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The Policy Content and Process in an SDG Context: Objectives, Instruments, Capabilities and Stages

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Agenda

- Formulating STI policy
- STI policy/instrument mixes
- Processes and structures for the implementation of STI policy
- STI policy monitoring and evaluation
- The research and development process in a corporation



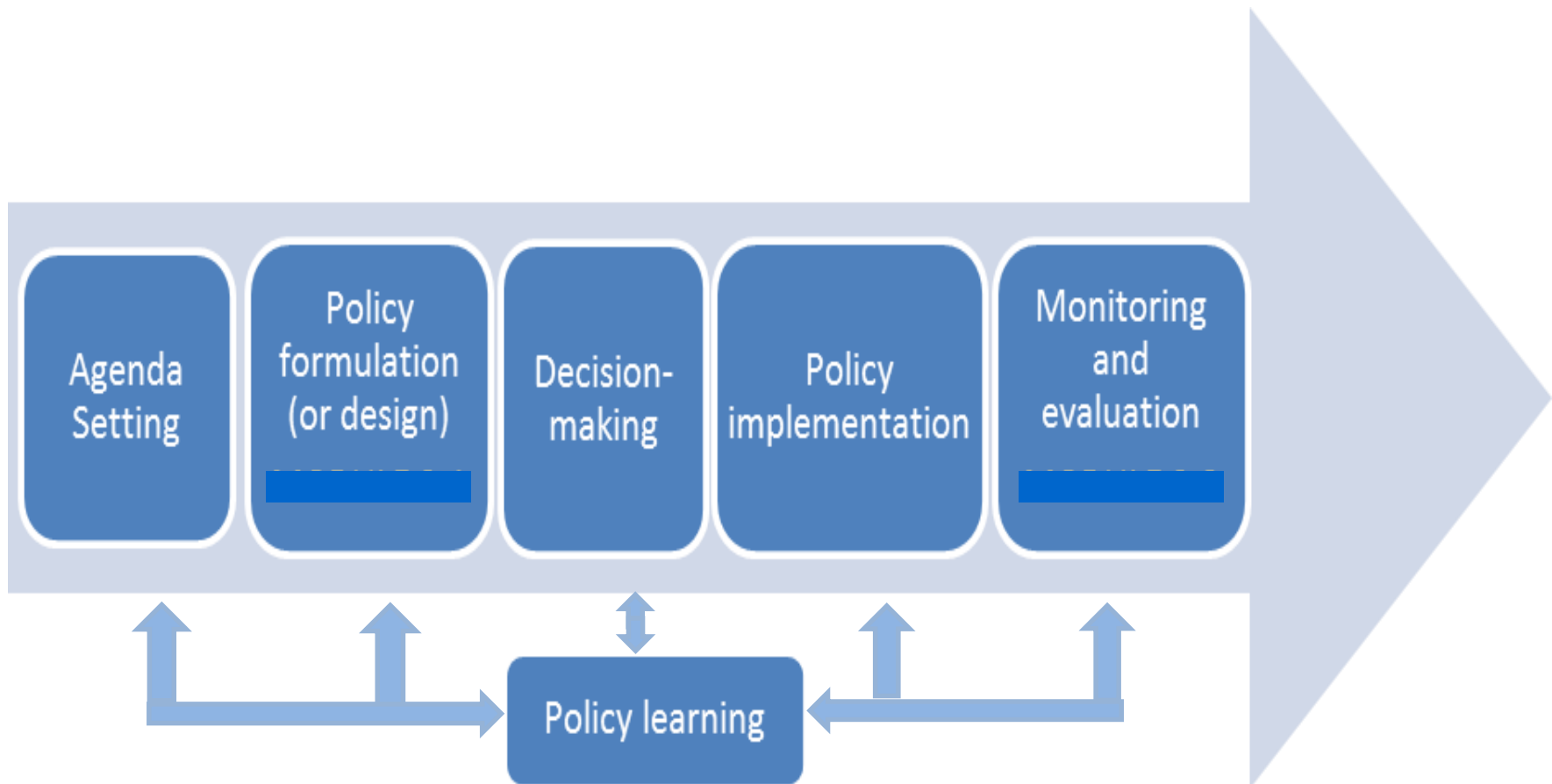
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The Policy Process



Formulating STI policy



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Setting STI policy objectives

- STI policy formulation is complex, multidisciplinary and multistakeholder process, often with conflicting agendas
- Policy levels:
 - The strategic level establishes the main national priorities, the speed at which it is hoped to attain objectives, how to act, with whom and for whom.
 - The political level defines the role of the institutions in charge of policy implementation and monitoring as well as the multisectoral and regional links, bringing together the macro- and micro.
 - The operational level is where projects and programmes are designed and implemented at sector, local or municipal level, in line with shorter time frames and more tangible and defined purposes.
- STI and development objectives are brought together either:
 - Through the relationship between national innovation systems and development with, for example, social inclusion as the ultimate goal
 - The other is framed by the theory on STI policy and considers social inclusion one of several STI policy objectives.
- The objectives of STI policy have to be highly contextual, aligned with broader national economic and social goals, respond to identified STI problems, on the basis of a detailed diagnosis, and include an analysis of technological trends worldwide.
- STI policy formulation starts with a definition of national objectives and their relative importance



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STI policy/instrument mixes

- An STI instrument is a policy measure that:
 - mobilizes resources through publicly (co-)financed research and innovation programmes or initiatives;
 - funds the generation or diffusion of information and knowledge in support of research and innovation activities;
 - promotes an institutional process designed to explicitly influence the undertaking of research and innovation by organisations.
- Types of instrument
 - Regulatory instruments are legal tools (laws, rules, directives, etc.) that regulate social and market interactions and are obligatory in nature
 - Economic and financial instruments provide specific pecuniary incentives (or disincentives) that support specific social and economic activities.
 - Soft instruments are voluntary and non-coercive. They make recommendations, set standards, promote codes of conduct, or offer voluntary or contractual agreements. d on less hierarchical forms of cooperation between the public and private sectors.
- Instrument mixes (i.e. the sum of the instruments used and the interaction between them) is key to STI policy formulation.
- Instruments are selected during STI policy formulation in a three-step process:
 - An initial selection is made of the most appropriate instruments from among a broad range of different possibilities;
 - The instruments are designed or adapted for the context in which they will be used; and
 - The instrument mix, i.e. the set of complementary policy instruments, is designed with a view to tackling the problems originally identified by the STI policy.



Figure 2.1 National development goals and STI policy

National economic and social development goals

- *National economic growth and prosperity*
- *Inclusive and peaceful society*
- *Enable environmental sustainability*



National science, technology and innovation goal

To make scientific and technological development, and innovation, pillars of sustainable economic and social progress



Specific national science, technology and innovation objectives

- *Grow national investment to attain 1 per cent of GDP;*
- *Build a high-level human capital base*
- *Develop regional STI capabilities;*
- *Link academia with industry;*
- *Strengthen the country's scientific and technological infrastructure*



Policy STI instruments

- *Technology and innovation funds*
- *Scholarships*
- *Financing of public research*
- *Intellectual property rights*
- *Creation of STI clusters, etc.*



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Table 1. STI policy mix matrix and approximation of its current use in El Salvador

		Deficiencies targeted ^(a)		
		Corrective or orthodox policies		Facilitating or systemic policies
Deployment mechanisms	Policy instruments	←-----→		
Direct financing measures	Research in public bodies	■		□
	Funds for university research	■ ■		□
	Training of human resources (scholarships and mobility)			■ ■
	Support for STI infrastructure			■ ■
	Funds for entrepreneurial R&D		■ ■	□
	Support for R&D in collaboration			■ ■
	Public sector procurement			□
Indirect financing measures	Tax incentives for R&D by volume	□		□
	Progressive tax incentives for R&D	□		□
Catalytic financial measures	Seed and venture capital		□	
	Networks of investment "angels"			□
	Guarantee funds for credit to MSMEs			■ ■
Other direct measures	Guarantee funds on net capital of MSMEs			□
	Competitive-technological intelligence services	■ ■		
	Technology brokerage services (transfer)			□
Indirect regulatory measures	Dissemination of an entrepreneurial and innovation culture			■ ■
	Promotion of networks			■ ■
	Intellectual property rights	■		
Mixed measures	Competition policies	■ ■		
	Metrology and standardization			■ ■
	Technological Development Centres			□
	Incubation of enterprises			□
	Creation of clusters			■ ■
	National STI foresight exercises			□

^a It should be noted that the orientation range of some instruments may vary in many of the cases. For example, tax incentives for R&D can be of general application (the same rules for all enterprises) or may target certain groups (reduced requirements or greater benefits for MSMEs).

■ Intensive use of the instrument
 ■ Little use of the instrument
 □ Not used



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Processes and structures for the implementation of STI policy



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STI governance

From the normative point of view, a desirable governance system is one in which:

- Public policies are the outcome of an agenda agreed by the agents;
- The State is accountable to society;
- Information and knowledge relating to public administration can be transparently accessed;
- Integration between the State and civil society generates effective alliances;
- The rule of law exists and the law is enforced;
- An appropriate regulatory framework exists for action by the State and the private sector

STI policy governance challenges common to developing countries

- The need for better horizontal coordination between agents
- Existence of overlapping roles between agents and unclear responsibilities
- Creation of committees or coordinating groups that do not function properly
- Inefficient use of limited resources, or reallocation of scarce resources to other programmes
- Difficulty in establishing priorities for STI policy
- Lack of continuity in STI policy

Key principles underpinning the institutional framework for STI governance

- ✓ Separate the functions of formulating and implementing STI policy
 - Clearly distinguish between roles and responsibilities, establishing institutional reporting lines corresponding to the hierarchy of subjects
 - Separate the functions of implementation and evaluation to avoid conflicts of interest



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Models and instruments for STI governance

- **Levels of STI governance**
 - Senior STI authorities tasked with formulating policy
 - STI councils and agencies in charge of policy implementation
 - Agents carrying out STI activities (research centres, firms, universities)
- **Main institutional arrangements for STI governance**
 - A dedicated STI ministry or agency
 - High-level STI Policy Council
 - High-level leadership (intervention by the Office of the President or Prime Minister)
 - Budget processes and structures
 - Agencies specialized in financing and implementation
 - National STI strategy
 - Strategic public-private partnerships
 - Consultative bodies to open spaces for participation by stakeholders
 - Legislative framework
 - Policy evaluation and review
 - Labour mobility of academics, officials and experts



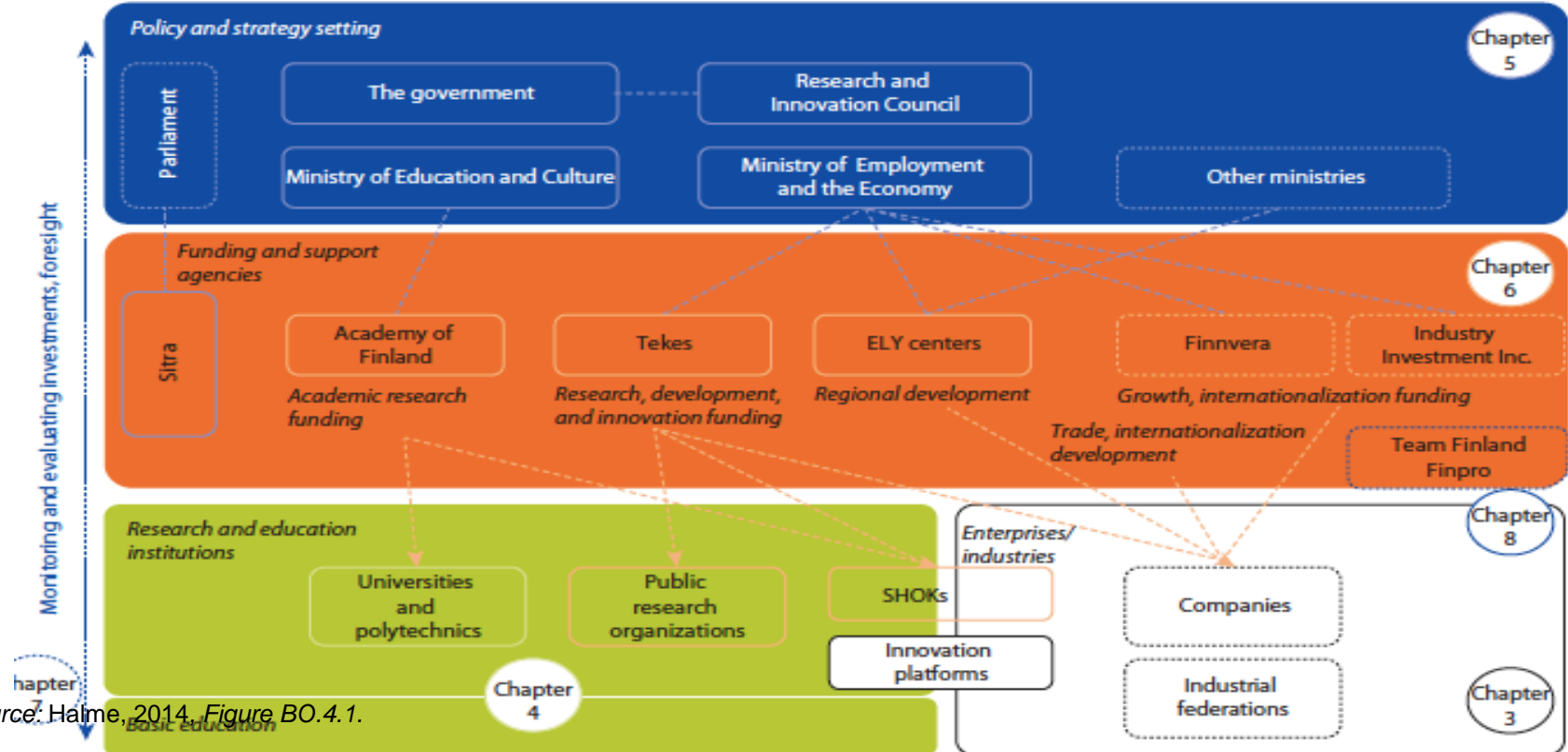
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Figure 2.4 Model of STI governance in Finland



Source: Halme, 2014, Figure BO.4.1.

Multilevel governance

- The need for coherent multilevel governance
 - Budget allocations (fiscal decentralization) and decision-making authority (political decentralization)
 - Attribution of authority and capacity to formulate and implement
 - Sharing of responsibilities
- Institutional arrangements to improve multilevel coordination
 - Consultation bodies, territorial representatives and agencies
 - Project co-financing and national-regional funds
 - National-regional contracts
- Challenges for regional-national links
 - Coupling regional STI strategies with the national strategy
 - Regional capacity-building
 - Dealing with the dilemma of how to promote excellence in more developed regions while furthering convergence between regions



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STI policy monitoring and evaluation



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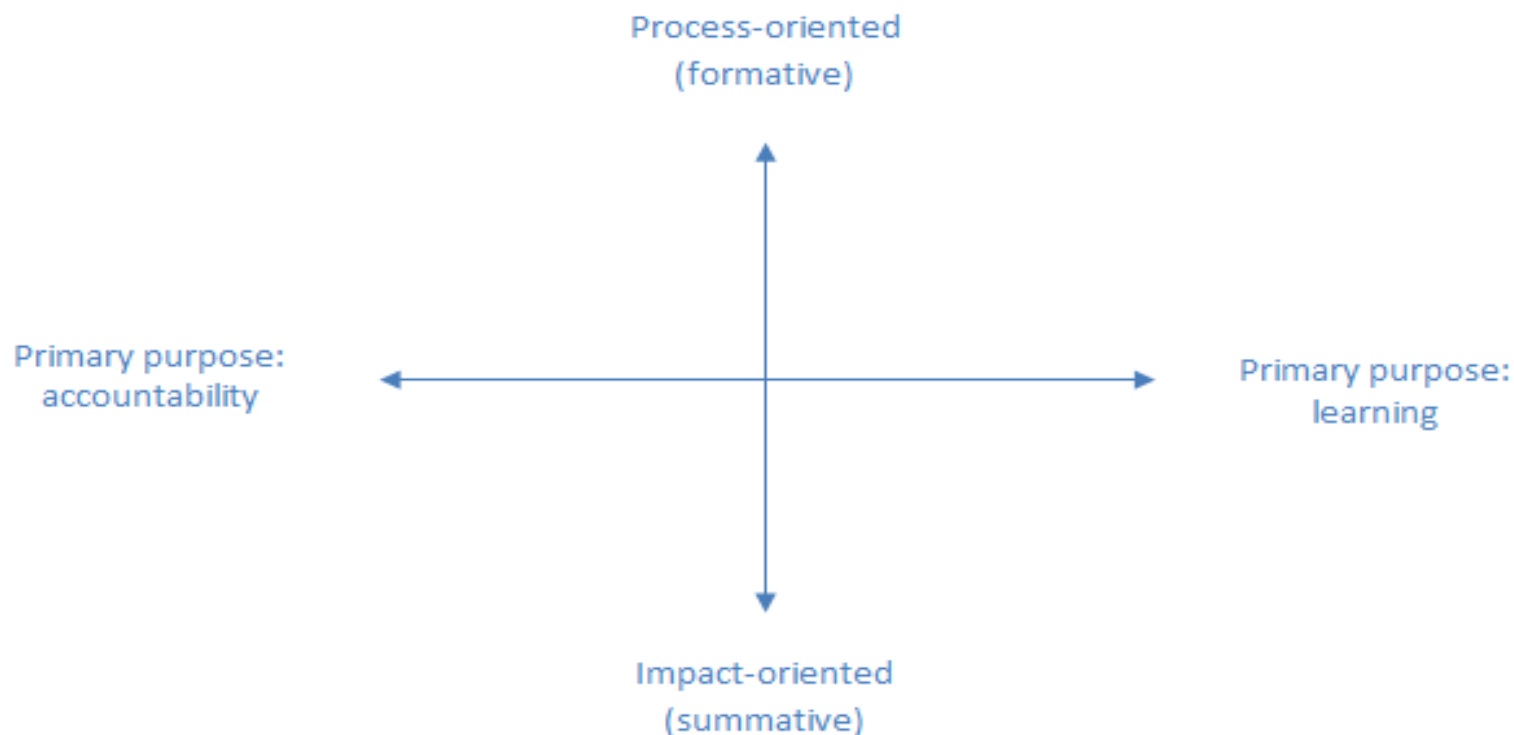
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The rationale for STI policy monitoring and evaluation

Figure 2.1 Purpose and orientation of STI policy monitoring and evaluation activities



Source: Adapted from OECD, 2014



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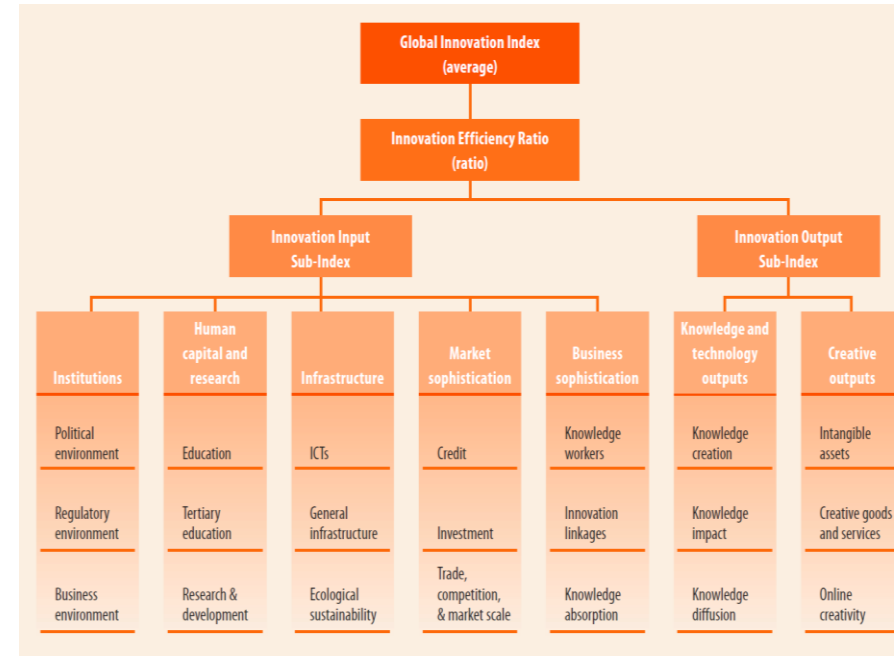
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Tools for informing, monitoring and evaluating STI policy

- Benchmarking
- R&D and innovation surveys
- Programme evaluations
- STI policy reviews
- Technological foresight
- Case studies
- Administrative data – Open data



The research and development process in a corporation



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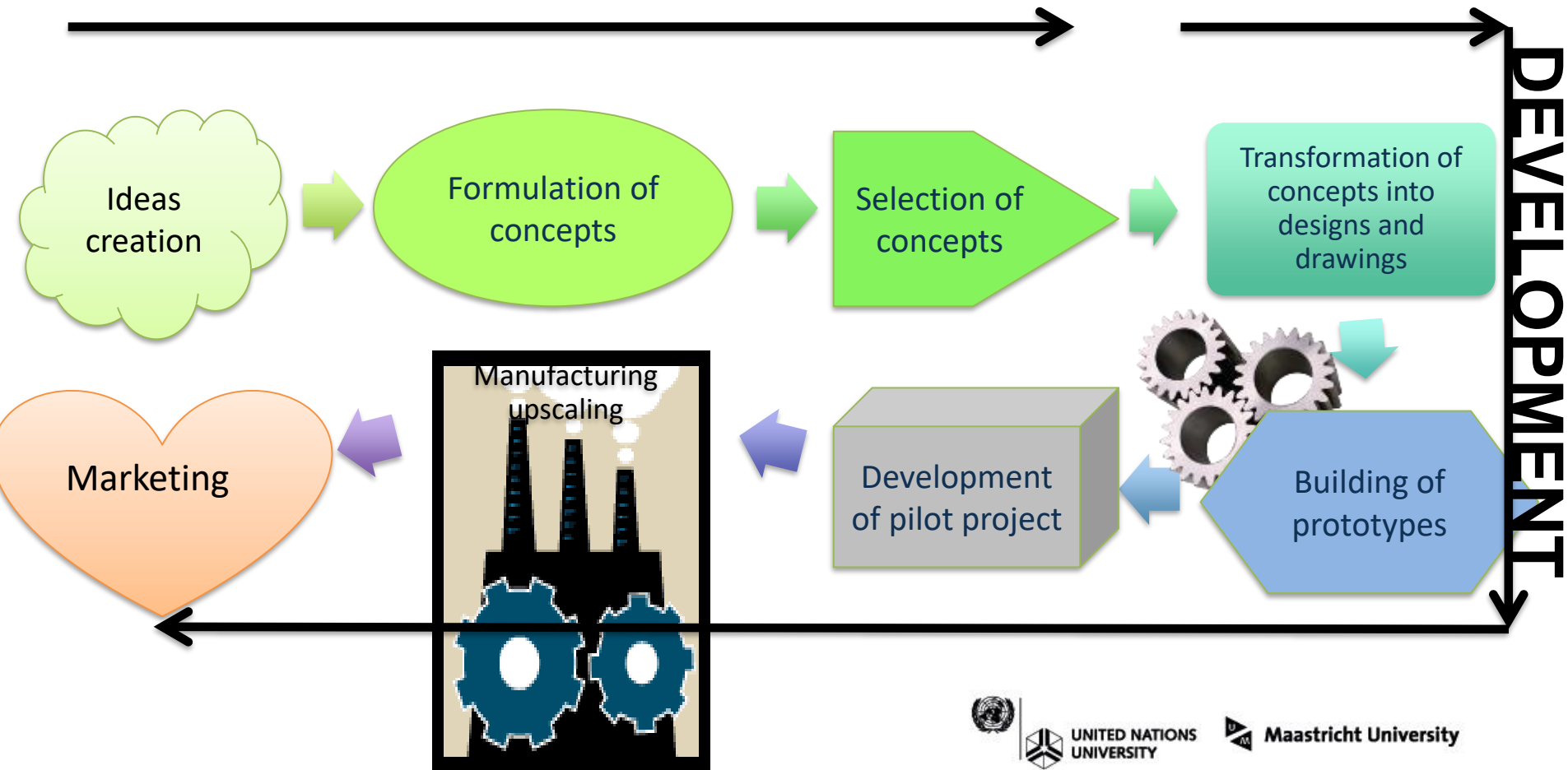
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Innovation Process

RESEARCH



Pulling threads together: Technology, innovation and strategy

What are the companies' core competencies, understood as harmonised streams of technical and organisational knowledge?

Does the company have:
The obsession of winning through innovation (strategic intent)?
Ways of protecting its innovation?
The necessary complementary manufacturing and distribution facilities?

Are the required leadership, organisational structure, personnel and incentives for innovation available?

At which stage of the technological life cycle is this company?
What opportunities does the corresponding stage open for innovation?

What is the potential for entry and for product substitution?
What is the extent of rivalry and power of suppliers and customers?

Which standards prevail in the industry?
Can they be modified?

What are the sources of knowledge in the industry?



Pulling threads together: Research and Development

R&D is a complex corporate process which inherently combines dimensions of order and chaos

Researchers need a tailor-made incentive system to excel

The organisational form of the R&D process needs to consider operational relatedness and strategic importance

The funding of R&D at the corporate level depends on the strategic importance of innovation and the level of R&D expenditure in the industry.
At the project level it depends on the rate of return of the project.

Collaborations with other companies are critical to achieve technical and market knowledge but they are extremely difficult to operationalise

Development is the most costly and yet less organised phase of innovation.
Building a portfolio of diverse types of projects is a challenge.

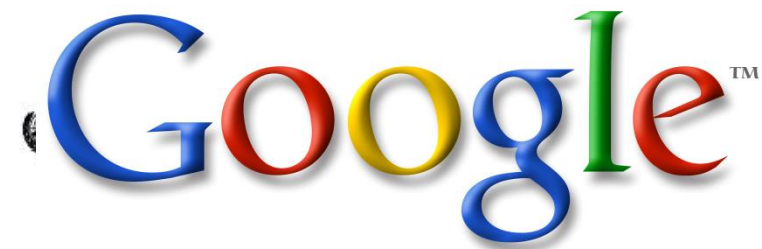
The team is the basic unit of development.
Its composition and leadership depends on the nature of the project at stake.

The R&D process does not end with launching a product.
Much of its success will depend on having the appropriate deployment strategy.
Often being first does not mean being best.





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