Managing Technical Project Risks using STPA

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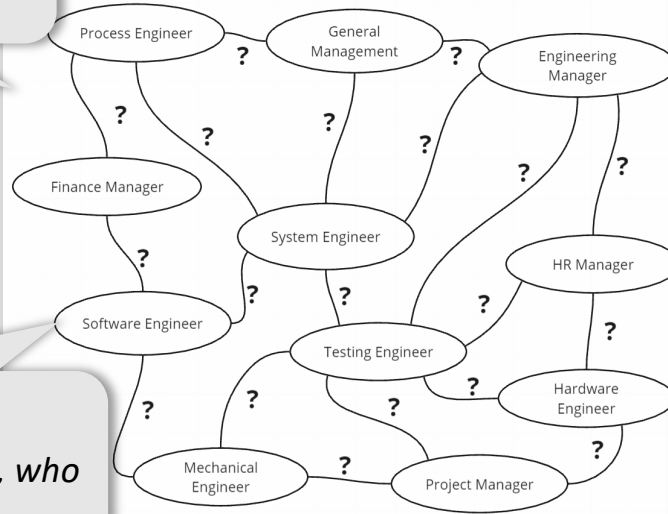
MIT STAMP Workshop
6 June 2024

Background & Challenges

- Sustainable transportation research project.

- Multiple project partners.

- New teams with >70% new members.

Background & **Challenges**

Motivations

To provide:

Project stakeholders **insights** into the project structure

To identify:

Existing or potential **flaws** in the project structure

To improve:

Both **efficiency** and **accuracy** of project works and communications

To create:

A **blame-free** working culture

Losses

L1: Loss of human life.

L2: Loss of capabilities of meeting project scopes.

L3: Loss of organizational reputation.

L4: Loss of damage to the property.

Project Team Level Hazards

L1: Loss of human life.
L2: Loss of capabilities of meeting project scopes.
L3: Loss of organizational reputation.
L4: Loss of damage to the property.

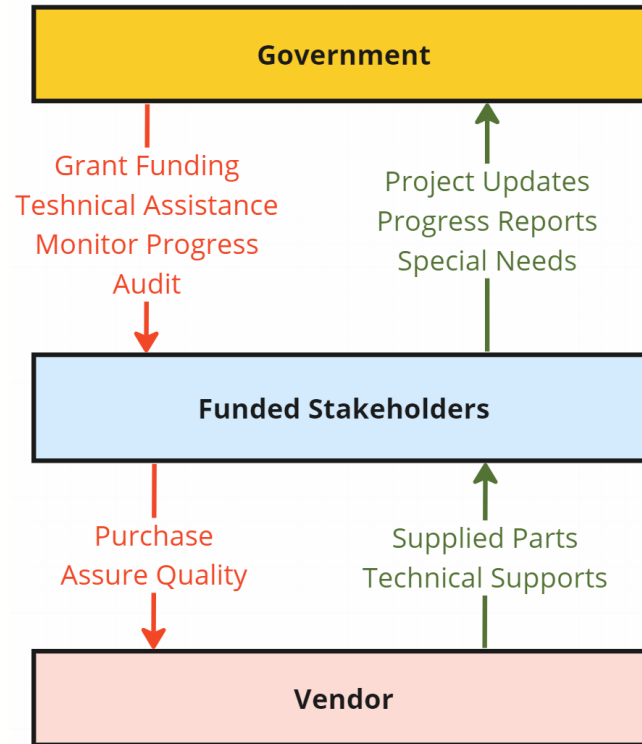**H1:** Project stakeholder(s) resign(s). **[L1, L2]**
H2: Project stakeholders lose trackers on the project. **[L1]**
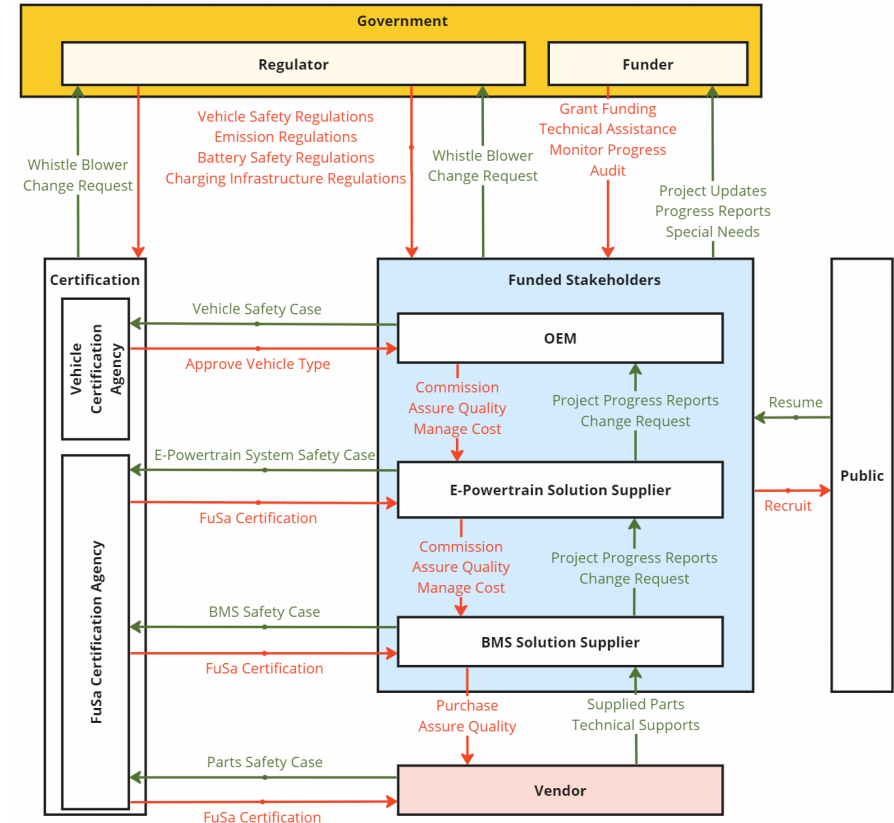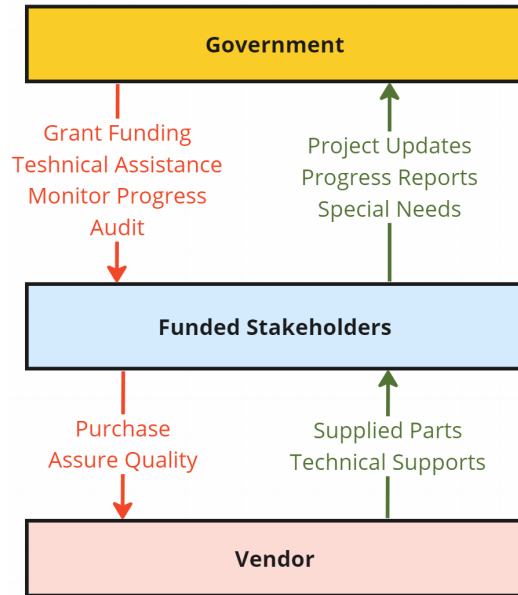**H3:** Project operations does not meet H&S regulations. **[L1, L2, L3, L4]**
H4: Project budgets were overspent. **[L2]**
H5: Project data were lost. **[L2, L3]**
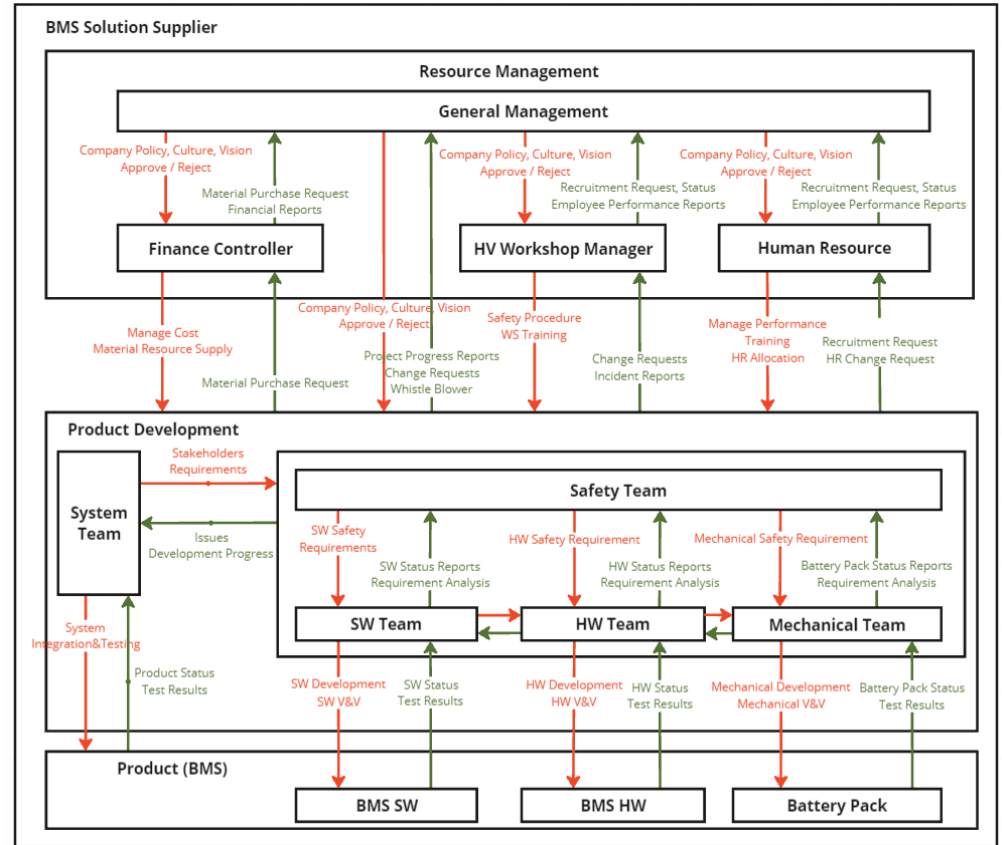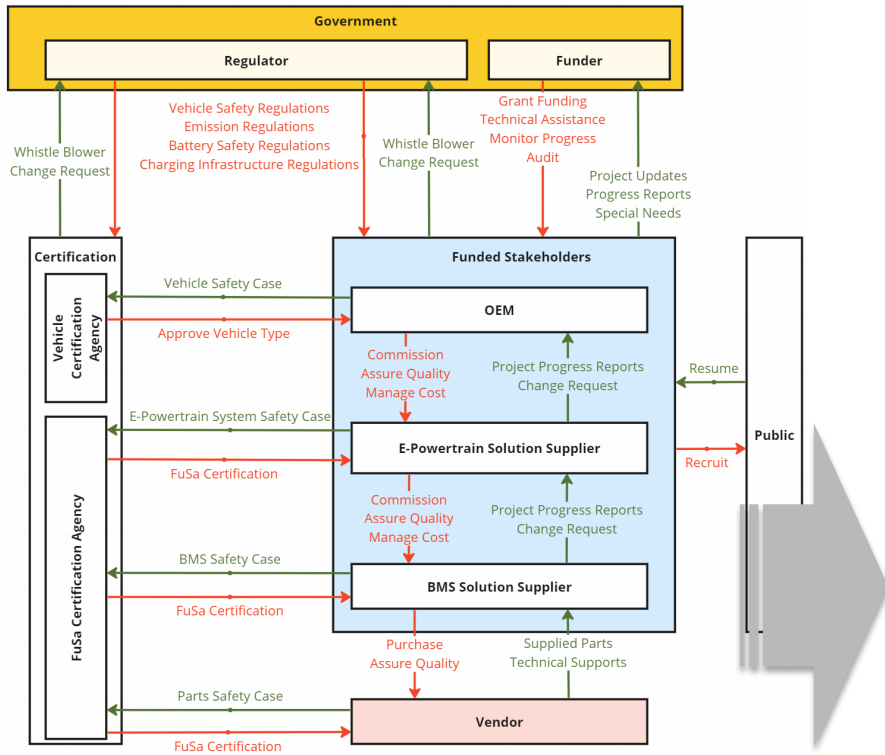
Control Structures

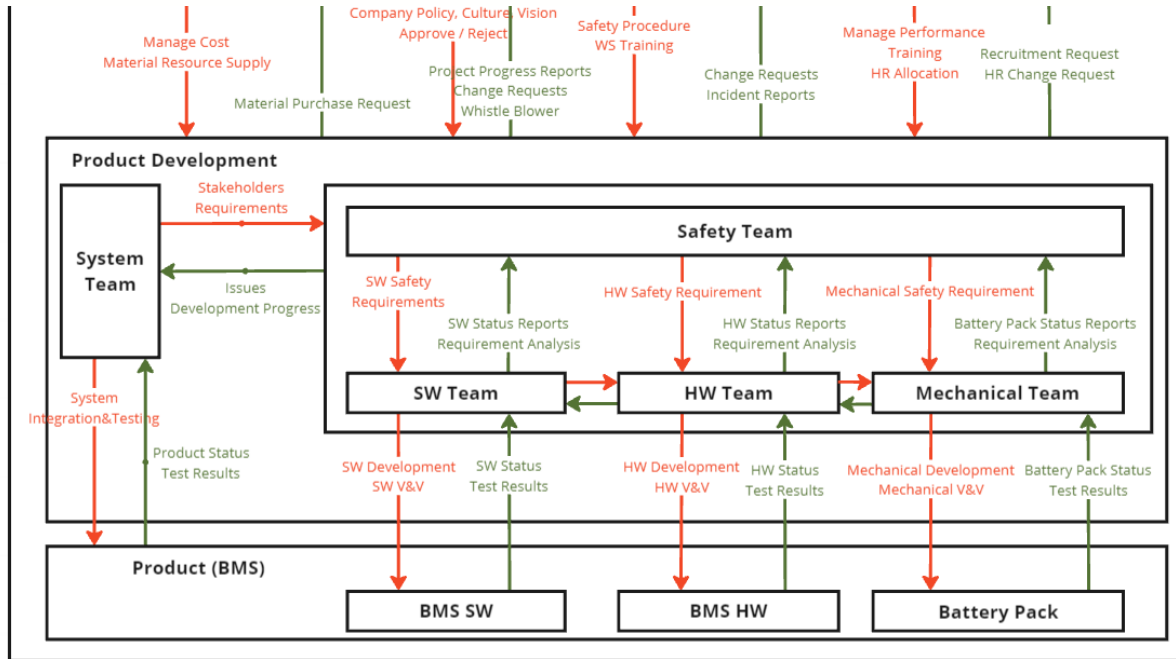# Control Structures

Control Structures

Some 'Impressive' UCAs

UCA1:

Safe Team issues outdated **SW Safety Requirements** to the SW Team when the SW team is in a critical phase of releasing the next version of the software.

Leading to:

H2: Project stakeholders lose trackers.

H3: Project operation does not meet H&S regulations.

H4: Project budgets are overspent.

Some 'Impressive' UCAs
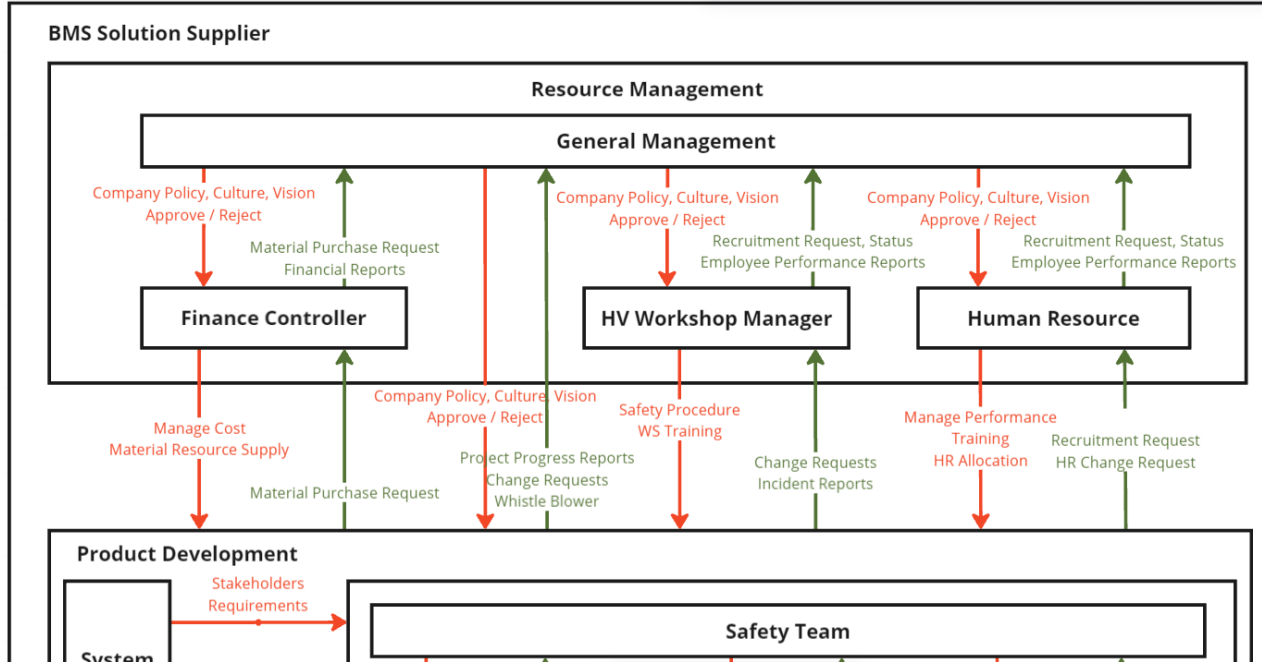
UCA2:
Finance Controller stops **managing cost** too soon when the project is still running and there are still purchase orders going on.

Leading to:
H4: Project budgets are overspent.

Some 'Impressive' UCAs
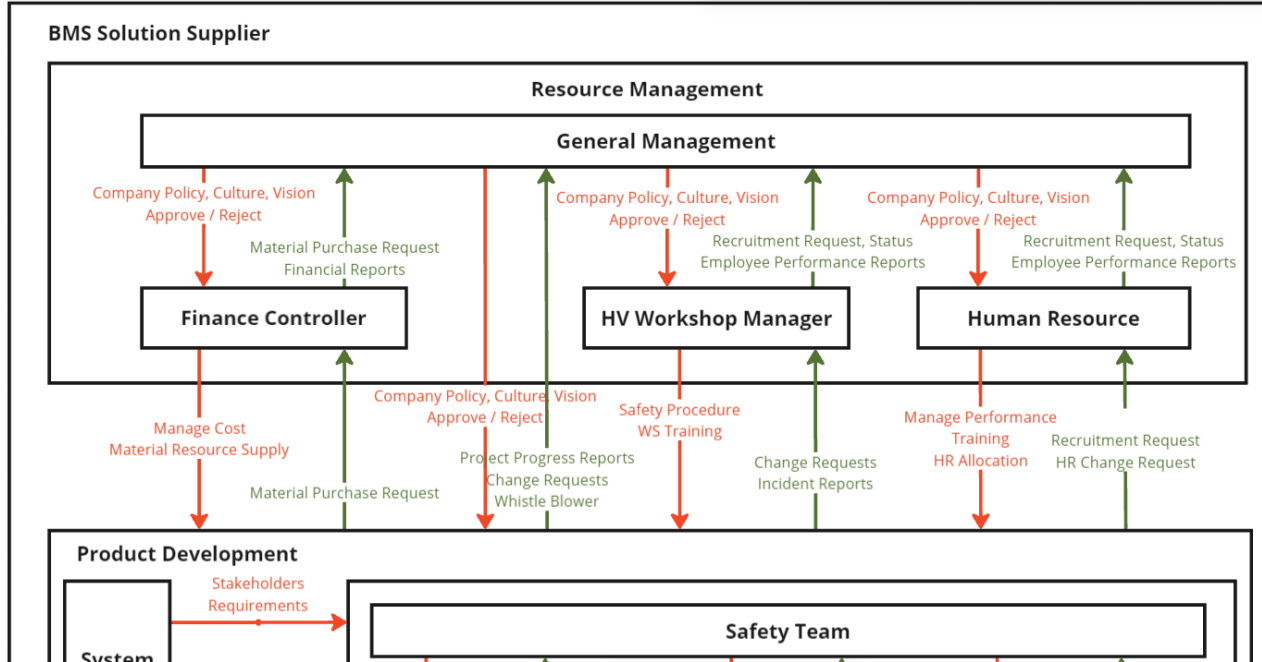
UCA3:

HV Workshop Manager provides WS Training too late when new team member has joined and started working in the workshop.

Leading to:

H3: Project operation does not meet H&S regulations.

Some 'Impressive' UCAs
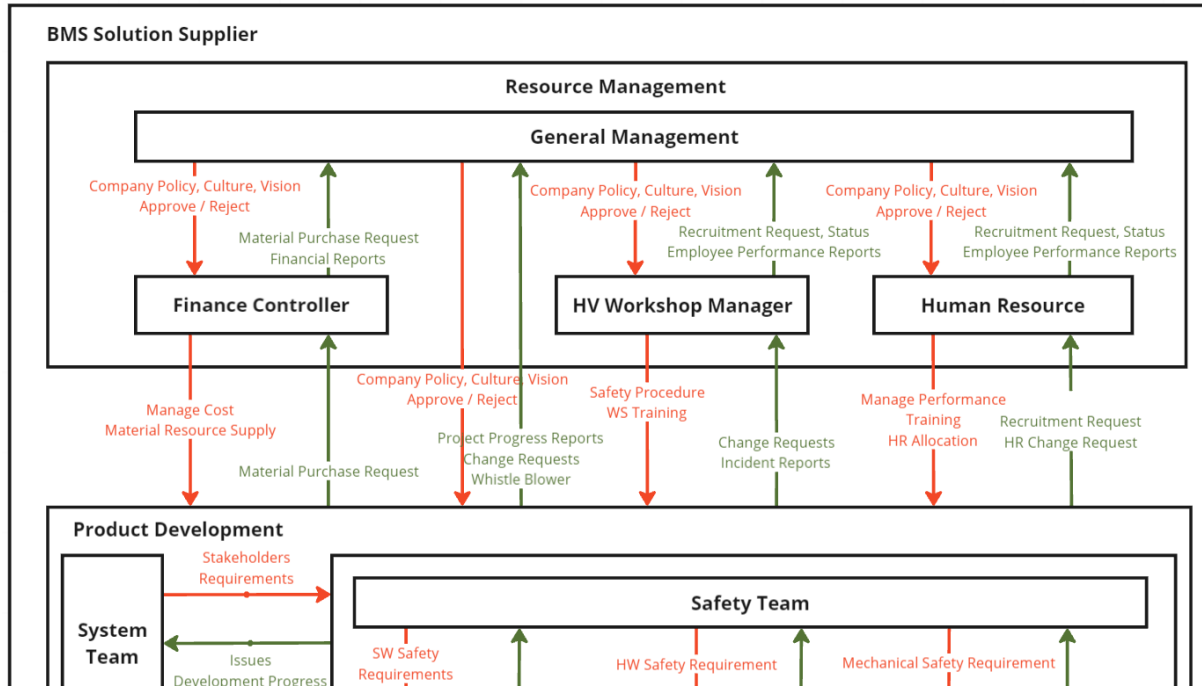
UCA4:

General Management provides company visions too late (>6months) since new people joined.

Leading to:

H1: Project stakeholder(s) resign(s).

H2: Project stakeholder(s) lose trackers.

Some 'Impressive' Loss Scenarios

UCA1:

Safe Team issues outdated **SW Safety Requirements** to the SW Team when the SW team is in a critical phase of releasing the next version of the software.

What happened?

- Safety Team was believing that the latest requirements were uploaded (but **actually NOT**!).
- There was an error message, but it was **unintentionally ignored** as Safety Team was **overloaded** with other work.

Should the Safety Team be **BLAMED**???

What have we learned?

For General Management:
- To emphasize the importance of **safety culture**.

For Safety Team Leader:
- To have more precise task plans and **prioritization**.
- To ensure **awareness** of importance of requirements.

For HR and Safety Team Leader:
- To recruit **dedicated** requirement manager(s).

What have we learned?

An underperformance team member cannot simply be identified as the **cause** of a project risk.

Even a project team with **fully skilled** individuals does not prevent the project risks.

Instead, it could be a **symptom** of the flawed management.

The way team members **interact** with each other is the key to a successful project – i.e., **teamwork**.

WMG
THE UNIVERSITY OF WARWICK

What has STPA benefited us?

Improved project efficiency and collaborations:
- Graphical nature of STPA.
- System-thinking process.
- Change management.

Improved working & safety culture:
- Blame-free.
- STPA complements with project tasks.
- Pro-active identification of risks and communications.

Thank you…
Discussion…

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