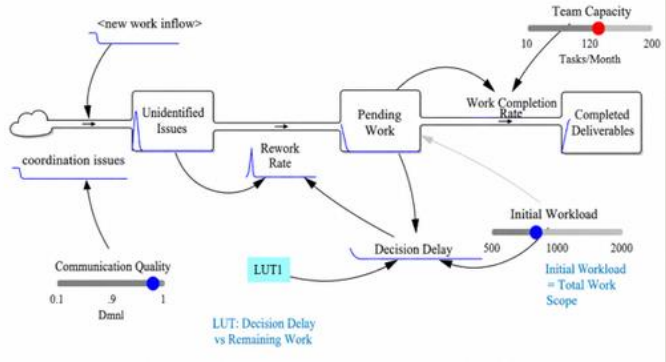
CURRENT SETTING



- Team Capacity = 100 tasks/month
- Communication Quality = 0.90 dmnl
- Reference case for comparison

SCENARIO A

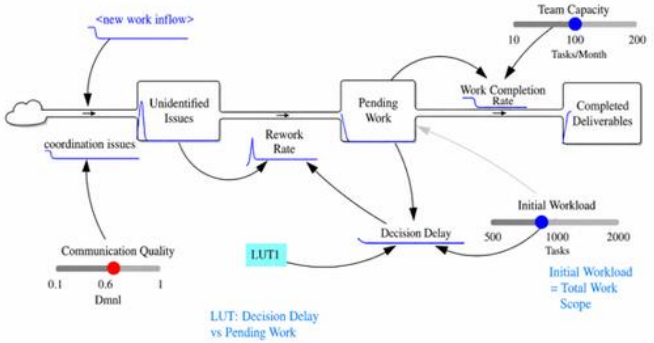
HIGHER TEAM CAPACITY



- Team Capacity increases from 100 to 120 tasks/month
- Expected effect: faster work completion
- Pending work is reduced more quickly

SCENARIO B

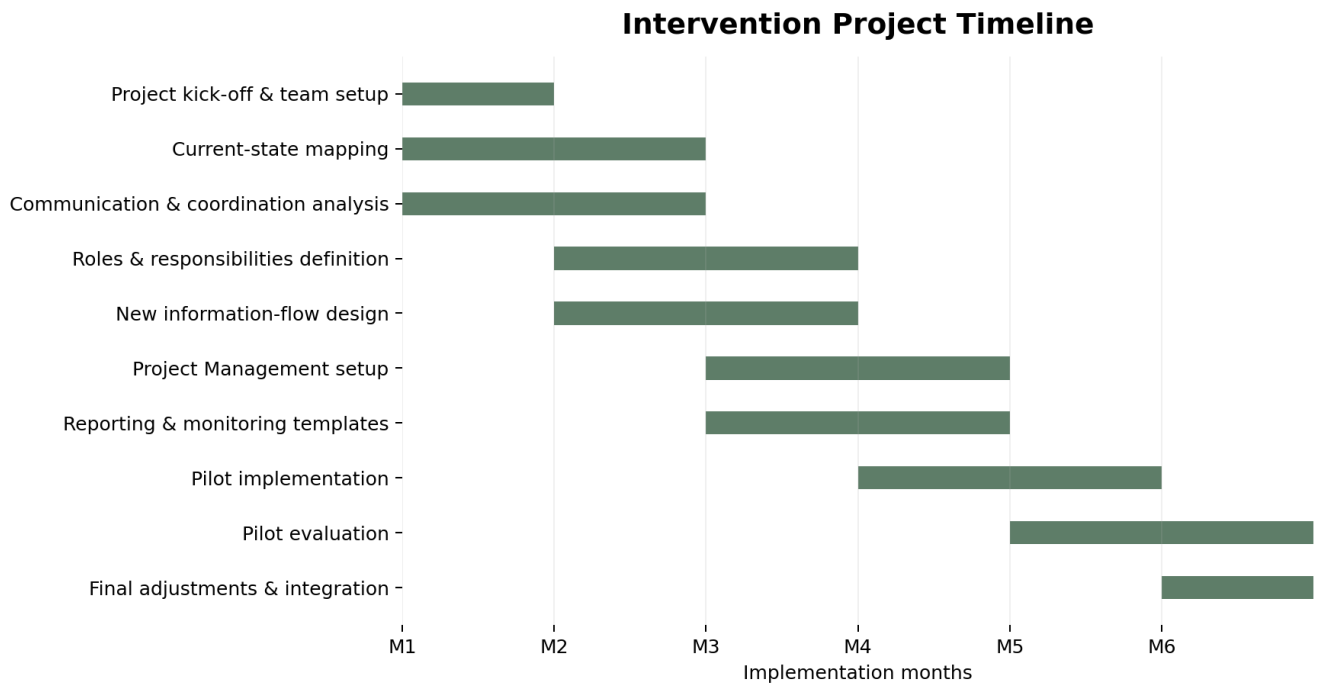
LOWER COMMUNICATION QUALITY



- Communication Quality decreases from 0.90 to 0.60
- Expected effect: more coordination issues and rework
- Completed deliverables grow more slowly

PROJECT-BASED ORGANIZATIONAL INTERVENTION

THE SYSTEMIC FINDINGS ARE TRANSLATED INTO A FEASIBLE SIX-MONTH IMPROVEMENT PROJECT



ACTION PACKAGE

ORGANIZATIONAL LEVERS

Clarification of roles, responsibilities, decentralized operational decisions and common reporting rules.

NEW COORDINATION ROLES

Strategic coordinator and stronger project management function for deadlines and deliverables.

IMPLEMENTATION LOGIC

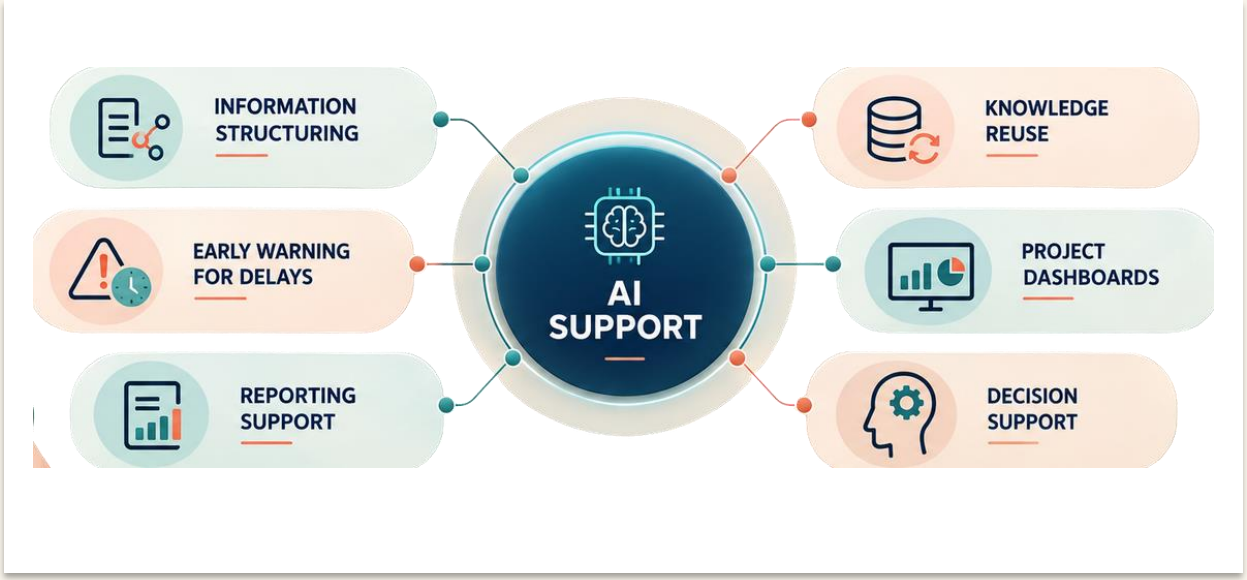
The intervention improves coordination without redesigning the whole organization at once.

DIGITAL TRANSFORMATION AND AI SUPPORT

AI IS USED AS A SUPPORT MECHANISM FOR INFORMATION ORGANIZATION, PROJECT MONITORING AND EARLY WARNING

CURRENT STATE → **AI SUPPORT** → **PROCESS CHANGE**

- **KNOWLEDGE BASE** — Scattered files/emails → shared searchable knowledge
- **DECISION SUPPORT** — Manual data collection → faster synthesis for management
- **PROJECT DASHBOARD** — Fragmented tracking → continuous progress overview
- **MEETING SUMMARIES** — Informal notes → structured actions and responsibilities
- **EARLY WARNINGS** — Late reaction → preventive intervention before rework



CONCLUSIONS AND FUTURE RESEARCH

FROM DIAGNOSIS TO A PRACTICAL ORGANIZATIONAL CHANGE PATH

THE CORE PROBLEM IS SYSTEMIC

Workload, delays, information fragmentation, coordination problems and rework form a reinforcing loop.

DIAGNOSIS

THE MAIN LEVERS ARE ORGANIZATIONAL

Decentralization, clear roles, structured feedback and project management change system behavior.

LEVERAGE POINTS

AI SUPPORTS HUMAN JUDGMENT

AI tools can structure information, monitor projects and detect early signs of delay without replacing decision-makers.

AI-ENABLED SUPPORT

FUTURE RESEARCH PATH

1. **CALIBRATE MODEL**
   Use real operational data.
2. **PILOT INTERVENTION**
   Test the proposed changes.
3. **AI DASHBOARDS**
   Evaluate coordination impact.

THANK YOU FOR YOUR ATTENTION

QUESTIONS AND DISCUSSION

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