



Universität Münster  
Institut für Wirtschaftsinformatik

Lehrstuhl für Wirtschaftsinformatik  
und Interorganisationssysteme  
Prof. Dr. Stefan Klein

[www.wi-ios.de](http://www.wi-ios.de)  
[mail@wi-ios.de](mailto:mail@wi-ios.de)



## Emergence of networks

Dr. Hans-Dieter Zimmermann  
Lehrstuhl für Wirtschaftsinformatik und  
Interorganisationssysteme  
Institut für Wirtschaftsinformatik  
Universität Münster



## Objectives of this modul

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- Explain the emergence/formation of networks from different perspectives:
  - an inside-out perspective: extending the company's boundaries
  - a theoretical explanation using organisation theory
  - an explanation "life-cycle of the firm" explanation
  - an empirical explanation concentrating on different facilitating conditions

*"Firms form partners for the dance but, when the music stops, they can change them. In these circumstances competition is still at work even if it has changed its mode of operation."*

*Richardson (1972, 896)*

# Agenda

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1. Networking and the extended enterprise
2. Network emergence from a theory perspective
3. Networking and the firm's life cycle perspective
4. Facilitating conditions and formation processes

# Agenda

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1. Networking and the extended enterprise

2. Network emergence from a theory perspective

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# 1. Networking and the extended enterprise

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- Explain the emergence of networks from an inside-out perspective.
- Value creation activities move to the outside, crossing firm boundaries ...

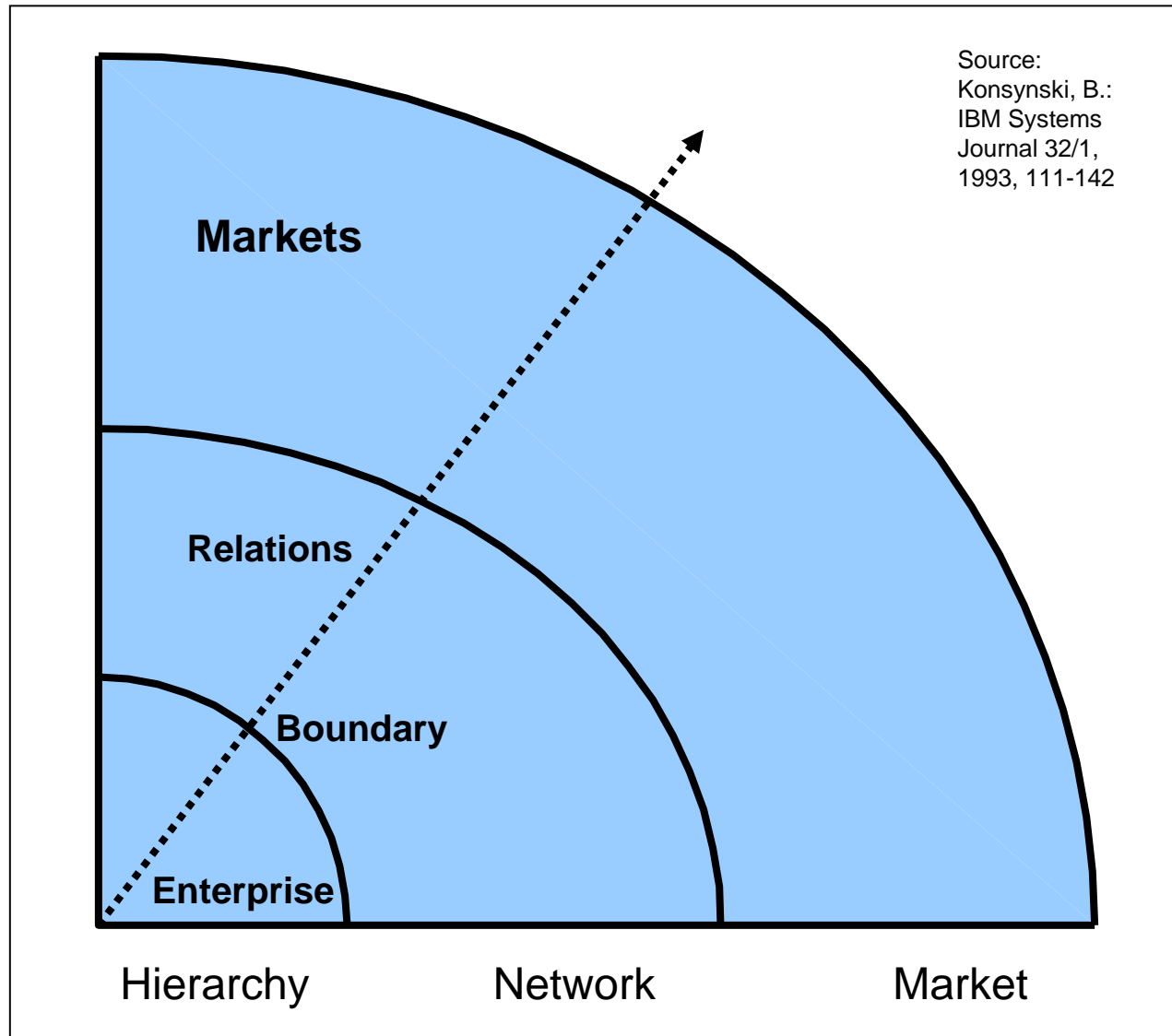
# The extended enterprise: blurring boundaries of the firm

1. Ext. enterprise

2. Org. theory

3. Firm life cycle

4. Conditions



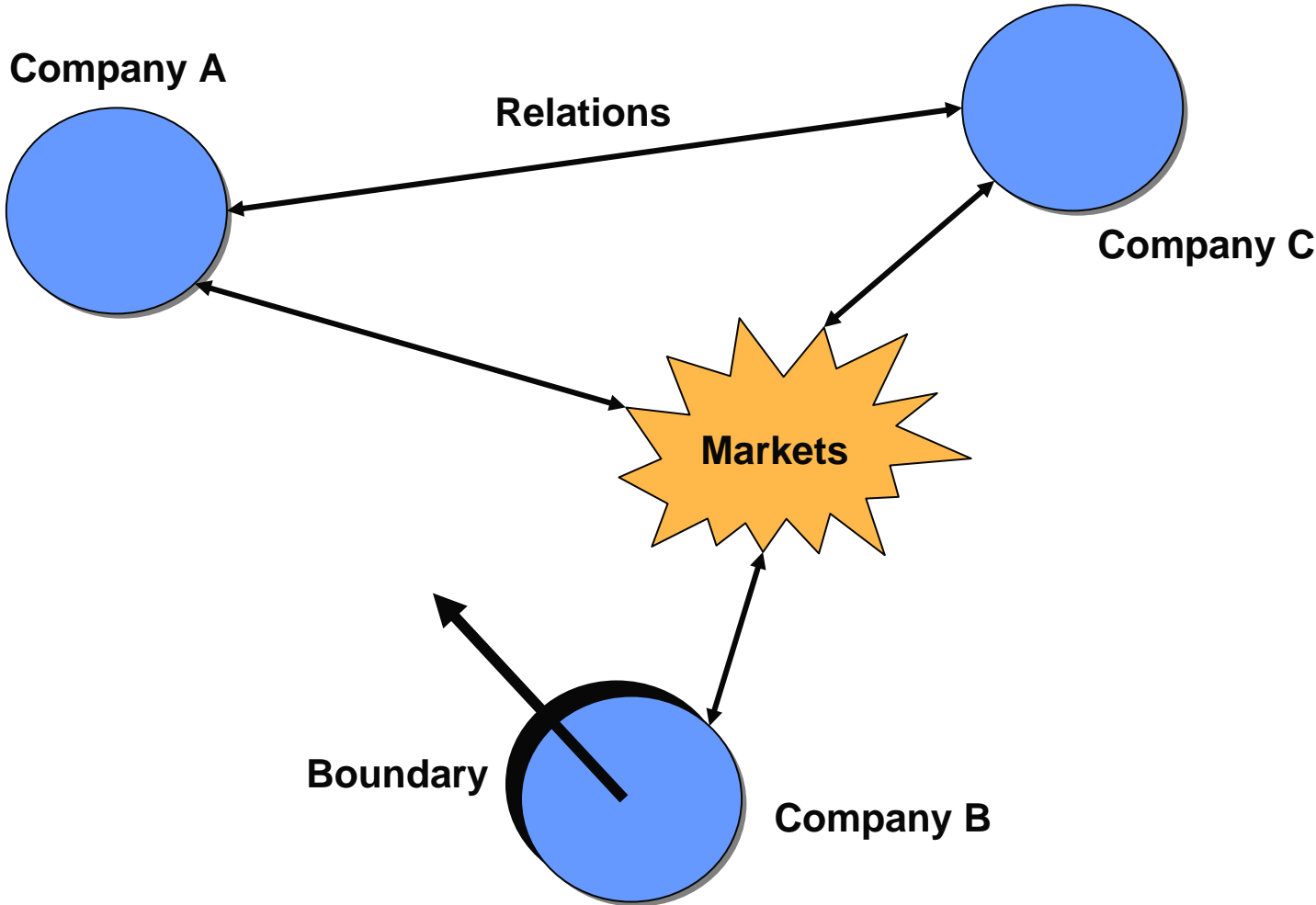
# A framework to deal with the emerging issue of networking and IOS from a firm's perspective

1. Ext. enterprise

2. Org. theory

3. Firm life cycle

4. Conditions



Source: Michael Bloch & Yves Pigneur (1995)  
on [http://inforge.unil.ch/yp/Pub/PAPER\\_EE/PAPER\\_EE.HTM](http://inforge.unil.ch/yp/Pub/PAPER_EE/PAPER_EE.HTM)

# The framework splits boundary-crossing activities in three groups

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1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

## 1. Boundaries:

- the activities taking place at the boundary of the firm and linking it to its environment, such as information collecting (intelligence) and the analysis of the environment (competitors, new products and technologies, etc.)

## 2. Relations:

- the (IT-enabled) relations between a company, its suppliers, customers, partners, the government and even its competitors.

## 3. Markets:

- infrastructures supporting the exchange of information and the coordination between sellers and buyers, sometimes managed by an operator, in order to facilitate commercial transactions and sometimes also adding subsidiary services (such as billing or legal services.)

## Types of boundaries

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- **Administrative** arrangements for hierarchical control,
- **Financial boundaries:** Firms seek to own all of their crucial assets - funds, plants, equipment, and intellectual property like patents and copyrights
- Firms are also communities bound together by shared values, social norms, and a common purpose. These ties all defined **social boundaries** of membership and reinforced financial and hierarchical control. (cf. Badaracco 1991)

# Knowledge boundaries and the model of the firm: from citadels to city states

1. Ext. enterprise

2. Org. theory

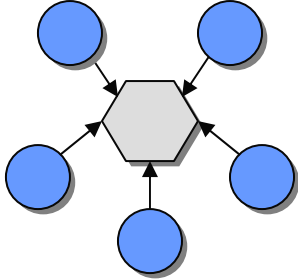
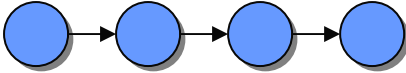
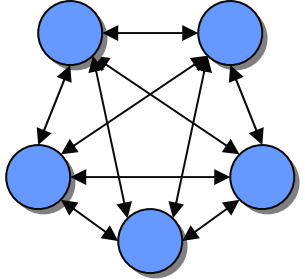
3. Firm life cycle

4. Conditions

- "The forces of knowledge have created a new economic environment in which it is dangerous for executives to think of their firms as **citadels** and manage them simply as independent economic entities." (11)
- "The core of a firm, like that of a **Renaissance city-state**, is a dense web of long-standing relationships. Ownership, hierarchical control, management power, and social bonds of membership, loyalty, and shared purpose reinforce each other. Most important, in an age of rapidly proliferating knowledge, the central domain is a social network that absorbs, creates, stores, transforms, buys, sells, and communicates knowledge. Its stronghold is the knowledge embedded in a dense web of social, economic, contractual, and administrative relationships." Badaracco 13-14

# Types of interdependencies between firms and their activities

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

	Pooled	Sequential	Reciprocal
Configuration			
Description	Shared infrastructures e.g. shared sales departments, shared IT	Value Chain stages	Collaborative project management, produce customer specific product
Examples	CashGroup: shared teller machine infrastructure Star Alliance: shared IT	Sainsbury, DaimlerChrysler, etc.	Virtuelle Fabrik R&D development initiatives (Sony, IBM, Toshiba)
Co-ordination mechanisms	Standards & Rules	Standards & Rules Schedules & Plans	Standards & Rules Schedules & Plans Mutual Adjustments
Structurability	high	medium	low
Type of IOS	Pooled information Resource IOS, e-Markets	EDI, SCM Applications Workflow Systems	Groupware Project Management etc.

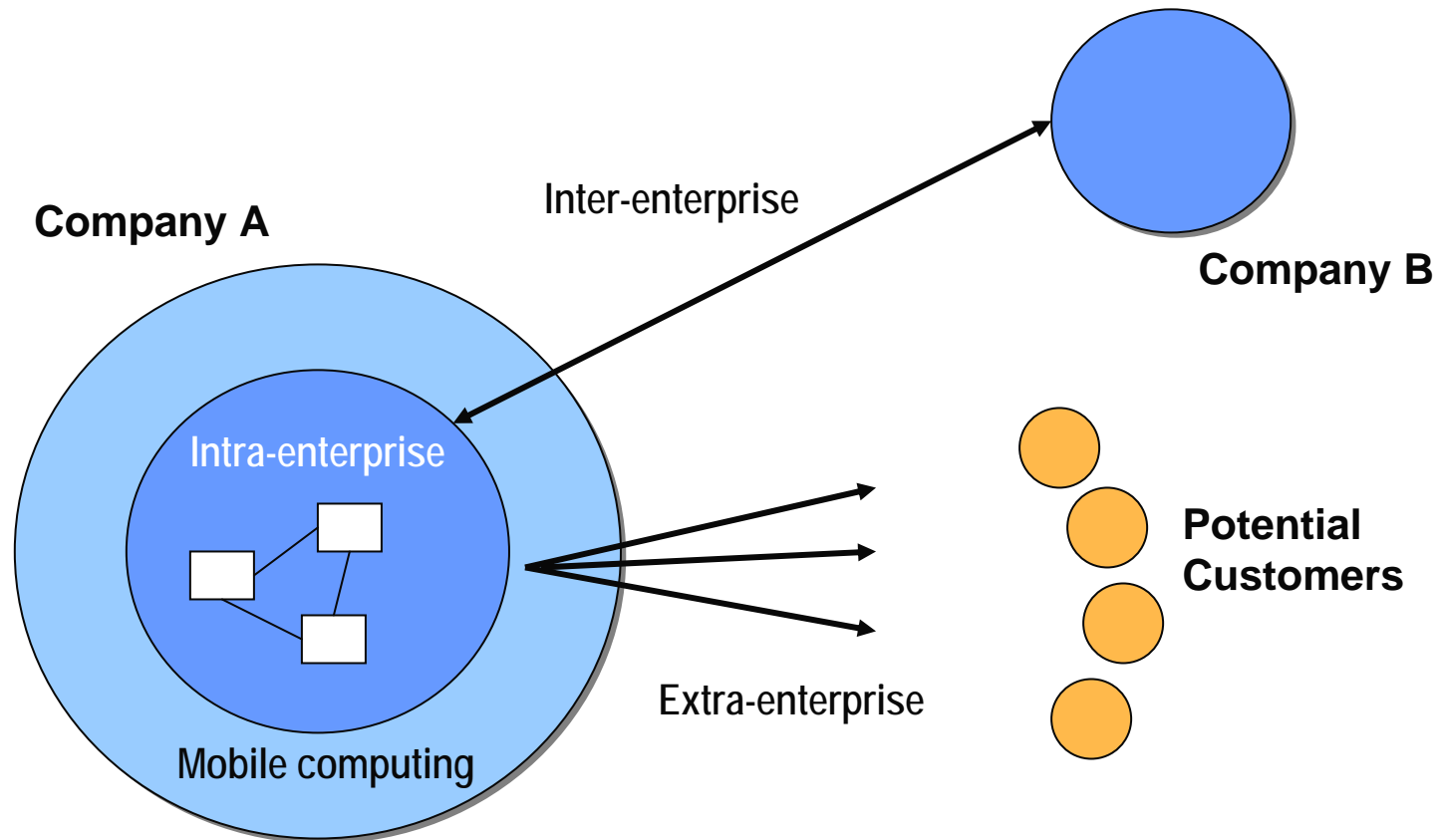
# The Lotus extended enterprise model (to classify IOS)

1. Ext. enterprise

2. Org. theory

3. Firm life cycle

4. Conditions



# IS support for the extended enterprise: crossing the firm's boundaries

1. Ext. enterprise

2. Org. theory

3. Firm life cycle

4. Conditions

- **(traditional) intra-enterprise systems:** accounting, production control, office applications, etc.
- **mobile computing systems:** linking remote users and including them in the same processes as fixed workers (telework, sales force support)
- **inter-enterprise applications:** supporting the communication, exchange and sharing of data between a company and its partners, customers or suppliers (EDI systems, Extranets, customer technical support).
  - They are characterised by a relatively small number of known partners, with intensive information exchange.
- **extra-enterprise applications:** supporting the communication between a company and its potential customers (Web site, Online Shop, electronic catalogues)
  - These are characterized by a large number of potential customers, which are not known upfront.

## Thus ...

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- With the extending enterprise, organisational networks arise
- Information systems cross the firm's boundaries: IOS
- There is a complex interaction between technology and the organisation
  - IOS driven linkages and networks
  - IOS usage in organisational linkages and networks
- The firm's boundaries get increasingly blurred:
  - telework/mobile workspaces: the firm itself gets virtual
    - regional concentration is no longer a constituent characteristic of a firm
  - partnerships with other firms: increasing amount of external dependencies in value creation activities
    - the extreme form is a firm, which only bundles/syndicates services with no (or little) further value creation (value webs)

# Agenda

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2. Network emergence from a theory perspective

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4. Facilitating conditions and formation processes

## Network emergence from a theory perspective

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1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

- Explain the emergence of networks using organisation theory.
- The historical development of organisation theory reflects the discussion of network emergence...

# The evolution of organisation theory: from engineering to a social view of the firm...

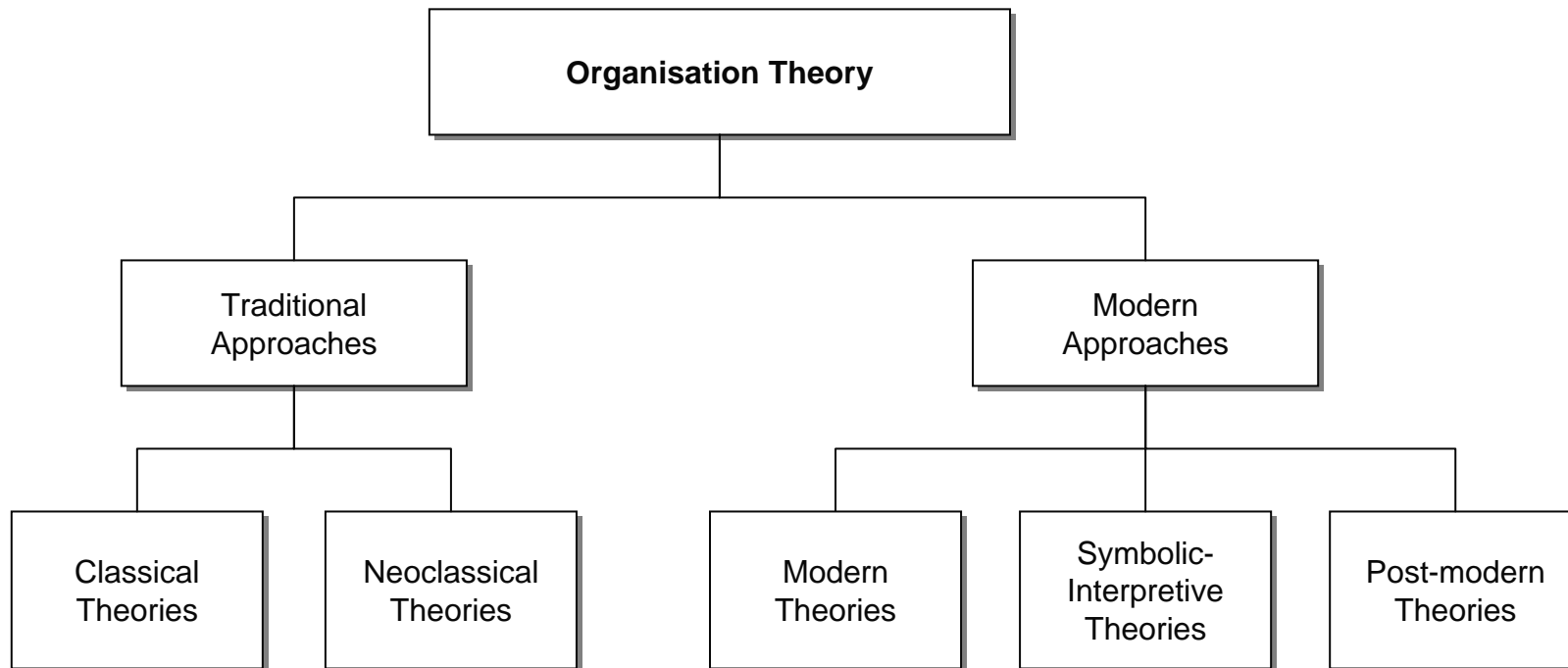
1. Ext. enterprise
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Perspective	Classical/Neoclassical	Modern	Symbolic-interpretive	Postmodern
Metaphor	<b>Machine</b>	<b>Organism</b>	<b>Culture</b>	<b>Collage</b>
Subject/ Focus	<ul style="list-style-type: none"> <li>• the effects of organisation on society</li> <li>• management of the organisation</li> </ul>	<ul style="list-style-type: none"> <li>• the organisation through "objective" measures</li> </ul>	<ul style="list-style-type: none"> <li>• the organisation through "subjective" perceptions</li> </ul>	<ul style="list-style-type: none"> <li>• organisation theory and theorizing practices</li> </ul>
Image of the organisation as ...	a machine designed and constructed by management to achieve predefined goals	a living system that performs the functions necessary to survival esp. adaptation to a hostile world	a pattern of meanings created and maintained by human association through shared values, traditions, and customs	An organisation theory is a collage made from bits of knowledge and understanding brought together to form a new perspective that has reference to the past
Image of the manager as ...	an engineer who designs, builds and operates the organisational machine	an interdependent part of an adaptive system	an artifact who would like to be a symbol of the organisation	a theorist the theorist is an artist

acc. to Hatch, Mary Jo: Organization Theory. Oxford University Press, Oxford et.al., 1997, p.49 and 52.

# Organisation theory overview

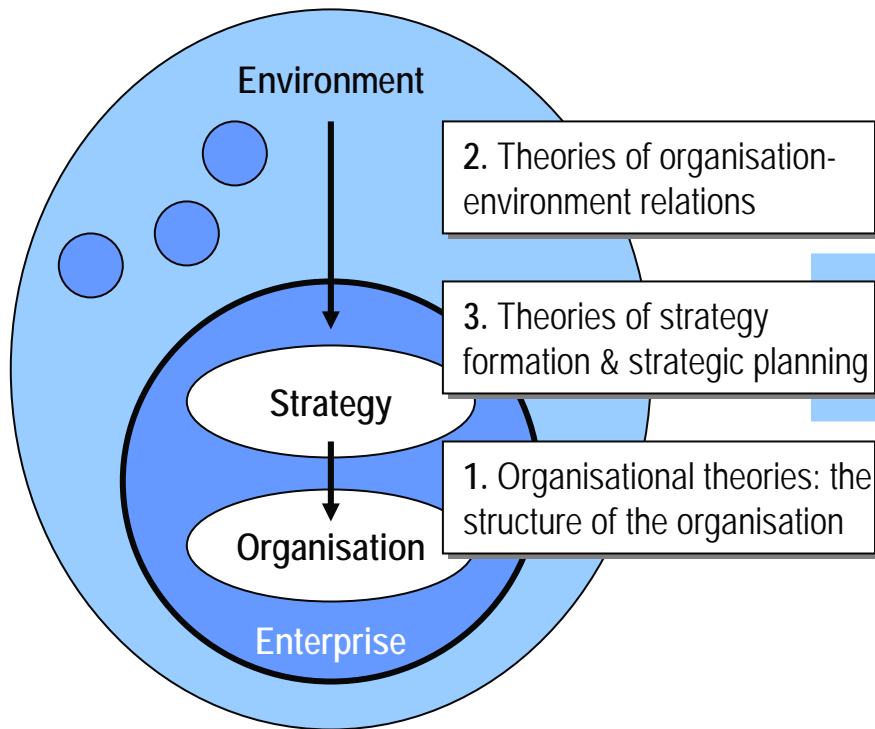
1. Ext. enterprise
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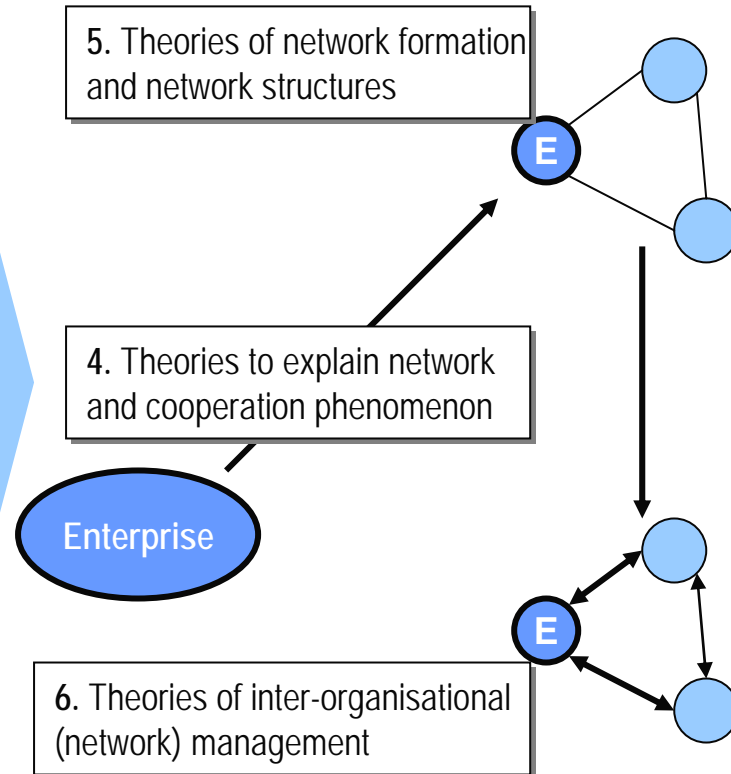
# The big picture: from traditional to network view

- 1. Ext. enterprise
- 2. Org. theory
- 3. Firm life cycle
- 4. Conditions

**A. Traditional view:** the enterprise as the dominating research object (within its environment)



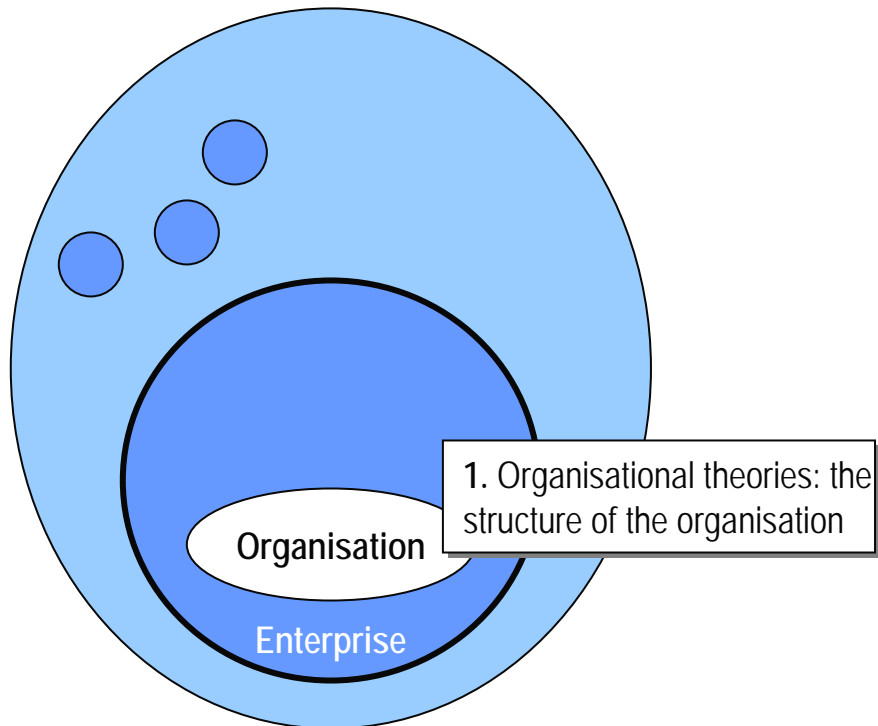
**B. Expanded (network) view:** the enterprise as part of (complex) interchange/interaction arrangements



# Step 1: Organisation theories

- |                    |
|--------------------|
| 1. Ext. enterprise |
| 2. Org. theory     |
| 3. Firm life cycle |
| 4. Conditions      |

A. Traditional view: the enterprise as the dominating research object (within its environment)



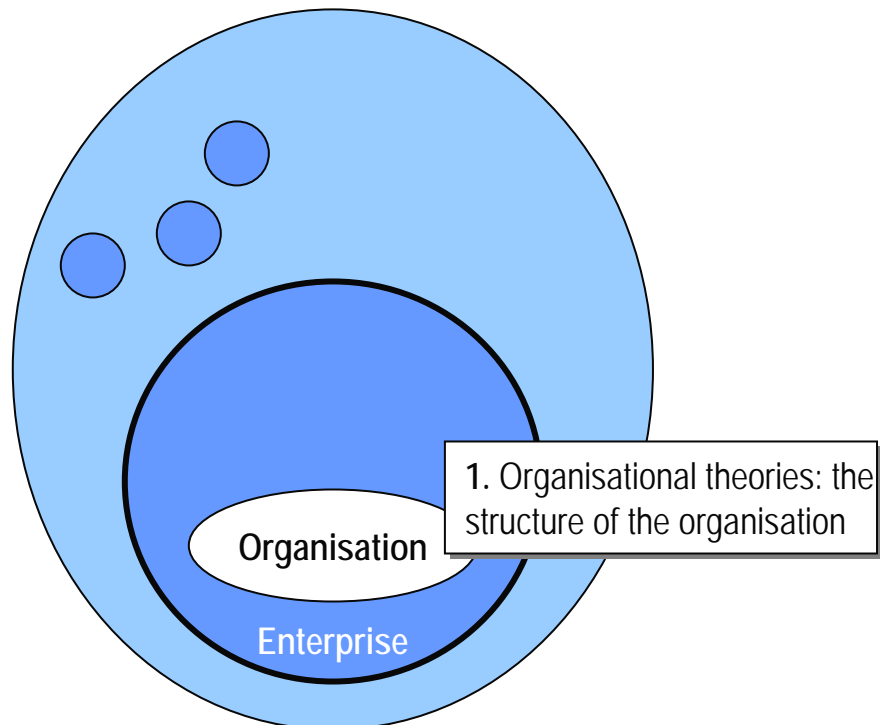
## Traditional organisation theory:

- theory of the firm: 1950s-60s
- bureaucracy model of the firm
- hierarchical organisation
- division of labor
- internal view of the organisation
- high degree of formalism, standardization, structure of authority,
- division of operative work and management

# Step 1: Organisation theories

- |                    |
|--------------------|
| 1. Ext. enterprise |
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| 4. Conditions      |

A. Traditional view: the enterprise as the dominating research object (within its environment)

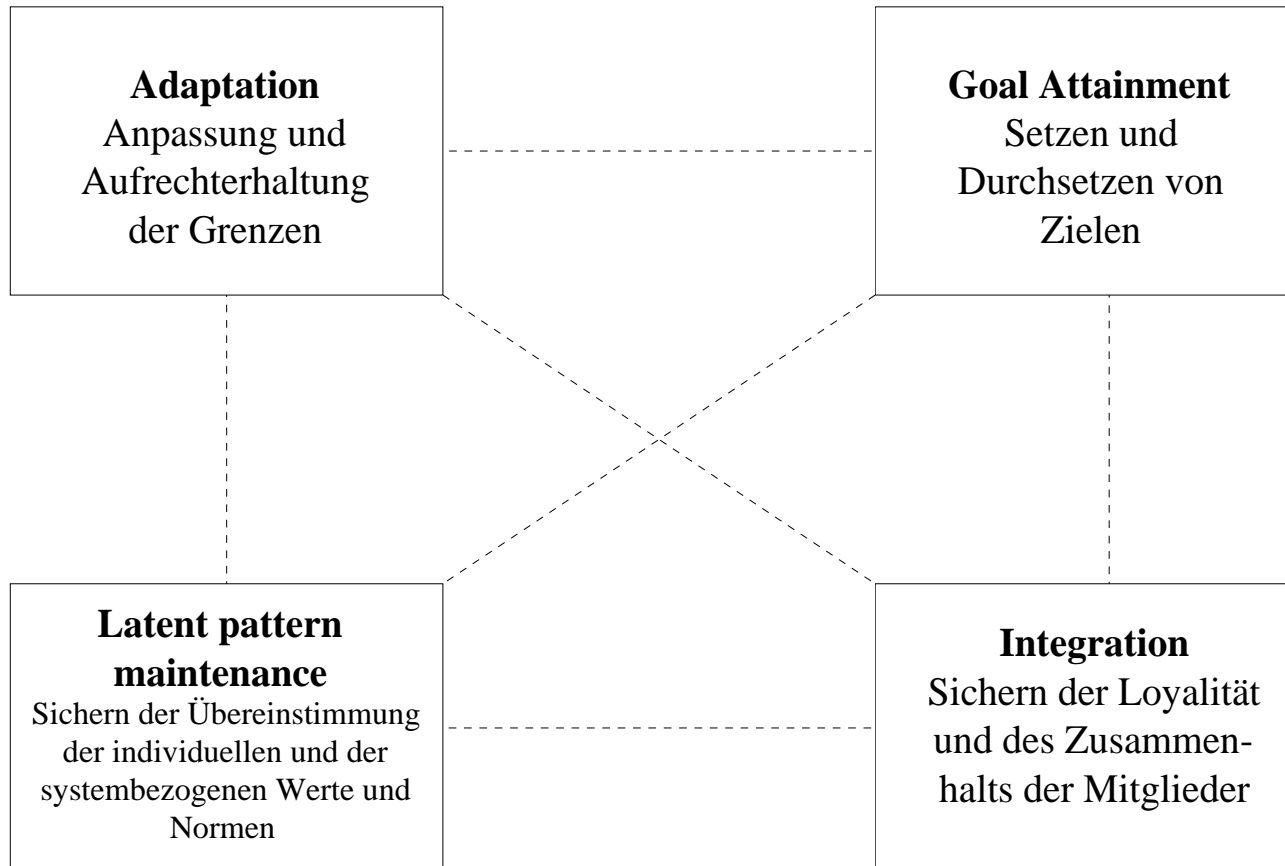


- **Management Theory**
  - division of labor, high degree of formalism, standardization, structure of authority, division of operative work and management
- **Systems Theory**
  - systems concepts include: system-environment boundary, input, output, process, state, hierarchy, goal-directness, and information
  - interaction with environment; can acquire new properties through emergence, resulting in a continual evolution
- **Theory of social (action) systems**
  - explanation of formation (evolution of systems as well as the (social) interaction within systems
  - AGIL schema: Adaptation, goal attainment, integration, and latent pattern maintenance
- **Conflict Theory**
  - conflicts are inherent part of organisations, built into organisational structures, roles etc.
  - conflict management for constructive conflict resolution
- **Operation Management**
  - identification, definition and measurement of key performance indicators for business processes (e.g. balanced scorecard)

## Example AGIL (Parsons)

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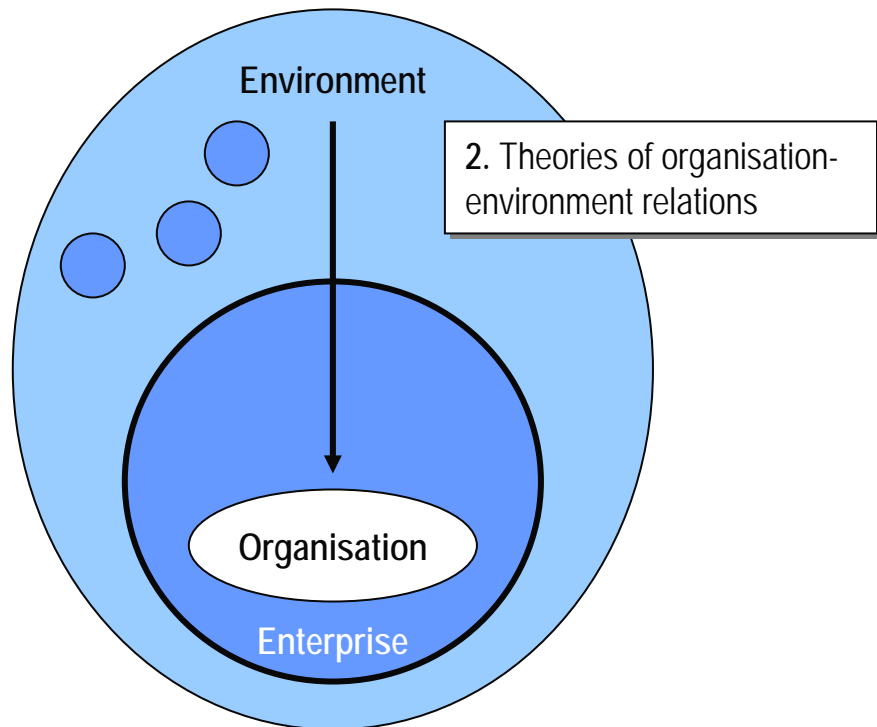
### Functions of social systems



## Step 2: Organisational-environmental relations

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

A. Traditional view: the enterprise as the dominating research object (within its environment)

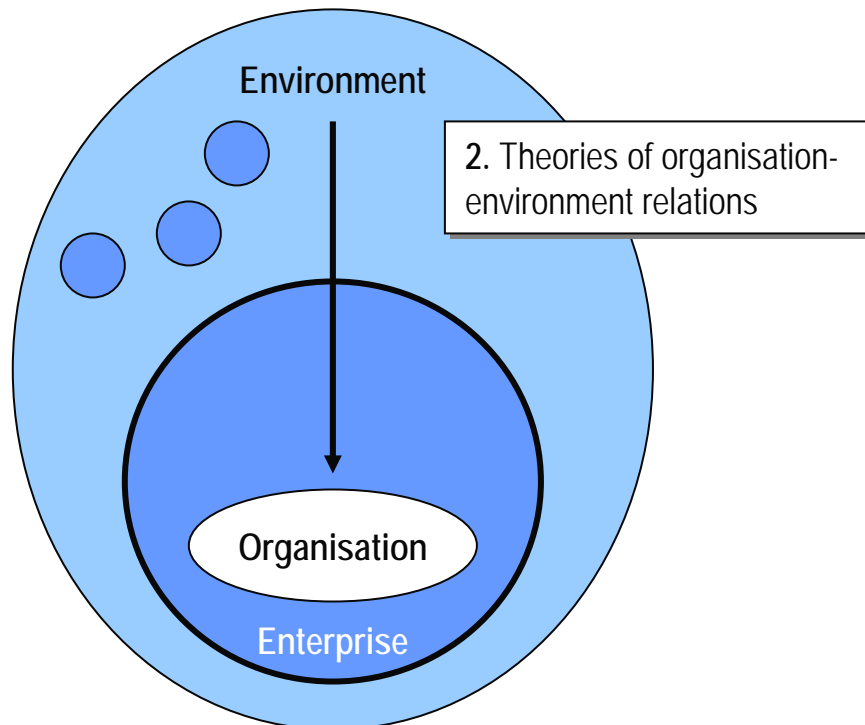


- **The organisation as a part of its environment:**
  - organisation has to achieve a fit with its environment (adaptation)
  - external dependencies exist
  - external institutions affect the organisation
  - different stakeholders have to be satisfied/taken into account by the organisation

## Step 2: Organisational-environmental relations

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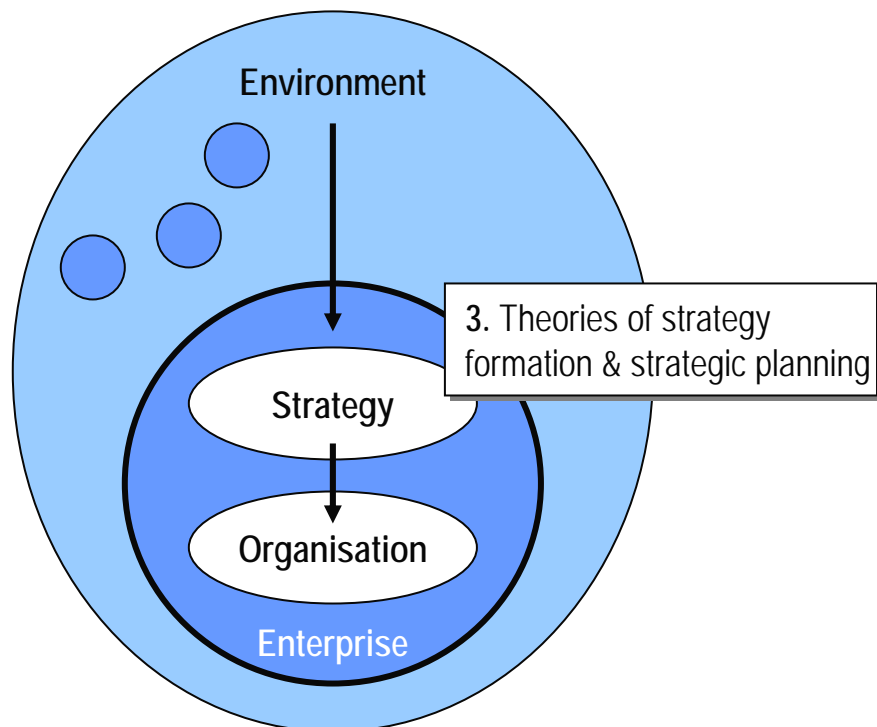


- **Contingency Theory**
  - “fit” of organisational structure and internal and external contingencies (“alignment”)
- **Resource Dependence Theory**
  - organisations are controlled by their environment (external actors like customers, suppliers, etc.) to some extent
  - avoidance of external dependencies, make external actors dependent on the organisation
- **Population Ecology**
  - Environment select from a group of competitors those organisations which best serve its needs (Darwinism)
- **Institutional Theory**
  - organisations are shaped by cultural and social influences of their environment
- **Stakeholder Theory**
  - examine the external organisational environment
  - stakeholders are persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity

## Step 3: Strategy formation and strategic planning

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

A. Traditional view: the enterprise as the dominating research object (within its environment)



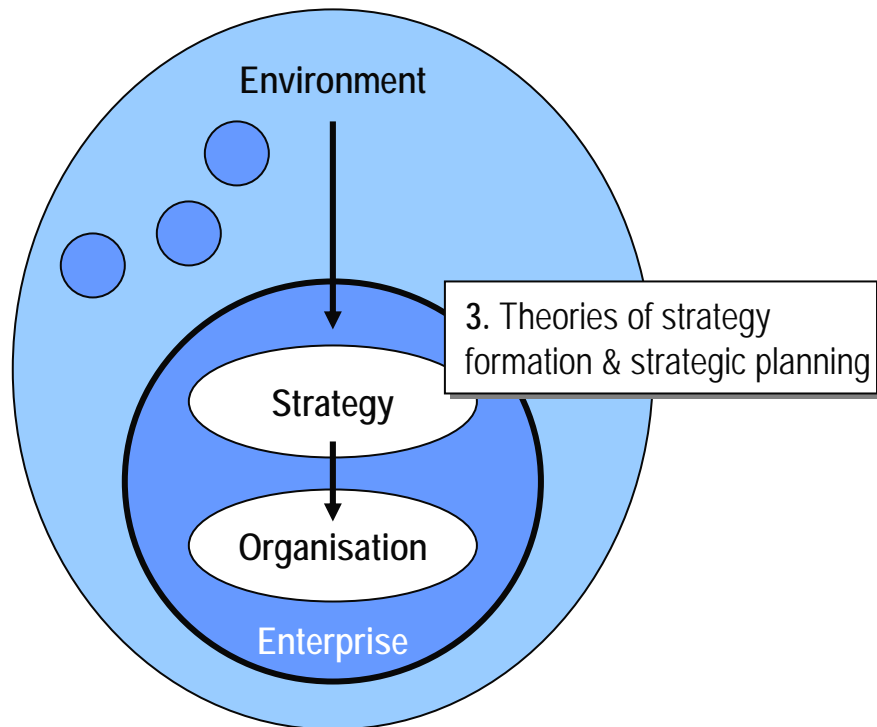
### ■ **Strategy discussion: systematic adaptation of the organisation to the environment**

- Positioning within the market, reaction to external pressures and threats is important.
- Aiming at a superior resource position in order to be able to offer superior products and services.
- Achieve sustainable competitive advantages to outperform competitors.

## Step 3: Strategy formation and strategic planning

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A. Traditional view: the enterprise as the dominating research object (within its environment)



### Market-based Approach

- outside-in perspective
- durable economic success is predetermined by the external market situation of the enterprise and can be influenced by a strategic positioning within the market
- theory of entrepreneurial patterns: prospector, defender, analyzer, and reactor

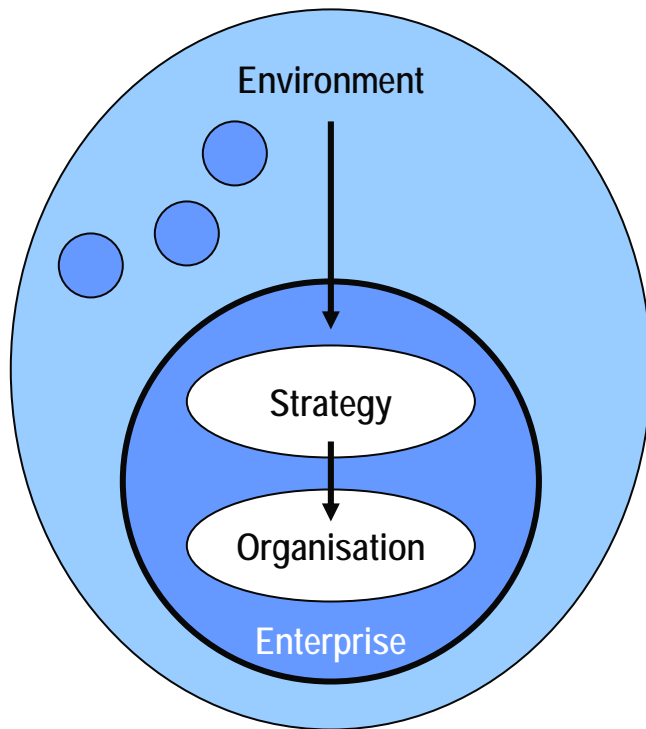
### Resource-based Approach

- inside-out perspective
- competitive advantage is based on unique and scarce resources and competencies, which can be transformed into products and services which are valuable for the market

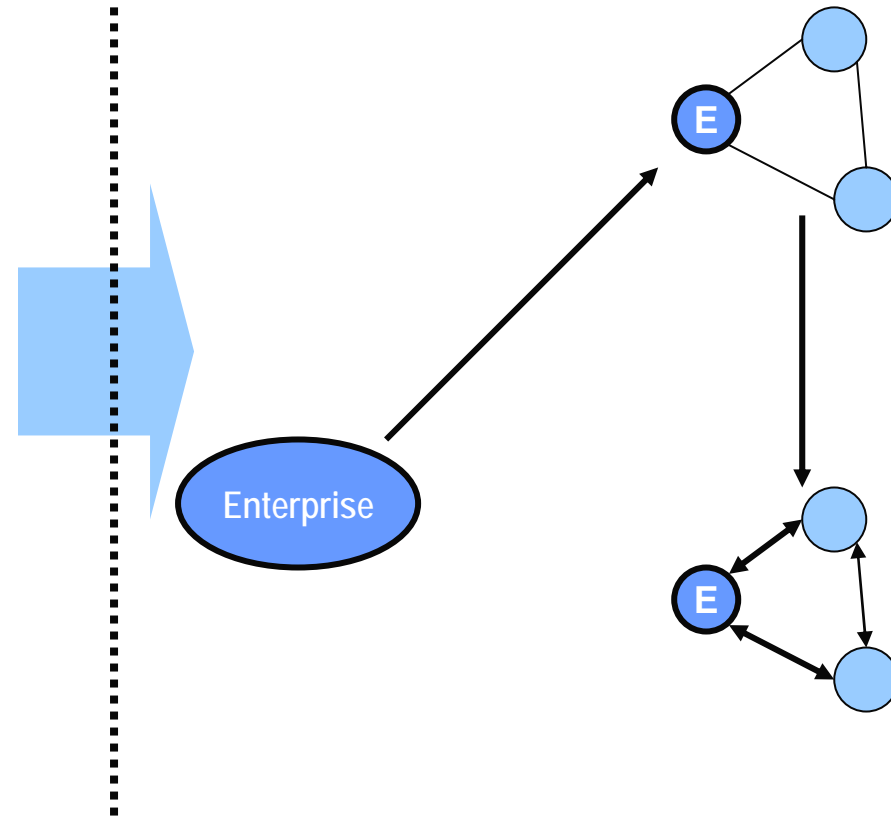
# From traditional to an expanded (network) view

- 1. Ext. enterprise
- 2. Org. theory
- 3. Firm life cycle
- 4. Conditions

**A. Traditional view:** the enterprise as the dominating research object (within its environment)



**B. Expanded (network) view:** the enterprise as part of (complex) interchange/interaction arrangements



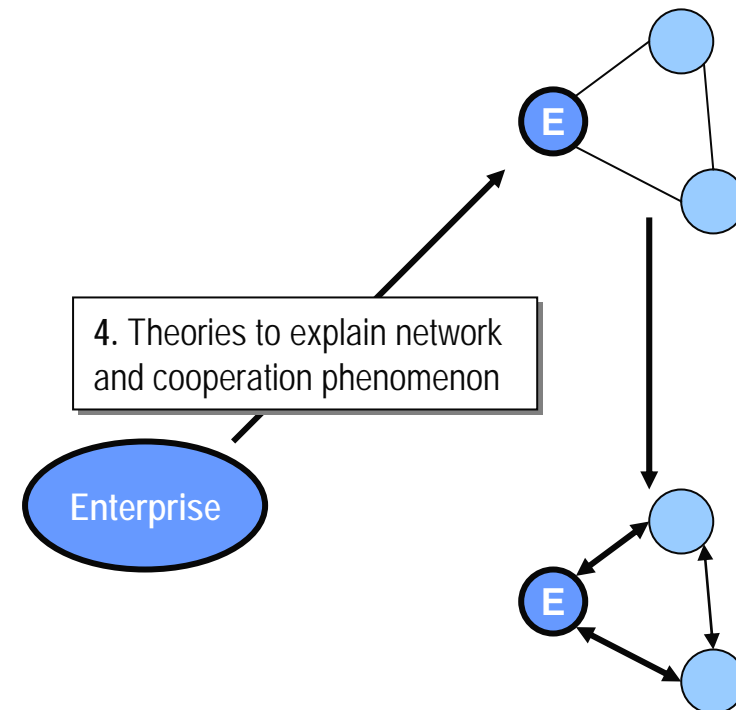
# Explanation of network phenomenon

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

## ■ New Institutional Economics

- explanation of real-world phenomena, analyzing efficiency of alternative organisational institutions (networks, markets, hierarchies)
- premises: revised individualist methodology, utility maximization, limited/bounded rationality, opportunistic behavior
- **Property Rights Theory:** Possible arrangements of property rights (legal rights to control goods)
- **Transaction Cost Economics:** analyzes the organisation of economic activities as a problem of governance of contractual relations
- **Agency Theory:** role of contracts in the exchange relationship between principal and agent under asymmetric distribution of information and uncertainty

B. Expanded (network) view: the enterprise as part of (complex) interchange/interaction arrangements



# Explanation of network phenomenon

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- **New Institutional Economics**

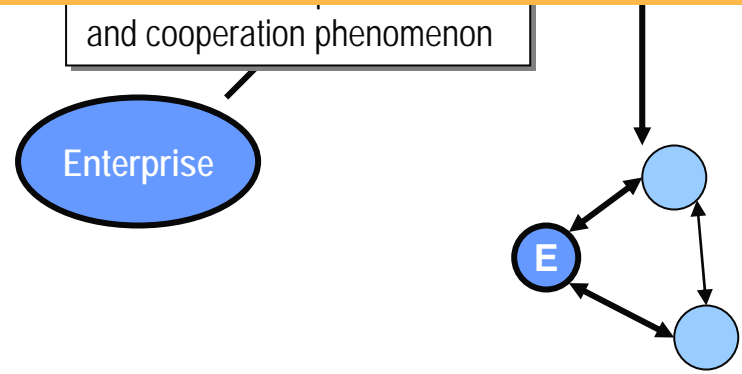
*"Transaction costs arise because of contractual hazards between opportunistic actors under uncertainty, bounded rationality, small numbers, information impactedness and asset specificity. Contractual hazards can be met by safeguards or trust, and the most cost-effective governance structure will survive under competitive condition."*

- explanat analyzing organis hierarchi
- premises utility ma rationalit

- Property arranger control goods)

- **Transaction Cost Economics:** analyzes the organisation of economic activities as a problem of governance of contractual relations
- **Agency Theory:** role of contracts in the exchange relationship between principal and agent under asymmetric distribution of information and uncertainty

**Reve (1990), 134**

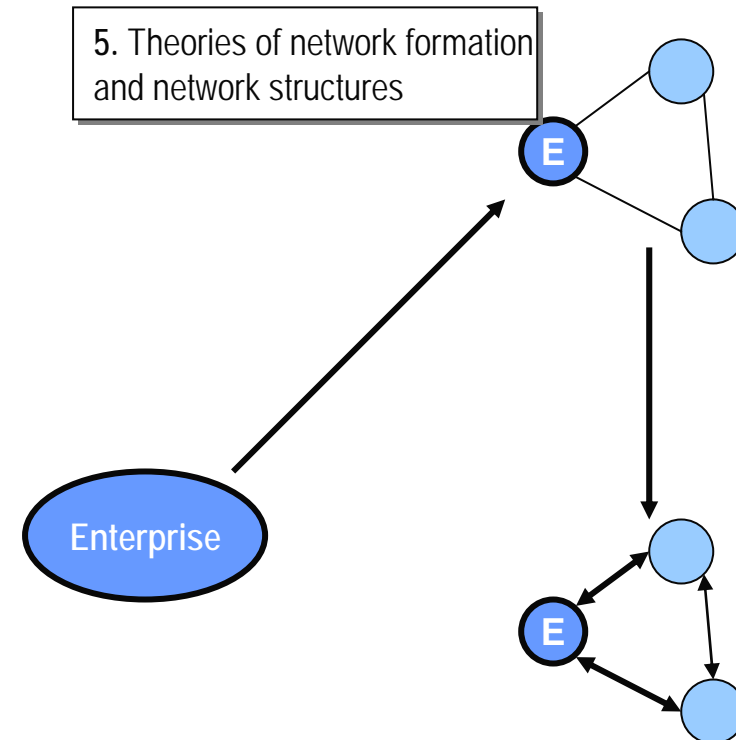


# Network formation and network structures

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

- **Business Network (Re)Design**
  - use of information technology to re-engineer business processes and business relationships, enables new forms of organisation
  - Roles and linkages model: abstraction model to characterize the business network in terms of roles (actors) and linkages (relationships)
- **Inter-organisational Learning**
  - Structuring learning relations in networks for knowledge creation and accessing new markets and technologies
  - innovations demand a combination of scientific skills and intellectual capacity that exceed the capabilities of an individual corporation
  - knowledge sharing depends on the establishment of long term relationships in which exchange occurs within a learned, shared, and trusted code
  - preventing free riding, and reducing costs of searching and accessing crucial knowledge

B. Expanded (network) view: the enterprise as part of (complex) interchange/interaction arrangements

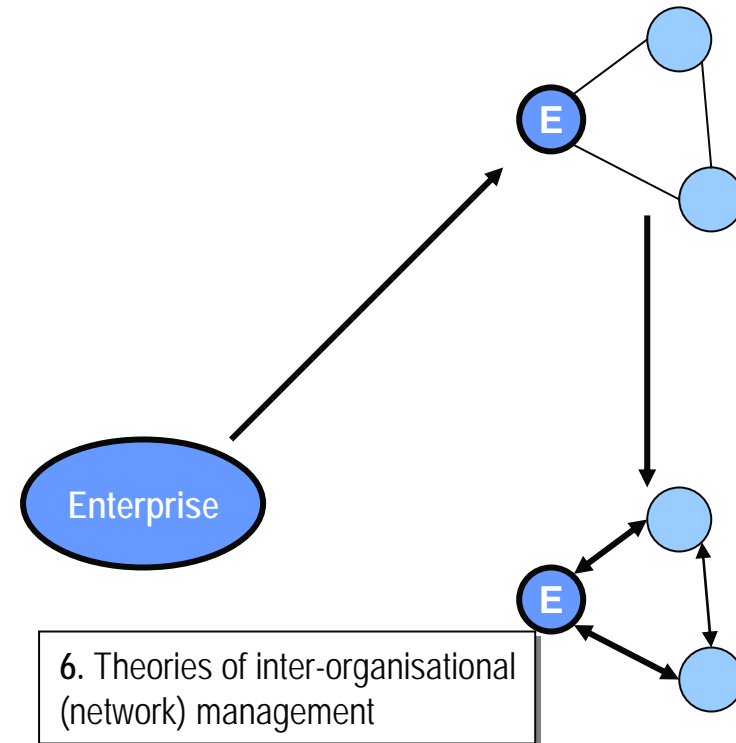


# Inter-organisational network management

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

- **Coordination Theory**
  - coordination of activities of complex systems, including both people and computers
  - to each type of dependency a certain type of basic coordination process refers, providing a possible solution
  - Coordination of distributed work (inter-organisational systems)
- **Theory of inter-organisational relationships**
  - management of organisation's external relationships to other enterprises
  - explanation of relationships within and among networks, their shifting boundaries and the governance of network organisations

B. Expanded (network) view: the enterprise as part of (complex) interchange/interaction arrangements



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### 3. Networking and the firm's life cycle perspective

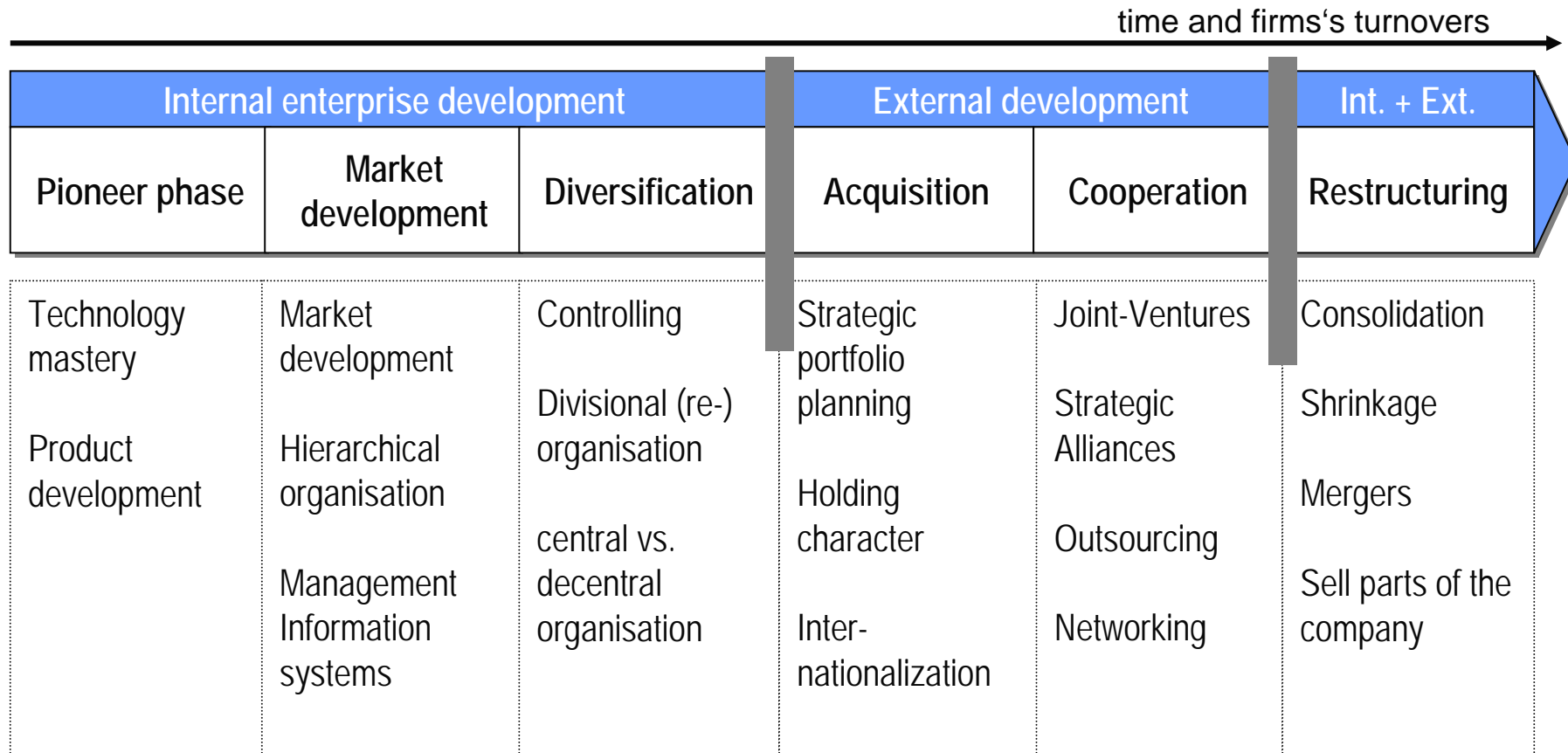
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1. Ext. enterprise
2. Org. theory
<b>3. Firm life cycle</b>
4. Conditions

- Explain the emergence of networks from a firm's development perspective.
- Networking/cooperating becomes promising in some stages of a firm's life-cycle...

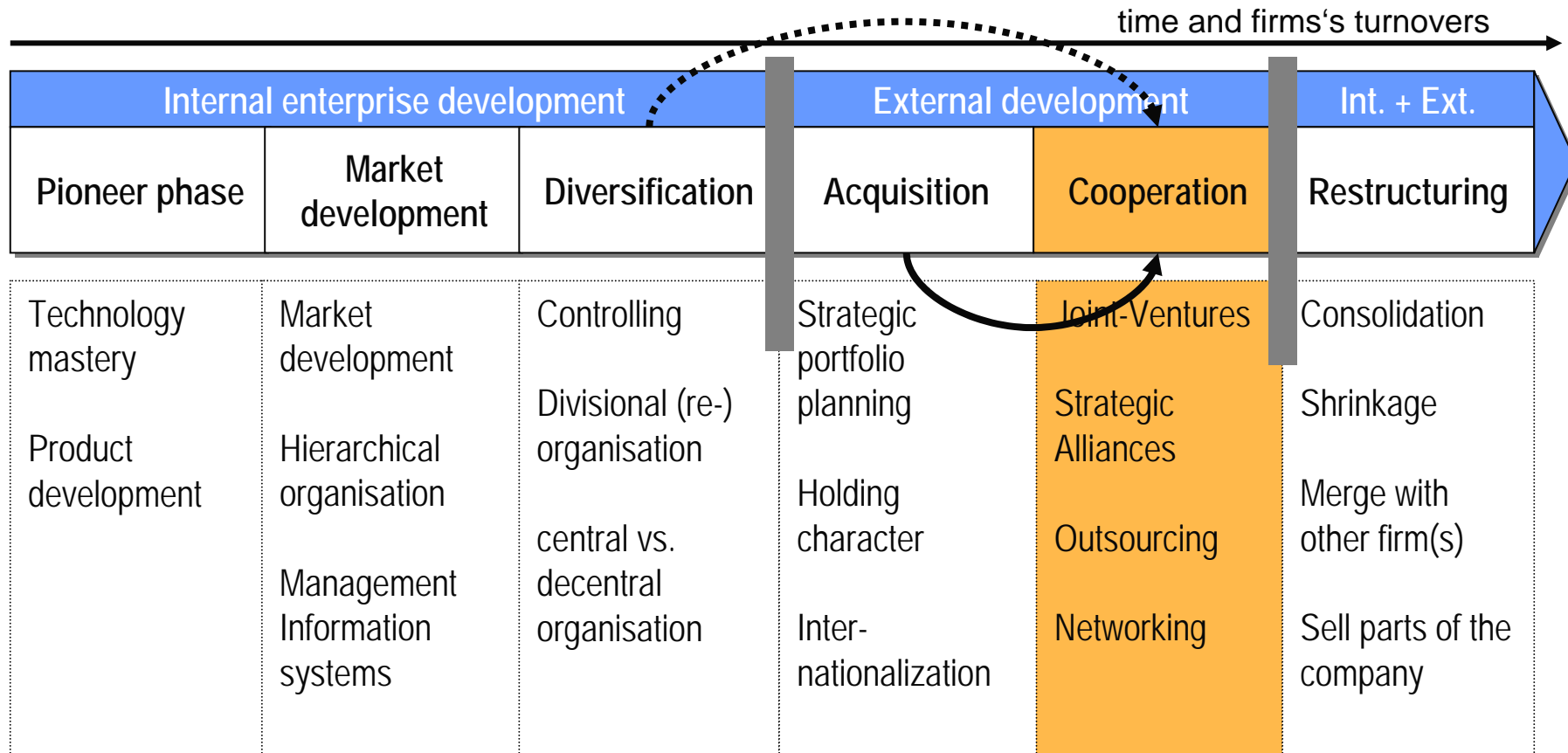
# Stages of enterprise development by Bleicher

- |                           |
|---------------------------|
| 1. Ext. enterprise        |
| 2. Org. theory            |
| <b>3. Firm life cycle</b> |
| 4. Conditions             |



# Stages of enterprise development by Bleicher

- |                           |
|---------------------------|
| 1. Ext. enterprise        |
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# Reasons for the transition to a process of „external enterprise development“

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

- „The external enterprise development overcomes the limitations of growth on the firm’s own account by leveraging other firm’s resources and capabilities.“ (Bleicher 1996, p. 461 [translated])
- The rationale is to collaboratively pool resources for achieving a higher degree of (customer) benefits:
  - Possibility 1: **Acquisitions**: enhance the firm’s portfolio of products and business units not by developing them, but by buying them on the market (integration).
    - example: Microsoft and its various acquisitions of innovative software companies to accomplish their office software portfolio
  - Possibility 2: **Cooperation**: looser linkages with other partners to leverage resources, design new products or enter markets.
    - example: Star Alliance: collaborative internationalization, new customer services, new markets for the particular airlines.

# The transition from acquisition to cooperation strategies

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

- Crises in the acquisition phase lead to a search for new external opportunities in the shape of cooperation initiatives.
  - acquisitions are difficult to integrate: e.g. cultural differences (DaimlerChrysler, UBS (merger of SBV & SBG))
  - overestimation of synergetic potential of acquisitions
  - governing of a huge, international, diversified holding is problematic: complexity concerns
  - firm's management system not flexible enough to govern a wide range of different technology areas
- Partnering/cooperation to leverage external complementary resources without the necessity to integrate. The firm remains flexible.
  - risks: lack of management skills to really cooperate; mistrust in the relationship, external dependencies, etc.

## Outbound ... inbound manoeuvres

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"... alliances are harnessed to reduce the gap between the corporation's competence and the complexity of the environment, through:

- a. *An outbound manoeuvre: controlling the complexity of the environment...*
- b. *An inbound manoeuvre: augmenting the organisational capabilities. ..."* Ciborra 1992, 96

## Extending a firm's capabilities ... has a price

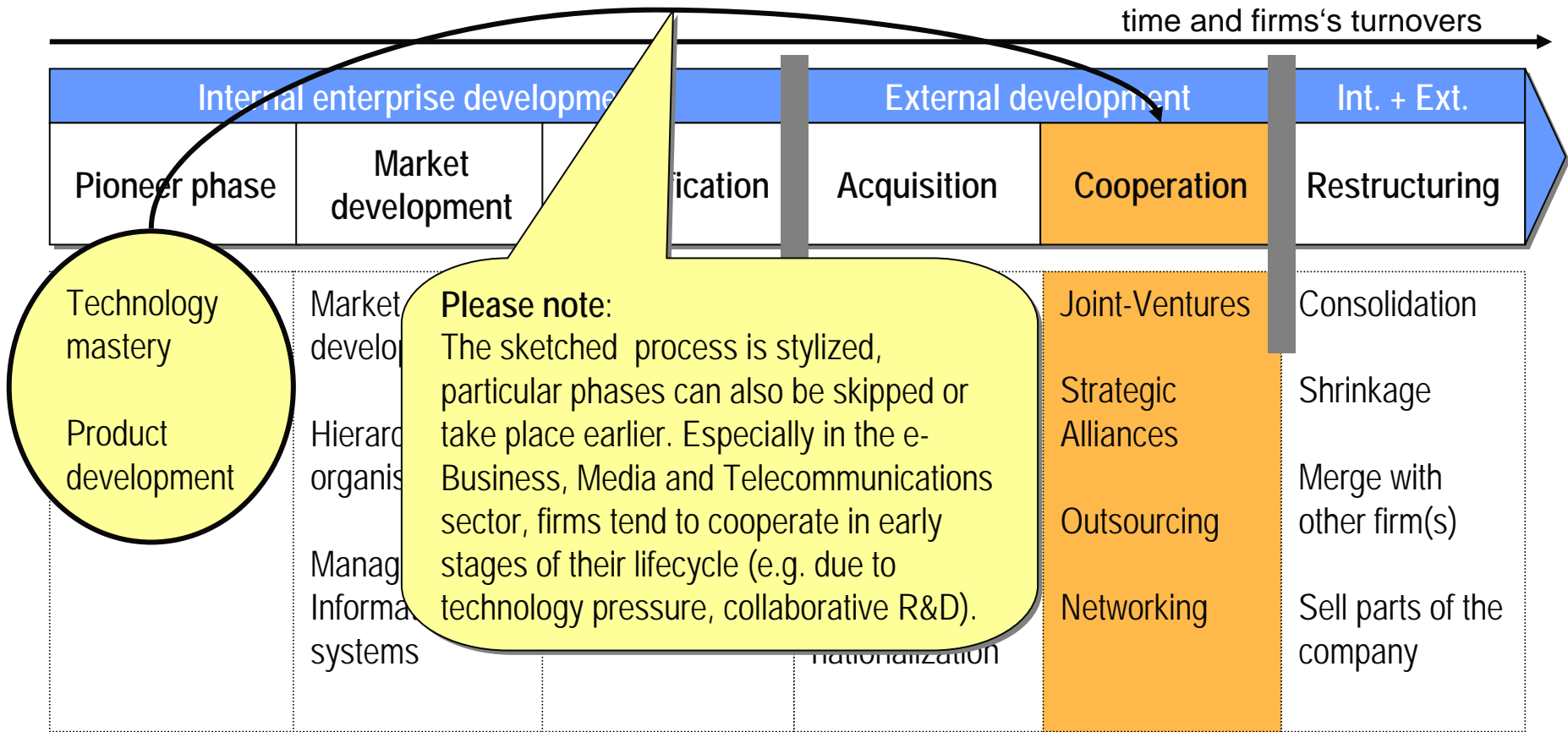
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- Starting point for many alliances is the insight that the companies capabilities can be extended (only) through inter-organisational arrangements.
- This justifies a situation which is no sufficiently controllable and often fragile/ precarious/ volatile.

„Auslöser für das Eingehen eines solchen Verbundes zwischenbetrieblicher Zusammenarbeit ist fast immer die Erkenntnis, dass auf diesem Weg strategische Möglichkeiten **jenseits der eigenen Möglichkeiten** erschlossen werden können. Dies rechtfertigt den Preis eines Eingehens eines **nicht immer ausreichend berechenbaren und beherrschbaren, labilen partnerschaftlichen Verhältnisses.**“ (Bleicher 1999, 546)

# Stages of enterprise development by Bleicher

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## Facilitating conditions and formation processes

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1. Ext. enterprise
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- Empirical explanation of the emergence networks (and networking as a popular strategy) from an outside perspective.
- Certain conditions facilitate network formations ...

## Facilitating conditions (Ebers 1997, p. 8)

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1. Ext. enterprise
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1. the institutional level of analysis:
  - political, legal, cultural, industry and/or regional conditions that have an impact on the formation of networks
2. the relational level of analysis:
  - particularities of various already existing links and interdependencies among organisations, that facilitate the formation of networks

1. Ext. enterprise
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## 1. Facilitating conditions at the institutional level

- The role of the **state** in industrial development, particularities of the financial, tax and corporate governance systems, cultural norms:
  - e.g. Asian regions like Singapore
- **Deregulation** in industries:
  - e.g. airline market, telecommunications
- Support by regionally embedded **institutions** like chambers of commerce, banks, universities, etc.
  - Institutions act as information brokers, bringing together interested parties. They also may provide resources.
- Spatial clustering of specialized resources and know-how in regional or **industrial districts**
  - e.g. „the valley concepts“ like the biotec valley in Munich region facilitate collaborative research initiatives

1. Ext. enterprise
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## 2. Facilitating conditions at the relational level

- Family and **friendship ties** among local business people (esp. in SMEs), membership in local trade associations, sports clubs, political institutions
  - social networks among professionals facilitate partnering (matter of trust and social integration)
- organisation's **positions** in their industries: incumbents, innovators, market leaders, new entrants.
  - existing linkages between firms facilitate more intensive partnering
- **Interdependencies** among firms and their products/services and processes:
  - Firm's that discover high dependencies of synergies between their products or competencies might decide to collaborate.

## Networks emerge in a networked environment

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"Economic units emerged from the **dense webs of political, religious and social affiliations that had enveloped economic activity for centuries.** ... The history of modern commerce ... is a story of family businesses, guilds, cartels, and extended trading companies - all enterprises with loose and highly permeable boundaries." Powell 1990, 298

"The point here is that **the entire economy** may be viewed as a vast hierarchy of subordinate, **criss-crossing networks.** ... Thorelli 1986, 38

# Network formation processes: Emergent vs. Engineered process

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
4. Conditions

## ■ Emergent networks:

- Networks can emerge triggered by a market condition following a certain idea leading to a certain network configuration in the end.
- Networks emerge from the interplay of environmental interdependence and the discovery of similar interests among different parties.

... the network as a result!

## ■ Engineered networks:

- Networks can also be designed by a triggering entity (one firm) which wants to pursue a certain goal. In this case, the triggering entity tries to reach a specific network configuration.

... the network as an option to achieve!

## Network emergence and actor interdependence

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**"Industrial networks are not designed by any single actor according to a master plan or a strategic decision. They emerge and develop as a consequence of interaction between semi-autonomous, interdependent industrial actors. Every such actor has to establish its own relations in the network and this cannot be done unilaterally. ... Industrial networks are functional entities, in which heterogeneous resources are used in industrial activities to satisfy heterogeneous demands. There is **technical, temporal, and social interdependence between the actors.**"**

(Håkansson; Johanson 1988, 370)

# Emergent vs. Engineered networks

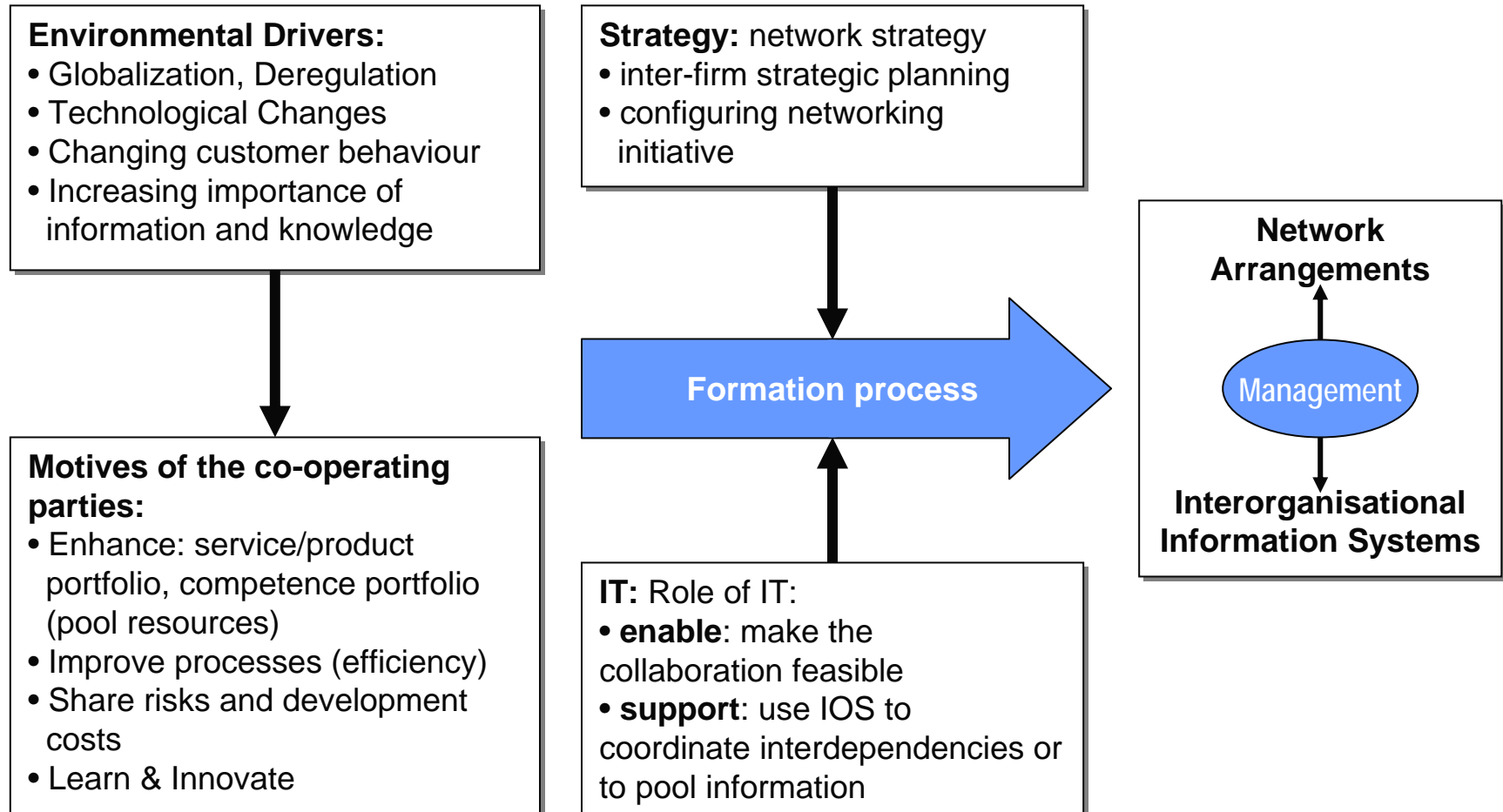
- 1. Ext. enterprise
- 2. Org. theory
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	Emergent process	Engineered process
Characterization of network	Competitive Collaboration	Options Exploration
Environmental interdependence	Strong effect	Less pronounced effect
Similar interest	Strong effect, formation based on recognition of similar interests	Triggering entity follows its intention seeking for suitable participants.
Triggering entity	no	yes, necessary for formation (constituent)
Openness of network	open to interested parties, snowball effect	triggering entity targets diverse members
Seeking domain consensus	defining boundaries of the network	aligning interests

Source: acc. to Doz, Olk, Ring (2000), p. 254.

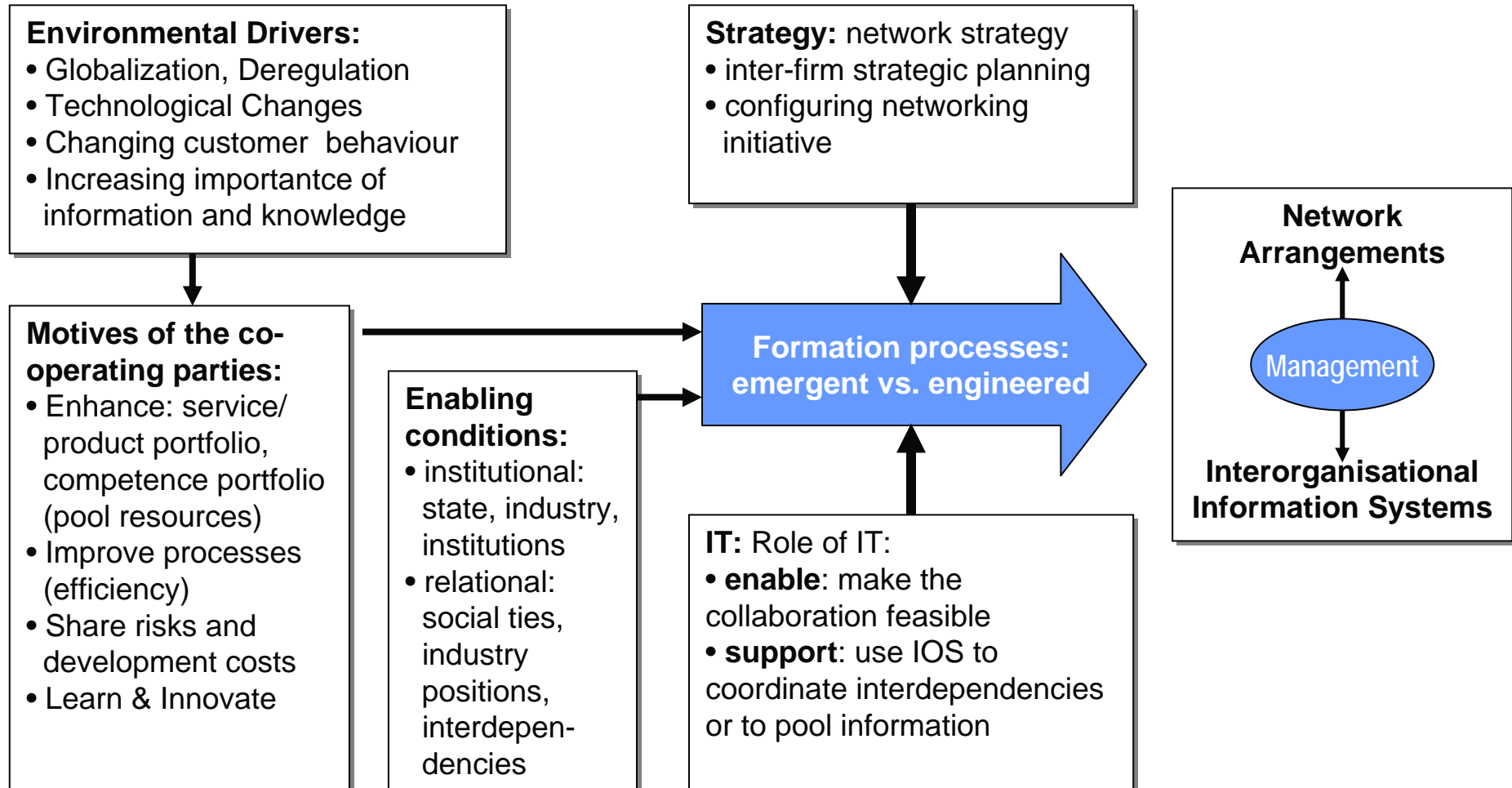
# Formation of inter-organisational networks and IOS

1. Ext. enterprise
2. Org. theory
3. Firm life cycle
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# Formation of inter-organisational networks and IOS

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|--------------------|
| 1. Ext. enterprise |
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## Summary

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- Extended enterprise
  - networking and the theory of the company
  - boundaries, relations and markets
- Organisation Science
  - various lenses and perspectives
  - expanding the scope towards networks
- Life-cycle of the company
  - path dependency of networking strategies
- Facilitators
  - institutional perspective
  - relational perspective