



# Dependability of IT systems

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# IT systems relation to crisis management

- Used in crises relief
  - Information channel
  - Generate a crisis if it does not work?
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- → many systems of interest



# Different types of systems

- Different functions
  - Providing information / managing operations / ...
- Different owners
  - Municipalities/Regions/National/International
  - Public/Private
- Different original intention concerning dependability
  - Intended to be used in a crisis / not intended to be used in a crisis / a complement

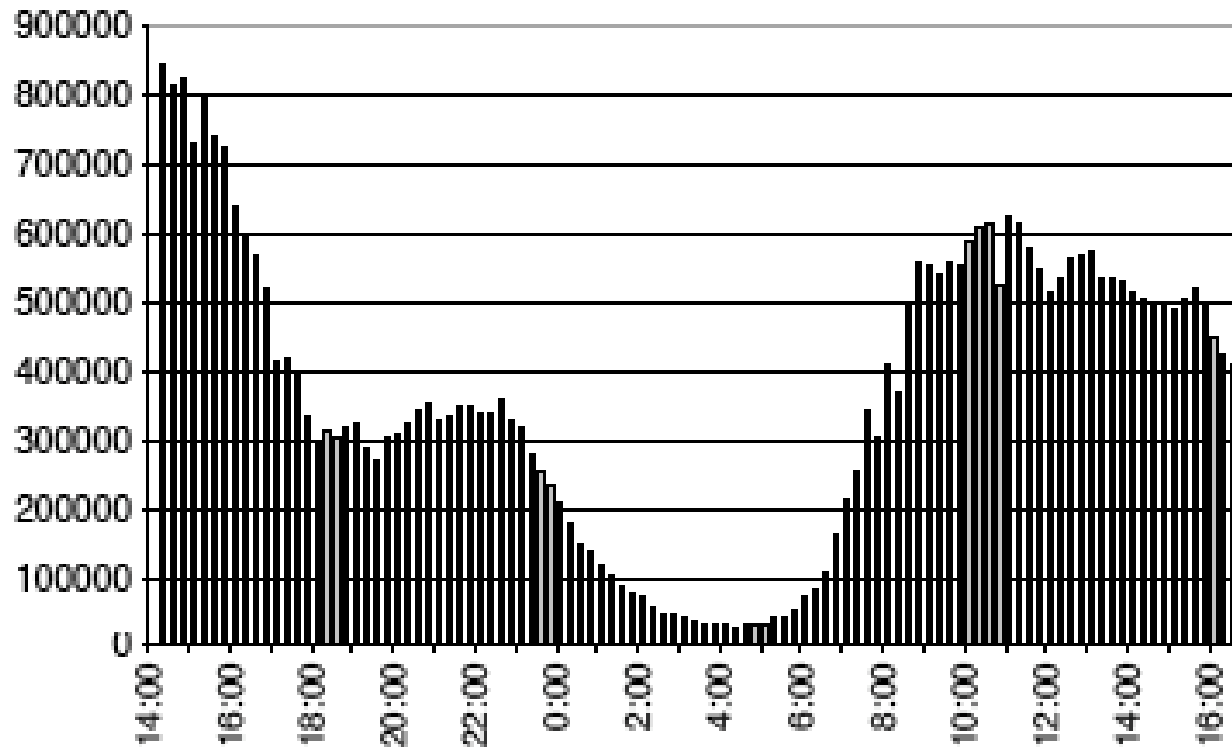


# Dependability analysis of IT systems is hard because...

- “Basic characteristics” of IT systems and software
  - Complex (products and development)
  - Rapid changes
  - Hard to verify reliability
- Information about how critical different systems are is not easy to find
- IT systems are changed rapidly, and to a larger extent being “business critical”
- Usage of IT systems will change in case of a crisis



# One example – information requests in a crisis



# In an early study we wanted to know...

... the current situation at Swedish municipalities:

- People involved
- Division of responsibilities
- Critical IT systems
- Current methods
- Problems



# Findings: Organisation

- System Responsibility
  - Specific systems and common systems: no responsibility for data collection, uncoordinated updates of both applications and OS/network
- Internal Communication
  - Lack of understanding (knowledge about purpose vs technical understanding)
- Service Level Agreements
  - No measurements
  - No guarantees



# Findings: Risk Analysis

- Emergency Management
  - Operational level, Scenario analysis, ...



- Practical IT work
  - System view, Maintenance, technical details, ...





# IDEM3 Maturity Model

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## IDEM3 (IT Dependability in Emergency Management Maturity Model)

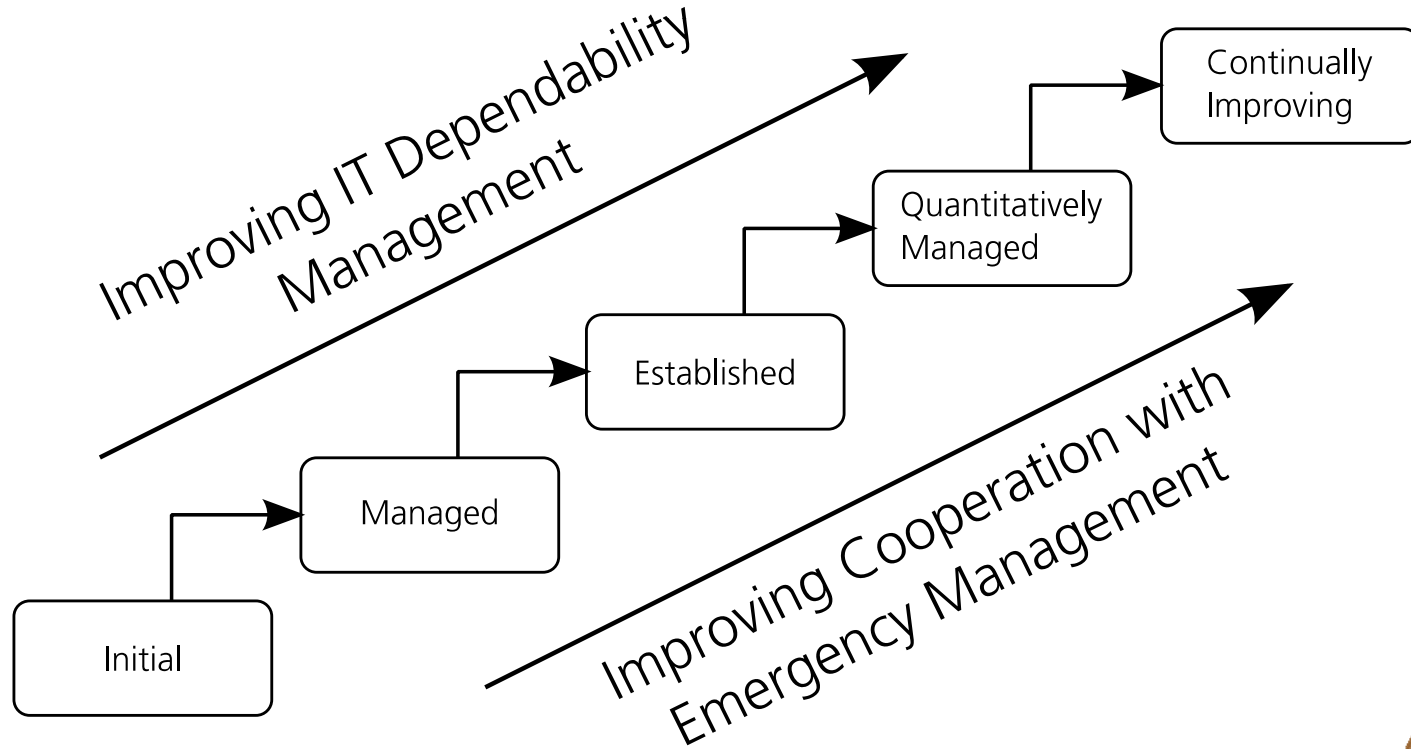
- Process improvement tool for governmental organisations
- Based on similar existing models
- Focusses on cooperation needed to include information about the dependability of IT systems in emergency management and vice versa
- Adapted based on feedback from experts and practitioners
- Currently being evaluated in practical setting



# Maturity Model (2)

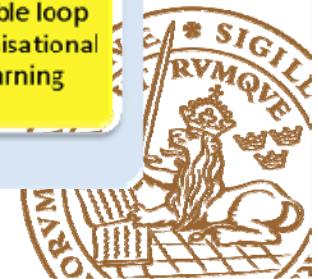
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## Maturity Model for IT Dependability in Emergency Management



# Four Categories of Attributes

	Level 1: Initial	Level 2: Managed	Level 3: Established	Level 4: Quantitatively Managed	Level 5: Continually improving
Outcomes	Low or unknown dependability	Dependability varying between systems	Stable dependability	Controlled dependability	Continuously improved dependability
IT Management	Ad-hoc	System-based	Basic, standardized procedures	Based on quantitative data	Continuously improved
Cooperation	Conflict relationship	Personal relations	Well-defined responsibilities	Detailed SLAs	Partnership
Organisational Issues	No one takes responsibility	Organised by individual system managers	Coordinated by IT safety manager	Single loop organisational learning	Double loop organisational learning



# Conclusions

- IT systems important in crisis management / relief
- Many types of IT systems
- Gap between operational level and practical IT management level
- This type of improvement can be supported by a maturity model – which is also developed

