Control Organisations

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Overview

› What are control organisations?

› Trends and developments

› HF-based framework for designing control organisations

› Implications for railway security

What are control organisations?

› Operational teams

› Critical environments

› Managing or controlling a system or process

› Deal with predicted and unexpected real-time events

› Typical examples:

  › Critical/vital infrastructures

    › Highway, rail, utility, telecom

  › Complex operations

    › Crisis management, logistics, defence

Environment

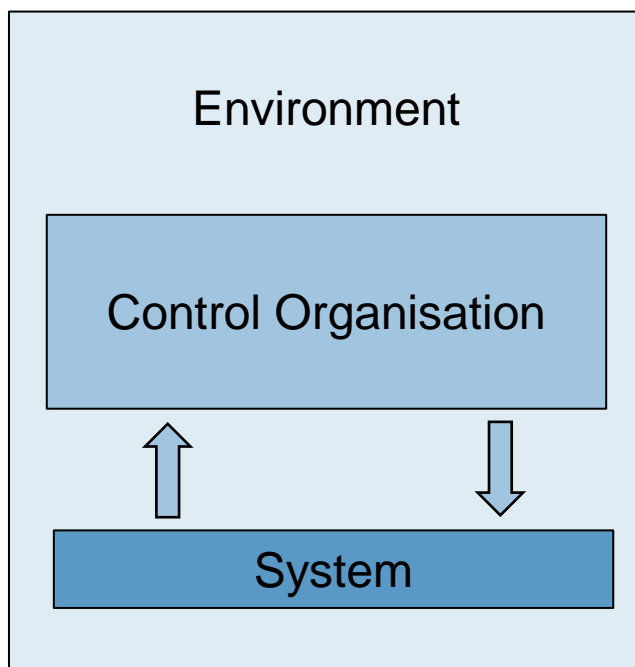Control Organisation

System

TNO innovation for life
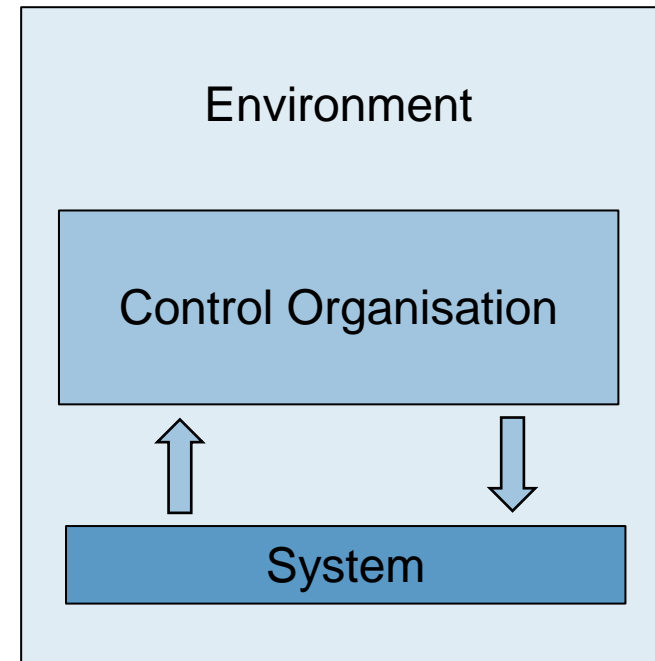
The environment is changing

Environment

Control Organisation

↑ ↓
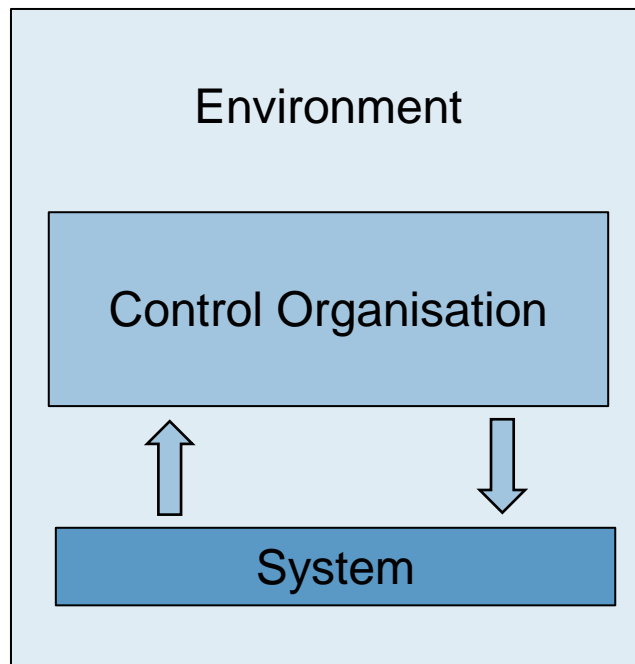
System

> Interdependency between organisations: multidisciplinary
> Network-enabled operations

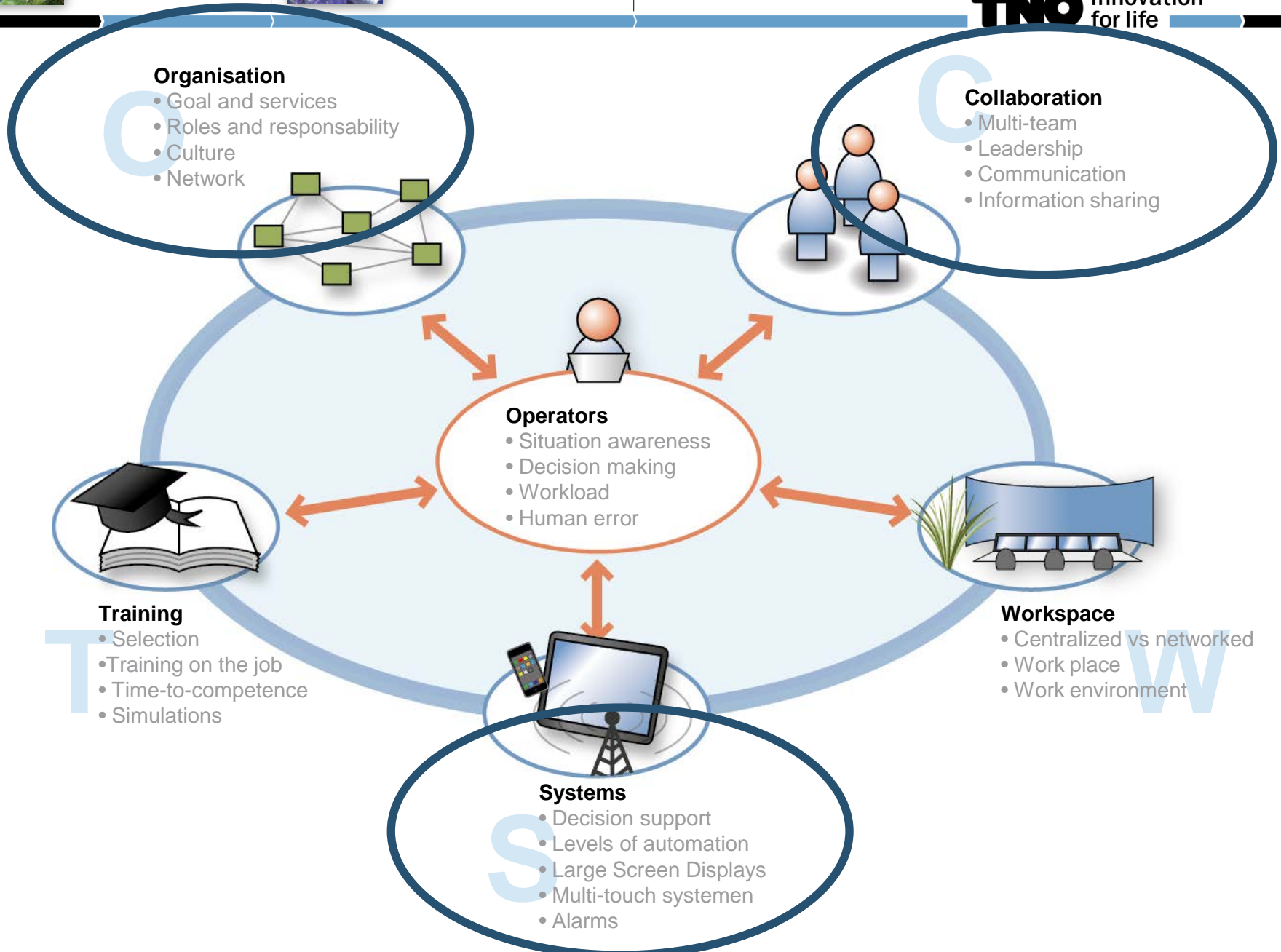# The system is changing

Environment

Control Organisation

System

> Self-organisation and autonomy
> Changing roles
> Social media

Control Organisations are changing

› Shift from operational to tactical tasks

  › Higher levels of automation

  › From direct control to supervisory control

› From reactive to a proactive mindset

› Smaller teams, higher operational efficiency

› From domain experts to information managers

  › Lower levels of domain knowledge required for operators

  › Other competences and skills required for operators

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Organisation
• Goal and services
• Roles and responsability
• Culture
• Network

Collaboration
• Multi-team
• Leadership
• Communication
• Information sharing

Operators
• Situation awareness
• Decision making
• Workload
• Human error

Training
• Selection
• Training on the job
• Time-to-competence
• Simulations

Workspace
• Centralized vs networked
• Work place
• Work environment

Systems
• Decision support
• Levels of automation
• Large Screen Displays
• Multi-touch systemen
• Alarms

Trends in organisation

> The control organisation is part of a network of organisations

> > Trans-organisational networks: the control network

> > Adaptive, variation in partners

> > Boundary spanning issues between organisations in different domains and disciplines

> Shift from isolated control rooms to a networked virtual control center

Trends in collaboration

› Multi-team systems (team of teams)

› Collaboration at a distance

  › Ad hoc virtual teams with local and remote experts

› New forms of leadership

Trends in systems

› Networking-enabled cooperation technologies

  › Interoperability

  › Integration of data sources

› Autonomous software agents, new HCI principles

› Social media monitoring and acting (Twitcident)

› Smart mobile devices bring control data and functions to the field

› Intelligent camera systems

Facebook party invite sparks riot in Haren, Netherlands

Up to 600 riot police were deployed

Railway security (and safety)

› Challenges (TRIPS/PROTECTRAIL):

  › The complexity of interconnected infrastructures and systems

  › Different and sometimes conflicting stakeholder requirements

› Interoperability needs to be addressed at a technological and an organizational level

Railway security (and safety)

› Challenge (TRIPS/PROTECTRAIL):

> › Quick threat/incident detection

› Two important technical enablers

> › Advanced camera systems

> › Social media tools

› Shift to proactive emergency response centres

> › Prediction and early signalling

> › Smarter influencing crowd behaviour

› Changing attitude towards citizens

> › Increasing self-reliance

> › Citizens can support first responders

Questions?