SPROM-OLF - Change management II

SPROM-OLF_HT2023 contents

1. Economic foundations; Organisation Theory
2. Leadership
3. Entrepreneurship; Teams & Projects
4. Change Management
5. Business Ethics; course summary

Contents

- Change (C1): Requirements change
- Change (C2): Organizational transition
- Change (C3): Technology acceptance

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C1 - Requirements change

C1 - Requirements change

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Requirement change: "*the tendency of requirements to change over time in response to the evolving needs of customers, stakeholders, the organization and the work environment*"

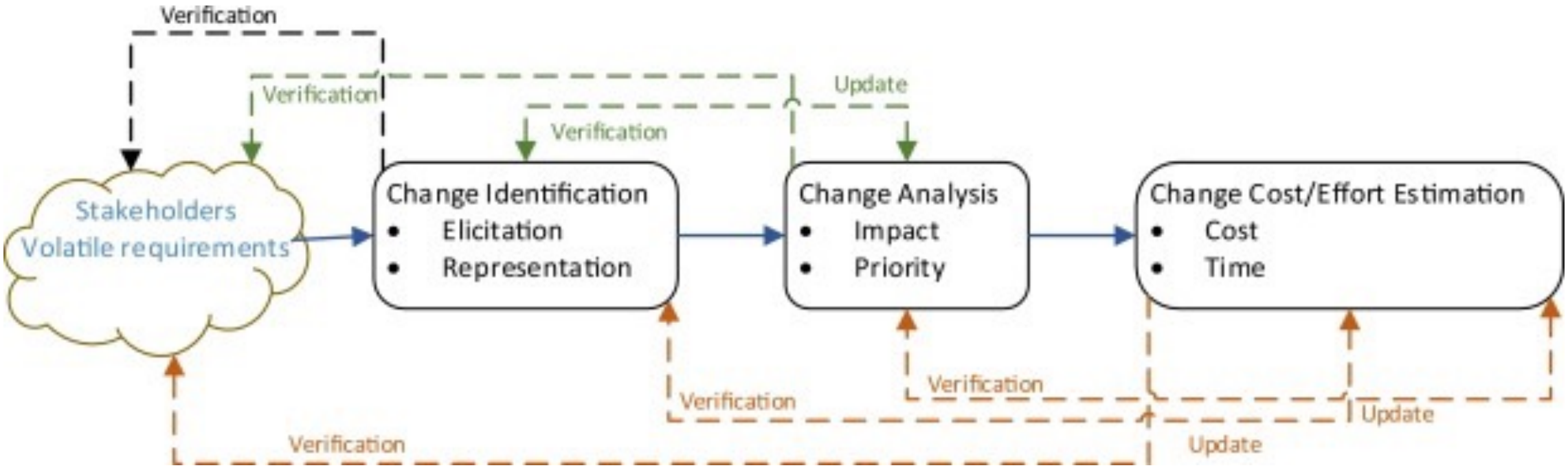
Requirement change management: "*management of such changing requirements during the requirements engineering process, system development and the maintenance process*"

- ➔ Requirement change management process
- ➔ Requirement change management process models
  - ➔ Activities
  - ➔ Artifacts
  - ➔ Roles

S. Ramzan and N. Ikram, "Requirement Change Management Process Models: Activities, Artifacts and Roles," *2006 IEEE International Multitopic Conference*, Islamabad, Pakistan, 2006, pp. 219-223, doi: 10.1109/INMIC.2006.358167.
Jayatilleke, Shalinka, and Richard Lai. "A systematic review of requirements change management." *Information and Software Technology* 93 (2018): 163-185.

C1 – Requirements change

Requirement change management process (RCMP)



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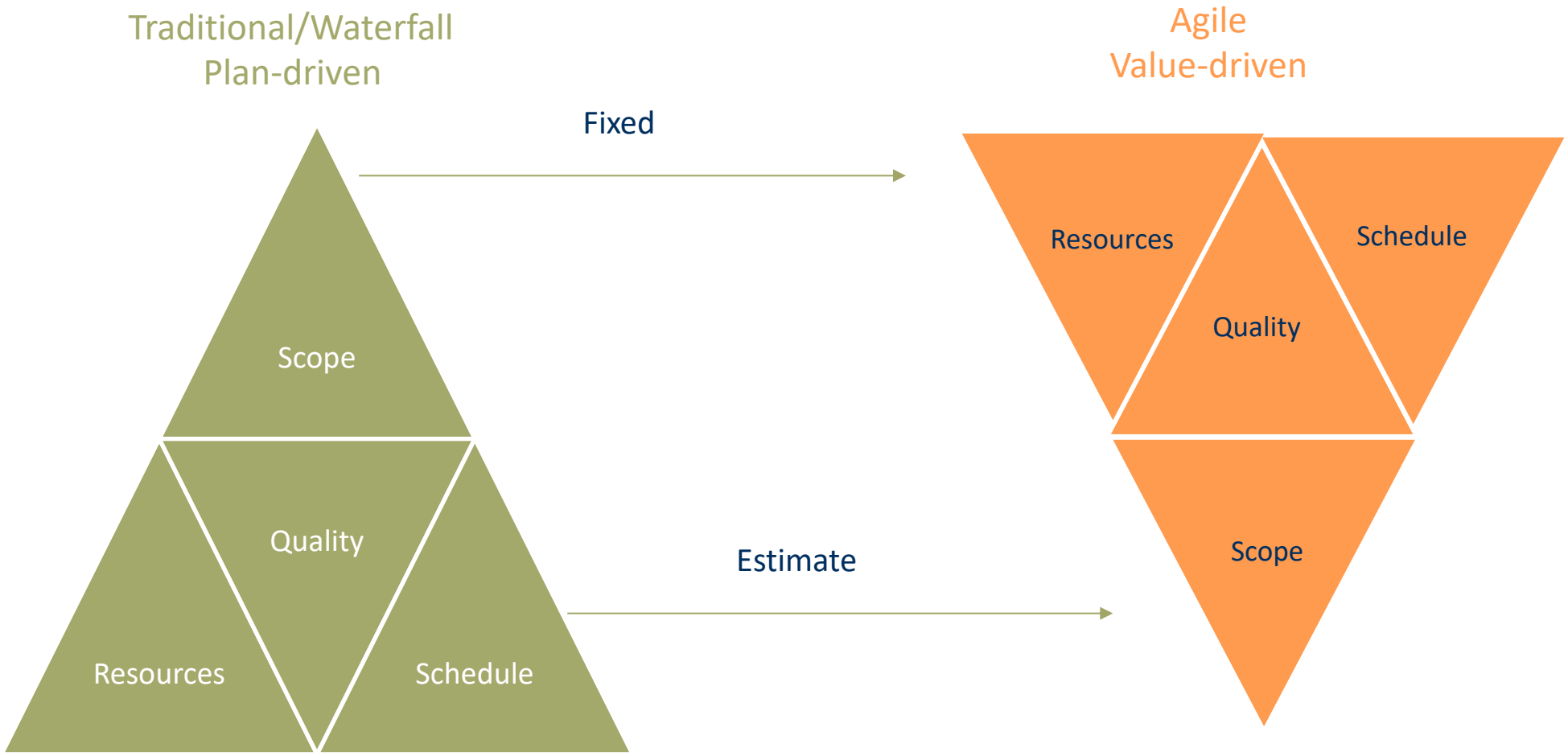
C1 – Requirements change
Traditional vs Agile



C1 – Requirements change - RCMP

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Change identification

Traditional approaches	Agile
Taxonomies (e.g., use case, ..)	Customer feedback; direct communication
Classification (e.g., direction based: add/delete function, reason, driver ..)	Retrospective, review meetings

Change analysis

Traditional approaches	Agile
Requirements traceability	Iterative requirements
Using history to predict change impact	Prototyping

C1 – Requirements change - RCMP

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Change cost/effort estimation

Traditional approaches	Agile
Algorithmic - Cost estimation models (e.g. COCOMO)	Expert judgement
Non-algorithmic – Expert judgement, bottoms up, …	Planning poker

C1 – Requirement change management process models (RCMP)

- ➔ Requirement change management process models
  - ➔ Activities
  - ➔ Artifacts
  - ➔ Roles

C1 – RCMP traditional models' comparison

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RCM Process Models / Activities	Dean Leffingwell and Widrig Model [20]	Olsen's Model [25]	V-Like Model [22]	Ince's Model [22]	Spiral Model [22]	NRM [23]	S.A. Bohner Model [31]	CHAM [32]	S.A. Ajila Model [33]	Simon Lock Model [34]
Plan for change	√							√		
Baseline requirements.	√									
Establish channel to control change	√			√						
Use a change control system to capture changes	√									
Change Impact on functionality	√		√						√	√
Change Impact on cost	√							√		√
Change Impact on customers and other external stakeholders	√									
Potential of the change to destabilize the system	√									
Negotiation process	√							√		√
Budget reconciliation process	√									
Decision making	√									
Manage change hierarchically	√									
Update documents	√			√				√		
Change creation		√		√					√	√
Change implementation		√	√	√		√	√		√	
Verification		√				√		√		√
Problem understanding			√		√		√			

C1 – RCMP traditional models' comparison

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Problem understanding			√		√		√			
Solution analysis			√		√			√		√
Solution specification			√		√		√			
Submit solution			√							
Regression testing			√				√			
Acceptance testing (Validation)			√	√		√			√	√
Submission of modification report			√							
Change authorization note filled				√						
Current configuration record updated				√						
Examined from the non-technical viewpoint.					√					
Documenting the actions and observations					√					
Determine the type of change								√		
Estimate effort								√		
Release								√		
cost benefit analysis										√
Document impact, cost and decisions										√
System release planning					√			√		√
System release and integration										√

C1 – RCMP traditional models' comparison

Stockholm University

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Baseline	√									
Vision Document	√									√
Use case model	√									√
Software Requirement Specification	√									√
Modification Report			√							
Receipt for problem statement			√	√						√
Change authorization note				√						
Implementation plan					√					
Test record				√						
Release plan					√					
change request form										√

Actors

Customer	√			√				√		√
Developer	√			√				√		√
End user	√							√		√
Change request and defect tracking system	√									
Change Control Board	√			√						
Maintenance organization			√							

C1 – RCMP traditional approaches and agile

Challenges in traditional RCM approaches	Solutions provided by Agile approaches
Communication gaps and lack of customer involvement causing ambiguous requirements	Frequent face-to-face communication, customer involvement, and iterative requirements
Changes that occur due to over scoping which is a result of communication gaps and changes after finalizing project scope	Continuous customer involvement, iterative requirements, and prototyping
Change validations	Requirement prioritisation through iterative processes, prototyping, and review meetings and acceptance tests

C1 – RCM wrt organizational level

Executive level

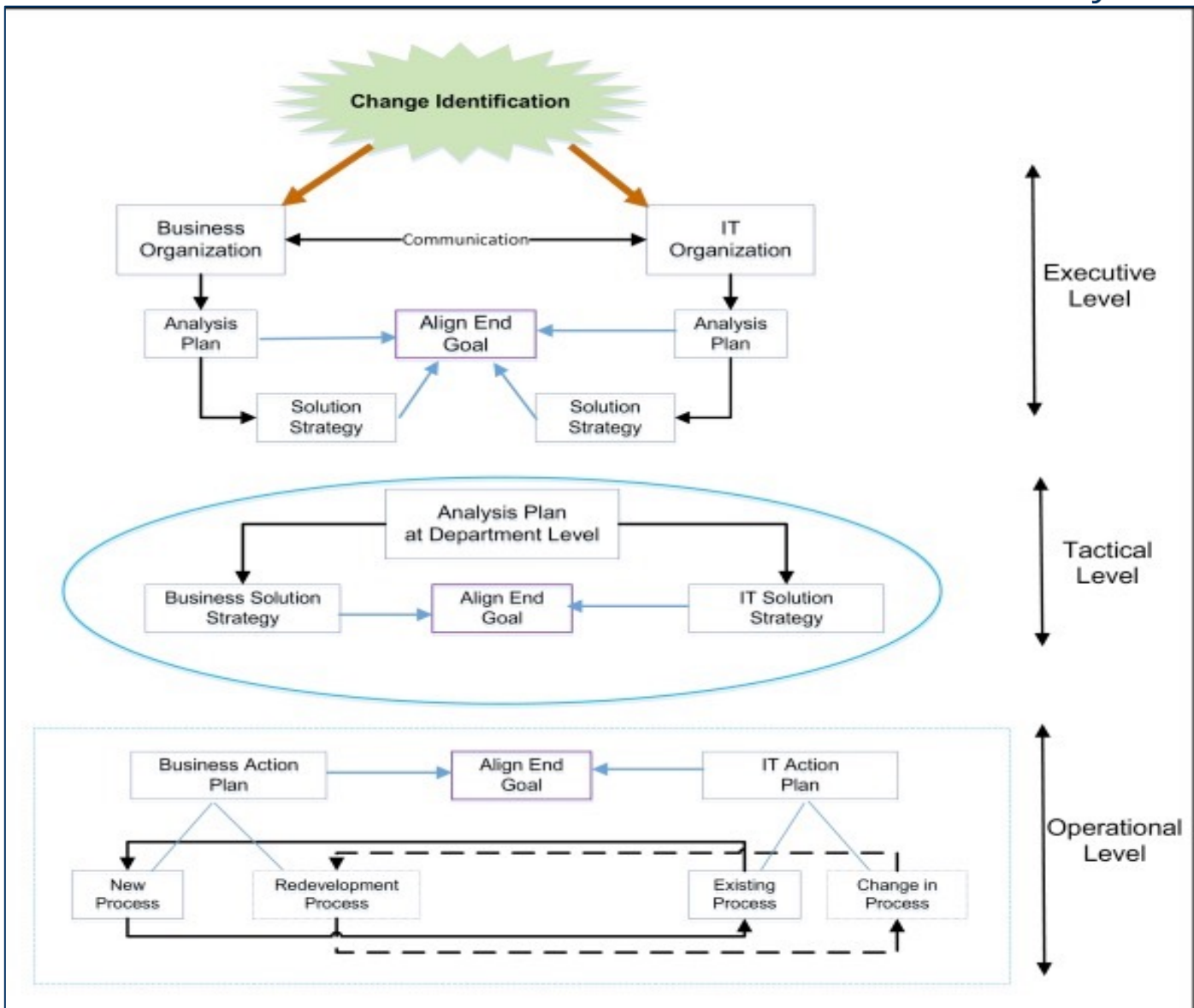
- Broad strategies for change management

Tactical level

- Functional strategies for change analysis - cost/benefit analysis

Operational level

- Plans for change implementation



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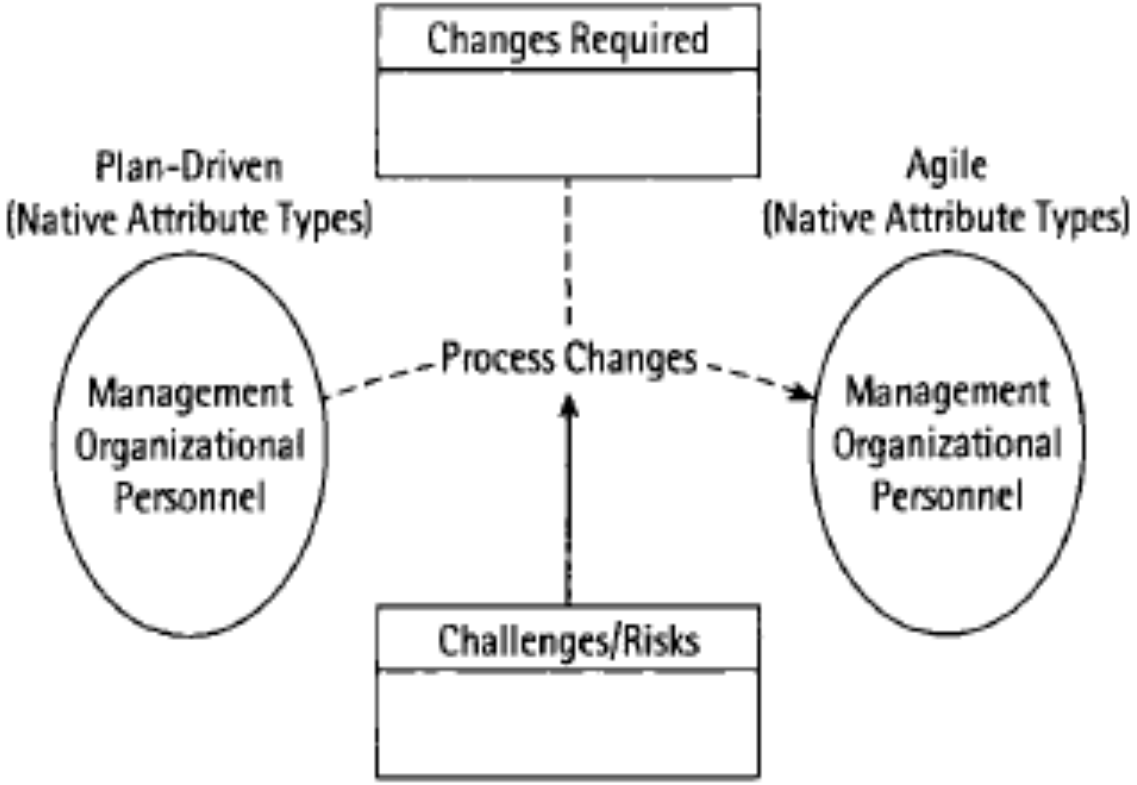
C2 - Organizational transition

C2 - Transition from plan-driven to agile



Challenges/Risks
Developer resistance
Developer perceptions of micromanagement
Developer perceptions of freedom
Distributed development
Productivity differences between team members
Decrease in productivity during transition
Overzealous teams
Tester resistance
Upper management resistance
Human resources resistance
Variability in subsystems and teams
Differences in life cycles
Problems with incorporating agile in legacy systems
Differences in development processes
Differences in performance measurements and benchmarks
Conformance with traditional process standards
Differences in management attitude toward project success
Problems with team-size scalability
Problems with selecting the right agile methodology

Misra, S. C., Kumar, V., & Kumar, U. (2010). Challenges in transitioning plan-driven software development projects to agile. *Software Quality Professional, 12*(3), 20-33.

C2 - Transition from plan-driven to agile - Challenges

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Challenges	Explanation
Resistance to change	• Developers (working style, attitude towards project success, performance…) • Testers (test after coding, resist test while coding) • Upper management (favour fixed price-fixed scope, less tolerant of risk of failure,..) • Human resources (care less of adopted processes, methods for development)
Distributed teams	• Difficult close interaction/feedback, timezone, culture,…
Development processes	• Heavy weight processes to light weight, customer feedback oriented, embrace change and respond, short iterations, driven by test plans…
Management style	• No fixed performance measures to rely on, success is qualitative based on customer satisfaction, autonomous teams

C2 - Transition from plan-driven to agile – Required changes

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Required changes	Explanation
Organizational culture	• Develop culture to work in teams rather than developing solitarily with individually assigned roles • Promote culture which considers satisfying customers most important and doing all development centering around that goal • Promote culture which provides freedom to the developers for choosing which modules to develop and how to develop.
Management style	• From command-and-control management to leadership-and-collaboration, from authoritative to collaborative and pluralist decision making. • Seek team's suggestions, remain open about the status of their projects with the team • Perform small-scale scope management without micromanaging the developers • Accept uncertainty and risk • Remain open to changes as might be required by the customers or developers for developing a quality product.
Development processes	• Having a working software rather than following fixed plans, processes, and tools, and documenting them. • Follow short iterations

C2 - Transition from plan-driven to agile

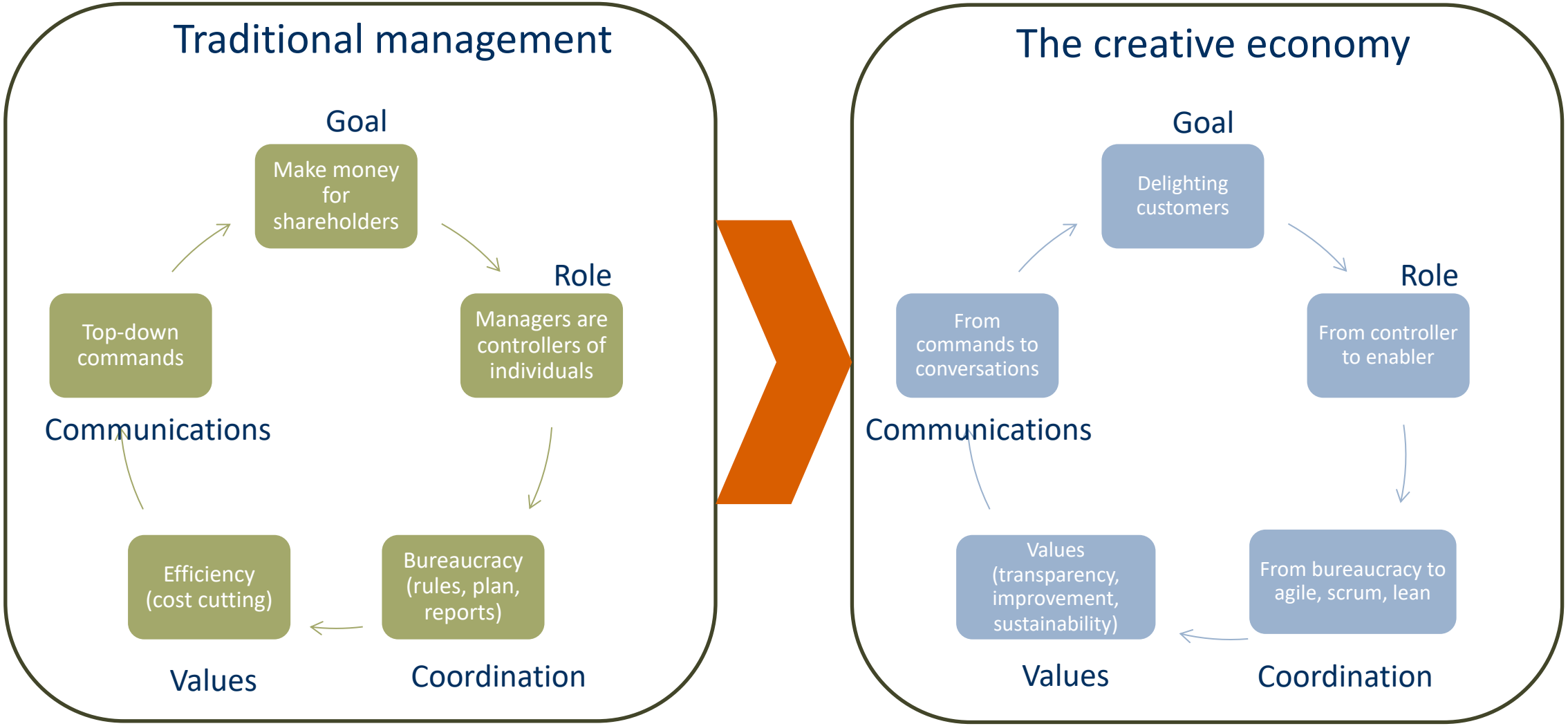
How to make the whole organization Agile

- More on *the need to change* the organizational culture and the leadership style

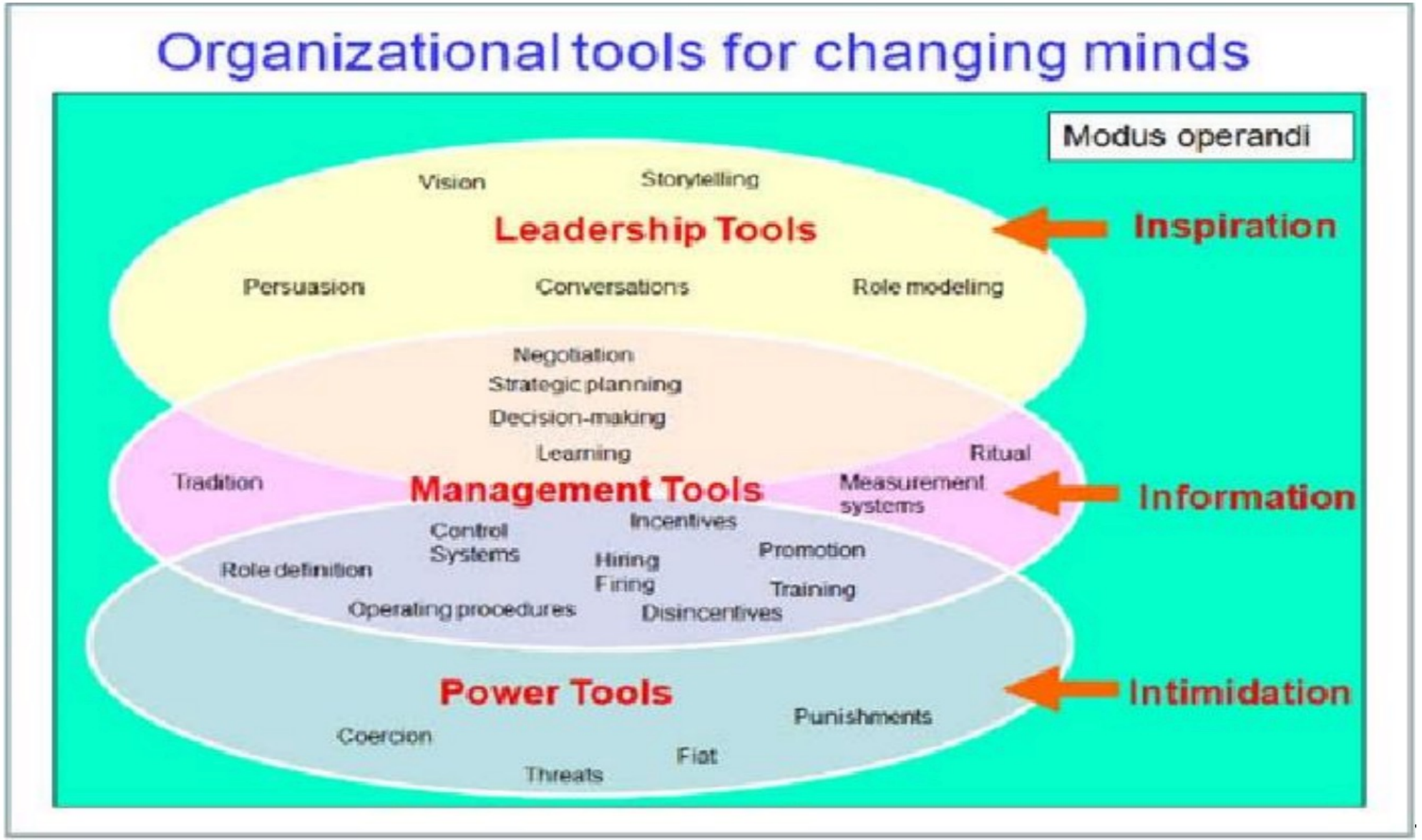
Denning, S. (2015), "How to make the whole organization Agile", *Strategy & Leadership*, Vol. 43 No. 6, pp. 10-17. https://doi.org/10.1108/SL-09-2015-0074

C2 - Transition from plan-driven to agile

Five simultaneous changes in management heuristics



C2- Transition from plan-driven to agile



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C3 - Technology acceptance

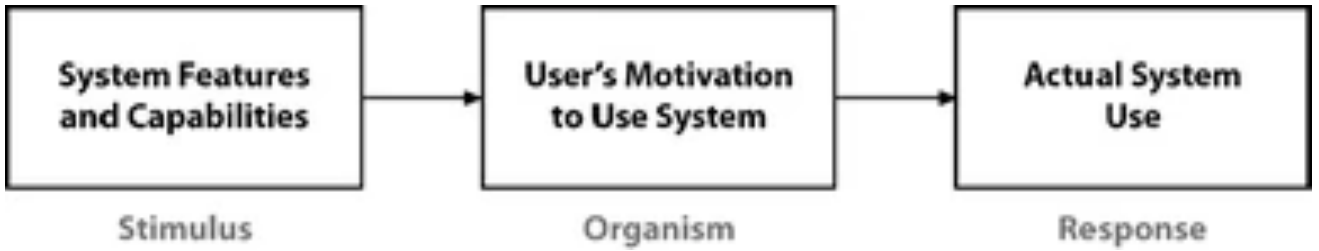
C3 – Technology acceptance

Technology acceptance model (TAM)

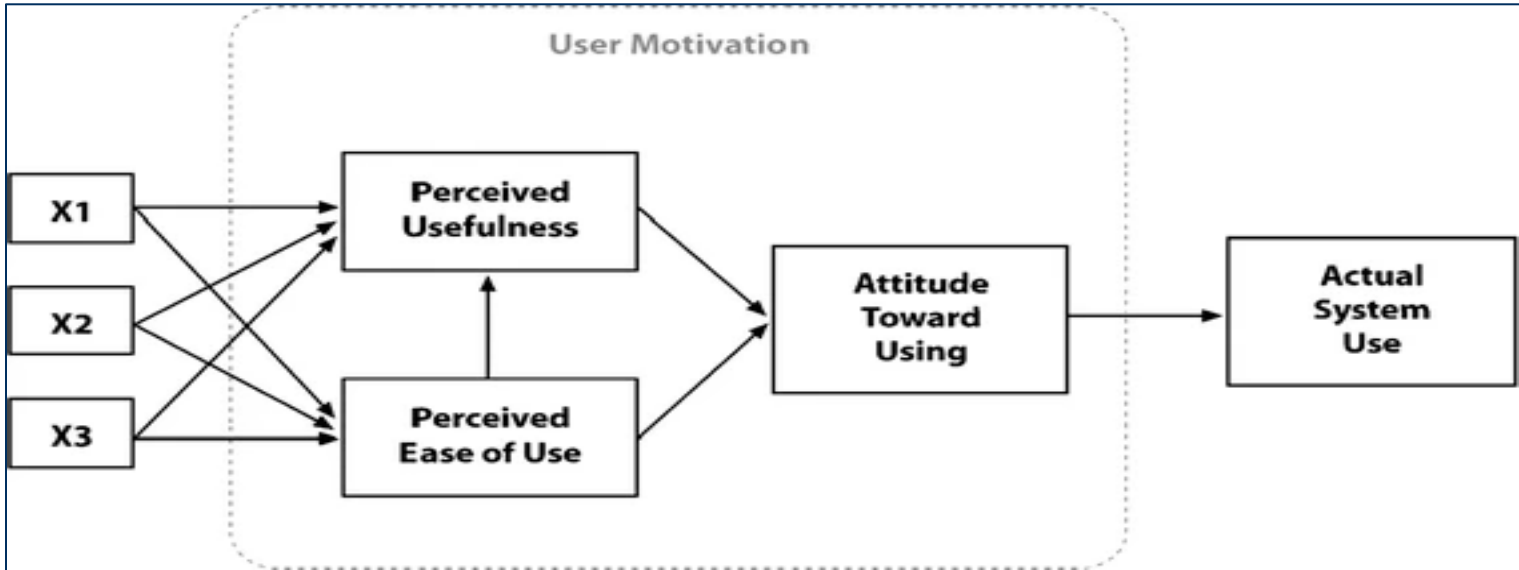
- A dominant model in investigating factors affecting users' acceptance of the technology.
- Derived from the psychology-based theory of reasonable action and theory of planned behavior TAM has taken a leading role in explaining users' behavior toward technology.
- Presumes a mediating role of two variables called *perceived ease of use* and *perceived usefulness* in a complex relationship between system characteristics (*external variables*) and potential system usage.

Venkatesh, Viswanath, and Hillol Bala. "Technology acceptance model 3 and a research agenda on interventions." *Decision sciences* 39.2 (2008): 273-315.
Marangunić, Nikola, and Andrina Granić. "Technology acceptance model: a literature review from 1986 to 2013." *Universal access in the information society* 14 (2015): 81-95.
Lala, Gianina. "The emergence and development of the technology acceptance model (TAM)." *Marketing from Information to Decision* 7 (2014): 149-160.
Chuttur, Mohammad. "Overview of the technology acceptance model: Origins, developments and future directions." (2009).

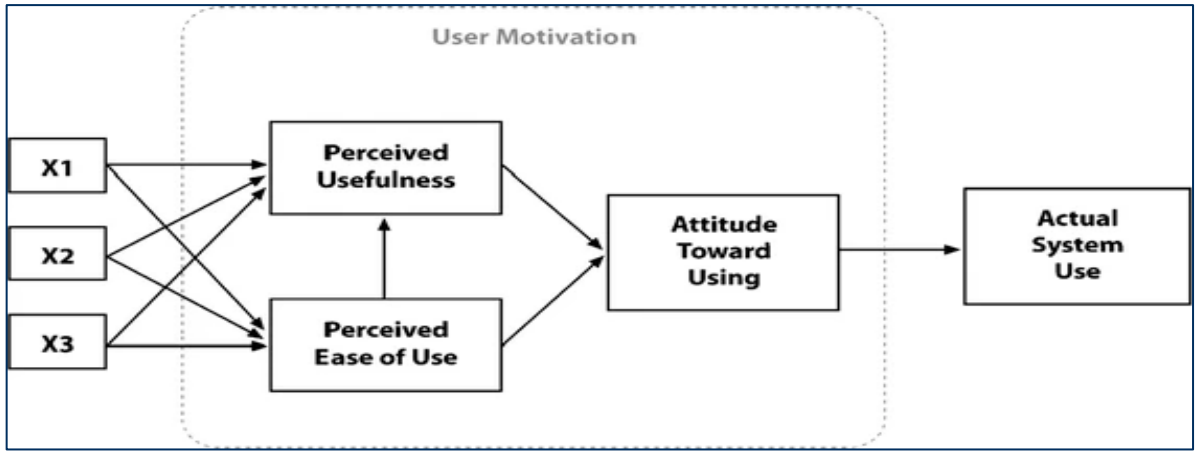
C3 – Technology acceptance



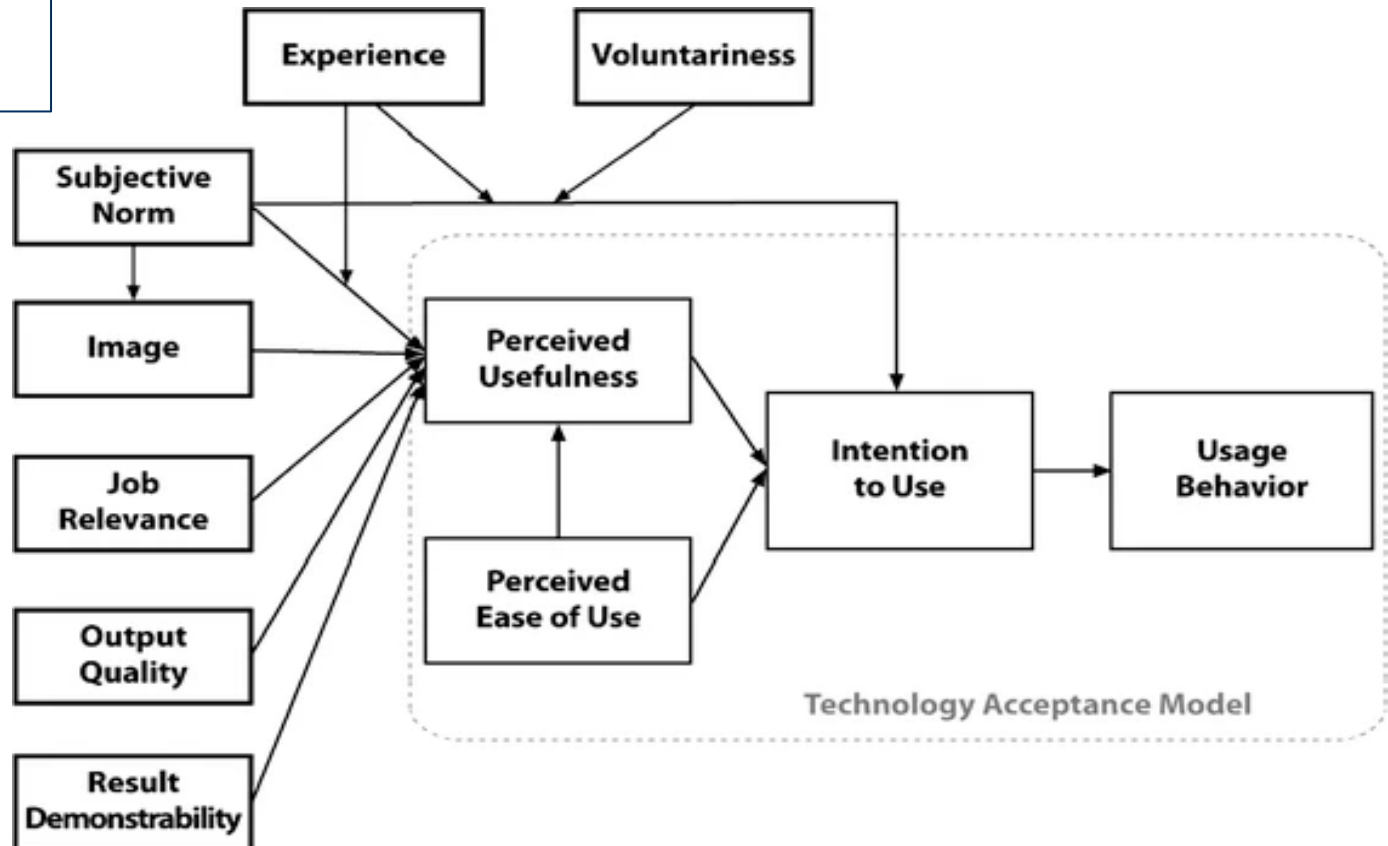
TAM: "actual usage of the system is a response that can be explained or predicted by *user motivation*, which, in turn, is directly influenced by an *external stimulus* consisting of the actual system's features and capabilities"



C3 – Technology acceptance



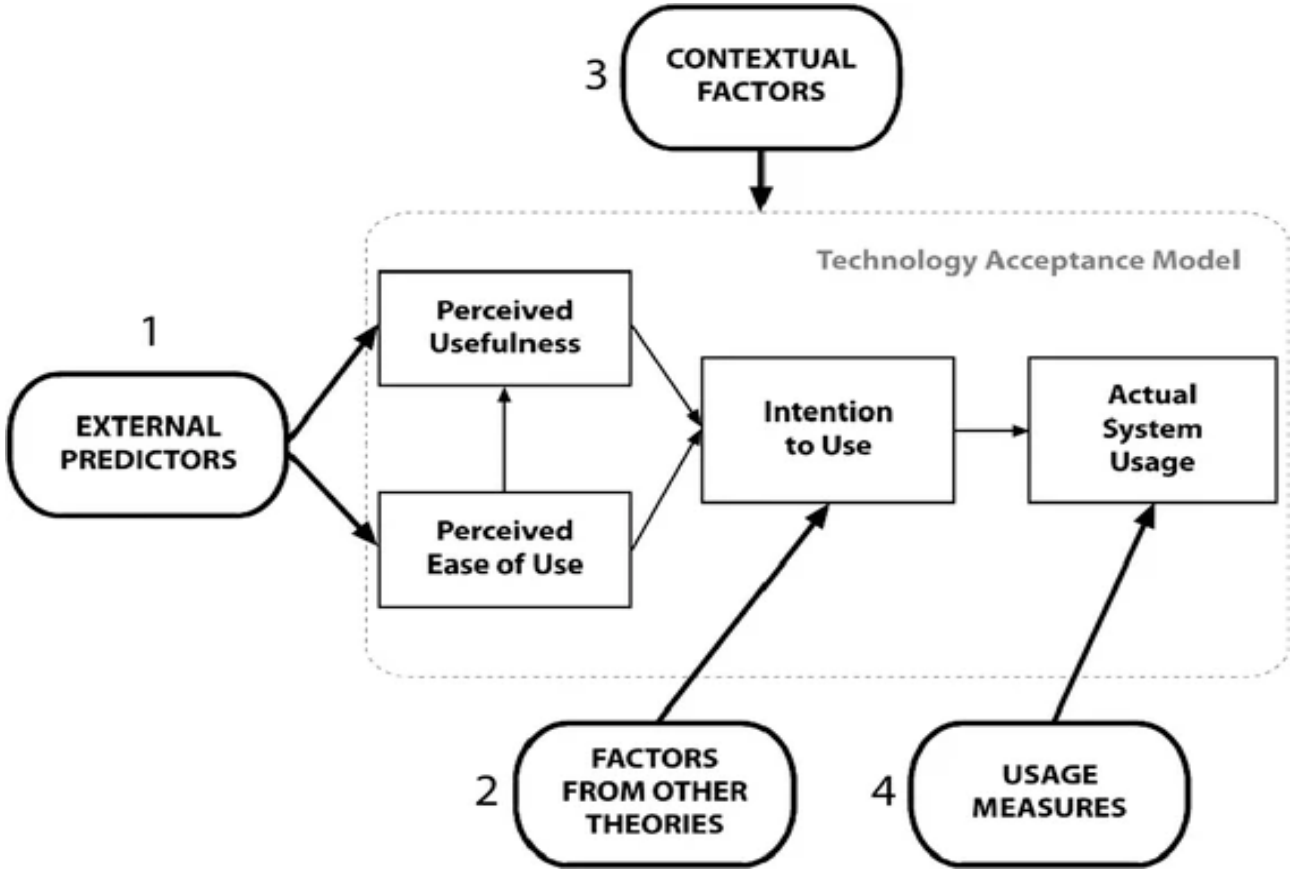
TAM - extension



C3 – Technology acceptance

TAM further extension

1. External predictors
2. Factors from other theories
3. Contextual factors
4. Usage measures



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Application of Kübler-Ross stages to technology acceptance

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This study [1] was an investigative case study about the experience of the end user and the identification and validation of themes within the Kübler-Ross model that relate to acceptance or rejection of technology in the life of a user. It uses the five core themes of the Kübler-Ross model of death and dying: denial, anger, bargaining, depression, and acceptance. It offers evidence that enhances the understanding of technology acceptance through the use of the Kübler-Ross model of acceptance.

[1] Sotelo, Benjamin & Livingood, Richard. (2018). A Qualitative Case Study for Technology Acceptance Using TAM and the Kübler-Ross Models. 10.4018/978-1-5225-5201-7.ch029.

Application of Kübler-Ross stages to technology acceptance

Stockholm University

Questionnaire:

1. The first stage of the Kübler-Ross model for death and dying is denial. Please articulate an incident where you experienced denial with (insert technology here)? (Examples: This (insert technology here) is just a fad, I will never (insert technology here), these can't be real, or I will just ignore (insert technology here), there is no need for this amount of technology in my life).
2. The second stage of the Kübler-Ross model for death and dying is anger. Please articulate an incident where you have experienced anger toward a technology? (I have thrown (insert technology here), this thing is never right, I am frustrated when I use my (insert technology here), or my (insert technology here) makes me angry whenever it goes off, or I get bad news, or maybe my (insert technology here) is out to get me)

Application of Kübler-Ross stages to technology acceptance

3. The third stage of the Kübler-Ross model for death and dying is bargaining. Please articulate an incident where you have experienced a situation of bargaining, or finding a way to get out of using your (insert technology here)? (I will find a workaround for this, or let's make a deal (insert technology here), I will use you just to check the (insert technology here))

4. The fourth stage of the Kübler-Ross model for death and dying is depression. Please articulate an incident where you have experienced depression with your (insert technology here)? (I am sad that I have to learn to use a (insert technology here), I miss the days when I just got (blank)).

Application of Kübler-Ross stages to technology acceptance

5. The fifth stage of the Kübler-Ross model for death and dying is acceptance. Please articulate an incident where you experienced acceptance of your (insert technology here)? (I use my (insert technology here) every day, I don’t need to log into email from home, I get it on my (insert technology here), I am hopeful and excited about (insert technology here) I can learn, I want to do more things with my (insert technology here)).

6. In view of your experience with technology acceptance, do you believe the technology acceptance was implied or forced, such as your job, interaction, or benefit of the technology was contingent on your acceptance? (For example, in order to keep my job I had to accept (insert technology here), or in order to communicate with my friends or family I had to accept (insert technology here)).

Application of Kübler-Ross stages to technology acceptance

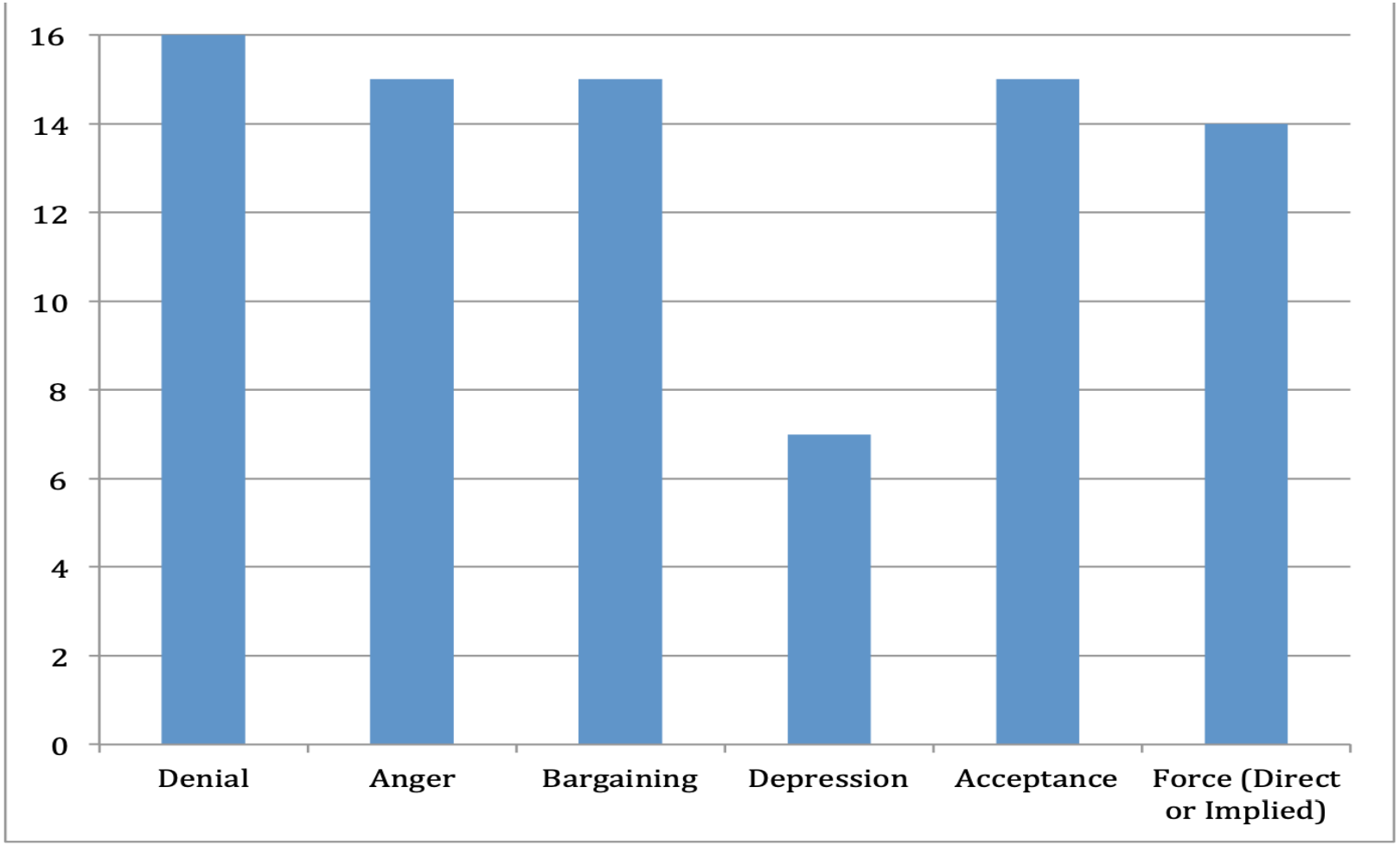

Figure 3. Kübler-Ross stages identified in technology acceptance.

Breakout room discussions

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- Groups of 2-3 students, 20 min group work
- Discuss the following article:

Moitra, Deependra. "Managing change for software process improvement initiatives: a practical experience-based approach." *Software Process: Improvement and Practice* 4.4 (1998): 199-207.

https://onlinelibrary-wiley-com.ezp.sub.su.se/doi/abs/10.1002/(SICI)1099-1670(199812)4:4%3C199::AID-SPIP107%3E3.0.CO;2-D

- Then reflect on your own experiences with organisational change/change management based on this article with a focus on what has changed now since the time of article.
- Contribute to the discuss in the plenum

Plenum discussion

- Own experiences
- What has changed on organisational change / change mgmt since the time of the article?