Summary of book, lectures and articles - Leadership and Technology Management

Leadership and Technology Management (Technische Universiteit Delft)

Leadership and Technology management

Chapter 1: The changing context of work: implications for knowledge and innovation

Changes to the view of labour

- Automation
  - Productivity paradox: IT does not itself create productivity gains, but depends on the conditions of use and it takes time to develop the benefits from IT adoption
- Importance of services

Both can be described as innovations, which is key to our understanding of the ways organisations have adapted to their ever-changing context.

The growing importance of digital innovation

Data-processing capabilities provide myriad opportunities for the development of innovations in new products, services, organisational processes, business models.
"Planned obsolescence": products and services are continuously updated based on data about usage in order to create more sales, based supposedly on improved design or functionality.
"Industrial symbiosis" or "Circular economy": innovation across companies to reduce the net environmental impact

Agency: innovation is a human activity that involves people using and creating knowledge, which involves the agency of material artefacts.
Definition of innovation: the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order. This recognises the human-centric nature of innovation.

"Knowledge management (KM)": organisations can generate value by improving the ways in which they create, capture/store, ditribute/transfer and effectively use/apply knowledge.

Knowledge exploitation vs. Exploration:

- Exploration: creating new knowledge for innovation. More fast paced firms will focus on this.
- Exploitation: ensuring that knowledge that is potentially available within and beyond a firm is actually accessed and used. Firms that provide standard solutions to reduce costs will focus more on this.

Importance of being ambidextrous: exploiting knowledge to improve efficiency while exploring knowledge to innovate and so gain competitive advantage.

Knowledge as a concept

Tacit vs. Explicit knowledge:

- Explicit: is known and can be codified and is able to be communicated between those who share the same symbolic reference code.
- Tacit: refers to the idea that we know more than we can tell.

Definition of knowledge: the individual ability to draw distinctions within a collective domain of action, based on appreciation of context or theory or both.

Epistemology of Possession vs. Of Practice:

- Of Possession: treats knowledge as something individuals and groups have or own, based on prior experience but separable from that experience. Knowledge is a personal property of an individual or collective knower and mental processes are mechanisms that confer meaning from data and information.
- Of Practice: treats knowing as something people do that is context-dependent, always emerging and socially situated. Knowledge and practice are immanent, two sides of the same coin.

    Practice is the engine of knowledgeability: an individual's possessed knowledge exists only in so far as it was created using social categories derived from practice that gave sense to this knowledge.

    Practice view is associated with research on "Communities of practice": how experts share knowledge with novices by having them works alongside them (legitimate peripheral participation).

The two epistemologies are not opposing but complementary.

Chapter 2: The innovation process

Innovation: an overview

Innovation is a complex process involving the development of a new idea and/or thing and its adoption and use among a community of potential users.

- Product and process innovation (looking at the output we can distinguish between the two)

    Examples:

    - BPR (Business process engineering), it involves rethinking organisational processes to improve efficiency and effectiveness.
    - BPI (Business process improvement), for example Six Sigma system, which aims at reducing process variability.
- Incremental, radical and disruptive innovation (looking at the degree of change, you can distinguish between radical/incremental) (considering impact on existing industry, we can identify disruptive)
    - Radical: leads to major changes
    - Incremental: on existing product
    - Disruptive: disrupt competitive equilibrium, threatening companies that produce products that are made redundant by the radically new product.
- Service innovation

    Increasingly important type of innovation because many new digital products come with a range of services that not only provide added value, but are important sources of revenue.

    Can be more or less radical/incremental depending on the view of producer/consumer.

Roger's model of the diffusion of innovation

Concepts belong to two categories:

- Resources: antecedents that play a role in the diffusion of innovation.
    1. The innovation: in Roger's model, the new idea or thing should always be about something involving a positive change.
    2. Adopters: they play a key role in translating and idea into a valuable innovation.
    3. Communication channels: effective communication channels need to be inlace and support the transfer of knowledge.
- Processes: describe how diffusion occurs.

    Innovation diffusion happens in a fairly predictable way as represented by the S-shared diffusion curve:

1. Innovators: customers with financial capacity, influence over social system, tight links with other innovators and are risk-takers.
2. Early adopters: customers with financial capacity who exhibit more opinion leadership and discretion than innovators. They provide candid feedback and will help improve the product to make it more marketable.
3. Early majority: above-average social status but adopt innovation after a period of time. Not necessarily risk-takers and rarely hold a social position of opinion leader.
4. Late majority: sceptical about innovations, have below-average status and limited financial resources and exhibit very little opinion leadership. They become customers when an innovation is "risk-free".
5. Laggards: limited social network, little financial capacity, no opinion leadership, generally anchored to traditions and show a high degree of resistance to change.

Roger described a linear approach to innovation.

An interactive view of innovation

Innovation phases (development, adoption and use) do not necessarily occur one after the other. Instead, back and forth interactions are needed.
The linear view of innovation is insufficient to explain how innovation processes unfold because it fails to acknowledge the often back and forth movements between the phases.

Absorptive capacity

Absorptive capacity stresses the relevance of prior knowledge as a necessary condition to absorb (new) external knowledge relevant for innovation. It is seen as an organisational resource that is needed to identify relevant (external) knowledge, then to understand and assimilate this knowledge, and apply it for commercial use through R&D.

Process view of absorptive capacity: a.c. should also be seen as a dynamic learning capability that needs to be developed over time. It is broken down in two phases: exploration and exploitation.
Two main advantages of this view/model:

- Absorptive capacity is seen as a set of dynamic processes rather than phases
- It incorporates the process of learning. There is a shift from a focus on outpost to learning.

Interactive view of absorptive capacity: knowledge exploration does not have to be "over" for the organisation to move on to a next step (exploitation).

Power and knowledge absorption

Power is a key concept in the knowledge management literature.
Power-over vs. Power-to:

- Power-over: derives from the organisational hierarchy
- Power-to or empowerment

Chapter 3: Organising for digital innovation

Organisational designs are changing: from bureaucratic structures to project-oriented modes of organising. The new organisational forms are more open and multifocal, rather than univocal (or top-down)
In adopting these new values, the example in the book makes use of four core values:

- Openness
- Being inspiring

- Being straightforward
- Being helpful

Introduction: Classic organisation design

From Max Weber's definition: bureaucratic form of organising. Sees three possibilities for authority:

- Traditional authority. "Has always been like this"
- Charismatic authority. Based on personal attributes of the leader
- Legal-rational authority. Based on a system of rules, operating according to predefined principles, that are assumed to create an efficient way of organising. The authority stemmed from the requirements of the occupied office. (Thought to become the predominant form by Weber)

Features of the "ideal" bureaucratic form of organising:

- Specialisation. At both individual and collective level.
- Hierarchical control. The bureaucratic solution for coordination across employees and departments is to have a chain of command.
- Formalisation. Employees work according to prescribed job descriptions.
- Impersonal operation

Dysfunctions of bureaucracy

1. Specialisation
   Might be detrimental to worker's motivation.
2. Hierarchical control
   Communication rarely follows strict lines anyway, rather following personal relationships. Rules exist but no-one necessarily follows them all the time.
3. Formalisation
   Having standard procedures poses the risk that if things change, the rules might no longer apply.
4. Impersonal operation
   Individuals goals are not necessarily the same as the firm's. Organisations are living entities which develop culture and informal relations. *Recalcitrance* problem: organisational members resist actions when do not serve their own purposes. *External accountability* problem: outside entities can defect from an organisation's goals.

Bureaucracies are effective in extremely stable environments, where innovation is not a pressing issue. It is still widely used and is good in getting things done, but it has big limitations in strongly innovative organisations.

Contingency theories

The use of specific technologies determines how people organise companies: different production sizes and methods are associated with different managerial structures, skills, levels of accountability etc.

Study by Burns and Sanders observed two different types of firms, with the contingent variable being the stable/dynamic environment:

- Mechanistic organisations: bureaucratically organised, unable to adapt to changing environment.
- Organic organisations: flat hierarchies, able to adapt.

Bureaucracies: Digital innovation and change

Reasons for why bureaucratic forms of organising can be poor for stimulating digital innovation and change:

1. Communication

   Can be slow and distorted. Decision making is done at the top, leading to information overload and maladaptive responses (omission, errors, approximations)

2. Control

   Rigid systems, with strong formal control, respond poorly to changing circumstances. Informal control, with an emphasis on socialisation, responds to change better.

3. Centralised decision-making

   Although it is done at the top, in reality it is those on the ground that hold most knowledge about the topics and can better respond to changing circumstances.

New forms of organising

Changes that increase ability to adapt, innovate and operate more globally:

- Flatter structures and more decentralised decision-making

  Population ecology: organisations compete for resources in a particular niche. Some organisational models appear more successful in the competition for resources. Other organisations will imitate this. In scarcity of resources, the models that can adapt survive.

  Flatter structures allow to reduce the burden on top executives and to quicken the decision-making process. Complex problems are more easily solved.

  Types of control different from bureaucratic:

  - Output control (sets targets and monitors against them)
  - Process control (defines how the work is done)
  - Normative/Clan control (without the need for hierarchy, a set of shared norms makes it so that people take actions consistent with the organisational goals)

- Business units

  Organisations are often divided in smaller units/divisions. Another approach is *modularisation*: divisions are made by task rather than by product/region. This brings benefits, as the independency of units, but can cause problems such as lack of synergy and challenges in modularisation when tasks are highly inter-related.

- Project forms

  Today the emphasis is on horizontal coordination. One solution is a *matrix* structure, where functions remain but a horizontal project or product structure is superimposed. They are quite common where projects are important.

  Power dynamics can become more intense since two sets of managers can be vying for the same resources.

  In horizontally structured organisations, there is a multivocal environment, potentially creating tensions, in particular due to the use of social media.

- Networking

  Rather than work in-house, organisations now work with an open innovation approach. To develop organisational alliances, two capabilities are required: *integrative capabilities* (ability to collaborate with diverse organisations) and *relational capabilities* (ability to integrate knowledge across diverse communities). These capabilities vary depending on the national context: *corporatism* (concentration and ongoing influence of a country's interest groups) levels influence organisational structures.

  - High corporatism levels —> interest groups are stable and organised, they participate in setting and implementation of economic policy.

- Low corporatism —> interest groups narrowly focused and insular, not resulting in long-term collaborative networks. Partners are searched in an exploitative fashion.

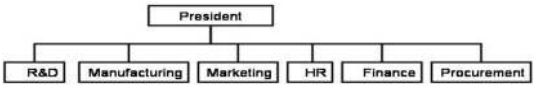
Aligning old and new organisational forms

An organisation should be ambidextrous: efficient and innovative/flexible.

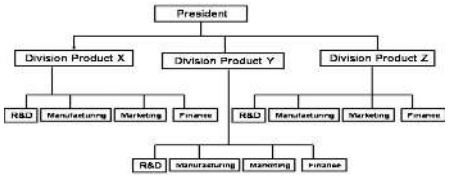
From Lecture 2

Main types of structures:

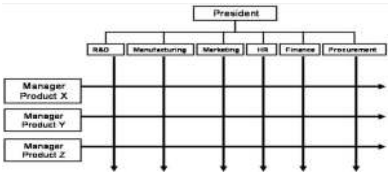
- Functional structure
  - Employees are working in departments based on what they are doing
  - This structure enhances the experience of each function.
  - This structure may save money because of the economies of scale.
  - This structure makes the coordination between different department more difficult than other structures.
  - It also does not allow for flexibility because of the centralisation



- Divisional structure
  - Employees are divided on the basis of the product/customer segment/geographical location.
  - This structures is a decentralised structure and allows for flexibility and quick response to environmental changes (innovation and differential strategies).
  - It does not support the exchange of knowledge between people working in the same profession because part of them are working in one division and the others are working in other divisions.



- Matrix structure
  - Matrix structure combines both structures. Some employees will have two managers: functional manager and product manager.
  - It is not easy to implement because of the dual authority. This structure is vey useful for multinational companies.



Chapter 4: Strategising for digital innovation

Strategy as a deliberate planning process

A firm must decide its strategy, and so in which niche to operate, based on five forces:

1. The threat of established rivals

Industries differ in terms of the concentration of market shares:
- Either only a few firms dominate
- Or the market is *fragmented*, which more competition and rivalry

Rivalry is also influenced by market growth (with more intense rivalry in slow markets), exit barriers (high e.b. —> high rivalry).

2. The threat of substitute products or services
   Threats of *substitution* lead to price competition and innovation.
3. The threat of new entrants
   Depends on entry barriers.
4. The bargaining power of suppliers
   From suppliers of raw materials, components or labour.
5. The bargaining power of customers
   Occurs in industries where there are only a few customers

Analysing these forces helps understand how a firm is positioned in respect to competitors, buyers, suppliers, type of market and product/services developed.

Switching costs: costs that keep a buyer tied to a firm, because it costs too much to change to an alternative that offers similar or equivalent services/products.

Porter's three strategies

Once a firm has decided where to compete, it needs to decide how.
- Differentiation - competing on the basis of some unique aspect of the product or service offered (even if the cost is higher)
- Cost leadership - competing on the basis of lowest costs of the product or service
  Example of cost-reducing innovation: *Gross-docking,* having goods delivered to stores without them sitting for long periods in warehouses.
- Segmentation - focusing on a very small segment of the market or a broader segment

An alternative, emergent view of strategy

It is hard, in practice, to plan a firm's strategy up-front. Strategy *emerges* over time as "a pattern in a stream of decisions". From this derives the differentiation between:
- Intended strategies
- Realised strategies

Strategy-as-practice: approach that emphasises the day-to-day activities of practitioners who shape, refine and actualise strategy through what they do. Strategising is viewed as an emergent set of practices, constantly in the making. Three conceptual elements:
- Practitioners
- Practices (the routines that quite the strategy work)
- Praxis (the flows of actual activity through which strategy is achieved)

Strategy-as-practice and ambidexterity

Ambidexterity's essence can be seen as the concurrent enactment of knowledge exploration and exploitation to achieve complementary effects.

Site of knowing: social and relational space where various practices come together as practitioners with different but complementary interests coordinate their efforts in order to achieve particular objectives. A site she shift over time: new practices and practitioners and new relationships between them are introduced. Some taken for granted assumptions and norms of practice can then become

invalid and create a space for debate and contestation. Site shifting can allow the emergence of new capabilities.

Digital technology and strategy-as-practice

Traditional view of strategy focuses in the *exploitation* of digital technology in line with business imperatives and is "top-down" in nature in that the digital strategy attempts to align itself with predefined business strategies.

Firms should be prepared to reconfigure their strategy because of how employees, customers or other stakeholders *enact* digital technology.

Aligning: continuous back-and-forth between the business strategy and emergent opportunities from the exploration as well as exploitation of digital technologies.

Chapter 5: Projects and teaming

Today there is prevalence of organising work in projects.

Introduction: Routines and innovation

Routine: individuals are not consciously making decisions every minute about what they should or should not do but rather are following "scripts". There are many social and material arrangements within an organisation that equip the context, so that following the routines appears natural.

Today, digital technology is a major part of the "equipped" (equipping that enables the worker to carry our daily tasks) context, "scaffolding" everyday practices in the sense of enabling and constraining what people do.

Routines suggest a degree of rigidity and inertia. There is an important distinction between the aspects of routine:

- Ostensive: abstract idea of it, enables people refer to specific performances.
- Performative: specific actions, that create and modify the ostensive aspects of a routine.

Routines are used to support innovation, in particular about the management of projects.

Projects, teams and teaming

Projects are typically used to organise activities associated with developing/introducing innovation, trying to accomplish pre-specified goals and objectives. The teams are usually given some autonomy and rarely involve a stable group.

Project ecology: a specific innovation may involve more than one project.

Types of project context:

- Stand-alone
- Co-located
- Distributed (over locations, often involving more than one organisation)
- Multiple (over location, time)

Ideal type: individual team members get something out of the team performing well.

In reality, even with an overall project goal, individuals may be involved intermittently, without much knowledge or interest in the overall project objectives.

Teaming: project personnel have to collaborate and overcome knowledge boundaries if they are to succeed.

Principles for success:

- Project management
- Team leadership

Project management

A project team is typically composed of representatives from different departments. The project is usually separated from the rest of the organisation ("lonely phenomenon") but the team need sto ensure that the organisation will recognise their results, meaning there is a need to overcome the *learning boundary* between the project and its various stakeholders.

PMBOK guide: project management body of knowledge guide. Summarises best practices, technologies and guidelines, which are accepted as standards within the project management discipline.

Three key features of projects:

- Temporary nature
- Focus on creating something unique
- Progressive elaboration (the scope should be predefined, but project specifications can be progressively elaborated

Project management: the application of knowledge, skills, tools and techniques to project activities to meet project requirements.

Managing a project involves a series of phases:

- identifying requirements,
- establishing objectives,
- balancing the triple constraint of scope,
- time and
- costs.

PMBOK changed over the years. Project management prescriptions went from focusing on the technical aspects to including the human aspects.

Despite the growth of sophisticated project management methodologies, only very basic ones actually get used and often not as intended. The tools, techniques and methodologies developed want to ensure that projects are delivered on time, in budget and to scope. It is assumed that progress will occur in a predefined, linear way, so that work can be divided into small, measurable units. Project management therefore doesn't necessarily resolve the issues surrounding bureaucracy, it simply changes the scale of the operation.

Problems associated with the routines of project management:

- Temporal features

  Often defined in terms of increasing flexibility. It relates to setting up a project to do something different, but not to accomplish it. Mainstream management is about predefining and controlling the activities to accomplish this something with team members simply following the plan.
- Spatial features

  Project management methodologies increases horizontal communication and coordination inside the project, but they separate it from the rest of the organisation.

Types of projects and project management

The extent to which an innovation project can fit into project management routines depends of the innovation at hand.

- *Complicated* innovations may pose challenges, but it is possible to know in advance what needs to be done.

Cause-effect relations already exist.

- *Complex* innovations pose management challenges.

  Problems and cause-effect relations are largely unknown. There are high levels of uncertainty, even *unknowability*. These innovations son over several years and can require financial investments without any guarantees.

  Characteristics summarised by Dougherty and Dunne: nonlinearity, unpredictable interdependencies and emergence of knowledge over long periods of time as innovators search the unknown unknowns.

Sources of uncertainty in projects and project learning

High levels of uncertainty require the use of *learning plans* in place of project plans. Four main sources of uncertainty in breakthrough projects:

- Technical

  Intellectual property (IP): sought through patent protection. Firms can also buy IP.
- Market
- Organisational

  Small firms are more vulnerable, making the "long-game" not the important focus. This can lead to necessary short-term decisions that can reveal themselves as sub-optimal in the long run.
- Resource

  In relation to digital innovations, it is also important to build the necessary infrastructure for the product or service.

Managers should identify particular sources of uncertainty in relation to each type, propose alternative assumptions and find ways to quickly test the assumptions. In more couples innovation projects, sources of uncertainty may be more difficult to root out quickly.

The nested nature of projects: Projects in their institutional context

Given that plans are constantly rewritten, why do managers keep on simulating certainty? As project do not exist in a vacuum but rather are nested in a broader organisation, they constantly fight for resources. It is therefore important that outsiders see progress being made.

Today more and more projects as adopting agile methodologies, where small parts are developed, tested and rolled out. It is not necessary to wait until the end to realise that the technology might not be supporting users in ways that are effective.

In complex contexts, innovations such as rapid development are difficult to execute.

Organisational practices are often symbolic rather than fictional. They are put in place simply to obtain legitimacy.

Chapter 6: Project liminality and open innovation

"Jamming": example of innovation through internal or external inclusion of a wider range of actors. Linked in similarity to the concept of crowdsourcing.

Project organising and liminality

Liminal space: where individuals can generate new ideas and practices, free from the constraints of ongoing organisational routines.

Three phases as a person (or project) moves from one social status to another:

- Separation
- Transition

- Incorporation

Projects can men the position of the employee is back filled, or that they are working part time on it. In the second case, the location dedicated to the project can be physically nearer to their main office.
The more separated a project is form the rest of the organisation, the more different may be the solutions, bu also the more difficult it will be to communicate them outside the project.

The transition state is liminal in the sense that it is a period of ambiguity, with those involved being in a social and cultural limbo. This limbo state has positive and negative connotations.
"Liminal" has been used to describe the condition of temporary employees in flexible organisations, the consulting experience and to consider individual and organisational learning experiences. It can be used to describe the project experience.

Characteristics of a liminal space:
- Temporary
- Ambiguous
- Opportunity for creativity
- Provides freedom in two senses:
  - Freedom from institutional obligations
  - Freedom to transcend existing ways of thinking and norms
- Sense of community

Paradoxes in projects and liminality

Ensuring project participants maintain connections with the rest of the organisation can increase the chances that the ideas and technologies created by the project will be better accepted. At the same time, the innovations may be less radical.

If the project is separated from the organisation, its presentation can create tensions. The handling of these becomes crucial and a language of peace-making can be helpful.

Open innovation

Absorptive capacity is path-dependent: an organisation will recognise the value of external knowledge to the extent that its employees have related knowledge that allows them to understand and evaluate pertinent new external knowledge.
Benefit of partners in open innovation:
- Partners have different knowledge so that a broader range of information can be absorbed.
- Partners can be more easily changed than in-firm resources.

Table 6.1 Differing assumptions of closed and open innovation approaches

Closed innovation assumptions	Open innovation assumptions
• Gather cleverest people as employees	• Recognise knowledge and expertise beyond firm boundaries
• Discovery, development and commercialisation must all happen internally	• Some parts of the discovery, development and commercialisation process can be done outside and still allow the focal firm to profit
• Will be only one winner - firm that can commercialise first	• Can be multiple winners collaborating together
• First to market will get the profits	• Often business model is as important as time to market
• Need to hoard intellectual property (IP) from competitors so firm can protect and profit from this	• Since a firm can benefit from others' IP, the firm can also share its own IP and collaborate with others
• A firm needs to have the best ideas internally to 'win'	• Winners will be those who can make use of best internal and external ideas

Who is involved in open innovation?
Different parties: customers, users, suppliers, universities, competitors.
Key idea: values co-creation. Not created by local firm and then exploited for its own benefits, but rather the value is created collaboratively by different stakeholders who each benefit from being involved in the process.

Four different types of open innovation arrangements:
1. Markets and contracts
   Focal firm contracts with another firms to provide a solution, based on the fact that the supplying firm has more knowledge on the topic. The knowledge transfer is limited.
2. Partnerships and alliances
   Focal firm works collaboratively with other organisations jointly to solve problems and come up with new solutions.
3. Contests and platforms
   Organisation truly opens up to a wide range of individuals and organisations that may possess relevant knowledge. Digital platforms are often used and the idea is that someone might be able to bring in a very different perspective. The focal firm's main task is to provide motivation such as prizes, but there is also the possibility that the participant has intrinsic motivation in participating, or might get repetitional benefits from it. Problems need to be highly decomposable.
4. Users and communities
   Use communities develop their own solutions to their own problems.the sharing of knowledge is very open, since the stakeholders don't have any interest in keeping it for themselves. The focal firm has little control over what the users decide to focus on.

Inside-out and outside-in open innovation
Any part of the innovation process can be made open. This can be done in two ways:
- Outside-in
  The focal company brings in third parties to support an innovation process.
- Inside-out
  The focal company decides to let go of some of tis innovation projects and allow outside companies/individuals to exploit the in-house work.

Companies should have "exit champions" added to project champions: often projects are let go prematurely or are kept on going due to momentum, just to then fail on the market. Exit champions explicitly question the viability of a project through demanding hard data and should try to disrupt the prevailing beliefs of those who are very involved and committed to the projects.
"False-negative" projects: were evaluated internally as not deserving continued investment but which might then also have the potential to be leaked and turn out to be very valuable to another company.

Business models and innovation
Business model: how a company makes money by producing something that consumers value. Organisations can and should innovate in their business models over time.
Business model canvas: enables organisations to develop a new (or document an existing) business model. It is a visual map, split into key sections which help describe an organisations's key

activities, resources, partners, cost structure, value propositions, customer relationships, customer segments, channels and revenue streams.

Inside-out is particularly useful when there are resource constraints: possibly profitable projects are sometimes abandoned in order to focus on short-term gains. Inside-out strategy could help in not abandoning the ideas completely. It should be kept into consideration that sharing this knowledge might give an advantage to competitors.
A way to encourage inside-out innovation is to set up *incubators*.

Open innovation and services
Digitally facilitated service innovation is increasingly important, even fro product-based firms. Outside-in (Lego example: customer's initiative first seen as illegal, then implemented) and inside-out strategies still apply (Amazon example: the model was copied. Instead of suing, amazon found a way to commercialise its knowledge and incorporate smaller firms).

Open innovation and networking: Brokering and boundary spanning
Structural hole: situation in which a person connects to two communities but these communities do not connect to each other. The person who *brokers* communities has access to information that others do not and can use this to their advantage. Brokers have been found to be more successful in their careers, although they can become distrusted and limited by the fact that they stand outside both communities.
Boundary spanners: bridge across communities by translating knowledge between the communities, so that each can better understand the other and share their knowledge. Boundary spanners often do not occupy a structural hole, as they usually belong to one of the communities. (Example: hybrid managers)
Boundary spanning between technological areas is more important for successful leadership than is brokerage (at least in open innovation communities).

Process-based capabilities: individuals managing partners relationships themselves and attempting to coordinate these partners even when there may be divergent or contradictory goals.
Knowledge-based capabilities: being able to integrate the diverse knowledge accessed through the partnership.

Open innovation: The search issue
Open innovation success depends on both the identification of new sources of knowledge and the ability to manage the partners once found.
Key issue: how to find the sources of external knowledge that may be valuable and not restrict the search to local networks. It is likely that a firm will identify more local search partners than distant: *local search trap*. A solution is to use a search engine that can be specifically designed to include distant as well as local knowledge.

Open innovation and governance
Managing and governing the relationships between partners once established is another key issue. Two dimensions to consider:
- Complexity: number of different aspects that need to be solved and their interdependence.
- Amount of hidden knowledge: how far the knowledge that is needed can be identified in advance.

These then influence the method of governance adopted:

- Where there is considerable hidden knowledge, open forms of innovation can be used
- Where the complexity is simple, open solutions using online platforms, wide audience and tournaments can be a solution
- With highly complex problems, such competitions may problematic

Table 6.2 Selecting different open innovation strategies (adapted from Felin and Zenger, 2014)

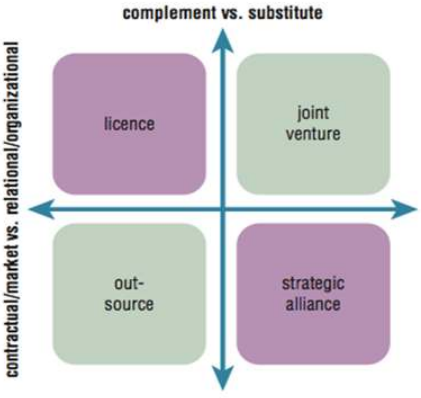
		Problem complexity	
Hidden knowledge		**Simple**	**Complex**
	Low	Contracts	Alliances or closed innovation
	High	Platforms and Contests	User-directed open innovation

From Lecture 3

Current trends for innovation

- Globalisation: virtual teamwork
- Outsourcing of R&D
- Early supplier integration
- User innovation
- External commercialisation of technology

Stategies to support open innovation



- Licence
  - •A company sells licenses to other companies to use intellectual property (IP), brand, design or business programs
- Joint venture
  - •A business arrangement in which two or more parties combine their resources for the purpose of accomplishing a specific task
  - •The firms that form a joint venture no longer operate independently

•Uber and Volvo → Driverless cars production. The ratio of the ownership is 50%-50%. The business worth was $350 million as per the agreement in the joint venture
•Sony and Ericson's → Manufacturing smartphones and gadgets. After several years, Sony acquired Ericson mobile manufacturing division

- Outsource
  •An agreement in which one company hires another company to be responsible for a planned or existing activity that is or could be done internally, and sometimes involves transferring employees and assets from one firm to another
- Strategic alliance
  •Agreement between parties to carry out an activity that is beneficial to both parties
  •The two parties remain independent from each other
  •Uber-Spotify → Riders can stream their Spotify music library when they take a ride. This leads to a personalized Uber experience and to more Spotify subscriptions

Chapter 7: The role of objects in organising for digital innovation

Introduction: Agency, objects and organising

Objects support knowledge sharing and knowledge creation processes and ultimately innovation. For example enterprise systems are used by several individuals variously for purposes related to sharing organisational data, creating reports and prospects but also translating knowledge into forms that are more easily understood by people with different backgrounds and business needs.
The knowledge that emerges through the use of these objects can be shared with people within the same communities, or it can be translated across different occupational communities.

Objects and innovation processes

Objects have agency, meaning they *do* things. Technologies are not just tools that can be exploited by organisational actors. Organisational processes should be seen from a perspective that involves people and technology jointly: *sociotechnical perspective*. The social system needs to be designed to fit the technical system in order to maximise productivity, which had to include the social and psychological effects of the selected organisation.
Practice perspective goes beyond sociotechnical approaches because the focus shifts from the mere identification of relationships between humans and things to the practices that emerge from these relationships. People enact objects in practice and the relationship between people and objects represents a mutual engagement rather than a one-off exploitation.

Two main ways in which objects support knowledge sharing and innovation:

- Strategic objects (e.g. PowerPoint presentations)
  Purposely created by strategists to share strategic considerations among senior management executives and other stakeholders. These objects are relatively static and effective to promote sharing of ideas.
  Generally referred to as strategic objects are common office entities (computers), digital entities (powerpoint), visual tools (pictures) that are used to deliver ideas and can incorporate a symbolic value.
  They usually have an "expiration date", because they can be used only as long as the purpose they serve is still something to pursue.

They serve the important function of communicating the idea to all stakeholders involved, ignorer to convince people that it needs to be taken further and to encourage coordination of all activities.
An alternative view on strategic objects is the subtle way of using them: omissions and specifically selected focus can lead to the legitimisation of ideas and processes simply based on the manipulation of data and not on their inherent validity. This is also referred to as "process power": the power that upper management exercises when it attempts to obtain approval by others in oder to advance personal interests.
It is almost impossible to identify universal tools that fit every situation in every company. The unsuccessful adoption of a strategic tool might nevertheless be helpful to reveal issues such as management's misalignment in understanding organisational processes.

- Boundary objects (e.g. literature review)

  Are set up or emerge during everyday organisational life. They incorporate knowledge in a form that is understandable by different occupational communities.
  They are objects which are plastic (interpreted differently by various occupational communities) enough to adapt to local needs and constraints of the several parties employing them, yet robust (its main properties are stable) enough to maintain a common identity across sites.
  They are weakly structured (do not look incomprehensible without specific knowledge) in common use, and become strongly structured in individual-site use.
  They may be abstract or concrete.
  They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognisable, a means of translation.

  Objects support collaborative practices, by providing information to different parts of the organisation comprehensible to all, even with different knowledge backgrounds.

  Three different boundaries:
  - Syntactic (from different technical languages used by different functional specialists)
  - Semantic (reflect the tacit aspects of knowledge shared within a specific unit, which are not fully understandable)
  - Pragmatic (refer to knowledge that arises from practice and is therefore context-specific. In this case, knowledge need to be translated)

The innovative power of objects

Strategic objects are key to a successful innovation process, as they are able to persuade people, involve collaborators and share knowledge. Yet they remain ephemeral and time limited, while boundary objects can generally be used for a long time in various contexts. Furthermore, digital objects offer the opportunity to build objects that are constantly modifiable.
Imbrication: objects and people are constantly interlocked in ongoing practices (properties of material actors are changed by those who adopt it, and adopters change their practises to meet the new properties of the material actor).
Boundary objects can be shaped by those involved to adapt to new contexts.

Co-development: all people involved in the use of a boundary object are constantly engaged not simply in its use but also in efforts to modify it to meet emerging needs.
Strategic objects are generally static because they are created by change agents and represent an effort to modify the status quo.

Human engagements in objects: The role of emotions

Emotions are a response to a situation perceived to be personally significant that leads to a mix of physiological changes, feelings, cognitive processes and behavioural reactions. Emotions are not limited to feelings, they are also *doings*. If objects introduce an emotional appeal, they may be more effective.

From a practice perspective, emotions are produced relationally: not only do relations between actors produce emergent task-related outcomes, they also produce emotions that can result in a particular felt quality or mood that characterises our being-in-the-world. Emotions are not simply experienced as an afterthought of action, but they are a psychosocial phenomenon that emerge from collective action.

A mood is always present, shaping and being shaped by our collective actions, and this mood can generate a collective energy.

Negative emotions produced by an object can potentially lead to resistance to innovation.

Table 7.1 The power and role of objects

Object/ innovative practices	Strategic objects	Boundary objects
Agency	They do things to the extent that they support the sharing of new ideas among peers.	They do things because they change people's practices (their function is not limited to sharing ideas).
Innovative power	Their power resides in the symbolic meanings that they carry.	Their power is related to the 'change agent' role that they have across communities.
Examples of their effectiveness	A graph showing growing ROI is visually impactful because ROI growth underpins a series of consequences for the company.	They are effective to the extent that they make knowledge available to different communities.
Longevity	These objects are constantly recreated and used (PowerPoint slides, Gantt charts).	These objects are constantly reshaped by those involved, so a boundary object, potentially, can last longer than a strategic object. A boundary object shapes and is shaped by ongoing practice.

Paper 1: Waking the sleeping beauty: Swarovski's open innovation journey (Drabrowska et al., 2019)

There are companies that have enjoyed decades of undisturbed success. After such prolonged periods of calm, existing market positions are challenged. Such companies are "Sleeping Beauties" and struggle to change their imposed hierarchy and organisation upon the market's changes.

Success syndrome: company structures and culture that are inert to change.

Sleeping beauties have been able to:

- Hone their processes and technologies over decades
- Experience extends periods of low competition and relatively undisturbed success in the past
- Have a competitive advantage based on a strong product/technology/brand and thus occupy a solid position in their market

Solutions to overcome the rigidity trap are connected to two strand of literature:

- Open innovation
- Organisational ambidexterity

These should be used together and in addition to changing the focus from exploitation to exploration.

Swarovski example is divided in three phases:

- Boundary-preserving (rigid boundaries)

  Or Closed innovation phase

  Maintenance of status quo, in-house innovation, tight organisational boundaries. Hierarchical structure, technology departments discouraged from looking for knowledge outside the boundaries of the company.

  "Static ambidexterity": focus on excellence and stability in core business units, with well-planned top-down legitimated explorative initiatives.

- Boundary spanning (porous boundaries)

  Or Open innovation networks phase

  Creation of team dedicated to boundary spanning and definition of a new strategy for determine which practices and processes to implement and where and how to search for new knowledge.

  "Structural ambidexterity": independence of the explorative unit (open innovation networks) but the links to the exploitative parts of the company remained, which allowed for cross-fertilisation between exploitative capacities and new incoming ideas identified through exploration.

- Boundary-expanding (porous boundaries)

  Or Ecosystem engagement phase

  Open innovation was defined and communicated to the whole company.

  Transition launch with a new structure:

  1. Focus on internal changes to enable IPM (Innovation and Portfolio Management) employees to build external networks of their own and to develop an open innovation mind-set.
  2. New role of former open innovation networks team was to facilitate a change road-map: cross-functional collaboration, knowledge sharing through internal workshops, infrastructure tools, support systems for collaborative innovation and technology intelligence.
  3. Innovation and HR departments put greater emphasis on the topic of cultural trasnition to greater openness in their strategic agendas.

  "Dynamic ambidexterity": deliberating over the choice of different types of ambidexterity based on the most feasible exploration and exploration opportunities.

  At the business unit, "contextual ambidexterity" was applied, by empowering employees to explore new ideas and initiatives, often with the help of external ecosystem actors.

  To manage the tensions between exploitation and exploration and the project level, "sequential ambidexterity" was applied: new exploratory projects and initiatives were indebted to be brought back as exploitative projects.

Organisational rigidity: outcome of decades of tinkering, development and trial-and-errror activity by dominant companies. It is a firm-level concept that explains how and why it becomes difficult and costly to change organisational structures, contracts and routines. Two types of rigidity:

- Structural

  Refers to how a company coordinates its innovation activities. It includes hierarchy and administrative issues (the organisational form). Structure also includes the organisation boundaries to innovation activities (which groups of actors are playing an active part in the innovation).

  - Internal structural rigidity

Results in team structures, divisional organisation, chain of command rarely changing or being questioned.

- External rigidity

  New suppliers and partners are rarely adopted. Knowledge comes from inside and rarely crosses the boundaries of the company.

- Capability

  Rigidity in organisational routines, processes and culture related to exploitation and exploration activities.

Paper 2: Leadership, creativity and innovation: A critical review and practical recommendations (Hughes et al., 2018)

Leadership is a key predictor of employee, team and organisational creativity and innovation. Creativity and innovation drive progress and allow organisations to maintain competitive advantage.

I. Conceptualisation and definition of creativity and innovation

   Creativity and innovation usually defined by their outcomes and products. Five markers of workplace innovation:

   - Problem recognition
   - Introducing
   - Modifying
   - Promoting
   - Implementing new ideas

   Difference between workplace creativity and innovation:

- Creativity concerns the cognitive and behavioural processes applied when attempting to generate novel ideas
- Innovation concernes the processes applied when attempting to implement new ideas

Table 2
Distinguishing between creativity and innovation.

Feature	Creativity	Innovation
Idea generation	Yes	No
Idea promotion	No	Yes
Idea implementation	No	Yes
Novelty	Absolute novelty: The generation of something "new"	Not necessarily, can be relatively novel i.e., adopting and adapting others' ideas
Utilitarian focus	Not necessarily – creative ideas can be generated with no specific regard to improving organizational outcomes	Necessarily – innovative actions are initiated with the goal of improving organizational outcomes
Where does it take place?	The *processes* involved in creativity are largely intrapersonal and cognitive. Social-exchanges can help to refine and improve creative ideas; however, creative ideas are by definition cognitive in nature	The *processes* involved in innovation are largely interpersonal, social, and practical
What does it result in?	The *product* of a successful creative process is an idea	The *product* of a successful innovative process is a functioning and implemented idea

II. Systematic review of the leader variables and their relationship with creativity and innovation; Categorisation of the proposed moderators of this relationship

   Leadership: See lecture notes, the paper is difficult to follow

III. Mediating mechanisms by which leaders are theorised to influence workplace creativity and innovation

   Leadership is a process whereby leader variables affect distal outcomes through more proximate mediating variables. Five classes of mediators:

   - Motivational (intrinsic motivation important for employees)
   - Cognitive
   - Affective
   - Identification
   - Social relational

IV. Study designs commonly employed

Problem of *Ecological validity:* experimental designs do not realistically simulate organisational settings.

V. Current approaches to measuring creativity and innovation

Table 6
Example items assessing creativity, innovation, both, or neither, across the measurement facets of person, process, and product.

	Person	Process	Product
Creativity	Served as a good role model for creativity.	Took risks in terms of producing new ideas in doing job.	Demonstrated originality in his/her work.
Innovation	Is innovative.	Promotes and champions ideas to others Develops adequate plans and schedules for the implementation of new ideas	Generates creative ideas. Introducing innovative ideas into the work environment in a systematic way.
Both		…searches out new working methods, techniques or instruments?	How ORIGINAL and PRACTICAL is this person's work? Original and practical work refers to developing ideas, methods, or products that are both totally unique and especially useful to the organization.
Neither	Is not afraid to take risks.	…wonders how things can be improved? …pays attention to issues that are not part of his daily work?	

From Lecture 4

What motivates people?

Motivation can be innate or acquired.

- Autonomy
- Mastery
- Purpose

Employee engagement: a motivational state characterised by

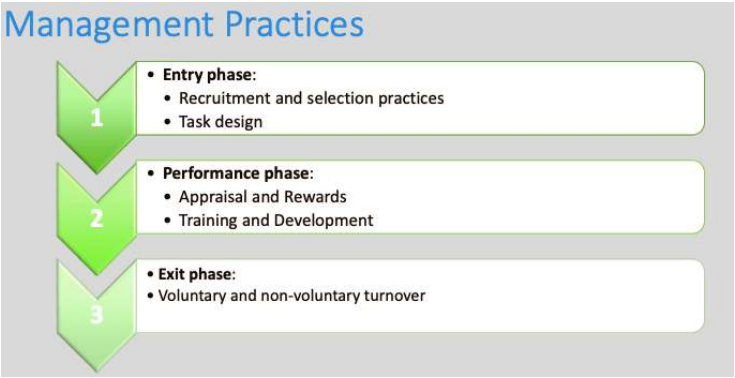
- Absorption (level of concentration)
- Dedication (levels of enthusiasm)
- Vigor (levels of energy and persistence)

What is Human Resource Management?

A strategic approach to managing employment relations which emphasises that leveraging people's capabilities is critical to achieving sustainable competitive advantage.

How do HR contribute to Sustained Competitive Advantage?

1. Employees are a source for success
2. From control to commitment
3. Line managers are primarily responsible
4. Alignment with business strategy
5. Involvement of top management



Leadership: the process by which an individual influences others in ways that help attain group or organisational goals

- Trait approach
  Great leaders possess key traits that set them apart from most others, traits that remain stable over time and across different groups.
- Behaviour approach
  Leaders are likely to be most successful when they demonstrate high concern for both people and production.

Transformational leadership:
- Intellectual stimulation+interpersonal consideration
- Inspiration
- Morality

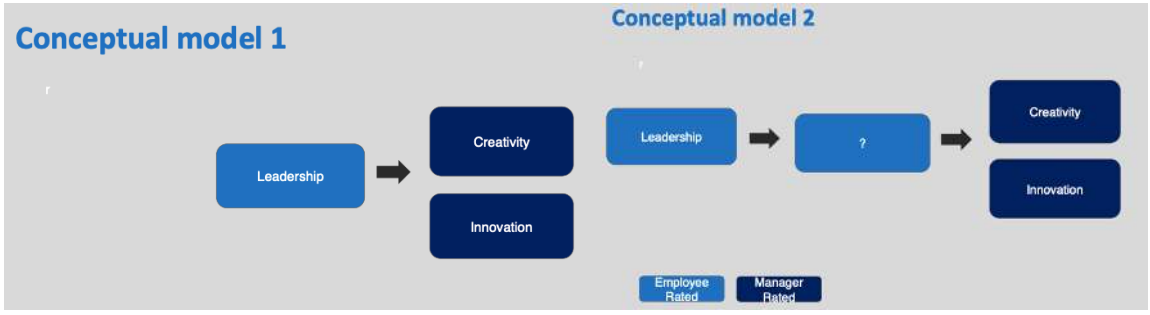
How do you become a charismatic leader?
1. Extraordinary person (leader)
2. Social crisis (situation)
3. Radical solution (vision)
4. Followers who believe in the solution
5. Validation by repeated successes

Primary function of the *leader* is to create essential purpose or mission of the organisation and the strategy for attaining it. The job of the *manager* is to implement that vision. They are responsible from achieving that end, taking the steps necessary to make the leader's vision a reality.

What make leadership an elusive concept?
1. Leadership is primarily in the eye of the beholder
2. It is easier to believe in leadership that to proof it
3. There is noe denying the fact that we have a tendency to overestimate the importance of leaders
4. There are not many good examples of leadership in practice

<u>Leadership, creativity and innovation: A critical review and practical recommendations</u>
- Difference between creativity and innovation?
- Impact of leadership on creativity and innovation
- Moderators and mediators
- Study design
- Measuring creativity and innovation

Two conceptual models:



Paper 3: The moderating effect of human resource management practices on the relationship between knowledge absorptive capacity and project performance in project-oriented companies (Popaitoon et al., 2014)

Many multinational companies (MNCs) have recently shifted toward operating as project-oriented companies (POCs). Managing and measuring performance of such projects can be challenging. Two most important factors contributing to project success:

- Human Resource Management (HRM) practices

  HRM practices are found to contribute to project success by facilitating knowledge management.

  Different patterns of people management systems should cary across different types of organisations.

  Four distinctive challenges for the analysis of HRM in POCs: competence, trust, change and people.

  Ability-motivation-opportunity enhancing HRM practices can improve the process of knowledge management and these practices affect a project team's capability to achieve knowledge outcomes.

  SHRM: strategic HRM. Emphasises importance of examine. Multiple HRM practices rather than focusing on a single one.

  HRM practices have a positive association with project-related performance in both short and long run. And they mediate the relationship between a project team's realised ACAP and short-run project performance.

- Projects team's knowledge Absorptive Capacity (ACAP)

  ACAP refers to a team's prior-related knowledge that results from the cumulative knowledge gained during previous product development projects. It contributes to the success by creating a faster process of knowledge utilisation and creation.

  ACAP: "the ability of a firms to recognise the value of new external information, assimilate it and apply it to commercial ends"

  - Realised ACAP (knowledge utilisation)

    Affects innovation-related outcomes and enhances competitive advantage.

    Refers to project's capacity to leverage knowledge and to transform and exploit the knowledge that has been absorbed. Associated with "within project learning" and "vanguard projects". Enables units to enhance their *short-term* innovation performance.

  - Potential ACAP (knowledge creation)

    Allows firms to sustain a competitive advantage in the *long term*. It is path dependent and influenced by past experiences, it is the cumulative knowledge resulting from prior projects. Associated with "between projects learning" and "project-to-project".

    Firms often retain core project members from previous successful projects to serve on successor projects.

Projects occur on four levels:

1. Organisational units (project embedded in a functional or business unit)
2. Entire organisation (the organisation is entirely based on projects)

3. Networks (that provide inter organisational cooperation on projects)
4. Organisational fields (in a particular region/industry, they provide a particular context for project-based organising)

Project performance can be simplistically measured using the cost-time-quality triangle, but this is appropriate only in some cases (e.g. time to market is of critical importance). The evaluation has been widened to include:

- Behavioural aspects such as communication with clients;
- View of stakeholder such as customer satisfaction and profitability;
- Internal and external stakeholders;
- Project environment such as incremental or radical change;
- Cross-cultural perceptions.

Attention goes to ho to manage project-to-project transitions as one of the key criteria for long-term project success.

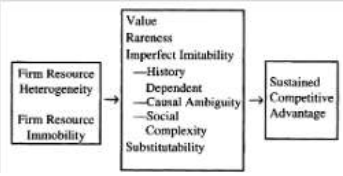
- Short-run project performance: refers to project completion, which includes project efficiency and immediate and commercial success of the project.
- Long-run project performance: refers to the potential created by the project for future projects.

From Lecture 5

Resources: all assets, organisational processes and firm attributes controlled by a firm, that enable the firms to implement strategies that improve its efficiency and effectiveness.

- Physical
- Financial
- Technological
- Human
- Social
- Organisational

VRIN: Valuable, Rare, Inimitable, Non-substitutable



Routines and capabilities

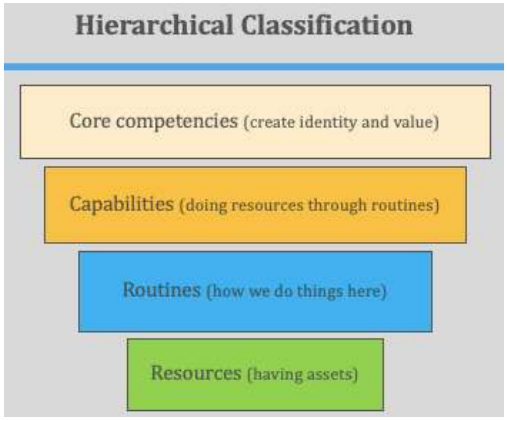
- Routines: particular ways of behaving, as a result of repetition and reinforcement ("How a company does it")
- Capabilities: capacity to deploy a combination of resources through collective organisational routines to achieve goals ("What a company does")

  Capabilities in innovation: Recognising, aligning, acquiring, generating, choosing, executing, implementing, learning, developing the organisation.

  Dynamic capabilities: firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments

  - Sensing: identification and assessment of an opportunity
  - Seizing: mobilisation of resources to address an opportunity and to capture value
  - Reconfiguring/Transforming: continued renewal

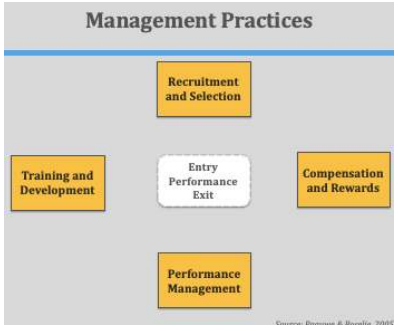
Core competencies: resources and capabilities that comprise the strategic advantages of a business ("What the company does best")



Three phases of employment management

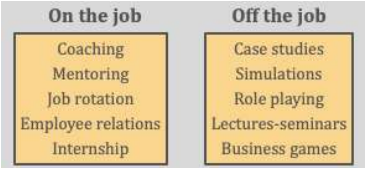
- Entry: recruitment and selection, planning, job design
  - Recruiting
    - Depends on job type, specialisation, hierarchy
    - Internal (common in promotions) and external
    - Inbound/Outbound
  - Selection
    - Interviews
    - Tests
    - Gamification strengthens employer branding

  High-tech recruiting and selection:
  - tech talent shortage
  - Focus on referrals
  - Emphasis on hard skills
  - Using cross-functional team
  - Investment in employer brand and candidate experience
  - Metrics (time to hire, acceptance rate)
- Performance: manage employee performance, ensure that perf. Remains at the desired levels
  - Formal and informal
  - Objective and subjective measures
  - Multiple evaluation sources
- Exit: high turnover rates are not favourable



Training and development

Employees prefer face-to-face training over e-learning, because e-learnirng is often socially isolating and does not always provide timely feedback.
Onboarding, promotional and continuous training and development to support knowledge, skills and attitudes.



High-tech training:
- Hard/soft skills training (soft skills: communication, leadership, problem solving, creativity, team development skills)
- Agile: focus on speed, flexibility, collaboration
- Microlearning
- Metrics (user rate, dropout rate)

Compensation and rewards
- E-compensation systems decrease costs, errors, time
- ESS: Employee self-service systems
- Monetary and non-monetary rewards
- Benefits
- Employee stock options plan

Best practices of best fit?
Three perspectives:
- Universalistic
  "Best practices" contribute to performance regardless of the strategic goals of the organisation
- Contingent
  Organisations need to adapt their strategies according to the business environment.
  - External fit: based on the assumption that the choice of practices should be determine by the competitive strategy, with traditional differentiation between a predominant quality-based or cost-based strategy, implying different HR practices.
  - Internal fit: purposes that practices should fit either the strategic priorities, human capital decisions or the organisational culture and related priorities.
- Configurational: bundles of practices can be used in corresponding organisational contexts

The link with innovation
- most studies focus on the effect of practices on tehcnological and product innovation
- HPWS associated with firm innovation through innovative work behaviours
- Management practices that promote commitment are more likely to result in higher levels of innovative orientation
- Staffing, participation, performance appraisal predict technological innovation
- Practices associated with innovation through employee creativity

The link with open innovation
Flows of knowledge initiated by HRM can open up organisational boundaries.

Collaborative-based HRM practices focus on developing long-term and quality partnerships with external entities, motivating internal and external actors to participate in collaborative decision-making and encouraging communication and collaboration between employees and employers.

What's next for people management?
- Digitalization
- Flexible work
- Lifelong learning
- Agility

Chapter 8: Explicit digital connectivity, knowledge and innovation

New developments in digital technology are changing the innovation process, for example by the introduction of crowdsourcing.

Implicit versus explicit digital connectivity

Obiquitous computing: computers are everywhere and we are connected to other people and organisations either explicitly or implicitly.

- Explicit connectivity: conscious use of technology

  Emergence of Web 2.0 (or Enterprise 2.0), where applications have been developed to allow communication and transactions, typically based on applications that connect to the internet (*social software*). In an organisational context, the purpose of using such social software is to take advantage of many people's ideas and expertise in order to identify new opportunities or solve problems through collaborative working.
- Implicit connectivity: our data is recorded more or less to our knowledge

  It does not rely on human actors purposefully inputting their ideas. Instead, objects are increasingly digitised and used to capture what is being done. This creates big data that can be analysed to identify elements to provide ideas for new products or services or monitor behaviour for security.

Explicit digital connectivity and e-Commerce

Organisations can be connected to their various stakeholders through virtual, online communications, and these connections can be exploited for innovation.

Reducing the *digital divide* is seen as a key goal for enabling developing countries to become more equal partners in the global economy.

Two approaches to rural e-commerce innovation:

- Orchestrated

Grass roots leaders (born locally, moved away to become successful, came back to stimulate economy) recognise the limited initial capabilities of the villagers and take action to remedy the shortcomings.

- Organic

  No central coordinating association is established, but rather there are multiple people involved in a general process of discovery and learning.

Table 8.2 Orchestrated and organic approaches (from Cui et al., 2017)

Orchestrated approach	Association organises training and workshops and Association mobilises the villagers	Association provides an operational infrastructure that coordinates the supply and demand	Association provides support to ensure the villagers Association showcases successful etailers
Organic approach	Pioneer shows by doing; self-learning by villagers; Pioneer co-evolves with the villagers	An operational infrastructure of distributor-agent model emerges from the co-evolution of the ecosystem actors	Success of the pioneering etailer inspires the villagers Mutual support through peer sharing and coalition building

E-commerce innovations can promote economic development in less advantaged areas. Explicit connectivity might develop overcome socioeconomic disadvantage, with centrally managed digital providers giving people in rural and deprived areas broader access to a market for selling products and services.

Explicit digital connectivity and use of social media within organisations

E-commerce rests on using our explicit connectivity to enable transactions between people and organisations. The social software-enabled knowledge-sharing can be controlled by the organisation (if it seeks out knowledge input from its distributed employee/partner network or from the broader crowd) or out of the organisation's control (employees or those external to the organisation degenerate content about an organisation and its products and services or where users connect to each other to offer goods and services).

Enterprise Social Media (ESM) systems: type of social software used within organisations. It can open up new opportunities for increased communication and knowledge-sharing within an organisation and so could foster increased employee participation and engagement, in turn leading to more people being involved in innovation projects and in organisational strategy-making.
When a platform is imposed by managers, what is shared may be quite restricted.
Even when successfully implemented, ESM are not without negative impacts: more open internal communication can allow diverse views to come into conflict.

Explicit digital connectivity and crowdsourcing

Social software can be used to involve external actors: crowdsourcing consists in having the source/ content originated outside the organisation's boundaries. It can be:

- Organisationally controlled

  Customer-led innovation: customers are an important source of knowledge for organisational innovations ("the crowd knows best"). Knowledge diversity can generate innovation more effectively than uniformity.

Crowd-sourcing successfully: crowdsourcing is used to generate ideas for introducing new products and services or as an "instant workforce". There is a duality of the freedom associated with crowd-working: it give the ability to work when/where it suits, but there are issues associated with poor levels of remuneration and scams. Additionally, ethical issues have emerged, associated with potential reidentification of crowd-workers (who are warranted anonymity when participating in studies).

Crowd sites are not just for profit, some have a more socially motivated objective (e.g. OpenIDEO)

Knowledge-sharing in crowd activity: research has focused on how to maximise knowledge-sharing in collaborative crowd forums. Although contributions from the crowd have been increasing, most crowd platforms produce only independent contributions and do not encourage co-creation. Many ideas are posted but not as many as elaborate upon.

Those who contribute with multiple rather than single ideas are those who contrite good ideas through crowdsourcing. Ideators can get an idea implemented, but then find it difficult to come up with further valuable ideas, because their subsequent contributions will resemble the initial one.

Co-creation is restricted by three tensions:

1. The simultaneous encouraging of competition and collaboration
2. Idea evolution takes time but crowd members spend little time
3. Creative abrasion requires familiarity with collaborators yet crowds consist of strangers

It is suggested to create systems that encourage idea evolution and incentivise contributors who work on other's ideas.

Organisations nerd to consider carefully when to include the crowd: social software offers promise for knowledge management, but it raises questions about the essence and value of firm knowledge, knowledge protection, firm boundaries and sources of competitive advantage.

- User-controlled

  Many digital sites allow to comment on an organisation's products and services. This has been found to influence what stakeholders feel about a firm's products or services, even more than a firm's own generated content. There are some ethical issues involved, as this can lead to individuals abusing others given that they don't have to disclose their identity.

<u>Peer-to-Peer crowd involvement: The sharing economy</u>

Social media are opening up opportunities for peer-to-peer innovations in products and services: "sharing economy", term used to identify any transactions that are undertaken via "online marketplaces", so not simply peer-to-peer free transactions but also peer-to-peer money-based transactions.

Critics argue that these innovations are leading to a reduction in well-paid secure jobs, while advocates argue that it is opening up opportunities for small entrepreneurs to start their own business and work more flexible hours.

Also these new services don't necessarily take customers away from established businesses, but rather they answer to an increasing demand for the particular type of service, which is now offered at a lowered cost.

<u>Explicit digital connectivity and work-life boundaries</u>

We live in a connected world and we ned to rethink the idea of work-life boundaries.

The changing nature of work-life boundaries includes the following:

1. Blurring boundaries between work and home

2. Emotional spillover
3. Constantly replanning our time
4. Managing public and private online identities simultaneously
5. Getting "sucked in" by digital technologies
6. Maintaining our digital lives
7. Physical inactivity

Chapter 9: Opportunities and challenges for innovation related to implicit digital connectivity

Introduction: Data and the digital world

Internet of things: objects are connected to each other and to people as well as simply people connecting to each other over the internet.

The data trail we leave is increasingly used by companies to target and personalise the information that we receive on products and services.

Datafication: the processing and analysis of vast amounts of data with the aim to distil relevant insights to support and/or automate decision-making. Companies benefit from being able to better profile their customers and to then shoot their marketing focus from traditional "market research" to data mining research on social media and online "digital traces". This goes for political parties as well. As a result, academics, media and governments have highlighted potential negative societal consequences associated with the intense use of digital traces:

- The processes underpinning data collected through computing devices and digitised objects are often not fully disclosed to the data creators ("walking data generators").
- The data collected by companies is processed by algorithms that make decisions on the basis of data analytic processes, which might lead to unfair discrimination.

Algorithmic decision-making and big and little data

The data trail left bu users provides the opportunity for organisations to move to data-driven or algorithmic decision-making. Algorithmic decisions making is based on collecting large quantities of data and then developing algorithms that make a selection in order to model a particular phenomenon of interest.

- Little (or Smart) Data: all the data that is today collected at the individual level, through digital traces from any kind of computing device or objects with inbuilt sensors that individuals carry and that record information related to whereabouts, activities and health data.

  Decision making use of little data is more sophisticated than traditional, general trend approaches to using data. It moves from the general to the specific.

  However, the use of little data in for example car insurance premium calculations can lead to the *monetisation of privacy*, meaning it is cheaper to give up privacy than to retain it.
- Big data: all the data collected from us as individuals that can then be combined to allow organisations to see connections in those data that might suggest ideas for new products or services or how to target products and services to particular individuals.

  Three characteristics of big data (3Vs):
  - Volume
  - Variety
  - Velocity

It is argued that algorithmic decisions are superior to traditional "HiPPO" (Highest-paid person's opinion) decision making, which usually carries biases. However, it has to be kept in mind that the

algorithms are still designed by humans and that there are negative consequences related to the datafication of our world.

Implicit connectivity and computing applications

The predictive power of computing applications and big data is far from perfect. The potential errors of big data predictions raise concerns because companies and government institutions often make decisions based on these analyses. Yet trends and statistics ignore exceptions, minorities, etc. and can be wrong.

Big data are a very large amount of data collected, but the algorithms that manipulate the data are extremely complicated and often even their own creators struggle in understanding how they come up with some predictions.

Two root causes fro the ambiguities affecting how algorithms operate:

1. Algorithms are set up to compare and combine very different types of data and look at historical data trends that might be invisible to humans.
2. Algorithms learn, so that what an algorithm can do at the time of its creation is different from what it can do after being trained with data. And they are not trained to be ethical.

So ten big data can lead to inappropriate generalisations, but also little data has problems: it can be more invasive and raise more privacy issues. The de-identification (supposedly) guaranteed by big data is no longer standing, since in little data the data related directly to the owners.

Uniformed control: what is presented to the reader is decided by an algorithm and is not based on an explicit personal choice. This leads to a "filter bubble": the computing application providers are making decisions about what we like/dislike and then filtering out what they think we don't like. This may produce societal changes, with stronger degrees of polarisation and less diversity exposure.

Implicit digital connectivity and digitised objects

The exponential diffusion of tracking software embedded in social networks and the sensors in other digital devices leads to think that it will be hard for organisations of governments to regulate how individuals use technologies that enable tracking responsibility.

Tracking can help assess employee's productivity. However, using algorithms that put together "productive behaviours", exceptions are not accounted for.

Recruiting based on algorithms: algorithmic decision-making can veto hiring potentially creative talents because they are judged as being unreliable by an algorithm. At least humans have the ability to recognise their own biases and overcome them.

Other problems: dependence and learning (e.g. constant use of maps makes us unable to orient ourselves without them; use of automatic brakes makes us not learn when and how to break appropriately) and take over of cognitive skill jobs.

Innovation opportunities from big and little data

Some companies have recognised the value of data and have built massive business empires on its successful exploitation. But there are legal and ethical considerations to be borne in mind with regard to how data can be used. The laws are not always effective and companies have found ways of circumventing legal constraints.

Making digital innovation more ethical

The focus on actual behaviours (rather than tends associated with demographics) is arguably a better and more ethical form of discrimination for all type of digital innovation. However, the collection of little data should always mean that those monitored are aware of it. Otherwise implicit connectivity might threaten basic ethical principles such as the right to give informed consent about participation in a research study.
Big data should ensure de-identification but unfortunately, most research that utilises big data is generally conducted with very poor security measures that threaten data anonymity. These risks are taken because it is argued that the innovative findings arising from this type of research are meaningful.

Chapter 10: The future of digital innovation: The role of responsible and frugal innovation

Responsible innovation: What is it and why does it matter?

Responsible innovation: is associated with more general issues of sustainability and the triple bottom line (firm's responsibility for considering social, environmental and financial results)
Organisations, governments and the public must serve to follow a process that seeks to promote creativity and opportunities for science and innovation that are socially and environmentally desirable and undertaken in the pubic interest.
Two criteria to weight up an innovation:

1. Consequentialist view: considers positive and negative consequences of an innovation's use.
   What ever has the best out come is the ethical choice to make. Within this approach is *utilitarianism*: the goal is to maximise happiness and minimise harm. Sometimes the consequences are unforeseen, but the decision maker should at least attempt to evaluate the positive and negative consequences of different innovation options and select the option that is likely to do most good with respect to social, environmental and financial criteria.

   From this perspective, developing algorithms so that people can more easily access things that interest them has some positive consequences. However, companies don't usually consider the negative consequences of exposing people to less diversity.
2. Non-consequentialist view: considers the motivations or intents that lead to the innovation's development.
   Focuses on intentions rather than outcomes. Taking an ethical or responsible approach to digital innovation from this perspective would mean that the social and environmental issues would weigh as heavily in decision-making as the financial.

Key opportunities and challenges for responsible digital innovation

It is in relation to governance and research where responsible innovation has been most discussed and is making noticeable impact. It is becoming a new model for innovation and central to how we think about governance and research, particularly for considering relations between innovation and society.
Challenges in governance and research:

1. There is much potential for responsible innovation to become something of a buzzword for organisations, policy makers and in research, without substance or proof of application. There are limited guidelines or agreed methods for judging or measuring RI and demonstrating clear impact of responsible innovation might be difficult.
2. Clarity: if we are still unsure what RI means, how can policy-makers and researchers be expected to integrate it in their regulations and projects and how would they go about this?

3. Consider what RI means and how this might bring about misconceptions regarding typical models of innovation.

Frugal innovation: an emerging consideration in developing and developed economies

Frugal innovation: concerned with how society, particularly emerging economies, are developing innovations that are less complex and therefore less costly to the end user ("doing more with less"). It denotes a new frame of mind that sees resource constraints not as a liability but as an opportunity. It favours agility over efficiency.

Frugal innovation is also important for developed economies, as they might miss out on the growth of prominent emerging middle-class markets in less developed countries. Moreover, on their own turf, they need to be able to face competition from emerging market competitors that are entering their markets with affordable yet increasingly reliable propositions. The frugal model might also offer new opportunities to make the most of technological expertise, to address challenges in developed economies and to better meet customer needs in home markets.

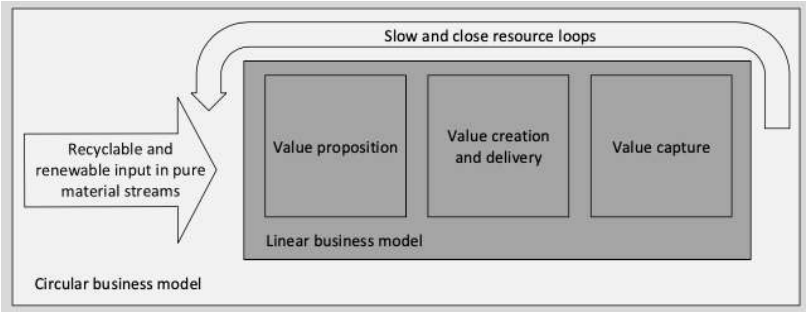
Frugal innovations can be low-tech, but can also focus on utilising the advancements of digital solutions to make services more affordable and more accessible to more customers.

Frugal innovation and established models of innovation

Conventional models of "more for more" are becoming obsolete for three main reasons:

- customers can no longer afford expensive products, due to diminishing purchasing power.
- We are running out of natural resources.
- The growing income disparity between the wealthy and everyone else has led to a big disconnect between existing products and services and customer's essential needs.

Circular economy: waste from one product or process is used by another product or process.



Three principles for frugal innovation:

- Simplicity
  Avoid innovations that are designed with advanced, luxury features aimed at impressing. Make products easy to use, accessible and with a clear purpose. Innovators are in the field.
- Creativity
  Particularly through leveraging existing resources and assets that are readily available.
- Agility
  Frugal innovation focuses more on thinking and acting horizontally.

The challenges of frugal innovation

- Potential resource constraint, typical in developing countries and economies
- Many frugal innovations are not needed in some countries

Still, an increasing amount of customers strives for value, which frugal innovations provide. Large organisations should not ignore the growing middle class and should build organisational structures

and capabilities to enable the development of frugal products. Successful frugal innovation requires a deep understanding of the specific environment for which such products are developed.

Key actions for successful responsible and frugal innovation

Five valuable actions that help drive successful responsible and frugal innovation into the knowledge base and culture of an organisation:

1. Develop "circular value networks".
   The linear economic model is wasteful, costly and environmentally unsustainable. Organisations must look to frugal innovation and reinvent their value chains to operate in a circular way.
2. Crowdsource solutions across industries.
   Organisations must strive to be more cost-effective and utilise digitally facilitated crowdsourcing for responsible and frugal solutions from external networks of suppliers, research institutions and creative entrepreneurs.
3. Encourage simplification of structures to empower employees.
   Companies need to be responsible and frugal with time. To save time and agility, companies can learn to fully utilise their assets.
4. Use key performance indicators (KPIs) to incentivise and sustain responsible and frugal behaviour across organisations.
   It is the responsibility of organisational leaders to create specific KPIs to drive both responsible and frugal thinking and action at all levels.
5. Emphasise the "doing more with less" mantra of frugal innovation but also the societal and environmentally desirable aspects central to responsible innovation.
   Organisations should put their personal reputations on the line by making major public announcements about responsible and frugal innovation goals.

A summary of responsible and frugal innovation: Key areas of applicability

Examples of possible areas of applicability:

1) Healthcare
2) Utilities
3) Retail
4) Security
5) Transport
6) Social care

In all these areas there is evidence of motivations that include improving the environment or society and some very positive consequences for individuals and potentially society. Possible underlying profit motives are an interesting consideration in contrast to some concepts in frugal innovation.

From Lecture 6

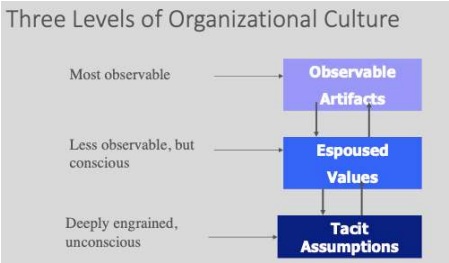
What is organisational culture?

A common perception held by the organisation's members, a system of shared meaning.

Characteristics:

- Innovation and risk taking
- Attention to detail
- Outcome orientation
- People orientation
- Team orientation
- Aggressiveness

- Stability



Culture's functions:

1. Defines the boundary between one organisation and the other
2. Conveys sense of identity for its members
3. Facilitates generation of commitment to something larger than self-interest
4. Enhances stability of the social system
5. Serves as a sense-making and control mechanism for fitting employees in the organisation

How do employees learn culture?

- Stories
- Rituals
- Material symbols
- Language
- Role-models

Dimensions of RI:

- Anticipation
  Ability to predict consequences of innovation
- Reflexivity
  Making values and beliefs in innovation processes more explicit in order to enable adaptation when necessary
- Inclusion
  Involvement of different stakeholders
- Responsiveness
  Response to new knowledge, different emerging perspectives, views and norms