UiO : University of Oslo

IN5431 – spring 2024

Tools, frameworks and projects

Agenda

- Introduction
- IT project risks
- Framework examples
- Summary

Introduction

Planned lectures (subject to change)

Date	Time	Topic
Fri. 19. Jan	12:15–14:00	Introduction of course and seminar
Fri. 26. Jan	12:15–14:00	Strategy, governing documents and other structural frames: what does it mean, and what is the importance of IT?
Fri. 2. Feb	12:15–14:00	Tools and frameworks 1: Introduction + projects
Fri. 9. Feb	12:15–14:00	Tools and frameworks 2: concept selection and alternative analyzes with a business case
Fri. 16. Feb	12:15–14:00	Tools and frameworks 3: Business processes and IT architecture
Fri. 1. Mar	12:15–14:00	Tools and frameworks 4: IT Governance & platforms.
Fri. 19. Apr	12:15–14:00	Agile organizations

Strategy and strategic context

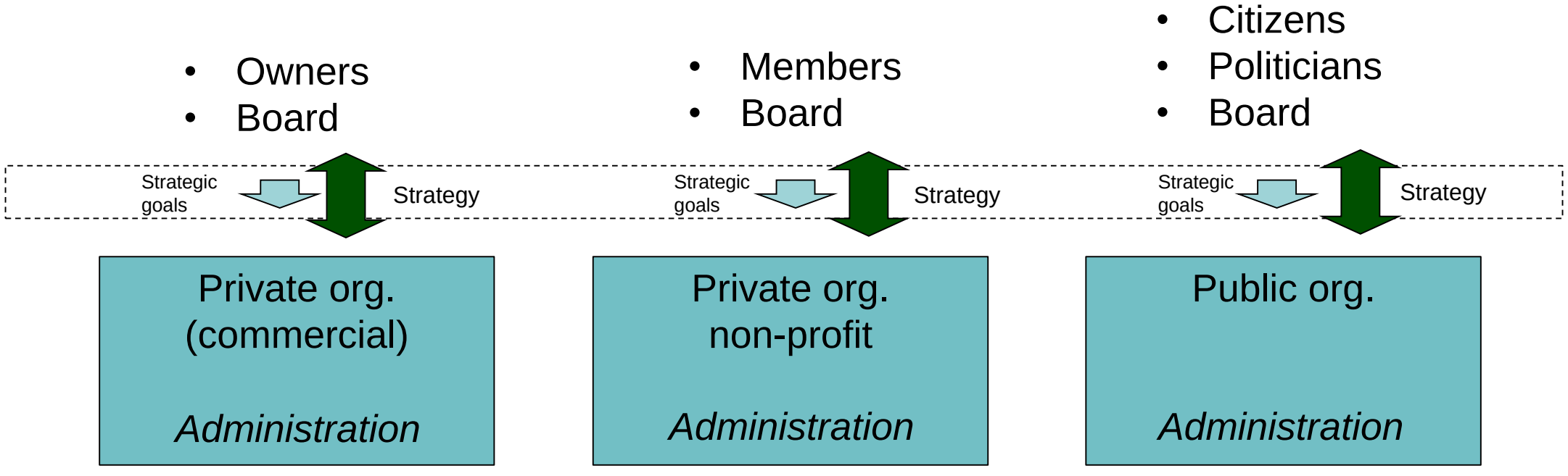
Management tools and frameworks

Date	Time	Topic	What is it really about?
Fri. 26. Jan	12:15–14:00	Strategy, governing documents and other structural frames: what does it mean, and what is the importance of IT?	The really big decisions in an organization: what should we improve the forthcoming years? Important discussion before choosing strategy: what are we really working together for – and who are we competing with?
Fri. 2. Feb	12:15–14:00	Tools and frameworks 1: Introduction + projects	After deciding improvements, one needs to make some kind of sub-organization to coordinate the improvements. One typical sub-organization is a project. There are several frameworks to manage projects.
Fri. 9. Feb	12:15–14:00	Tools and frameworks 2: concept selection and alternative analyzis with a business case	
Fri. 16. Feb	12:15–14:00	Tools and frameworks 3: Business processes and IT architecture	
Fri. 1. Mar	12:15–14:00	Tools and frameworks 4: IT Governance & platforms.	
Fri. 15. Mar	12:15–14:00	Agile organizations	

From last lecture: the result of a strategy process

- Normally, the strategy is accompanied with an *action plan*
- This **action plan** contains:
  1. Activities to change or develop the current operation to meet strategic goals
  2. Assigned responsibility for these activities
  3. Expected ordering and timeframe for executing the activities (roadmap)
  4. Estimates/budgets
- Note: in modern organizations, there is a huge debate regarding what level of detailed planning one should perform. This can have a great impact on the action plan with respect to the level of detail, e.g. whether the activities are detailed in advance or simply outlined – and how precise the estimates are expected to be.
- However, it does not change the fundamental requirements for a working plan.
- Actions to implement strategic change could be projects, reorganizations or simply other priorities in day-to-day operation.

Different organizations



Regardless of organization type or strategy, there is a set of *expectations* from the surrounding stakeholders towards the Administration.

Goodumbrellas Inc

- Production in Vietnam
- Retailers all over the world

For decades, customers have purchased umbrellas through retailers all over the world.

Goodumbrellas Inc

- Production in Vietnam
- Retailers all over the world

http://www.umbrella-heaven.com

For decades, customers have purchased umbrellas through retailers all over the world. The new strategy aims to establish a direct sales web channel – www.umbrella-heaven.com – and that within 3 years, at least 30% of the sales occurs through www.umbrella-heaven.com. The goal is to keep more of the profits.

This is a strategic decision:

For decades, customers have purchased umbrellas through retailers all over the world. The new strategy aims to establish a direct sales web channel – www.umbrella-heaven.com – and that within 3 years, at least 30% of the sales occurs through www.umbrella-heaven.com. The goal is to keep more of the profits.

These are activities in an action plan:

- Develop a web shop
- Establish their own warehouse with capability of shipping small orders on demand
- Integrate with shipping providers to allow users to track process of their order
- Establish a capability for online support and return to consumers

To achieve this, Goodumbrellas Inc must:

- Develop a web shop
- Establish their own warehouse with capability of shipping small orders on demand
- Integrate with shipping providers to allow users to track process of their order
- Establish a capability for online support and return to consumers

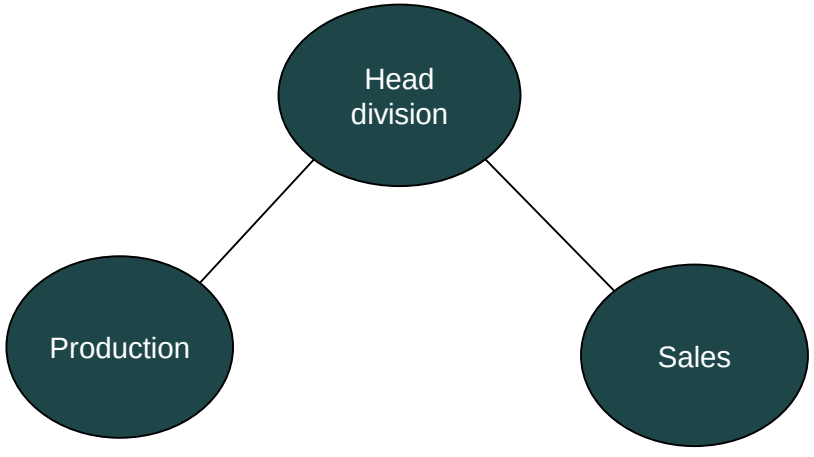
Legal issues

Risk

Time

Coordination challenges

And what about organization?

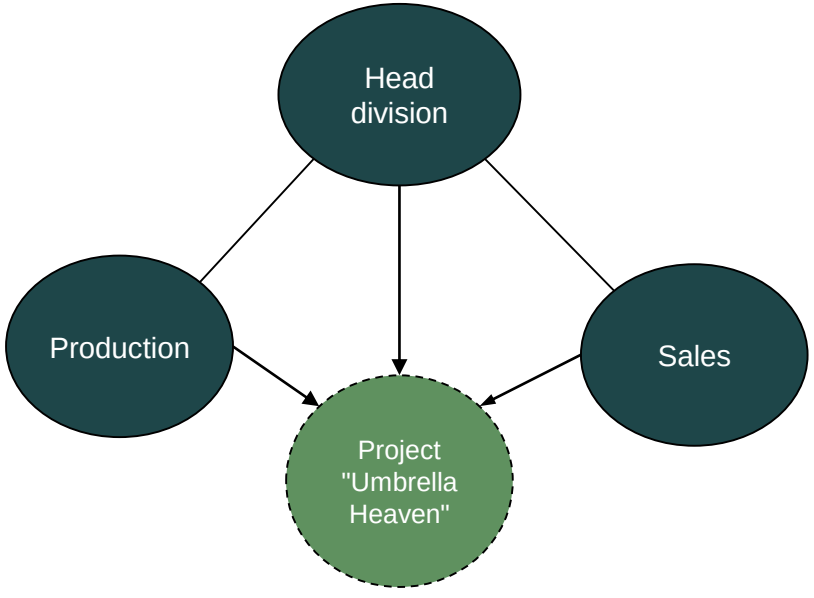


Project Umbrella heaven

- The leader group of Goodumbrellas Inc decides to establish a project to ensure the development and launch of www.umbrella-heaven.com is as predictable and smooth as desired
- The question is: how?

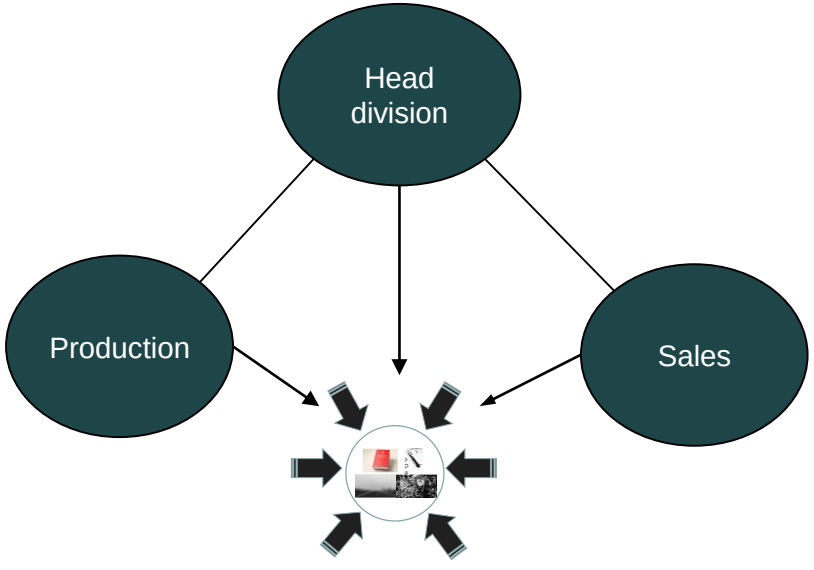
What is a project?|

"A project is a temporary organization established to deliver one or more specified results or products within a specified period."



Challenges of the project situation

- There are always *expectations* behind every project
- Funding is granted based on estimated costs and benefits – which is again based on assumptions
- In the presence of *risk*: how to differentiate between unrealistic expectations and incompetent execution?



Why Your IT Project May Be Riskier Than You Think

(Based on Flyvbjerg & Budzier 2011)

Levi Strauss

- Global corporation
- 110 countries
- **Challenge**
  - Balkanized mix of incompatible country-specific systems
- **Chosen solution**
  - Hire Deloitte
  - Migrate to a single SAP system
  - Estimated budget: $5 mill.

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Result

- Underestimated requirements and complexity
- Massive delays
- Q2 2008: $192,5 million charge against earnings
- CIO resignation

NAV modernization

- Goal:
  - Completely revamped IT-platform
  - Multiple new services
  - Estimated cost 2011: 3 300 MNOK
- Result:
  - 2015: Estimated cost 4 800 MNOK
  - Programme terminated
  - Both the NAV CEO and CIO forced to resign

Trouble at NAV as tech boss resigns

October 28, 2014

SHARE

The top IT executive of state welfare agency NAV resigned on Monday, alleging that she had been under "inhumane pressure" from her bosses to quit. Nina Aulie had been tasked with modernizing the welfare giant's complex web of incompatible and sometimes antique computer systems.

A key reason behind Aulie's decision to resign appears to be a report by consultancy McKinsey, which had looked into NAV's many tech troubles. In an email to the agency's IT staff of more than 1,000 people, Aulie claimed that the McKinsey documents were "based on errors and insufficiencies".

More trouble at state welfare agency NAV as its IT director Nina Aulie quits. PHOTO: nyebilder.no

"For this reason, I have resigned from my position as IT director (*IKT-direktør*) of NAV," Aulie wrote in the email, a copy of which was quickly obtained by news websites *Computerworld* and *Digi.no*.

Source: https://www.newsinenglish.no/2014/10/28/more-trouble-at-nav-as-it-boss-resigns/

[Apple's worst failures of all time, from AirPower to Bendgate to the Newton - CNET]

Flyvbjerg & Budzier's study

# of projects	1471
Average cost overrun	27%
Average cost	$167 million

Black swan
1/6 projects were a "black swan" projects – with cost overrun averraging 200% on average, and schedule overrun averaging almost 70%

Black swans:
High-impact events that are rare and unpredictable but in retrospect seem not so improbable.

Origin:
"Black swan" used to be a metaphor of something non-existant or impossible, until Dutch explorers in 1697 discovered black swans in Western Australia

Taleb, Nassim N. (2010). *The black swan : the impact of the highly improbable* (Rev. ed., pp. XXXIII, 444). Random House

Probability of Goodumbrellas Inc's project becoming a complete disaster

=

Probability of throwing a 2 in a single dice throw

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Framework examples

- Goodumbrellas Inc decides to hire a consultancy company to help them in their endeavor towards umbrella heaven.
- They get various offers, and many of the consultants use fancy acronyms to present their knowledge. They know both Prince2, TOGAF, ITIL and Scrum.

But what are Prince2, TOGAF, ITIL and Scrum?
And are they useful?

Examples of IT management frameworks

Framework name	Intended usage	Origin	Brief intro	More depth
Prince 2	Project governance and management	UK government	What is PRINCE2?	Managing Successful Projects with PRINCE2 or PRINCE2 for dummies (Graham, 2010)
ITIL	IT Service management	UK Government	What is ITIL?	Become ITIL® 4 Foundation Certified in 7 Days: Understand and Prepare for the ITIL Foundation Exam with Real-Life Examples
TOGAF	Enterprise architecture	US defence	How the TOGAF Standard Serves Enterprise Architecture	TOGAF Library
Scrum	Custom software delivery	Research	Scrum Development Process	A Scrum Book (Sutherland 2019)

Management frameworks usually prescribe *processes* and *roles* used to perform some coordinated activity. They are uses for much more than projects.

Examples of management frameworks

Framework name	Intended usage	Origin	Brief intro	More depth
Prince 2				and ntley, 010)
ITIL				ed in 7 the ITIL xamples
TOGAF			Enterprise Architecture	
Scrum	Custom software delivery	Research	Scrum Development Process	A Scrum Book (Sutherland 2019)

Caveat: For these (and similar) frameworks and methods, their **usefulness** and **value** is highly context-sensitive – and sometimes disputed.

Management frameworks usually prescribe processes and roles used to perform some coordinated activity.

Why use management frameworks?

- First: very rarely are someone able to say that a given practice is "best" – it always depends. On the people, the environment and the given strategy.
- Still, the value of using frameworks is rarely disputed. They can:
  - decrease the number of uncertainties when a new phenomenon is tackled
  - support the achievement of organizational strategies and prompt ‘intra-company connectedness’
  - add to managers’ reputations by showing that a manager is credible and capable of dealing with uncertainties in the future
  - depict features of various phenomena
  - compare and guide numerous organizational practices

Claim: with the right combination of confidence,com-munication and intelligence applying it, a prediction of almost any established framework adding value can become a self-fulfilling prophecy.

Budler, Marko & Trkman, Peter. (2019). The Nature of Management Frameworks. Journal of Management & Organization

Are management frameworks "memes"?

- **Meme**: A meme can be thought of as a specific idea: one with the capacity for copying itself from mind to mind and from person to person
- **Management framework**: A management framework is a combination of interlinked items that supports a particular approach to a specific objective (“Framework”, Business Dictionary). As such, a management framework is nonfalsifiable. It is a set of articulated memes.
- **Management fashion**: A management fashion is a relatively transitory collective belief, disseminated by management fashion-setters, e.g., a management technique that drives rational management decision-making (Abrahamson 1996). For the purpose of this paper, management fashion can represent a management framework that has reached a critical mass and has become an intersubjective phenomenon.

"Adopting frameworks has become a craze because it allows organizations to signal that they are progressive (Nohria & Berkley, 1994). A framework comes with benefits and drawbacks (Lambert et al., 2005).

Because the alternatives, outcomes, and value of a framework are often not considered, the adoption of a framework requires scant effort and is easily facilitated (Secchi & Gullekson, 2015).

The adoption of a management framework is not mainly determined by the rigor of developing frameworks (Iivari, 2007) but by other determinants, such as interorganizational memetic pressures that encourage managers to put a novel management framework into practice (Lawton & Wholey, 1993).

After development, the framework's widespread adoption is dependent upon the network effect and its ability to self-reproduce after it had become an intersubjective reality

Budler, Marko & Trkman, Peter. (2019). The Nature of Management Frameworks. Journal of Management & Organization

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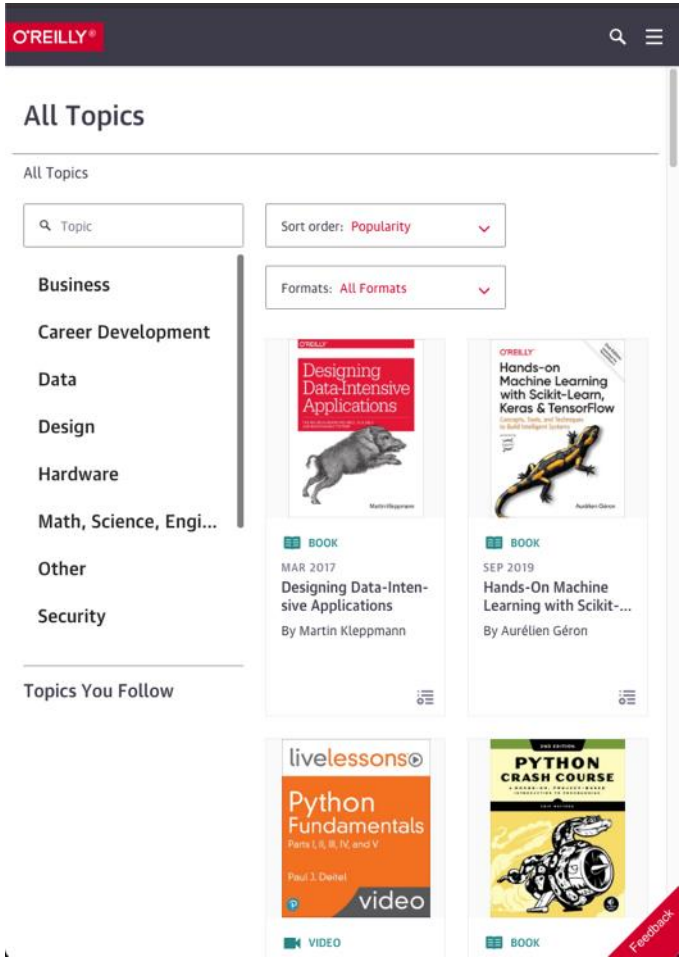

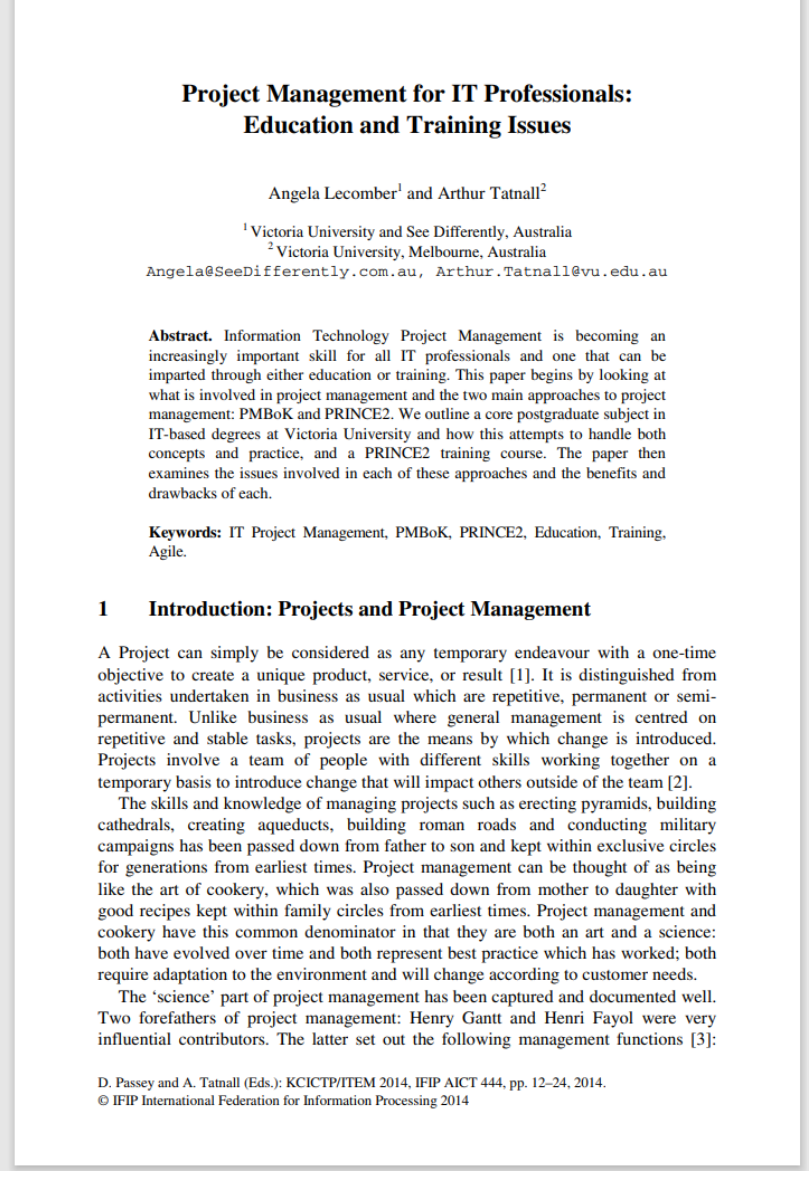

Project Management for IT Professionals: Education and Training Issues

Angela Lecomber[1] and Arthur Tatnall[2]

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[2] Victoria University, Melbourne, Australia
Angela@SeeDifferently.com.au, Arthur.Tatnall@vu.edu.au

Abstract. Information Technology Project Management is becoming an increasingly important skill for all IT professionals and one that can be imparted through either education or training. This paper begins by looking at what is involved in project management and the two main approaches to project management: PMBoK and PRINCE2. We outline a core postgraduate subject in IT-based degrees at Victoria University and how this attempts to handle both concepts and practice, and a PRINCE2 training course. The paper then examines the issues involved in each of these approaches and the benefits and drawbacks of each.

Keywords: IT Project Management, PMBoK, PRINCE2, Education, Training, Agile.

1 Introduction: Projects and Project Management

A Project can simply be considered as any temporary endeavour with a one-time objective to create a unique product, service, or result [1]. It is distinguished from activities undertaken in business as usual which are repetitive, permanent or semi-permanent. Unlike business as usual where general management is centred on repetitive and stable tasks, projects are the means by which change is introduced. Projects involve a team of people with different skills working together on a temporary basis to introduce change that will impact others outside of the team [2].

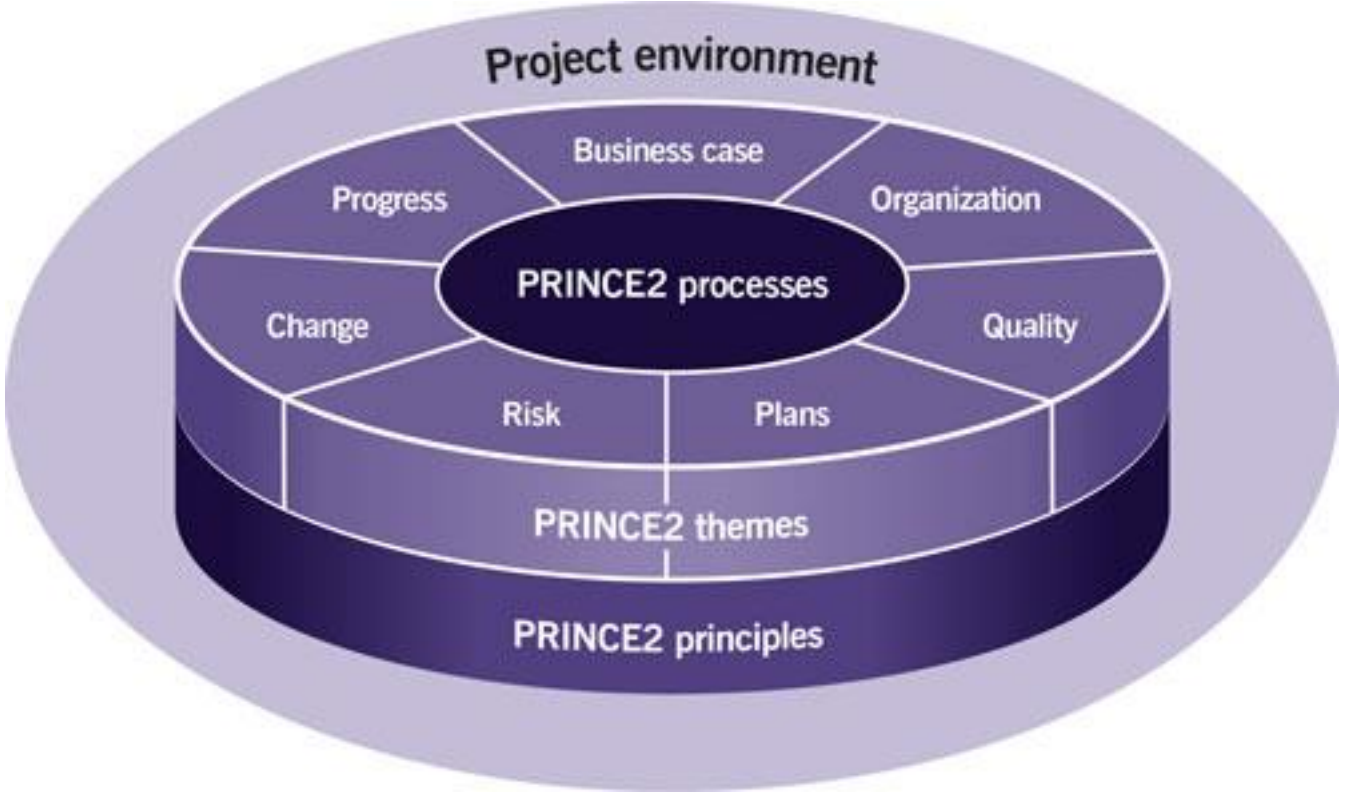
The skills and knowledge of managing projects such as erecting pyramids, building cathedrals, creating aqueducts, building roman roads and conducting military campaigns has been passed down from father to son and kept within exclusive circles for generations from earliest times. Project management can be thought of as being like the art of cookery, which was also passed down from mother to daughter with good recipes kept within family circles from earliest times. Project management and cookery have this common denominator in that they are both an art and a science: both have evolved over time and both represent best practice which has worked; both require adaptation to the environment and will change according to customer needs.

The 'science' part of project management has been captured and documented well. Two forefathers of project management: Henry Gantt and Henri Fayol were very influential contributors. The latter set out the following management functions [3]:

D. Passey and A. Tatnall (Eds.): KCICTP/ITEM 2014, IFIP AICT 444, pp. 12–24, 2014.

Section 1 and 3 is a good introduction to IT projects, project management and typical frameworks

Prince 2

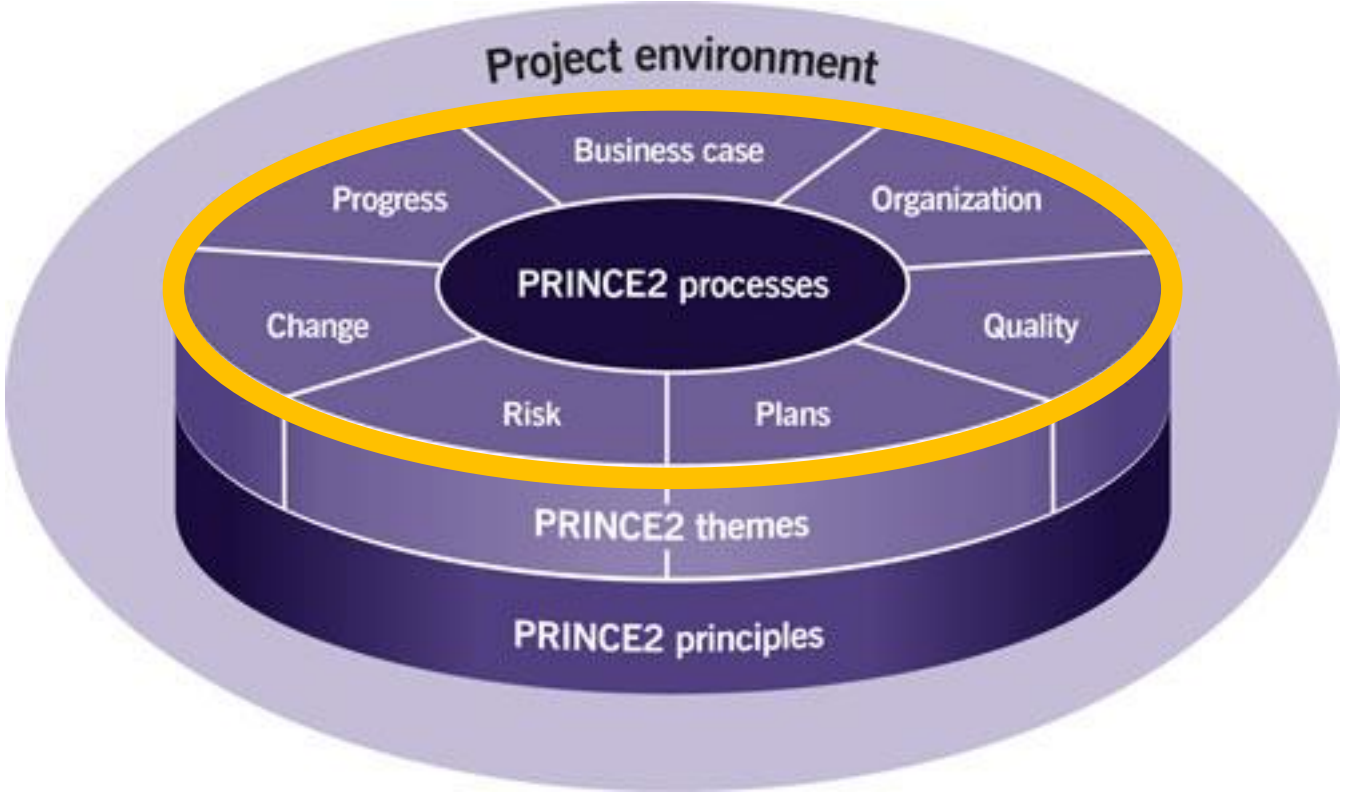

Project environment
Business case
Progress
Organization
PRINCE2 processes
Change
Quality
Risk
Plans
PRINCE2 themes
PRINCE2 principles

PRINCE 2 principles

1. **Continued business justification:** there must be a justifiable reason to be running and managing the project. If not, the project should be closed.
2. **Learn from experience**: PRINCE2 project teams should continually seek and draw on lessons learned from previous work.
3. **Defined roles and responsibilities**: the PRINCE2 project team should have a clear organizational structure and involve the right people in the right tasks.
4. **Manage by stages:** PRINCE2 projects should be planned, monitored and controlled on a stage-by-stage basis.
5. **Manage by exception**: people working within the project should be given the right amount of authority to effectively work within the environment.
6. **Focus on products**: PRINCE2 projects focus on the product definition, delivery and quality requirements.
7. **Tailor to suit the project environment**: PRINCE2 must be tailored to suit the project's environment, size, complexity, importance, capability and risk.

Source: https://www.axelos.com/best-practice-solutions/prince2/what-is-prince2

PRINCE 2 themes



PRINCE 2 processes

1. Starting up a project
2. Directing a project
3. Initiating a project
4. Controlling a stage
5. Managing product delivery
6. Managing stage boundaries
7. Closing a project

"Each process provides checklists of recommended activities, related responsibilities and guidance about how to tailor to a specific environment."

Source: https://www.axelos.com/best-practice-solutions/prince2/what-is-prince2

Excerpt from the "Risk Theme"

"PRINCE2 requires that two products are produced and maintained:

- **Risk management approach.** Describes how risk will be managed on the project. This includes the specific processes, procedures, techniques, standards and responsibilities to be applied.
- **Risk register.** Provides a record of identified risks relating to the project, including their status and history. It is used to capture and maintain information on all the identified threats and opportunities relating to the project.
- Both of these products should be created during the "***initiating a project process"***. The risk management approach should be reviewed and possibly updated at the end of each management stage. The risk management approach will define how and when the risk register is reviewed and updated."

Source: Managing Successful Projects with PRINCE2® 6th Edition, AXELOS

The Agile Manifesto

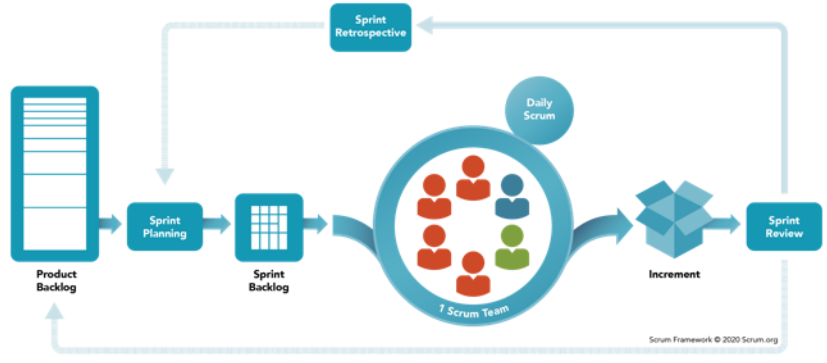
Scrum

Among the most common methods to organize agile software development. Scrum is implemented in very different ways.

Different certifications paths.

Key points:

- Self-organizing teams
- Work is grouped in sprints
- Tasks are prioritized by value



Scrum requires planning at the sprint level – less structured work might mandate other methods like Kanban

Scrum - history

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The new new product development game

Stop running the relay race and take up rugby

Hirotaka Takeuchi and Ikujiro Nonaka

In today's fast-paced, fiercely competitive world of commercial new product development, speed and flexibility are essential. Companies are increasingly realizing that the old, sequential approach to developing new products simply won't get the job done. Instead, companies in Japan and the United States are using a holistic method—as in rugby, the ball gets passed within the team as it moves as a unit up the field.

This holistic approach has six characteristics: built-in instability, self-organizing project teams, overlapping development phases, "multilearning," subtle control, and organizational transfer of learning. The six pieces fit together like a jigsaw puzzle, forming a fast and flexible process for new product development. Just as im-

The rules of the game in new product development are changing. Many companies have discovered that it takes more than the accepted basics of high quality, low cost, and differentiation to excel in today's competitive market. It also takes speed and flexibility.

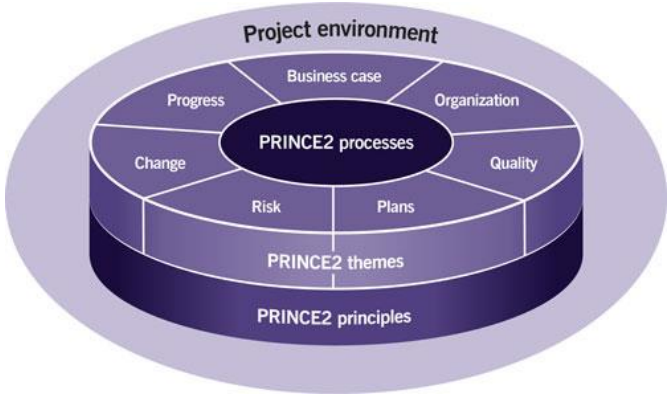
This change is reflected in the emphasis companies are placing on new products as a source of new sales and profits. At 3M, for example, products less than five years old account for 25% of sales. A 1981 survey of 700 U.S. companies indicated that new products would account for one-third of all profits in the 1980s, an increase from one-fifth in the 1970s.[1]

By BobTheCorkDwarf's photos - Flickr, CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=2142619

> In today's fast-paced, fiercely competitive world of commercial new product development, speed and flexibility are essential. Companies are increasingly realizing that the old, sequential approach to developing new products simply won't get the job done. Instead, companies in Japan and the United States are using a holistic method—as in rugby, the ball gets passed within the team as it moves as a unit up the field.

Question for discussion

How do you think PRINCE2 and Scrum could interact?



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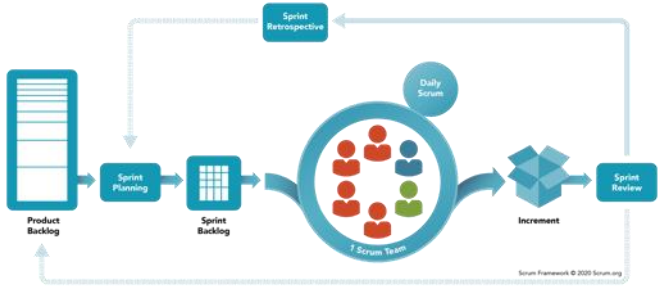

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Scaling agile – organizational implications

Organizational Implications of Agile Adoption: A Case Study from the Public Sector

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ABSTRACT

While agile software development is increasingly adopted in large organizations, there is still a lack of studies on how traditionally organized enterprises adopt and scale agile forms of organization. This industrial multiple embedded case study explores how the organizational model of a large public sector entity evolved over four years to support the adoption of agile software development methods. Data was collected through semi-structured interviews and document analysis. We describe the change in three phases: pre-transformation, initial transformation, and maturing. Changes in three subcases of organizational units are further described in detail. Moving from an outsourced project-based way-of-working with separate business, IT and vendor organizations, the new organizational design emphasizes internal development capability, cross-functional autonomous teams organized around products and grouped in product areas, and continuous delivery. Starting from the IT department, the transformation expanded to the whole organization, and went beyond software development to the finance and leadership. We describe the target and intermediate organizations employed when adopting agile development methods for the whole organization and three organizational units responsible for different services. Defining suitable product boundaries, achieving alignment across teams, enhancing the competence of product owners, the coexistence of old and new types of systems, processes, and structures, and balancing the teams' need for autonomy with the organizational needs for coordination and control are remaining challenges.

CCS CONCEPTS

• **Software and its engineering** → **Agile software development**; • **Social and professional topics** → **Project and people management**.

KEYWORDS

Large-scale agile software development, agile adoption, agile organization, team autonomy

ESEC/FSE '21, August 23–28, 2021, Athens, Greece

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ACM Reference Format:
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1 INTRODUCTION

Agile methods, which originally were developed for single collocated teams (e.g., [7]) are increasingly becoming state-of-the practice also in large organizations and enterprises, outside their original "sweet spot" [5]. By adopting agile methods, such organizations are seeking benefits such as shorter time to market, increased flexibility to handle requirements changes, increased productivity and better alignment between business and IT [1], to name a few.

Large organizations typically have both a large number of products, as well as products that are too big for a single team to develop. This creates a scaling problem, requiring the adaptation and extension of the basic agile methods. In solving this scaling issue, a variety of scaling frameworks and approaches have emerged in the practitioner space, the most prevalent ones are summarized in [8]. These scaling approaches specify the structure and processes of what they consider an ideal agile organization, and are prescriptive in nature. Their scope vary, from focusing on small groups of teams working on the same product [4, 27] to large organizations with several potentially large groups of teams working on different products [17]. The scaling problem is multi-dimensional and include changes in organizational culture, leadership, structure and processes, not only in the development organization, but also in the surrounding units. For the purposes of this paper, we are mostly interested in the organizational dimension, i.e., what an agile organization looks like, and how an existing large organization transforms itself towards that end.

While agile software development is already the norm in industry, public sector organizations are increasingly adopting agile methods as well, although the uptake has been lagging compared to the industry. The public sector faces both the same challenges as any private sector organization, and some that are particular to the public context. According to a systematic literature review on agile methods in the public sector, several benefits were reported from successful adoption of agile methods, including faster value delivery, increased end-user satisfaction, lower cost, better collaboration between business and IT, reduced dependency on contractors, and improved team morale [34]. Factors making adoption difficult included an unsuitable organizational culture, lack of experience with agile methods, the ingrained use of prescriptive approaches, and big bang deliveries. In addition, the public sector often runs "IT

Mohagheghi P, Lassenius C.
Organizational implications of agile adoption: A case study from the public sector.;
2021:1444–1454. doi:10.1145/3468264.3473937

Agile methods, which originally were developed for single collocated teams are increasingly becoming state-of-the practice also in large organizations and enterprises, outside their original "sweet spot“.

The scaling problem is multi-dimensional and include changes in organizational culture, leadership, structure and processes, not only in the development organization, but also in the surrounding units.

Conway’s law

Conway’s law aka «The mirroring hypothesis»:

Organizations, who design systems, are constrained to produce designs which are copies of the communication structures of these organizations.”

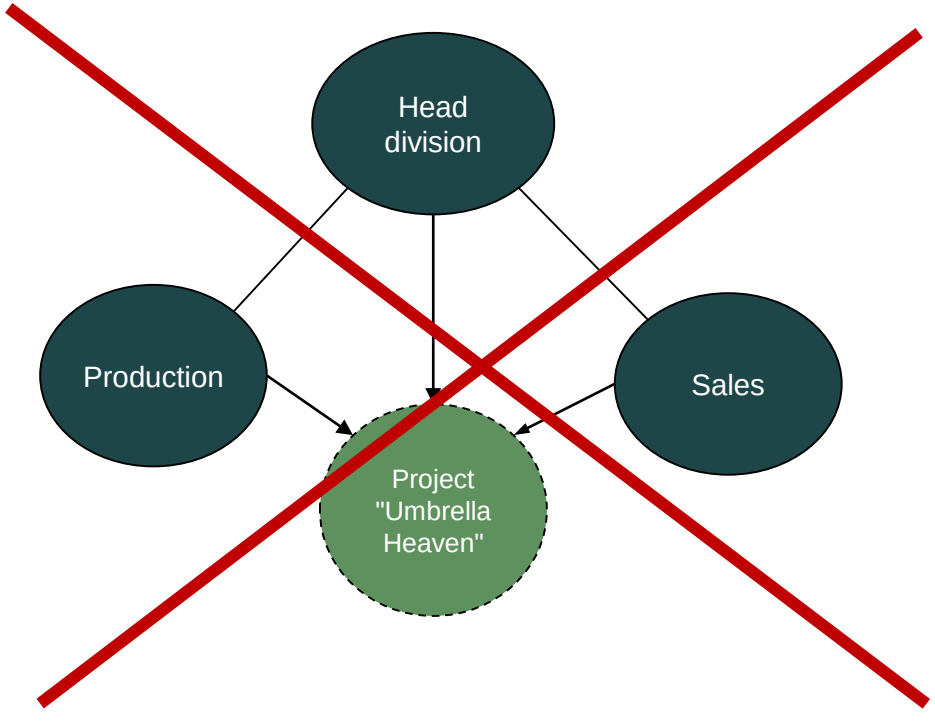
See Colfer, & Baldwin, C. Y. (2016). The mirroring hypothesis: theory, evidence, and exceptions. https://doi.org/10.1093/icc/dtw027)

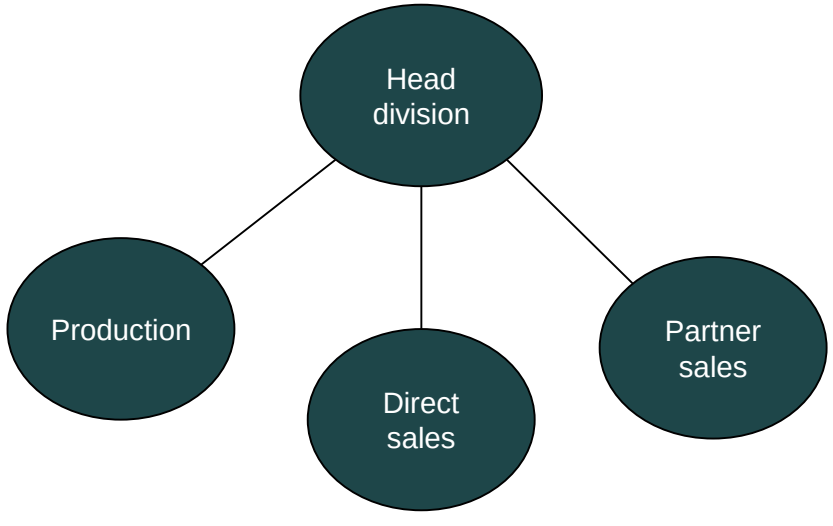
«Reverse Conway Maneuver»

“Designing a cohesive structure with clear boundaries and loose coupling between product areas”

Mohagheghi P, Lassenius C.
Organizational implications of agile adoption: A case study from the public sector.; 2021:1444–1454. doi:10.1145/3468264.3473937

Reverse Conway Maneuver





So what should our friends in Goodumbrellas Inc do?

- Goodumbrellas Inc decides to hire a consultancy company to help them in their endeavor towards umbrella heaven.
- They get various offers, and many of the consultants use fancy acronyms to present their knowledge. They know both Prince2, TOGAF, ITIL and Scrum.

Any advice or opinions?

You must know:

The message from the following part of the course introducing management frameworks is not "use these tools, and you will succeed"

What framework(s) should we use – if any at all – is one of the **hard questions** of IT management and leadership.

The answers to this question depends both on the organizational structure, the people within it, the problem at hand, and about you (as a manager). And often, multiple approaches could work if implemented correctly.

Instead, the goal is to help you understand what the frameworks are, and to ensure you are better prepared for what you will meet out there.

We will, of course, also discuss which situations they might be applicable in – but there is no real credible research regarding when to use which framework. Which means leaders and organizations are, to a large extent, on their own in this.

Summary

- Projects are ad-hoc organizations
- The risk of a given project failing big is uncomfortably high
- Management frameworks represent interconnected ideas to solve a given problem – both for project management and other purposes
- That a given management framework is applicable for a given problem is very rarely based on research – frameworks become a sort of fashion
- That does not mean they are not useful

Summary