Innovation is increasingly about teamwork and the creative combination of different disciplines and perspectives.

There is correlation between people management and business performance.

**Components of the innovative organization:**

1. Shared vision, leadership and the will to innovate
2. Appropriate structure
3. Key individuals
4. Effective team working
5. High-involvement innovation
6. Creative climate
7. External focus

### 3.1 Shared vision, leadership and the will to innovate

Innovation is essentially about learning and change and is often disruptive, risky and costly.

We have become used to seeing core competences as a source of strength within the organization, but the downside is that mindset can block the organization from changing mind.

There need to be long-term commitment to major project, as opposed to seeking short-term returns. One way of dealing with slowly emerging returns is to focus not only on returns on investment but also on other considerations like future market penetration and growth or the strategic benefits which might accrue to having a more flexible or responsive production system.

- Top management acceptance of risk is important

One of the most important roles that leaders play is to create the climate for innovation. Leadership has some direct influence on the differences found in performance of businesses. Expertise and cognitive-processing skills are key components of creative leadership.

- This combination is critical for the evaluation of others’ ideas.

At higher levels of management the problems to be solved are more likely to be ill-defined, demanding leaders to conceptualize more.

**Environmental uncertainty:** not only build confidence, but solve problems and make appropriate strategic decisions.

**Research environment:** the perception of leader’s technical skills is the single best predictor of research group performance.

Transformational leadership: Greater impact on performance in research environment than administrative, although both have a positive effect.

**Transactional leadership:** positive effect in administrative and negative in research environment.

### 3.2 Appropriate organization structure

Innovation is becoming a corporate-wide task, involving production, marketing, etc. This provides strong pressure for widespread organizational change towards more organic models.

→ GE moves from rigid and mechanistic structure to a looser and decentralized form

<table>
<thead>
<tr>
<th>Mechanistic</th>
<th>Organic</th>
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<tbody>
<tr>
<td>Mature industries</td>
<td>Fast-growing industries</td>
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</tbody>
</table>
Managing Innovation by Joe Tidd and John Bessant (4th edition)

Rapid product innovation and improved customer responsiveness are being achieved through extensive organizational change programs involving:

- Parallel working
- Early involvement of different functional specialists
- Closer market links
- User involvement

Size, age and company strategy influence structure.

There is no single ‘best’ structure, but successful organizations tend to be those which develop the most suitable ‘fit’ between structure and operating contingencies.

- Simple structure
- Machine bureaucracy
- Divisionalized form
- Professional bureaucracy
- Adhocracy
- Mission-oriented

3.3 Key individuals

To prevent the failure of a promising invention, is a key individual who is prepared to champion its cause and to provide some energy to help it through the organizational system.

Roles of key players: (champion model)

1. Source of critical technical knowledge (inventor/team leader)
2. Organizational sponsor (pull strings, often board member)

Heavyweight project managers are deeply involved and have the organizational power to make sure things come together. Lightweight project managers have more distant involvement.

Negative champions – project assassins – negative influence on outcome of innovation project.

3.4 High involvement in innovation


High involvement innovation (HII) business performance turnover per employee employees become receptive (vatbaar) to change itself

- Not a quick fix but a major strategic commitment
- Misnomer, concentration still on shop-floor activities
- Most HII takes place on an ‘in-line; basis

The five-stage high-involvement innovation model

Stage 1 “Unconscious HII” Little HII, no formal attempt
Stage 2 First attempt to mobilize HII, establishing the habit of HII
Stage 3 Coupling HII habit to strategic goals, makes an impact
Stage 4 Empowerment, requires understanding, commitment, training.
Stage 5 Everyone is fully involved in experimenting, improving, sharing and creating.

3.5 Effective team working

Groups have more to offer than individuals in terms of both fluency of idea generation and in flexibility of solutions developed. teambuilding is critical of project success

- Bridging boundaries within the organization in dealing with inter-organizational issues
- Enable achieving the kind of decentralized and agile operating structure

Key elements: clear task and objectives, effective leadership, balance of roles that match with individual styles, effective conflict resolutions, continuing connection with external organization.
Managing Innovation by Joe Tidd and John Bessant (4th edition)

Effective teamwork
1. Clear, common and elevating goal
2. Results-driven structure
3. Competent team members
4. Unified commitment
5. Collaborative climate
6. Standards of excellence
7. External support and recognition
8. Appropriate use of the team
9. Participation in decision making
10. Team spirit
11. Embracing appropriate change

Challenges
1. Group versus team (how to treat)
2. Ends versus means
3. Structured freedom (be clear)
4. Support structures and systems
5. Assumed competence (not assume, train)
6. Princpled leadership

3.6 Creative climate
Creativity is an attribute which everyone possesses.
Stifle creativity: unsupporting accounting practices, unfocused innovative activity, formal vehicles for change, top-down dictated, limited tools, poor communication.

Building a creative climate involves systematic development of organizational structures, communication policies and procedures, reward and recognition systems, training policy, accounting and measurement systems and deployment of strategy.

→ 3M gives employees 15% of their time for innovation, if they back it up = intrapreneurship

Innovation Energy is the power behind productive change and is the confluence of three forces:

1. Attitude
Innovation teams need a majority of people with the right attitude and others need to be at least neutral. Money rarely motivates or affects attitude. Motivation arises when people feel good about what they’re doing and they feel good being a part of it. A crisis will fire up people about a company’s bold vision. Also: connect senior management with real people, their consumers.

2. A group’s behavioral dynamic
Suspend judgment and replace it with what we call greenhousing – building ideas collaboratively. The most useful innovation behaviors are: freshness (trying new stuff out), greenhousing, realness (quickly making an idea into the form a customer will buy it as), bravery (guts to disagree) and signaling (helping a group navigate between creative-analytical behavior).

Story telling:
- Most effective way to help turn behavior into habits by articulate what’s okay
- More powerful than any mission statement of set of values

3. Support an organization provides
Force people into the shared space the ‘heart’. This breaks down barriers and prevents people from only fraternizing with people in their immediate teams.

Climate versus culture
Climate: recurring patterns of behavior, attitudes and feelings that characterize life in the organization.
Culture refers to the deeper and more enduring values, norms and beliefs within an organization.
Managing Innovation by Joe Tidd and John Bessant (4th edition)

<table>
<thead>
<tr>
<th>Climate</th>
<th>Culture</th>
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<tbody>
<tr>
<td>Look at individuals and their shared perceptions</td>
<td>Look at entire organization</td>
</tr>
<tr>
<td>Social psychology</td>
<td>Anthropology</td>
</tr>
<tr>
<td>Normative, not looking for different but better things</td>
<td>Descriptive, assumptions are not better/worse than another</td>
</tr>
<tr>
<td>Quantitative research</td>
<td>Qualitative research</td>
</tr>
<tr>
<td>More easily observable and influenced</td>
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**Trust and openness**

**Strong level of trust**
- Ideas and opinions arise (motivate employees to contribute)
- More efficient decision making
- Influence effectiveness of an organization through structuring and mobilizing
- Lack of questioning each other \(\rightarrow\) mistakes \(\rightarrow\) less productive outcomes
- Cliques

**Bases of organizational trust:**
- Contractual
- Goodwill
- Institutional
- Network
- Competence
- Commitment

**Challenge and involvement**

Too low: apathetic about work, not interested in development.
Too high: burn out because there's too much of a stretch

Building and maintaining a challenging climate involves systematic development or organizational structures, communication policies and procedures, reward and recognition systems, training policy, accounting and measurement systems and deployment of strategy.

- Intellectual stimulation is one of the most underdeveloped components of leadership.
- Much of employee involvement in innovation focuses on incremental change

**Support and space for ideas**

Idea time is the amount of time people can (and do) use for elaborating new ideas.
Low: time pressure makes thinking outside the instructions and planned routines impossible.
High: boredom, slow decision making, bureaucratic

**Organizational slack** identifies the difference between resources currently needed and the total resources available. Too much: static inefficiency. When innovation and change is needed, slack can act as a dynamic shock absorber, and allows scope for experimentation.
- Appropriate level of organizational slack is associated with superior performance

**Conflict and debate**

Level of conflict too high: dislike, hate. Level of conflict too low: low motivation, deadlines not met.
Maintain a level of constructive conflict consistent with the need for diversity and a range of different preferences and styles of creative problem solving.

**Debate** focuses on issues and ideas. It involves the productive use and respect for diversity of perspectives and points of view. Where debates are missing, people follow authoritarian patterns without questioning. When the debate level is low, people moan and complain about the way things are.
Managing Innovation by Joe Tidd and John Bessant (4th edition)

Risk taking
In risk-avoiding climates, there is a hesitant mentality and low-energy jobs.
When there’s too much risk taking, there are too many ideas floating around, but few are sanctioned.

Strategies for dealing with risk: failure mode and effects analysis (FMEA), potential problem analysis (PPA) and fault tree analysis (FTA). The goal is to help identify risks and payoffs, key uncertainties, decision points and future opportunities that might be created.

Freedom
The independence in behavior exerted by the people in the organization
Much freedom: autonomy, initiative, unbalanced concern, going off in their own directions
Little freedom: guidelines and roles, demonstrate little initiative

3.7 Boundary spanning
In many companies, the focus is on technology. This does not mean that customer focus is irrelevant: the issue here is one of building relationships which enable clear and regular communication, providing inputs for problem solving and shared innovation.

Benefits of networking:
Powerful solution to resource problems  A way forward for industrial development
Increase market share  Collaborative learning experiences (SCL)
Reducing time and costs of development

Networks are emergent property: the whole is greater than the sum of the parts.
The network culture has to be right, the following elements help build this:
- Key individuals
- Facilitation - support
- Key organizational roles

3.8 Beyond the steady stage
Organizations have to deal with innovation in the steady state (doing what they do, but better), but also under discontinuous (do different) conditions.

Those organizations that are able to thrive and exploit innovative opportunities under these conditions are agile, fast moving and tolerant of high levels of using their agility to probe, learn and reconfigure in search of the dominant design which will eventually emerge.
- Established organizations run the risk of being too slow

<table>
<thead>
<tr>
<th>Components of the innovative organization under discontinuous conditions</th>
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<tbody>
<tr>
<td>Shared vision, leadership and the will to innovate</td>
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<tr>
<td>Key individuals</td>
</tr>
<tr>
<td>Continuing and stretching individual development</td>
</tr>
<tr>
<td>Extensive communication</td>
</tr>
<tr>
<td>High involvement in innovation</td>
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</table>

→ Table 3.8, page 154
7.2 Meeting the challenge of uncertainty
Innovation management tries to turn the uncertainty into a calculated risk.
- Requires knowledge about the architecture: components and how put together?

Decision making is often shaped by emotional forces as well as limited facts and figures.

7.3 The funnel of uncertainty
Knowledge converts uncertainty to risk. In innovation management the challenge is to invest in acquiring early knowledge – through technological R&D, market research, competitor analysis, trend spotting etc. – to get early information to feed decision making.

Innovation funnel: a roadmap which helps us make decisions about resource commitment

Each step involves committing more resources, but this only takes place if the risk/reward assessment justifies it. Move from uncertainty to increasingly well-calculated risk management.

7.4 Decision making for incremental innovation
Since this involves comparing something new with something that already exists we can set up criteria and measure against these.

Incremental innovation is important in high involvement systems. But how will we manage the large amount of ideas from employees? – Policy deployment (inzetten)
- Creation of a clear and coherent strategy for business
- Deployment of it through a cascade process which builds understanding and ownership of the goals and sub goals.

7.5 Building the business case
Radical innovation projects have higher risk and so the business case needs to be more strongly made & mobilize both emotional and factual components to secure buy-in from decision makers.
- Tools: advanced computer modeling, rapid prototyping, simulation techniques

7.6 Building coalitions
Innovation problems arise from multifunctional nature of development and the lack of shared perspective on the product being developed and the marketplace.

Formal supplier involvement programs are important. Their expertise can save you costs. It secures acceptance and also obtains improved quality process design.
7.7 Spreading the risk – building a portfolio

Portfolio management provides a coherent basis on which to judge which projects should be undertaken, and to ensure a good balance across the portfolio risk and potential rewards.
- helps with both the “do what we do better” and the “do different” agenda.

Without portfolio management there may be no limit to projects taken on; lack of strategic focus in project mix; weak or ambiguous selection criteria and weak decision criteria.

7.8 Decision making at the edge

Established incumbents often face challenges. Incumbent decision-making and underlying reward and reinforcement systems strongly favor the status quo, working with existing customers and suppliers. This makes it easy for new entrants to colonize new market space.

Selection and framing
- viewing the world in different ways and changing the ways they make selection decisions.

Discontinuous innovation presents challenges which do not fit the existing model and require a reframing – something that existing incumbents find hard to do.

Cognitive dissonance – interpret new situations to match for their established world views.

Self-imposed barriers caused by inability to reframe which pose problems for established players. Their strategic resource allocation mechanisms are effective within a framework, but break down when a challenge comes from outside the box.

The problem of reframing provides clues as to where and how alternative routines might be developed to support decision making around selection under high uncertainty.

Wait and see – deal with early-stage uncertainty.
Fast-second – exploiting innovation opportunities more successfully than early entrants → Microsoft

7.9 Mapping the selection space

Tools to help with uncertainty decision making
1. building alternative futures
2. prototyping
3. probe and learn
4. alternative measurement/evaluation criteria
5. mobilize networks of support
6. alternative decision-making pathways
7. deploy alternative funding structures
8. mobilizing entrepreneurship
9. alternative/dedicates implementation structures
Chapter 11

11.1 Creating value through innovation

There is a weak relationship between innovation and performance. Decide between 2 strategies:

1. Innovation leadership
2. Innovation followership

Late entrant firms appear to pursue one of two very different strategies.

1. Based on competencies other than R&D and new product development
2. Focus on major new product development projects in an effort to compete with pioneer.
   - A pioneer strategy appears more successful in markets where the purchasing frequency is high, or distribution important.

Intellectual property rights (IPR) have only a minor role to play in the creation/capture of value from innovation because:

1. The propensity to use and enforce, IPR varies by sector. → strong in pharmaceuticals
2. High variation in innovation and performance within the same sectors and within similar IPR regimes indicates that other, firm-level factors are also at work.

IPR has a negative effect on a strategy of long-term value creation, and that lead time, secrecy and the tacitness of knowledge are more strongly associated with creating value. Only a limited level of IPR is desirable to encourage risk taking and innovation, and that a broader repertoire of strategies is necessary to create and capture the economic and social benefits of innovation.

11.2 Innovation and firm performance

Difficulties in constructing a model of effects of innovation:

1. Relationship between inputs-outputs is much weaker than at the industry level
2. Reporting behavior of firms may change in respect of any variable monitored to be used
3. Objective of indicators may be to influence financial markets and lending behavior
4. Financial markets will concern themselves only with the gain appropriable by the firm itself

Product R&D is less productive than process R&D.

Explanatory factors: scale, technological opportunity and management
- The scale of R&D effort is important only in chemicals and pharmaceuticals
- Large firms tend to innovate more because they have a higher incentive to do so

A major problem with measuring inputs and outputs is: how do we take account of the ‘spillover’ of innovation benefits or information to other firms or industries.

New patents – below-average performance over time
- Face high costs and uncertainty associated with emerging technology

Older patents – outperform the average over time
- Face more limited opportunity to exploit these commercially

The P/E (price/earnings) ratio may be a better indicator of (future) innovation performance.

Profitability declines as the market evolves over time for a number of reasons:

1. Product and service differentiation tend to be reduced
2. Competition tends to shift to price and rates of return fall
3. Capital intensity tends to increase, driving returns down even further
11.3 Exploiting knowledge and intellectual property

Organizations can acquire knowledge by experience (least effective), experimentation or acquisition. A more active approach involves scanning the internal/external environments: Searching, filtering and evaluating potential opportunities from outside the organization.

Identifying and codifying knowledge

- Data: Set of discrete raw observations
- Information: Data that has been organized, grouped or categorized into some pattern
- Knowledge: Information that has been contextualized
  1. Explicit knowledge, which can be codified
  2. Tacit/implicit knowledge, which is personal, experiential, hard to formalize

Learning how is more relevant where speed or quality is critical, but learning why will be necessary to apply skills and know-how in new situations.

<table>
<thead>
<tr>
<th>Embraided knowledge</th>
<th>Conceptual skills and cognitive abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embodied knowledge</td>
<td>Action oriented, partly explicit</td>
</tr>
<tr>
<td>Encultured knowledge</td>
<td>Achieving shared understanding and meaning</td>
</tr>
<tr>
<td>Embed knowledge</td>
<td>Systematic routines and processes</td>
</tr>
<tr>
<td>Encodes knowledge</td>
<td>Represented by symbols and signs</td>
</tr>
<tr>
<td>Commodified knowledge</td>
<td>Embodied in outputs of an organization e.g. product/service</td>
</tr>
</tbody>
</table>

Transformation of individual knowledge into organizational knowledge involves 4 cycles:

1. Socialization  Tacit → tacit knowledge
2. Externalization Tacit → explicit knowledge  *(boundary objectives are critical here)*
3. Combination     Explicit → explicit knowledge
4. Internalization  Explicit → tacit knowledge

Codifying knowledge involves taking information that human agents carry in their heads and find hard to articulate, and structuring it in such a way that its complexity is reduced.

C-space (culture space) enables an organization to map its resources and key linkages between them on to the C-space. And acts as an elicitation (opwekking) device to facilitate a discussion about the meaning and action required in terms of core competencies and knowledge resources.
Storing and retrieving knowledge
Problems: codifying tacit knowledge, retrieve and reuse relevant knowledge.
There are 2 common approaches to knowledge management:
1. Based on investment in IT, based on groupware and intranet technologies
2. People and process based, encourage staff to identify, store and share information

Collective attributes: intangible, positional, functional, cultural (page 548)

Sharing and distributing knowledge
- Converting data and information to knowledge → identifying patterns
- Converting text to knowledge → synthesis, comparison, analysis
- Converting individual to group knowledge → supportive culture, incentives
- Connecting knowledge to people → seminars, software agents
- Connecting people to knowledge → intranets, agent systems
- Connecting people to people → networks
- Connecting knowledge to knowledge → common projects

If the conflict is too high, you may see information hoarding, open aggression. If conflict is too low, individuals may lack motivation or interest, meetings are one-way, rather than debate.

Mechanisms to help knowledge transfer between different communities of practice:
1. Organizational translator - mediate, heavyweight product managers
2. Knowledge broker - participate in different communities, rather than mediate
3. Boundary object or practice - shared document quality manual, something of interest

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Characteristics</th>
<th>Requirements</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripple</td>
<td>Bottom-up, kaizen</td>
<td>Process tools, sustained motivation</td>
<td>Isolation from technical excellence</td>
</tr>
<tr>
<td>Integration</td>
<td>Of functional knowledge</td>
<td>Early involvement, overlapping phases</td>
<td>Conformity, coordination burden</td>
</tr>
<tr>
<td>Embedding</td>
<td>Coupling systems, products, service ERP</td>
<td>Motivation, rewards, common information</td>
<td>Loss of autonomy, system complexity</td>
</tr>
<tr>
<td>Bridge</td>
<td>Novel combinationexisting competencies</td>
<td>Common language and objectives</td>
<td>High control needs, technical feasibility, market failure</td>
</tr>
<tr>
<td>Transfer</td>
<td>Exploiting existing knowledge related diversification</td>
<td>New market knowledge</td>
<td>Inappropriate technology, customer support and service</td>
</tr>
</tbody>
</table>

Converting knowledge into innovation
Innovation rarely involves dealing with a single technology or market but rather a bundle of knowledge. Successful innovation management required that we can get hold of an use knowledge about the architecture of an innovations – how components can be put together.
Exploiting intellectual property
IPR may provide some legal rights, but secrecy is often a more effective alternative. Patents require certain legal tests to be satisfied
- Novelty
- Inventive step
- Industrial application (must be capable of being applied to a machine, product)
- Patentable subject (discoveries and formulae cannot be patented, software-Europe)
- Clear and complete disclosure

Highly cited patents are of much greater importance than patents which are never cited. They can set off a stream of follow-on inventions.
Indicators of patents:
- Number of patents
- Cites per patent
- Current impact index (CII)
- Technology strength (TS)
- Technology cycle time (TCT) – speed of invention
- Science Linkage (SL) – how leading edge the technology is
- Science Strength (SS) – how much the patent applies basis science

Efficiency: how well companies translate technological and commercial inputs into new products, processes and businesses.

Effectiveness in the sense of how successful such innovations are in the market and their contribution to financial performance.

Copyright is concerned with the expression of ideas, and not the ideas themselves. They provide limited legal rights for certain types of material for a specific term.

Patent strategies:
1. Offensive multiple patents to prevent or limit competition
2. Defensive specific for key technologies
3. Financial to optimize income
4. Bargaining to promote strategic alliances
5. Reputation

Design rights are similar to copyright protection, but mainly apply to three-dimensional articles. Excludes integral and functional features, such as spare parts.
- Cheaper and easier that patent protection, but more limited in scope

Licensing IPR
+ reach larger market, establish standards, gain access, exploit
Common methods: going market rate, 25% rule, return on investment, profit sharing
Increase in patent activity by changing in government funding, intellectual property law and technological opportunity

11.4 Broader economic and social benefits
Global standards and position in international value chains can constrain the ability of firms based in emerging economies to upgrade their capabilities and appropriate greater value, but they also present ways in which these firms can innovate to overcome these hurdles.
Different routes to upgrading through innovation:
- Process upgrading
- Product upgrading
- Capability upgrading
- Inter-sectoral upgrading

Firms in emerging economies face a reverse product-process innovation life cycle.

**Dominant design:**
- locus from innovation shifts from product to process
- radical → incremental improvements

**Emerging economies**
- begins with incremental process innovations, produce existing product lower cost/quality

**Innovation and social change**

Social innovation:
- Aim to create social change and value, rather than commercial innovation/financial value
- Involves business-, public- and third-sector organizations to achieve this aim

→ poverty relief, community development, health, welfare, education, sustainability

Social entrepreneurs share most of the characteristics of entrepreneurs but are different in:
- Motives and aims - independence and health, + social means and ends
- Timeframe - short-term growth, longer term harvesting venture + long-term change
- Resources - reliance firm and management + network stakeholders & resources

The feasibility will be influenced by characteristics such as background and personality.

**Innovation and sustainability**

The most conventional approach to innovation and sustainability focuses on how to influence the development and application of innovations through regulation and control.

*Formal policies* are used in an attempt to direct innovation by using systems of regulations, targets, incentives and usually punishments for non-compliance. → slow and incremental

Innovation as solution environmental issues:
Cleaner products, more efficient processes, alternative technologies, new services, systems innovations.