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Memo

Managing transport safety in the context of global competition: Theoretical resources

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The project "Managing transport safety in the context of global competition" addresses the following main problem: *How can companies and regulators work to create good framework conditions (environmental conditions) in the context of global competition?* This memo is the first part of a literature study conducted at the outset of the project. The memo provides conceptual and theoretical tools that will be used in the empirical studies:

- The notion of "framework conditions" or "environmental conditions";
- The notion of "internationalisation";
- Action research as means to improve and change environmental conditions;
- A value chain perspective;
- A common framework for roles and responsibilities in the transport domain; and
- Perspectives on power.

The second part of the literature study is a separate memo describing the state of the art of research on internationalisation related to transport safety related to each transportation sector.

The study is carried out in collaboration between SINTEF Technology and Society and NTNU Social Research.

Contents

1 Introduction

1.1 Background, purpose and structure of memo

Over the last decades, all four branches of the transport sector in Norway (air, sea, road and rail) have undergone massive changes. As transport patterns, value chains and labour markets have become global, competition has become increasingly fierce. This has led to restructuring of the sector, with a strong emphasis on cost-cutting and finding new models of organization based on outsourcing and specialization.

The project "Managing transport safety in the context of global competition" addresses the following main problem: *How can companies and regulators work to create good framework conditions for safety in the context of global competition?* "Framework conditions" are the conditions that influence the opportunities different actors have to control risk. Internationalization is in itself a framework condition, but will also be a key driver influencing other framework conditions for safety. We focus on how the various stakeholders of transport safety contribute to transport safety, by adapting to framework conditions, by creating good framework conditions for safety for actors further down the chain, or by using their influence to improve the framework conditions that are produced higher up in the chain. The study is carried out in collaboration between SINTEF and NTNU Social Research.

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This initial chapter presents the initial research issues and framework for the project.

Chapter 2 elaborates the notion of "framework conditions" or "environmental conditions". The two terms are used interchangeably in this memo. The chapter also identifies a set of theoretical resources that can be used to study environmental conditions.

Chapter 3 presents the notion of "internationalisation".

Chapter 4 provides a brief discussion of action research as a toolbox and a means to improve and change environmental conditions;

Chapter 5 presents a value chain perspective on internationalisation in the transport sector;

Chapter 6 presents a common framework for roles and responsibilities in the transport domain.

Chapter 7 presents four perspectives on power and elaborations of research issues based on these perspectives.

1.2 Initial research issues and conceptual framework

In the proposed study, we will identify and explore important framework conditions for safety for actors involved in ensuring safe transport, including political and regulatory authorities. The ambition is not only to provide a list of actors and framework conditions, but to propose mechanisms that lead to and maintain the current framework conditions as well as mechanisms that might be exploited to improve framework conditions for transport safety.

The main problem to be addressed is the following: *How can companies and regulators work to create good framework conditions for safety in the context of global competition?* This question contains three dimensions: First, most actors are *receivers* of framework conditions, in the sense that they must adapt to framework conditions that are produced on a higher organizational or societal level. Second, they can utilize different strategies to influence and change these framework conditions. Third, most actors in the risk management chain will produce framework conditions that influence the work of other actors, i.e. they will also be *senders* of framework conditions themselves. All these three dimensions of framework conditions will be studied. Internationalization will in many ways be a particularly framework condition that has massive influence on other framework conditions.

The general problem to be addressed has been split into six research questions:

1. How do Norwegian companies work to create good framework conditions for safety in the context of increased competition from foreign transport actors?
2. What characterizes the framework conditions for safety in selected foreign transport companies operating in Norway?
3. How do national regulatory authorities work to create good framework conditions for safety within their respective industries? Does the internationalisation of regulation involve a drive toward a minimum standard of safety, or is there still leverage left for national regulators?
4. How can regulatory authorities and other policy makers address the interrelationships between different transport modes?
5. How can the various actors work and collaborate to influence the framework conditions for safety in the context of global competition and international regulation? This includes the roles of regulatory authorities, transport companies and their customers and unions. A particular emphasis will be made on the role of tendering processes and contracts as framework conditions for safety.
6. How can regulatory authorities cooperate and learn from each other to create good framework conditions for safety within their respective sectors and in the transport system as a whole?

Figure 1 gives an overview of actors in the risk management chain (the rectangular boxes), examples of framework conditions (the grey boxes), and the combination of adapting to, creating, and influencing framework conditions (the grey arrows)

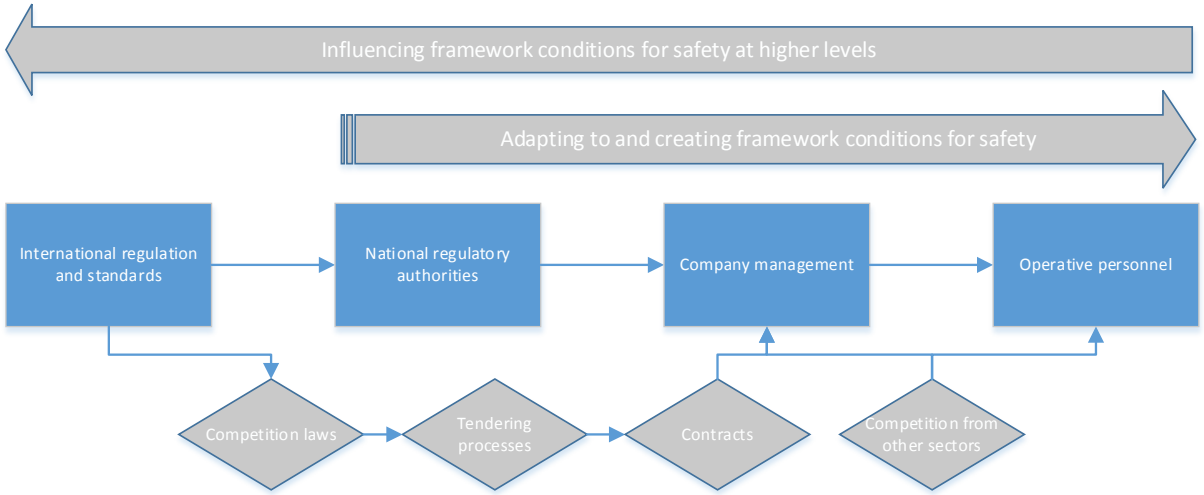


Figure 1. The risk management chain and framework conditions for safety

2 The notion of "framework conditions" or "environmental conditions"

The notions of "framework conditions" and "environmental conditions" are used interchangeably in this project. They both correspond to the Norwegian term "rammebetingelser", which may not have a precise equivalent in English.

2.1 Framework conditions for safety

Although accidents are commonly attributed to single causes, e.g. technical failure or human error, investigations show that accidents are usually produced by a number of root causes related to equipment, time, competence, management, language, cultural differences, fragmentation of responsibility and a number of factors that are produced at an industry, management and planning level (e.g. Baker, 2007; Hopkins, 2008; Rosness et al., 2011; Starbuck and Farjoun, 2005; Vaughan, 1996; Degani & Wiener, 1990; Woolmar, 2001). Consequently, our ability to improve safety is dependent on understanding how such underlying factors are created, and how they may influence operative actions and decisions. Such factors have been labelled "framework (or environmental) conditions for safety" (Rosness et al. 2012).

The term “framework conditions”, refers to the *conditions that influence the opportunities an organization, organizational unit, group, or individual has to control the risk of major accidents*. Importantly, this is not limited to tasks and decisions of safety professionals. A board of directors making decisions related to organizational design, investment or allocation of resources, a truck driver, train driver, pilot or sea captain carrying out his daily work in a safe and proficient manner are all contributors to transport safety. Rasmussen (1997) shows that many societal levels are involved in creating framework conditions for safety, including politicians, regulators, companies, management and operative staff. He further stresses the need for studies considering the interaction among these levels. This will be of particular importance to transport safety. We take this multi-level perspective as our starting point.

Importantly, the concept of "framework conditions" can be used to explore the production of negative as well as positive outcomes, i.e., accidents as well as accident-free performance (Rosness et al., 2013). Safety science has, somewhat paradoxically perhaps, been predominately interested in studying the factors that make things go *wrong*, i.e. that make accidents possible. Less interest has been devoted to studying what can make things go *right*, i.e. the factors creating safety. The perspective of framework conditions allows us to understand both sides of this coin.

2.2 "Senders" and "receivers"

The analytical approach for the project is based on the metaphors of “senders” and “receivers” (Rosness et al. 2012). This metaphor conveys the idea that some actors (“senders”) exert a strong influence on framework conditions that other actors (“receivers”) face when they strive to keep risks under control. This should not be understood as a simple, linear model. Rather, it is an attempt to show that the risk management chain spanning from regulation to operative work (e.g. Rasmussen 1997) consists of a series of interactions of mutual influence and power struggles. We will study the dynamic relationships between the actors in the risk management chain and how they simultaneously adapt to, produce and try to influence framework conditions, as shown in figure 1.

Rosness et al. (2013) used this approach to analyse the interactions between different levels of decision-makers involved in the explosion at BP's Texas City refinery. Adverse framework conditions for safety work created by BP senior management cascaded down the organizational levels and towards the sharp end of operations, going through significant transformations at the level of the refinery management. At this point, budget cuts were translated into organizational change, reduced maintenance, and reduced training of

operators and reliance on operational rather than technical barriers against major accidents. This example shows that the conceptualization of framework conditions allows us to analyze interactions between different levels and actors, and how internationalization affects organizations on different levels.
Where there is power there is also resistance, and there will often be room for interpretation, negotiation and power games between "sender" and "receiver". Power is not only connected to agents, but represents a complex web of relations partially determined by the system of knowledge constituted in the discourse (Clegg, 1989). Used as a heuristic device, the interpretation of "sender" and "receiver" is thus different from a causal relationship.

In the proposed study, we will identify and explore important framework conditions for safety for actors involved in ensuring safe transport, including political and regulatory authorities. The ambition is not only to provide a list of actors and framework conditions, but to propose mechanisms that lead to and maintain the current framework conditions as well as mechanisms that might be exploited to improve framework conditions for transport safety.

2.3 Theoretical resources for studying framework conditions

The proposed conceptualization of framework conditions for safety work allows us to exploit a broad range of theoretical resources, as shown in Table 1.

Table 1: Theoretical resources for studying framework conditions. Adapted from Rosness et al. (2012).

Source	**Relations between framework conditions and risk**	**Implications for safety work**
Efficiency-Thoroughness Trade-Off Hollnagel (2004, 2009)	Individuals and groups produce variability as they try to balance efficiency and thoroughness requirements. Such variability becomes part of the framework conditions of other actors. Variability from different sources may "resonate" and trigger an accident.	Identify situations where actors have to make efficiency-thoroughness-offs with an effect on safety, in particular where variations in output may negatively affect the framework conditions of other actors.
Contingencies for decision-making Rosness (2009)	Decision processes and their outcomes are influenced by constraints related to the decision setting and the way decision-makers adapt to such constraints.	Decisions may be allocated to settings that are conducive to making sound decisions. Decision aids may be devised to counteract unwanted effects of situational constraints..
Resource dependency Pfeffer & Salancik (2003)	Some demands from an organisation's environment may concern safety, whereas others may conflict with safety objectives.	Need to devise strategies that enable them to prioritise safety when they are faced with conflicting demands from their environment.
Normalisation of deviance Vaughan (1996)	Adverse framework conditions can be conducive to processes where an organisation gradually comes to accept serious anomalies as "normal" .	Organizations should seek the help from outsiders to challenge assumptions and norms that are ingrained in the culture.
Principal-Agent Theory Eisenhardt (1989)	Agents will adapt their behaviour and/or control the information that the principal receives about their efforts or performance in accordance with their self-interest. Reward structures may influence management attention, decision-making, and prioritisation of resources.	Identify and remove/mitigate unwanted effects of current incentive systems. If it is difficult to devise an adequate incentive system to promote safety work, consider if the effects of competing incentives can be reduced.

Source	Relations between framework conditions and risk	Implications for safety work
Weak ties and social networks Granovetter (1973)	Weak ties can be critical for the mobilisation of knowledge and other resources in complex organisations because they bridge otherwise unconnected networks.	Build and maintain weak ties when the linking of otherwise unconnected networks is critical to safety, in particular in periods of transition.

Several of the theoretical resources listed above will be discussed in more detail in the chapter on perspectives on power.

3 Internationalisation: The broad picture

The project studies how internationalization and increased competition influences the ability to create good framework conditions for safety at different levels of the risk management chain, attempting to study the transport system as a whole. In this chapter we introduce the term "internationalisation" and discuss the broader impacts of the phenomenon, including its implication for regulatory authorities. A discussion of the specific impacts of internationalisation in the Norwegian transport sector will be addressed in the following chapters.

3.1 The term "internationalisation"

By the term "internationalisation", we mean a development where enterprises are increasingly involved in international markets, and where competition is no longer restricted to actors on a domestic market. Internationalization in itself introduces massive changes in framework conditions. It involves increased competition, the introduction of new actors in new markets and also tends to involve a turn toward standardization of regulation as a means to achieve level playing fields of competition (Almklov et al. 2014).

3.2 Internationalisation and the regulatory authorities

Internationalization has transformed the regulators' roles, and their leverage to influence safety in the transportation branches. Though the nature and weight of these challenges vary between the four sectors in our project, there are also marked similarities. The changes represent a dual challenge

1. Internationalization increases the competition in the sector, and the regulator and policy makers will try to provide framework conditions within which Norwegian companies can compete.
2. Internationalization increases the importance and reach of international regulation, which means that the regulators must do much work to translate and implement international regulation. It also limits the leverage for national rules.

Combined, these developments narrow the playing field for national policy makers and regulators. Rather than just lamenting the regulatory paralysis (Renn, 2008) produced by these developments, a goal of this project is to investigate new methods and policy instruments contributing to safety in an internationalized transport sector.

Internationalization of transport sectors implies a transition to regulation regimes based on accountability as a key regulatory strategy. As illustrated by Almklov et al. (2014), there is a tight link between internationalization and safety regulation based on standards. When tasks and targets are standardized and measurable, performance can be compared across sites. International safety standards should be seen not only as attempts to ensure safety and interoperability but also as a means of making safety regulation transparent across contexts.

Some regulatory authorities have experimented with new forms of communicating with the industry. The Petroleum Safety Authority of Norway has explored "dialogue-based audits", conducted more as an appreciative inquiry than a traditional inspection (Antonsen et al. 2014). This exemplifies innovative regulatory practice within the context of international regulation.

4 Action research as a toolbox and a means to improve and change environmental conditions

As mentioned, a key problem to be addressed in this project is how the actors (both senders and receivers) can work to create good framework condition in the context of global competition. One approach that will be pursued in the project is *action research*. By means of facilitated workshops (Solem & Kongsvik, 2013), involving key actors in the different transport branches, we will attempt to create arenas where problem areas are commonly defined and concrete measures are developed, put into action and evaluated. The above described theoretical resources imply that it is essential that both regulators and transport companies participate in this work, and also that representatives from different levels within organizations are involved.

Action research (AR) is not a unified, canonical approach, but has different roots, including social psychology, philosophy and critical theory (Kemmis et al., 2014). Still, a unifying idea is that AR can be applied to resolve social or organizational challenges by a joint venture between researchers and those who directly experience the challenges (Coghland & Brannick, 2010). This joint venture is described by Greenwood & Levin (1998:4) in the following manner:

"AR is social research carried out by a team encompassing a professional action researcher and member of an organization or community seeking to improve their situation […].Together, the professional researcher and the stakeholders define the problems to be examined, cogenerate relevant knowledge about them, learn and execute social research techniques, take actions, and interpret the results of actions based on that they have learned."

As such, AR is clearly not within a positivist research paradigm, where great emphasis is placed on separating the researcher and the research object. Researcher influence within the positivist paradigm is considered a form of 'pollution' of the process and a threat to the trustworthiness of the research. AR on the other hand builds on researchers taking an active, participatory role, and puts weight on joint reflection and learning processes. In AR, the different competencies that researcher and 'problem owners' possess are acknowledged, and it is considered fruitful to bring these competencies together in joint ventures.

The work of Kurt Lewin has been influential in the development of AR, especially his notion of action research cycles. Such cycles are composed of different steps. The first pre-step involves constructing some common ground, i.e. defining the problem and a future desired state, and establishing a sound collaborative relationship between the parties. During the second step, joint action is planned and the responsibilities for different measures are distributed. In the third step the plans are taken into action, followed by the fourth step where the actions and measures are evaluated. The measures may be adjusted or replaced as a result of the evaluation, and the process may be repeated.

Figure 2: Action research cycles (adjusted from Coghland & Brannick (2010))

Action research cycles resemble Demings (1986) quality circle (Plan-Do-Check-Act), although AR has a more clear ideological base with its emphasis on democratic values, liberation and redistribution of power.

The time and resources of the present project may not allow us to go through a full loop of the action research cycle. The project's main contributions will be to construct some common ground. The participating companies will then have to decide for themselves whether they will follow up the results of the study. By referring to the AR paradigm, we commit ourselves to creating arenas where different stakeholders can meet to define problem areas and possible measures. We will thus use AR as a tool box.

5 A value chain perspective on internationalization in the transport sector

5.1 Introduction

Supply and value chains represent framework conditions or contexts for transport safety. As the transport sector in Norway has undergone extensive development over the last years, it is essential to examine how globalization and competition have affected supply and value chains which in turn affect transport safety. This literature study focuses on the supply chain concept and how transportation is a critical link in the supply chain. The first part of this document starts with a short discussion on the concept supply and value chain. This is followed by looking into how supply and value chains influence transport safety, as the structure becomes more complex and multi-leveled, diffusion of responsibilities, incentives and competition are factors that affect the overall transport safety. Finally, the issue on how supply and value chains can be organized, designed, and regulated to strengthen transport safety, will be discussed.

5.2 What are supply and value chains?

There are diverse definitions of the concept "supply chain" (Lummus & Vokurka, 1999). A supply chain may be defined as "a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finance, and information from a source to a customer"(Mentzer et al., 2001). Asbjørnslett (2009) describes the supply chain systems as "complex entities with multiple physical and virtual relationships, and multiple internal and external interfaces." The APICS Supply Chain Council defines supply chain as: "*The processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies."* and "*The functions within and outside a company that enable the value chain to make products and provide services to the customer"* (Cox et al., 1995).

A typical supply chain is an extended enterprise that consists of suppliers, distributors, manufacturers, wholesalers, and retailers/customers (see **Figure 3**) (Coyle, Novack, Gibson, & Bardi, 2010). In this system, there is a high demand for both product and services, as well as regularity and dependability of the supply chain (Asbjørnslett, 2009). As opposed to domestic supply chains, global supply chains involve a higher level of risk due to various interconnections among the firms involved in network (Manuj & Mentzer, 2008). The risks include susceptibility to breakdowns, disruptions and risks involving political as well as economic changes (*ibid*.)

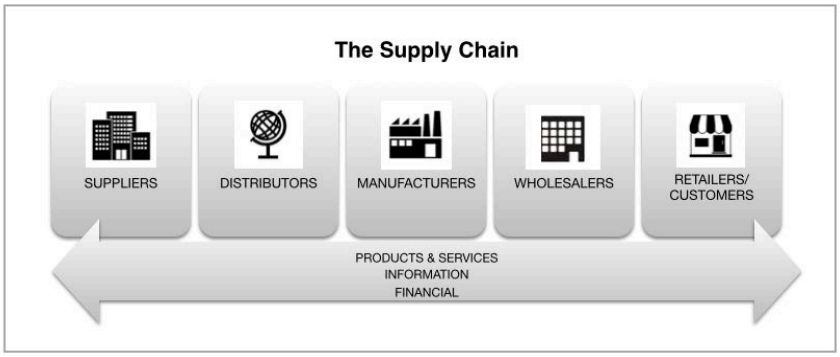


Figure 3 The supply chain based on Coyle et al. (2010)

Management of risks must be given adequate consideration as a supply chain involves a diverse set of risks such as delays, forecast inaccuracies, system breakdowns, procurement failures, capacity issues and inventory problems (Chopra & Sodhi, 2012). Breakdown in the supply chain may result in a colossal

financial loss in sales such as the case of Telefon AB L.M. Ericsson where lightning caused fire in their supplier's microchip plant (Chopra & Sodhi, 2012). Since Ericsson had a single-sourcing policy, their production was disrupted for months, causing a loss of $400 million in sales (*ibid*).

Supply chain disruptions may be caused by natural disaster, labor disputes, terrorism, war, supplier bankruptcy, single-supplier dependency, and political instability (Wilson, 2007). The 2011 Tohoku earthquake and tsunami in Japan resulted in various supply chain disruptions as the country is a major supplier of paint for automakers, flash memory, silicon, and automotive microcontrollers (Park, Hong, & Roh, 2013). In the US, the West Coast port lockout in 2002 impacted the transfer of goods from the port to the warehouses and stores, while the 9/11 terrorist attack on the World Trade Center prevented goods across US borders (Oke & Gopalakrishnan, 2009).

Lummus and Vokurka (1999) identify three reasons for existence of supply chains. First of all, companies continue to be more vertically integrated and specialized, and as they do so, they require suppliers that can provide them with quality materials at a lower cost instead of owning their source of supply (Lummus & Vokurka, 1999). Next, customers have a number of sources to select from, and as there is increase in both domestic and international competition, no longer need to rely on one specific supplier or maintain inventory at various locations throughout the chain. Large inventories are costly and customer demands are ever changing. The third reason is that companies are coming to understand that with increased performance on one of their functions, there is a corresponding decrease in performance in the rest of the company. Therefore it is wiser to purchase components instead of producing it themselves due to these inefficiencies (Lummus & Vokurka, 1999) .

Michael Porter introduced the idea of applying a competitive strategy in order to accomplish successful performance in business (Feller, Shunk, & Callarman, 2006). Value is defined as "benefits relative to costs"(Porter & Kramer, 2011).

Kaplinsky and Morris (2001) provide a definition for the value chain: "*The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use*". (Kaplinsky & Morris, 2001)

This definition of the value chain is strikingly similar to the definitions of a supply chain mentioned in the previous section. The difference between value chain and supply chain is that a value chain is more focused on the activities **a firm** applies in order to **create a competitive advantage** while a supply chain addresses the processes **different companies** perform in order to fulfill a **customer order** (Investopedia.com). The APICS dictionary provides a definition of "value chain" which points to a single company: "*The functions within a company that add value to the products or services that the organization sells to customers and for which it receives payment" (*Cox et al., 1995).

According to Porter (1985) a firm's value chain and how the company performs these individual activities reflect "*its history, its strategy, its approach to implementing its strategy, and the underlying economics of the activities themselves*." He identifies the five primary activities of a generic value chain as: Inbound logistics, operations, outbound logistics, marketing and sales, and service. Supporting activities to the main activities consists of firm infrastructure, human resource management, technology development and procurement (Porter, 1985). These nine activities in a generic value chain contribute to provide value to customers (see **Figure 4**) (Feller et al., 2006). The firm gains a competitive advantage by shaping their value chain, the activities involved in creation, delivery and so on (Porter & Kramer, 2011).

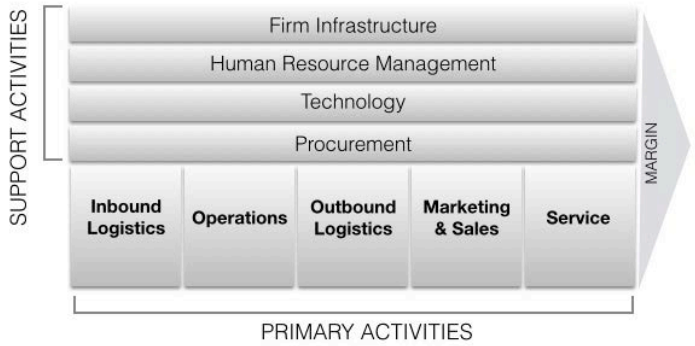


Figure 4 Value chain (Porter, 1985)

Due to the shift from business management focusing on only one "autonomous entity" the business management now focuses on the entire supply chain (Lambert & Cooper, 2000). Over the years, the terms supply chain and value chain, seem to have fused together, as reflected by a quick look at a question regarding the difference between the two terms at researchgate.net[1].

5.3 How might supply and value chains influence transport safety?

"Transportation can be viewed as the glue that holds the supply chain together" (Coyle et al., 2010). The individual firms need to coordinate or integrate flow of goods, information and financials in order to successfully compete; practically acting as one large organization (Coyle et al., 2010). Due to globalization, transportation plays an increasing role in the supply chain as distance and transit times increase, in conjunction with the risks (ibid.). Due to social media and the Internet, information is available to individuals within a few seconds. This empowerment has influenced the way transportation is being shaped today. Specialization in production of certain goods and services in particular geographical areas result in the need to rely on other locations for the goods and services they lack. This interdependency results in the increased criticality of transportation´s role in bridging the gap between supply and demand. Similarly, passenger transport bridges the function between supply and demand for people. The more mobile a society is, the more that society is dependent on efficient and cost-effective transportation (Coyle et al., 2010).

Customers expect that their orders arrive on time and in an acceptable condition. Thus, effective transportation is an important part of the two-way flow of products and services in a supply chain (Coyle et al., 2010). This two-way flow (see **Figure 3**) illustrates transportation´s role in the delivery of raw materials or components, as well as the reverse logistics used in return of defective components that were damaged, in need of maintenance, recycling of reusable elements, and so on (Coyle et al., 2010; Kumar & Shirisha, 2014). Transportation accounts for a considerable amount of uncertainty in the cycle time of a majority of supply chains (M. R. Crum, 2015).

Parallel to the shift from local or regional sourcing to global sourcing, production methods have also changed. Just-in-time production and flexible production specialization, for instance, entail transportation systems that are fast, flexible, and able to cater to the diverse needs of customers (Skjøtt-Larsen, Schary, & Mikkola, 2007).

As a result of trade agreements and government incentives, cheap fuel (low transportation rates) global supply chains outsource production to countries with lower labor costs. New technology makes it possible for relationships or collaborative efforts between companies to occur on real time basis. This ability to communicate and exchange vital information real time allows trade between developed countries and underdeveloped countries (Coyle et al., 2010).

[1] https://www.researchgate.net/post/What_is_the_difference_between_value_chain_and_supply_chain

The challenges today´s transportation systems must face include global competition, government budget constraints and taxes, interest group demands, infrastructure challenges, sustainability issues, energy costs (Coyle et al., 2010). Increased congestion in the ports and highways, fuel efficiency of different modes of transport, and sustainability issues, all play a role in the selection of transportation services (Coyle et al., 2010). For instance, rail and water carriers are more fuel efficient compared to their air and motor counterparts.

Some changes in transportation services are derived from developments in regulations and policies. Changes in the environment in which transportation services operate also affect the supply chain with regards to costs and transit time.

Deregulation of the transport market, EU's single market framework[2], and the increase in number of member states have contributed to changes in transport policy within EU (Skjøtt-Larsen et al., 2007). The increased movement of goods within EU primarily used road transport, thereby increasing road congestions. With the growing public awareness about the consequences of road transport, transport using rail, waterways and intermodal[3] transport are being encouraged (Skjøtt-Larsen et al., 2007). Although it would be beneficial to use waterways and railways, their infrastructure, however, are more suited for national rather than international transport (Skjøtt-Larsen et al., 2007).

The deregulation of intra-union transport in 1993 resulted in cabotage transport in order to make use of transportation resources more efficiently (Skjøtt-Larsen et al., 2007). This allowed foreign carriers to perform domestic transport in another country. Cabotage has increased competition in international transport and forwarding companies on major traffic routes. Deregulation has changed the competitive environment: new competitors, mergers and strategic alliances between transport and forwarding companies, global coverage and various transport and logistics services (Skjøtt-Larsen et al., 2007).

Safety regulations were introduced as a way of ensuring a minimum level of safety for the providers of transportation to comply with despite market pressures to become more effective and efficient. The safety regulations include labor safety regulations, operating procedures and equipment specifications or standards (Coyle et al., 2010). Transportation safety also extended to environmental safety issues. The amount of safety regulations has increased the transportation costs (Coyle et al., 2010).

5.4 Diffusion of accountability in the supply chain

Supply chains are becoming more complicated, with several risks and vulnerabilities that may influence the system as it becomes more complex and tightly coupled (A. Marley, T. Ward, & A. Hill, 2014; Perrow, 1984; Skjøtt-Larsen et al., 2007). Researchers also point at complexity as one of the biggest challenges in modern supply chains management as well as a major drawback for performance (Bozarth, Warsing, Flynn, & Flynn, 2009). As the network of actors and fragmented processes become more convoluted, issues such as social responsibility, occupational health and safety, or the environment may easily fall between the cracks.

Hesketh (2010) points out that international supply chains have grown intricate to the extent that visibility has become obscure. For instance, the transport of goods between seller and buyer seem to be focused on limiting liabilities more than targeting an "accurate description of the goods" (p. 9) (Hesketh, 2010). Many large companies have experienced a barrage of criticisms due problems such as unfair labor practices and product toxicity and so on. Big brand companies like Nike, Coca Cola, Dell, Nestle, are a few known labels that have taken a beating from the public (Parmigiani, Klassen, & Russo, 2011; Wolf, 2014). Many

[2] The single market concerns bringing down of barriers between member states and simplifying existing rules. The four cornerstones include free movement of people, goods, services and capital. More information on EU's single market can be found at http://ec.europa.eu/internal_market/top_layer/index_en.htm

[3] Intermodal transport includes containers or bodies that can be transferred from one transport mode to another such as ISO containers (ships, trains, trucks), swap bodies (train and truck) and piggyback trailers (train and truck).

companies rely on other countries for cheap labor, exposing workers to risks of unfair labor practices or taking advantage of weak regulatory implementation (Locke, Qin, & Brause, 2007). As an example, a study of 51 Nike suppliers across the globe reported that there is extreme variation with regards to working conditions and labor rights(Locke et al., 2007).

As a way of preventing these negative consequences, governmental as well as non-governmental regimes have introduced several industry norms, codes of conduct, and industry standards (Castka & Balzarova, 2008). The standard ISO 26000 on social responsibility acknowledges the relationship between businesses, society, and the environment in which the enterprise operates in. It also provides guidance on socially responsible operations (see ISO.org on Social responsibility). ISO 26000 was launched in 2010 after a long process involving different representatives from the government, NGOs, industry, consumer groups and labor organizations from different parts of the globe (ISO, 2014).

5.5 Social responsibility through the supply chain

Many decision makers in the supply chain have viewed social responsibility simply as a responsibility, with no financial benefits (Walley and Whitehead, 1994 in Crum et al., 2011). Initiatives on promoting social responsibility and sustainability by companies in the supply chain have mainly focused on "standalone" projects, without applying a holistic view of the terms CSR or sustainability, thus ending with projects that do not fit in the supply chain puzzle (M. Crum, Poist, Carter, & Liane Easton, 2011). Carter and Rogers (2008) introduced the concept of SSCM or Sustainable Supply Chain Management as a way to achieve long-term economic viability through the integration of environmental, social, and economic criteria (Carter & Rogers, 2008). Literature on sustainable supply chain management is abundant. However, there is a gap between research about promoting safety in the supply chain and its connection with sustainability.

Research literature on focal companies' motivation for improving occupational health and safety among their suppliers show that the companies were mostly influenced by external pressures (legal demands, stakeholder and interest groups), rather than sustainability agendas or business advantages (EU-OSHA, 2012). The study also showed variation in the type of sector or industry and the size of the company. Furthermore, it was revealed that successful promotion of OSH among the companies within the supply chain entails a combination of state regulation with other initiatives and measures (EU-OSHA, 2012).

Introduction of health and safety issues have been included in corporate codes of multinational enterprises. Tulder, Wijk and Kolk (2009) examined whether stakeholder involvement in designing corporate codes of conduct resulted in a higher implementation of the code. They found out that the inclusion of occupational health and safety issues in the codes of conduct in the International Framework Agreement (agreed upon by trade unions and multinational enterprises) had a higher degree of implementation than the codes of a benchmark group of leading multinational enterprises (Tulder, Wijk, & Kolk, 2009).

Certain factors in a supply chain may be used in order to influence the management of health and safety of organizations within the supply chain (Walters & James, 2011). In a study about strategies on how a supply chain can influence occupational health and safety (OHS) standards, three strategies were identified: 1) procurement strategies of the "Purchaser", 2) Industrial-level certification schemes, and 3) product-related incentives. In the first strategy, the purchaser of a service or product has included health and safety as part of their contractual requirements. The problem with implementing this strategy is that despite including health and safety as part of the requirements for the procurement of services, there may be unsubstantial effort placed in monitoring of the contractor's compliance to the requirements. Despite this challenge, they have pointed out that in large construction projects [4] where there is close regulatory supervision and a high reputational risk; there is a better chance of success when it comes to inclusion of health and safety requirements in the procurement of services. In the strategy involving certification schemes, the law may require companies to only use contractors that comply with health and safety laws. In this case, contractors

[4] Construction project linking Denmark and Sweden in the 199os demonstrated the positive effects of including HSE requirements in the procurement process (EU OSHA, 2000). Heahtrow Airport Terminal 5 (Ewing, 2006), Renault industrial plant in France (EU OSHA, 2000)

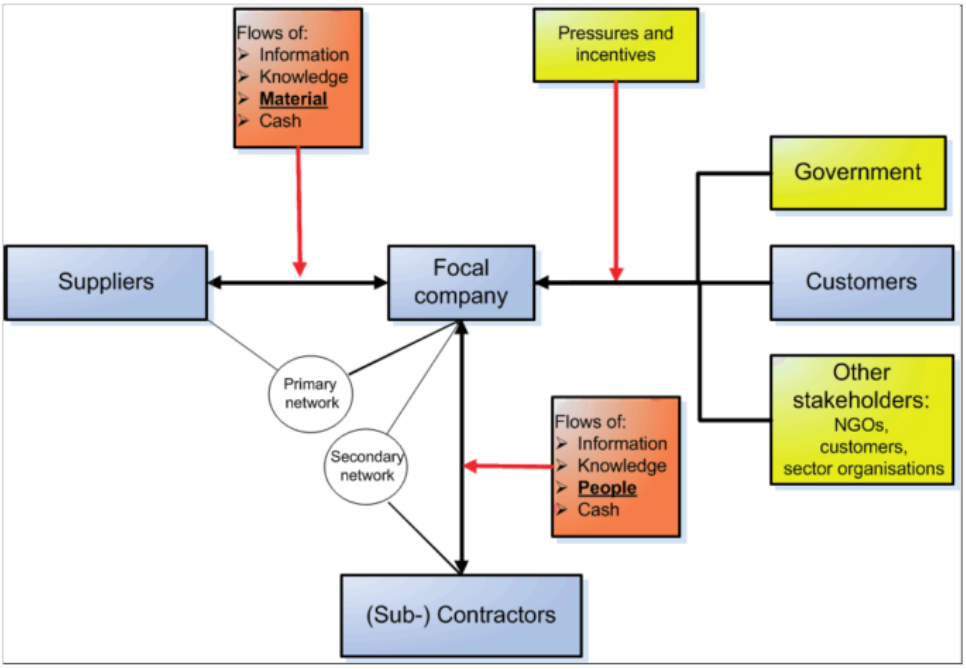
would have to provide a certification that proves health and safety competencies in both the individual and organizational level. There is a wide range of certification schemes within different industries, which may result in confusion among actors in the supply chain regarding their value. This then led to a European certification scheme such as SCC certificate where a third-party certification system evaluates the performance of a contractor in OSH by applying a set of industry best practices to demonstrate the compliance of a contractor to fundamental safety requirements. The third strategy, using product-related initiatives, was also used in a number of suppliers and trade bodies to increase the level of health and safety. For instance, large companies in the hire tool trade in construction underline the advantages of safety in their equipment, using this as a marketing strategy. Trade associations in cooperation with larger firms may work together in developing a standard for health and safety and provide training in relation to safe use of equipment provided by the companies they collaborate with (Pointing, 2008 in Walters & James, 2011). Associations for wholesalers may establish management systems for their members that monitory their inventory of products and offer company-specific advice, based on the wholesaler's inventory, on substitution possibilities for hazardous chemicals. The authors summarize their work by emphasizing that these initiatives may generate preventive benefits. However, very few organizations may utilize this potential in the SC. They argue that encouragement by regulators for voluntary action is insufficient and that regulatory strategies and stronger legal frameworks will need to be developed in order to encourage organizations in powerful positions in supply chains and relevant trade and industry bodies to make use of this potential (Walters & James, 2011).

5.6 Safety in transportation through the supply chain perspective

As transportation is continuously being shaped by the supply chain environment and the global market, safety in transportation may also be influenced through the supply chain that shapes it. Studies on the different strategies in promoting safety in the supply chain (as discussed by Walter & James, 2011) may be transferred to the transport industry. For instance, procurement strategies in transportation may include more specific requirements on health and safety. This will only be successful if there is also equal attention towards monitoring and implementation of these requirements by the transport provider as well as the client (Locke, Rissing, & Pal, 2013). Another example is certification schemes that may make the transport service provider more attractive to the client. It may also be the basis of selection for clients in obtaining transport services. Also, focal companies may offer training or safety management systems to the members of their supply chain, including transport services. Voluntary efforts by companies may only be successful to a certain degree. That is why it is also important to have a more cohesive national and international regulation that lessens administration time and increases focus on safe transport operations (Knudsen, 2009), more stringent laws on compliance to safety regulations (such as penalties for non-compliance). Finally, it may be further improved by strengthening labor unions and increasing their participation in the development and inclusion of health and safety in corporate codes (EU-OSHA, 2012; Tulder et al., 2009; Wright & Brown, 2013).

5.7 Summary

While the supply chain describes the processes different enterprises perform in order to fulfill a customer, the value chain focuses on 9 activities a firm applies in order to create a competitive advantage and add value to the product. As globalization, technology, regulations, customer awareness, and client demands change, the supply chains of today will continue to be shaped according to these drivers. Supply chains are becoming more complex and tightly coupled, resulting in increased risks and difficulties in determining accountability. The recent focus on designing supply chains as sustainable and socially responsible, are primarily due to external pressures and regulations. Safety and projects related to increasing the sustainability of the supply chain need to be looked upon from a holistic perspective so that the effects can be integrated into the supply chain processes and possibly provide synergy. Research in this area is needed to provide knowledge on how the supply chain perspective maybe used in increasing safety in transportation. As transportation is a critical link in the supply chain, any improvements in transport systems will ultimately affect the supply chain.



Source: adapted from Seuring & Muller, 2008

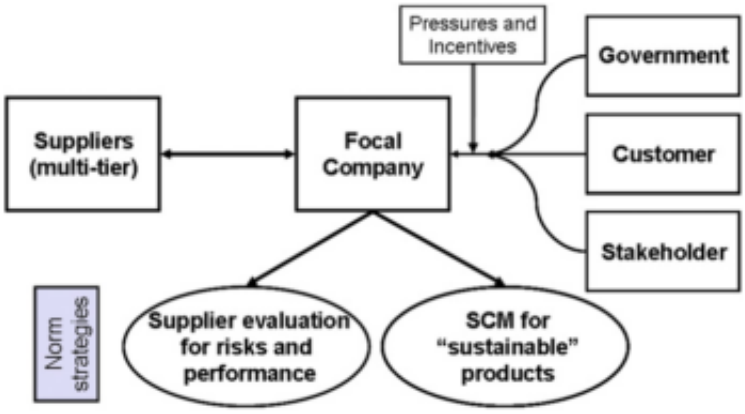


Fig. 4. Triggers for sustainable supply chain management.

Figure 5 Taken from (EU-OSHA, 2012)

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6 A common framework for roles and responsibilities in the transport domain

6.1 Introduction

This paper is part of the documentation of the work done in the research project *Managing transport safety in the context of global competition* funded by the Research Council of Norway. The objective of the paper is to ensure that the project has a common platform concerning terminology as for the description of the different roles in the four transport modes road, rail, sea and air. The research project compares amongst others how safety is organised and managed in the four transport modes. *The common framework will enable the project partners and participants representing the four transport modes to describe the organisations, the roles and the actors in the different transport modes in a consistent and comparable way*.

The framework described in this paper is based on ARKitektur for TRANSportsektoren(ARKTRANS) [Natvig et al. 2009] which is the Norwegian multimodal Intelligent Transport Systems (ITS) framework architecture. The specifications are common to all transport modes (road, sea, rail and air) and are also harmonised across freight and person transport. ARKTRANS provides a generic and simplified view on the person and freight transport sector that contributes to yield new and improved ITS solutions. ARKTRANS may also be used as a common platform for defining roles and responsibilities for a mode independent framework for safety management systems. The ARKTRANS framework is described with a reference model divided into domains and abstract roles related to the different domains. Actors in the person and freight transport sector may fulfil several roles; each role is defined by a set of responsibilities and belongs to one sub-domain only.

The ARKTRANS project was initiated by the Norwegian Ministry of Transport and Communications more than 10 years ago and was funded by The Research Council of Norway. All four transport modes were project partners and the framework was developed by SINTEF ICT in close cooperation with the transport authorities and operators. The framework is unique compared with other similar frameworks, e.g. Keystone Architecture Required for European Networks (KAREN) [KAREN 2000], as it covers both transport of persons and goods and it is multimodal covering all four transport modes.

6.2 The ARKTRANS reference model

The ARKTRANS reference model is a model for the whole transport domain where the transport domain is further divided into sub-domains. Each sub-domain represents a group of roles where the roles are logically linked together and related to common responsibilities and focus and business areas. Figure 6 shows the ARKTRANS reference model with its 5 sub-domains. The arrows represent the information flows between the sub-domains.

A *role* is an abstract entity that is defined by a set of responsibilities. An *actor* is a concrete person, company, organisation or authority that fulfils parts or the whole of the responsibilities of a role. An actor may also cover the responsibilities of more than one role. An instance of the Infrastructure Manager is a Road network manager which is an abstract role covering the planning, building and maintenance of a road network. The Norwegian Public Roads Administration (NPRA) (Statens vegvesen) is a typical actor that fulfils all the responsibilities for the main road network in Norway. An instance of the abstract role Utilisation manager is a Road network utilisation manager that plans the utilisation of a road network and carries through an operational traffic management of the moving objects in the road network. NPRA is also here a typical example on an actor that covers all the responsibilities of the Utilisation manager. Hence, NPRA being one organisation (actor) fulfils two roles. A similar example is the Norwegian rail network managed by the Norwegian National Rail Administration (Jernbaneverket). The rail infrastructure is managed, i.e. planned, built, maintained and operated, by Jernbaneverket which implies that Jernbaneverket is the Infrastructure Manager. Jernbaneverket also manage the utilisation of the rail network and is by this also the Utilisation Manager.

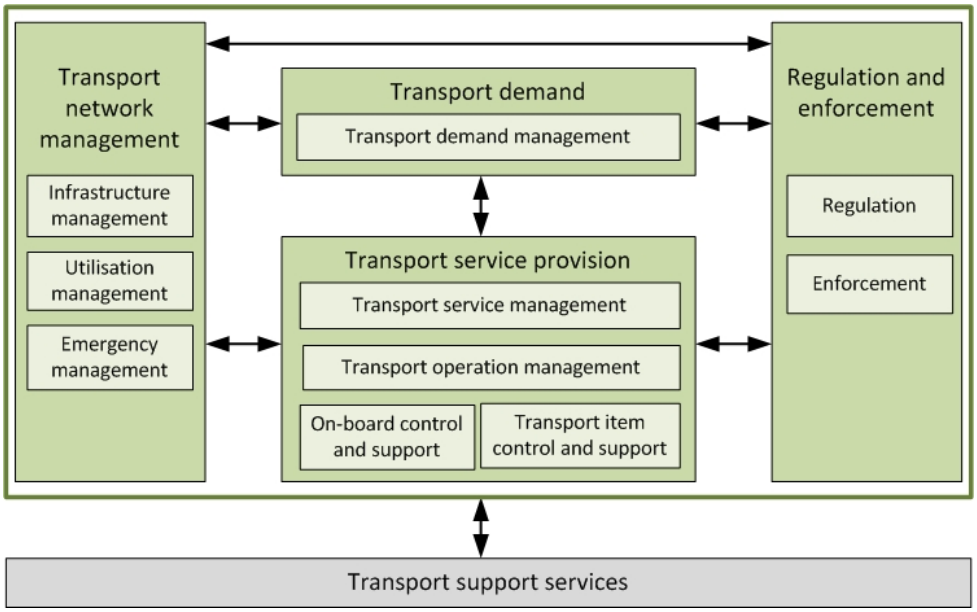

Figure 6: The ARKTRANS reference model

The *Transport demand* subdomain covers all roles that demand or request a transport service, e.g. a company that wants to move a transport item from A to B or a person that wants to be transported from C to D. It also covers the roles that demand or request a transport related service, e.g. traffic information or real time information on arrival of public transport means.
The *Transport service provision* subdomain includes all roles that sell and sign contracts related to a transport service, organises and deliver the transport service and manages/manoeuvres the transport means, e.g. truck, vessel, train or aircraft, used for the transport service.
The *Transport network management* subdomain covers all roles related to the management, operation and maintenance of the infrastructure in a transport system, e.g. a road or rail network. It also covers all roles related to the utilisation of the infrastructure, e.g. the management of vehicles in a road network or vessels in a harbour. The sub-domain also covers all roles related to Emergency management.
The *Regulation and enforcement* subdomain includes all roles related to the regulation and monitoring of the transport domain. The subdomain includes typical roles as transport departments and authorities, financial authorities etc. preparing and issuing laws, regulations, prescriptions and recommendations on how the transport in a transport system shall be carried through and controlled and/or monitored. It also includes roles that prepare and issue laws and regulations that are applicable for any type of transport system, e.g. the telecommunication authorities.
The *Transport support services* covers all roles that provide any type of service that could be used to operate a transport system. Their core business is not related to transport but their services are used to enable and/or facilitate an effective and secure operation of a transport system, e.g. the communication services provided by a telecom operator or the positioning services from the GPS system.

6.3 Transport Demand

Transport demand covers all roles that have one or more of the following responsibilities given below. A responsibility is not in this case a legal responsibility but more a description of the duty assignments of the role.

- Define the need for a transport service, e.g. a need to move a person from A to B or to move a container from C to D.
- Define and/or plan how the transport service should be carried out, e.g. a person may plan which transport mode(s) to use, which route to go, which facilities to benefit from, when to go and which level of safety is acceptable.

- Enter into an explicit or implicit contract with a role that is able to fulfil the transport service requirements and provides the transport service, e.g. purchase a ticket that is valid for all public transport within a month and within a defined region. Another example is agreeing with a transport operator to move 10 new cars from Drammen harbour to Trondheim.
- Monitor and control the provision of the transport service ensuring that the transport service has been delivered in line with the requirements and contract.

An entity covering all the responsibilities is called a **Transport user** (short for Transport service user) or just User. A car driver and a bus passenger are typical examples on Transport users. A wholesaler who needs to move the goods from his warehouse to the individual shops is also a typical example. In some cases the Transport users requests the support from the role providing the transport service as for defining the optimum way of carrying out the transport service. However, the responsibility always remains by the Transport user.

The Transport user may be a person, company or an organisation requiring a transport service. It could also be a public authority, e.g. a city transport authority purchasing public transport services. It may even be an organisation representing a specific group of transport users presenting general safety requirements on behalf of their members.

Relevance for the *Managing transport safety in the context of global competition* project:

- The Transport user may include safety requirements in his definition/specification of the transport service, e.g. that the transport means used for the transport should fulfil the national regulations and certifications or that the actors providing the transport services shall comply with national or international safety management standards.

6.4 Transport service provision

The Provision of transport services domain has been divided into four sub-domains:

- Transport service management
- Transport operation management
- On-board control and support
- Transport item control and support

The **Transport service management** sub-domain includes all roles that have one or more of the following responsibilities:

- Define and market the transport services that shall be provided to the transport users, e.g. define and market the provision of D2D (door-to-door) container transport services.
- Enter into a contract with the Transport user concerning provision of the transport service and the payment for it, e.g. CargoNet enters into a contract with Coop concerning the transport of 15 containers from Alnabru to Trondheim three times a week.
- Enter into contracts with actors that provide transport services, e.g. Bring enters into a contract with a local transport company concerning last mile delivery with electric vehicles in a city.

An entity covering all the responsibilities is in ARKTRANS called a **Transport service manager**.

Relevance for the *Managing transport safety in the context of global competition* project:

- The Transport service manager may offer transport safety as one of the attributes describing the transport service products marketed by the Transport service manager which again is based on his business, reputation and/or operational policies and/or quality assurance system.
- The Transport service manager may include safety requirements in his contracts with entities providing the transport services. This could be safety requirements defined by the Transport user that are transferred to the transport service provider. It could also be the requirements of the Transport service manager based on his business, reputation and/or operational policies and/or quality assurance system.
- The Transport service manager will have to take into account any safety related regulation prepared and issued by a role that regulate, governs and monitor the transport infrastructure and objects moving around in the transport infrastructure, e.g. a rail or road network. The regulations will be part

of the constraints and restrictions for how the transport service product shall be marketed and delivered to the Transport user.

The **Transport operation management** sub-domain includes all roles that have one or more of the following responsibilities:

- Define and market the transport services that shall be offered to the Transport service managers and delivered to the Transport users.
- Enter into contracts with Transport service managers that are the links between the Transport users and the Transport Operation Manager.
- Plan the transport service in detail based on the Transport user and Transport service manager requirements. The degree of freedom for the planning will differ from one transport mode to another, e.g. a road transport operator will not have the same constraints as a railway operator.
- Carry through the transport service delivering the transport service that the Transport user has purchased from the Transport service manager.
- Monitor and control the delivery of the transport service ensuring that the transport service is being delivered in line with the requirements and contract

An entity covering all the responsibilities is in ARKTRANS called a **Transport operation manager**.
Relevance for the *Managing transport safety in the context of global competition* project:

- The Transport operation manager may offer transport safety as one of the attributes describing the transport services marketed by the Transport operation manager which again is based on his business, reputation and/or operational policies and/or quality assurance system.
- The Transport operation manager will have to take into account the safety requirements being part of the contract with Transport service manager.
- The Transport operation manager will have to take into account any safety related regulation prepared and issued by a role that regulate, governs and monitor the transport infrastructure and objects moving around in the transport infrastructure, e.g. a rail or road network. The regulations will be part of the constraints and restrictions for how the transport service product shall be marketed to Transport service managers and delivered to the Transport users.

The **On-board control and support** sub-domain includes all roles that have one or more of the following responsibilities:

- Control/drive the transport means used for delivering the transport service in line with the usage rules, laws and regulations issued for use of the relevant transport infrastructure and transport means. Typical examples are a truck driver, a bus driver, a train driver, a vessel or aircraft crew..
- Handle information related to the transport means, e.g. information collected during the driving or information related to the transport means like registration documents, certificates, cargo documents etc.
- Monitor and report to the Transport operation manager how the transport service is carried through.

An entity covering all the responsibilities is in this document called a **Driver** (of the transport means). The term Driver is not the appropriate term for all transport modes but was accepted as the common role name of the ARKTRANS partners representing all four transport modes. In real life architecture descriptions the role name Driver will be replaced with more transport mode relevant names.
In some cases a specific group of drivers may present and/or promote their safety requirements via their interest organisation, e.g. the Norsk Lastebileier-forbund (NLF) (Norwegian Truck owner association) on behalf of the drivers.
Relevance for the *Managing transport safety in the context of global competition* project:

- The Driver will have to take into account any safety related regulation prepared and issued by a role that regulates, governs and monitor the transport infrastructure and objects moving around in the transport infrastructure. The safety related regulations will be part of the constraints and

restrictions on how the Driver will control/drive the transport means, e.g. regulations on resting time, maximum permissible weight, speed limits, signals and signs.

- The Driver has to take into account any safety requirement coming from Transport operation manager that are based on Transport user requirements or Transport service manager requirements conveyed via the contract between the Transport service manager and the Transport operation manager.
- The Driver has to take into account the safety measures, rules and regulations coming from his employer which usually is the Transport operation manager.
- The Driver will take into account his own safety requirements and acceptable level of risks. This may vary a lot from one driver to another based on e.g. learning, training, sex, age, cultural background, time constraints in deliveries, type of cargo transported, type of transport means used, monitoring and control of driver behaviour and enforcement of rules and regulation violations.

The **Transport item control and support** sub-domain is regarded as outside the scope of the *Managing transport safety in the context of global competition* project.

6.5 Regulation and enforcement

The Regulation and enforcement domain has been divided into two sub-domains:

- Regulation
- Enforcement

The **Regulation** sub-domain includes all roles that have one or more of the following responsibilities:

- Prepare, approve and publish laws and regulations governing the transport infrastructures for the different transport modes and the objects benefitting from the transport infrastructures. Examples are laws and regulations for the design, management, maintenance and operation of the Norwegian road network, regulations for the vehicles used in the road network and regulations for the drivers of the vehicles.
- Inform the Transport users, the Transport service managers, the Transport operation managers and the Drivers about the laws and regulations, e.g. Regulations relating to the technical requirements and approval of motor vehicles in road transport (Kjøretøyforskriften).
- Collect information on the use of the transport infrastructure and distribute the information for the general public knowledge and for service providers who wants to develop and offer transport related services to the users.

- Provide information to and cooperate with other authorities, both national and international

Typical examples are the laws, regulations and mandatory guidelines prepared and published by the Norwegian Parliament (Stortinget), Ministry of Transport and communication (Samferdselsdepartementet), the Norwegian Public Roads Administration (Statens vegvesen), the Norwegian National Rail Administration (Jernbaneverket), The Norwegian Coastal Administration (Kystverket) and the Civil aviation Authority Norway (Luftfartstilsynet). The laws, regulations and mandatory guidelines may both be based on e.g. Norwegian research and transport authority safety policies but also on European legislation, e.g. European Directives in the transport domain.

The **Enforcement** sub-domain includes all roles that have the following responsibility:

- Enforce laws and regulations by means of:
  - Dialogue with transport operators on their activities and safety management
  - Data collection and analysis of safety related incidents Inspections and certifications, e.g. vehicle control performed by NPRA

- Monitoring of the behaviour of the different roles benefitting from the transport infrastructure in order to detect law and regulation violations
- Handling of exceptions and enforcement in case of violations

Examples are cargo and transport inspection authorities, safety regulatory authorities, police and transport means inspection authorities. NPRA, Road Supervisory Authority (Vegtilsynet) and Norwegian Railway Authority (Jernbanetilsynet) are typical actors in this sub-domain.
The transport operators may also have their own internal monitoring and handling of safety related incidents.

Transport regulator is a common term used for actors that fulfils one or more of the responsibilities listed above.
Relevance for the *Managing transport safety in the context of global competition* project:

- The Transport regulator will prepare safety related laws and regulations that regulates and governs the Norwegian transport infrastructure and objects moving around in the transport infrastructure.
- The Transport regulator will have to take into account international and EU laws and regulations when preparing the Norwegian laws and regulations.
- The Transport regulator will monitor and enforce safety related laws and regulations.

6.6 Transport network management

The Transport network management has been divided into three sub-domains:

- Infrastructure management
- Utilisation management
- Emergency management (outside the scope of this paper and not further described)

The **Infrastructure management** sub-domain includes all roles that have one or more of the following responsibilities:

- Plan and establish the transport infrastructure including equipment related to the transport infrastructure, e.g. planning and establishing a road network with signs and signal, a rail network with signs, signal and electric power and seaways and harbours with signs, signal and navigation support systems.
- Maintain the transport infrastructure
- Collect, maintain and distribute information about transport infrastructure

The **Utilisation management** sub-domain includes all roles that have one or more of the following responsibilities:

- Strategic and tactical planning of transport and traffic issues in an area
- Monitoring and controlling the traffic flow or individual transport means by guidance or orders given to traffic flows or individual transport means during normal and abnormal traffic situations
- Management of traffic status information and provisions of such information
- Provision of supporting services to transport means using the transport network
- Assignment of infrastructure resources to transport meanss, e.g. allocate time slots in a transport network with limited availability

In Norway the Norwegian Public Roads Administration (Statens vegvesen) will fulfil all roles in utilisation management for the main roads in Norway. The Norwegian National Rail Administration (Jernbaneverket) will fulfil all roles in the utilisation management of the rail network in Norway.

Relevance for the *Managing transport safety in the context of global competition* project:

- The Transport network manager will have to take into account any safety related regulation prepared and issued by a Transport regulator. However, as the Norwegian transport network managers are transport authorities without any foreign competitors or foreign operators it seems to be of less relevance for the core research questions of the research project *Managing transport safety in the context of global competition.*

6.7 Crucial relationships between Transport demand and Transport service provision

Figure 7 shows the crucial relationships between the three roles Transport user, Transport service manager and Transport operation manager. Although the figure is presented as a sequence diagram the order of the relationships may change from one case to another. The payment flows are not included in the figure because payment could be either pre-paid or post-paid in relation to the services provided and they are also outside the scope of this paper.

The figure shows that the Transport operation manager, e.g. a truck fleet owner, defines and markets the transport service products he is offering to the market, e.g. a Transport service manager that in this example could be a logistics service provider. The Transport service manager defines the transport service products he is offering to the Transport user market based on the available transport service products from the Transport operation manager, e.g. services offered to a wholesaler who needs truck transport services for his distribution of goods. This could be a single transport service, e.g. a transport of two containers from one terminal to another. It could also be a combination of products offered by several Transport operation managers enabling the Transport service manager to offer Door-to-Door (D2D) products to the Transport users.

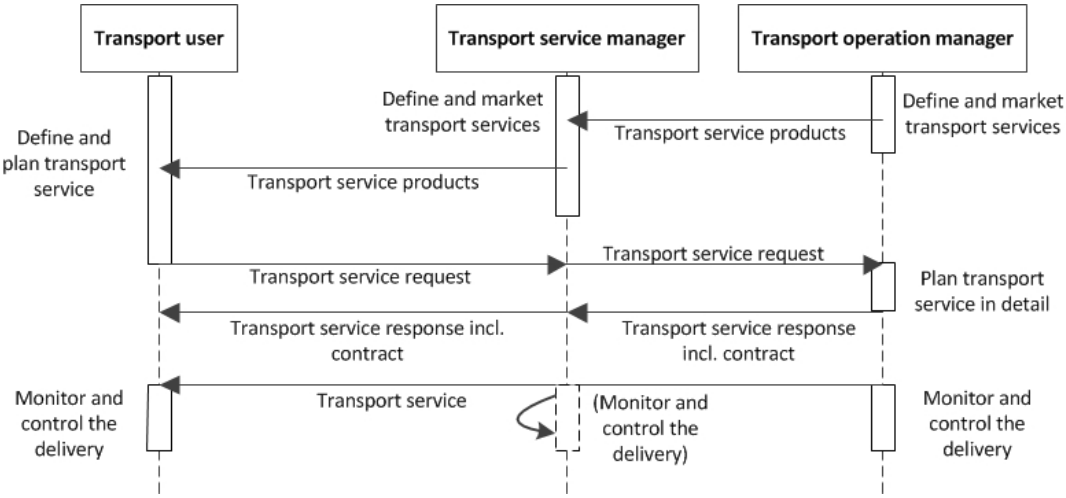

Figure 7: The crucial relationships

The Transport user defines and plans the transport service he needs and sends a request to the Transport service manager. The request is either forwarded to the Transport operation manager or the Transport service manager acts on behalf of the Transport operation manager and sends a transport service response to the Transport user. The Transport operation manager provides the transport service to the Transport user and the provision of the service is monitored and controlled both by the Transport user benefitting from the service and the Transport operation manager providing the service. The Transport service manager may also monitor and control the service provision on behalf of himself as part of his QA system or on behalf of the Transport user.

The crucial relationships shown in Figure 7 will have an impact on the safety management in the transport value chain. This is further described in the safety relationships between the roles following below.

6.8 Safety related relationships between the roles

Figure 8 shows the major safety related relationships between the crucial roles. The safety relationships are of crucial importance as they consist of information flows that have a major impact on the traffic safety management. In the complete transport service value chain the actors as well as the safety relationships may vary considerably. As long as all actors are national they should all adhere to the national safety framework for transport services. In the global competition which is now the case in many transport value chains the actors are international. Hence, the safety framework for transport services is a complex conglomerates of international laws and regulations, safety awareness, safety policies and risk assessment.

1. The User (e.g. a customer to a transport operator) is assumed to have a safety awareness concerning the transport service he is going to purchase/benefit from. Based on the level of safety awareness the User may have safety requirements to the Transport service manager (TSM) that enters into an explicit or implicit agreement with the User. A public purchaser of bus transport services, e.g. Ruter in Oslo, may for instance have a requirement that the transport service provider shall be compliant with ISO 39001:2012 Road traffic safety (RTS) management systems - Requirements with guidance for use.
2. The Transport service manager (TSM) is assumed to have a safety awareness and a safety policy. Based on the awareness and policy the TSM may promote his products referring to his awareness and policy, e.g. certification in line with ISO 39001, and he may also have some safety prerequisites that the User has to take into account when considering the transport services offered by the TSM.

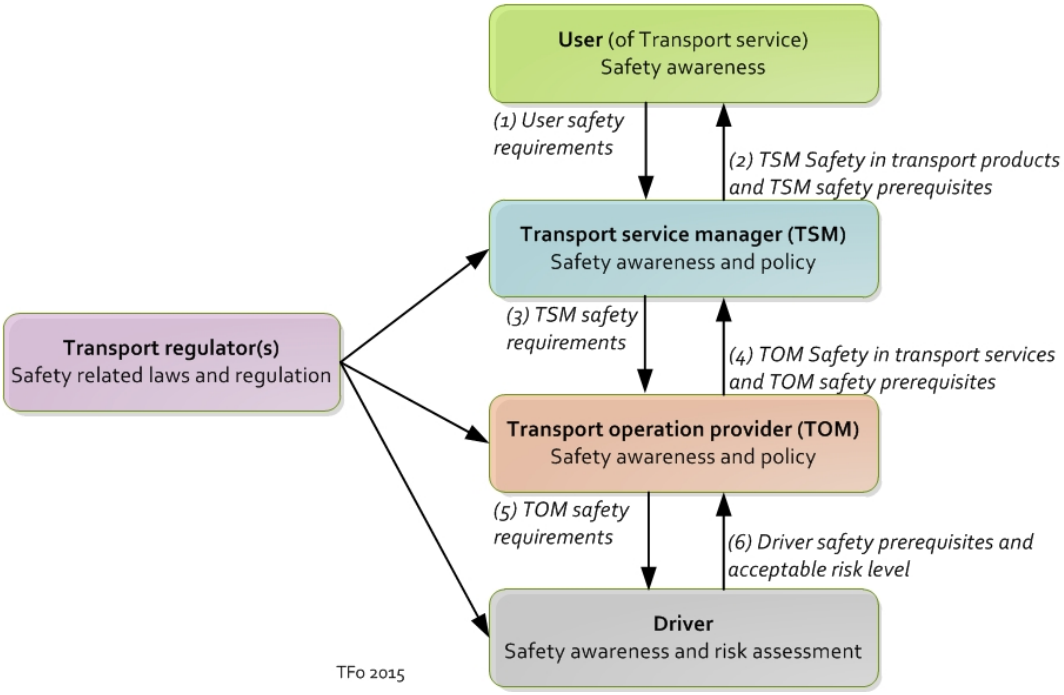

Figure 8: The safety relationships between the roles

3. The TSM will have safety requirements to the Transport operation manager (TOM) that operates the transport service, e.g. a rail service moving people and goods in a rail network. These requirements may originate from the User or they may be based on the TSM safety and awareness.
4. In same way as the TSM the Transport operation manager is assumed to have a safety awareness and a safety policy. Depending on the level of awareness and policy the TOM may promote his services referring to his awareness and policy and he may also have some safety prerequisites that the TSM

has to take into account when developing his products to the users and/or when he his selecting the TOM to operate the transport service sold to the user.

5. The Transport operation manager is the entity delivering the transport service to the user. The transport means used for delivering the transport service is operated by the Driver and the TOM may have some safety requirements that he wants the Driver to adhere to. These requirements may come from the User requirements, the TSM requirements or the safety awareness and policy of the TOM himself.
6. The Driver is assumed to have his/her own safety awareness and based on this awareness he/she will make his/her own risk assessment before and during the operation of the transport means and transport service delivery. The driver awareness and risk assessment may cause the Driver to inform the TOM about his/her safety prerequisites and/or acceptable risk level before, during or after driving/controlling the transport means. This may again have an impact on the TOM safety awareness and policy.

6.9 Conclusions

This paper covers how a set of abstract roles in the transport domain could be used to describe any configuration of real live actors in a transport service value chain. The abstract roles are the following:

- *Transport (service) user* (also called just User, Customer and Traveller) that requires a transport service. The role category covers a wide range of actors. Some examples are a person requiring a public transport service from A to B, a wholesaler that requires truck transport services for his distribution of goods to the sale points, a public transport authority (PTA) requiring bus services for the city public transport network and a tour operator that requires road, rail and sea transport services to be included in his Visit-this-country product.
- *Transport service manager* (TSM) that represents the interface between the Transport user and the transport service provision domain. This implies explicit or implicit agreements related to the service provision, transport service products marketing and transport user payments. The responsibilities of the TSM also include requiring the services from the Transport operation manager. Some examples of real life actors fulfilling the responsibilities of the TSM role are CargoNet, Bring, Ruter and AtB. The last two examples provide PT services to the PT customers based on bus transport services purchased from the Transport operation managers like Nettbuss and Tide buss.
- *Transport operation manager* (TOM) provides the transport service based on an agreement with the Transport service manager. In many cases the TSM and TOM are the same legal entity, e.g. Bring (road) and Norwegian (air).
- *Driver* who is the person driving and/controlling the transport means used for providing the transport service, e.g. a truck driver, a captain on a vessel or a pilot on an airplane, a bus driver or an engine driver (rail).
- *Transport regulator* that is the entity responsible for the laws and regulation governing the transport of objects (transport means, persons and goods) in a transport network. The Transport regulator will also monitor and enforce the laws and regulations applicable for a transport network.

The roles can be applied for all the four modes of transport, i.e. road, rail, sea and air. The common roles definition will enable the project partners and participants representing the four transport modes to describe their organisations, the roles and the actors in the different transport modes in a consistent and comparable way. Any real life actor in the transport service value chain can be allocated to one of the roles described above except actors that belong to the Transport support services domain, e.g. telecom operators providing important services in value chains in intelligent transport systems.

The paper further describes the safety relationships that are crucial for the traffic safety management in transport networks. The safety awareness, the safety policies, the risk assessment and the safety relationships are together building the safety framework applied to a transport network. A safety relationship implies in this paper requirements, constraints and prerequisites that have a safety impact on the role at the downstream

end of the relationship as shown in Figure 8. The requirements, constraints and prerequisites may be transferred to roles downstream in a transparent way. For instance, a requirement from the Transport user may be transferred in a transparent way through the Transport service manager and the Transport operation manger to the Driver. A Driver safety requirement may in the same way be transferred from the Driver up to the Transport user as a constraint or prerequisite having an impact on the Transport user choice of transport service.

References for Chapter 6

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7 Perspectives on power

7.1 Introduction

This memo is a contribution to the literature review for the project "Managing transport safety in the context of global competition". We outline four different perspectives on power and a synthesising framework:

1. *Power in action.* This perspective addresses the things actors do or may do to achieve their objectives against the preferences or interests of other actors. This is the most concrete perspective on power, because it looks at power as it is manifested in specific actions and strategies. This is also a highly dynamic perspective. Power is manifested in actions that take place at specific points in time, and timing may be essential for the actors' success in achieving their objectives.

2. *Power as a resource.* In this perspective, power is something actors *have*, and which they use to make other actors do things they otherwise would not do. The actors are well-defined – for instance individuals, groups or organisations or governments. This perspective is an important complement to "power in action", because some actors may possess resources that enable them to achieve their objectives without manifest actions that display the use of power.

3. *Power in collaboration and networks.* This perspective extends the previous perspective by conceptualising how actors may achieve their objectives by collaborating and creating coalitions and alliances. As a consequence, power is no longer located "in" specific actors but distributed in networks of actors. A central topic in this chapter is discipline, which may involve extensive control of the details of behaviour, and even cognition and emotions, of many people.

4. *Power in symbols and discourse.* In this perspective, power is not primarily something specific actors have, and which they deliberately use to achieve their objectives. Rather, power resides in discourse, i.e. in our use of language and symbols. Within a given domain of discourse, some statements appear meaningful and relevant and perhaps obviously true, whereas others appear meaningless or irrelevant. Knowledge entails constraints, regulation and the disciplining of practices (Hall, 2001). Power may be hidden in things that are tacitly assumed rather than displayed in what is stated explicitly.

5. *A synthesising framework.* In his book "Frameworks of Power" Clegg (1989) proposes a framework for analysis of power with the purpose to help sketching plausible narratives. The framework is based on thorough discussions about different theories of power. It connects different theories and opens for the opportunity to take advantage of different perspectives. Even more important, the framework proposes how different perspectives may be interconnected.

Finally, we discuss how these perspectives on power can be used to explore the research issues related to transport safety and internationalisation.

The different perspectives entail different conceptions of the nature of power. We therefore refrain from giving a rigorous definition of power at the outset of the memo.

This memo draws heavily on the report "Exploring Power Perspectives on Robust Regulation" (Rosness et al. 2011). The sections "Power in discourse" and "Critical discourse analysis" are abbreviated and slightly

adjusted versions of text written by Ulla Forseth for that report, whereas the chapter on "A synthesising framework" is based on a text written by Helene C. Blakstad.

7.2 Power in action

This perspective seeks to capture *the things people or organisations do when they exert power and when they build up and maintain their power base*. We suggest that “power in action” is an appropriate starting point for an exploration of perspectives on power. It provides a concrete grounding for the more abstract conceptions of power. This perspective is also highly practical. If successful, theories about power in action should help people and organisations identify ways to attain their goals in the presence of opposition. Equally important, theories about power in action should help us recognise the power tactics we are subjected to ourselves.

Pfeffer's book "Managing with Power" fits squarely into this perspective. Pfeffer defines power as “the potential ability to influence behavior, to change the course of events, to overcome resistance, and to get people to do things that they would not otherwise do” (p. 30). Pfeffer emphasises the positive aspect of power, the capacity to coordinate activities and achieve goals that are not attainable without such coordination. He also links power to the implementation of decisions, arguing that the way a decision is implemented is often more important than the decision itself, and that formal authority is a less effective means to get things done than it used to be. However, he also shows that power can also be used to obstruct and to prevent things from happening.

Pfeffer's book, which addresses business school students, provides a recipe for managing with power (p. 29):

1. Decide on what your goals are, what you are trying to accomplish.
2. Diagnose patterns of dependence and interdependence; what individuals are influential and important in your achieving your goal?
3. What are their points of view likely to be? How will they feel about what you are trying to do?
4. What are their power bases? Which of them is more influential in the decision?
5. What are your bases of power and influence? What bases of influence can you develop to gain more control over the situation?
6. Which of the various strategies and tactics for exercising power seem most appropriate and are likely to be effective, given the situation you confront?
7. Based on the above, choose a course of action to get something done.

This recipe requires extensive analysis of the situation. Item 4 and 5 refers to "power bases", and thus implies a notion of power as a resource. That will be the topic of the next chapter. In this chapter, we shall concentrate on the strategies and tactics proposed by Pfeffer (1992). These are mainly based on phenomena described in the social psychology literature, e.g. framing or interpersonal attraction.

Framing implies influencing the context in which a proposal is interpreted and assessed – what they are compared to, whether there is a committing history of action, and whether the associated benefits are perceived to be scarce:

- The *contrast effect* is familiar from sales situations, where an offer is made to seem inexpensive because it is presented after the customer has just been exposed to a much more expensive offer or has just invested a large sum of money. Regulatory agencies may be exploiting the contrast effect when they use a system of escalating sanctions in case of conflicts. If the first means of sanctioning does not work, the next one will appear more serious as an effect of the contrast to the initial sanction. Moreover, the stronger means of sanctioning may appear more serious when they are rarely used, because a contrast is created to the more common forms of sanctions.

- Actors may exploit the principle of *psychological commitment*, which suggests that "we are bound to actions that 1) we choose voluntarily with little or no external pressure; 2) are visible and public, so we cannot deny being responsible for them; 3) are irrevocable, so we cannot change them easily; and 4) are explicit in their implications about our attitudes, and subsequent behavior" (Pfeffer, 1992:192). A practical way to get something accomplished is thus to begin with any useful action, however small, which may produce some degree of commitment. Conversely, in order to change someone's behaviour, one may have to unbound them from past commitments. One way to get around commitments is to help the committed persons reinterpret their past, for instance to view an action that created commitment as formed by external pressure.

- According to the *scarcity* principle, things or persons or benefits are perceived as more valuable and attractive if the potential recipient believes they are scarce or difficult to obtain. Pfeffer thus suggests that "what you advocate should always appear to be scarce" (1992: 203).

Interpersonal influence tactics exploit effects that occur when persons interact in dyads or small groups. They can be based on the principle of social proof, the use of ingratiation, and the role of emotions in interpersonal influence:

- The *principle of social proof* refers to the tendency of people to ask for and be influenced by the opinions of others in situations that are characterised by uncertainty and ambiguity. Pfeffer suggests that it is common to use social proof as a strategy for making judgements even at the executive level of major organisations. A considerable momentum will build up once a social consensus starts to develop in one direction, because the perceived agreement tends to reinforce the convictions of each individual. Actors may exploit this effect by arranging group decisions in a way that ensures they have allies in the group during the early phase of a decision process.

- The use of *ingratiation* implies that an actor tries to win somebody's favour and gain an advantage by pleasing him or her. The clue is simply to appear as a likeable person, and thus as somebody one would not want to refuse a favour. The means can be simple, such as flattery, emphasising social similarity or cultivating contact and cooperation. In a social psychological perspective, bribery and palm greasing may also be viewed as instances of ingratiation. Pfeffer also draws the implication that it is important to work through friends or mutual acquaintances to influence third parties, i.e. to build and use social networks.

- *Influence through emotions* requires that we are able to control our emotions, as they are perceived by others. Emotions are used to attract or keep customers, as well as to increase the effectiveness of police interrogations (the "good cop/bad cop" strategy). Pfeffer (1992:224) emphasises that strategic display of emotions involves considerable skill and that the cost of controlling one's emotional display over sustained periods of time are considerable. He notes from his own experience that business executives often develop skills in displaying or not displaying feelings in a strategic fashion.

Timing is used both to promote and prevent specific decisions:

- *Being early* or *moving first* entails benefits as well as disadvantages. Sometimes it is possible to create a *fait accompli*, i.e. to make a change that is difficult to undo, such as hiring a person or starting a project. One sets the terms for debate and the framework for subsequent action. One may take advantage of surprise and leave one's opponents unprepared. Pfeffer suggests that "when surprised, we are likely to react emotionally rather than strategically to the situation" (19992:230).

- *Delay* is often an effective tactic to stop something. The supporters for a proposal may tire of the effort, run out of resources or no longer be around. Media pressure for action may subside as the media turn their attention to other matters. Decisions may have deadlines associated with them, or the benefits associated with a proposal may decline over time. A common way of delaying something is to call for further study or consideration.

- The *waiting game*, a variety of the use of delay, may be used as a means to display power. By making others wait, one makes them confirm one's position of power. Wasting time waiting for others also creates a behavioural commitment and may have the psychological effect of enhancing the value of what one is waiting for (Pfeffer, 1992:236).

- *Deadlines* favour the side that has momentum or the edge. They are also used to get things accomplished, by conveying a sense of urgency and importance. Deadlines are therefore often used as a countermeasure to the strategy of interminable delay. Deadlines are also used to deprive opponents of the time they need to mobilise arguments or allies to oppose a proposal.

- *Order of consideration* may have an impact on the framing of each issue or proposal, as discussed above in conjunction with the effect of contrast. A proposal will appear more attractive if it occurs after one or more unattractive proposals. Decisions that are already taken may produce psychological commitment, and thus influence later decisions. Actors may also take advantage of interdependencies of decisions. If decision A is more or less an implication of decision B and vice versa, actors may start with the issue that is most likely to yield the result they want, thus increasing the likelihood of getting their way on both issues.

- Actors may use early decisions to *build social proof* that may influence later decisions.

- *Propitious moments* are those windows of opportunity that arise when an issue is on top of the agenda, public attention is on its peak, when a proposal can find a problem to which is perceived as an appropriate solution, or when the participation and attention of decision-makers is particularly favourable with regard to a given proposal (March and Olsen, 1976). Pfeffer suggests that attention is possibly the scarcest resource in organisations (1992:245). He suggests that persistence often pays off because the likelihood of hitting the right moment increases if one makes several attempts over a sustained period of time.

Facts and their interpretation are rarely as clear-cut as we like to think, and this ambiguity can be exploited as a source of power. Pfeffer refers to this family of power tactics as ***politics of information and analysis***. Rational or seemingly rational processes of analysis can be used effectively to exert power both because the use of power can be made unobtrusive, and because information collection and analysis confer legitimacy to the ensuing decisions. Many aspects of safety lend themselves to politics of information and analysis. There is, for instance, no objective way in which we can "measure" the risk of a major accident – although we can have informed discussions and use risk analysis methods to combine experience-based judgements in a systematic and traceable manner. It is also difficult to assess the impact of organisational changes on risk levels. Pfeffer outlines several tactics related to information and analysis:

- *Employing an outside expert*, such as a consulting firm, is often more effective than depending on in house analysis. Spending money on a third party analysis creates commitment, the reputation of the analyst lends credibility to the conclusions, and it is easier to give the analysis an appearance of objectivity and impartiality.

- Analysis results may be tailored to desired conclusions through *selective use of information*, i.e. by strategically ignoring information that does not favour one's own view. Selective use of information may be incorporated into formal systems through the establishment of formal objectives, criteria or

decision rules that favour desired decision outcomes. A quest for quantification or "hard data" may be used to favour certain information sources or perspectives at the expense of others under a guise of methodological rigour. Technical skills in the collection and analysis of information can become a significant source of power if such skills are unevenly distributed among the actors.

- The tactical use of information and analysis is all the more effective because it is often difficult to trace the effects of organisational or political decisions. It is usually possible to produce alternative explanations for what could be construed as the unfavourable outcome of a decision. This opens a new field for *employment of power when decisions are evaluated in retrospect or successes and failures are accounted for*.

Actors may ***change organisational structure to consolidate their power***. A person's position in a formal organisation influences her access to information, her formal authority, her area of jurisdiction and her access to other powerful actors. Organisational design and redesign can be used to develop and exercise influence. Structures are also designed and used to produce and implement political power.

- The slogan *divide and conquer* may refer to the common experience that breaking up independent units or reducing their power usually tends to increase the power of those in more centralised positions (Pfeffer, 1992:269). The effect is not always intended. However, actors in central positions often strive to keep subdivisions with power aspirations weak or under control. Conversely, actors outside the central positions of power may strive to create separate domains with defined responsibilities as a means to establish a competing power base.

- Another structural tactic is to *expand one's domain*. We may think of organisational territory as the reach and span of activities controlled or influenced by an actor. Territorial expansion by means of structural reorganisations is thus an option for those who have gained control of a unit. One way to expand one's domain is to take on new activities and new responsibilities. Another way is to make sure one gets full value out of the domains that are already ostensibly under one's control. One may, for instance, use appointments strategically to place one's allies in key positions within the domain. One may also make aggressive use of formal powers.

- *Task forces and committees* can be useful for co-opting others (Pfeffer, 1992: 274ff). Co-optation is based on the idea that a person appointed to a board, committee or task force will develop loyalty to the organisation or unit to which the group is attached and commitment to the ideas it proposes. Decisions taken by committees and task forces come to be seen as collective decisions. This may relieve a powerful executive from the personal liability associated with making a controversial or unpopular decision. An actor using task forces and committees as a power tool may prefer to appoint task force or committee members with little expertise or interest in the issues at hand in order to control the process.

- A related tactic, which is given less attention by Pfeffer, is *change of organisational structure* as a means to deprive other actors of their power base. Organisations may devise structures where employees are no longer formally employed in the organisation where they perform their work, in order to bypass some of their rights according to the work environment legislation and tariff agreements.

Pfeffer (1992:279) uses the term ***symbolic management*** about causing others to feel good about doing what we want them to do. Political language, settings, and ceremonies can be used to elicit powerful emotions in people. He claims that "these emotions interfere with or becloud rational analysis" (1992:279). Pfeffer argues that strong norms against being influenced by emotions may actually make us deny our susceptibility to emotional appeals, and thus make us even more susceptible. He thus claims, based on his own experience,

that “people with training in engineering and business are more readily seduced by emotional appeals than people trained in literature or drama …” (1992:281).

- *Political language* involves calling things by names that are designed to manage the emotions of others. For instance, the Reagan administration passed several laws that increased the tax level, but it consistently avoided labelling these actions “tax increases”. The laws were given palatable titles such as “Tax Equity and Fiscal Responsibility Act” or “Budget Reconciliation Act”. Political language exploits our tendency to judge people by their goals and intentions, rather than by the outcomes of their actions.

- *Symbolic rewards*, such as a new title, may be used to keep potential rebellions in the fold at a very low price.

- Actors also use *ceremonies* to mobilise political support or quiet opposition. A ceremony or meeting may, for instance, be held to reassure some group in the organisation that it is important. Corporate training activities can be used for the same purpose. Even regular routine meetings often function as ceremonial occasions. This may explain why otherwise busy and efficient persons find the patience to sit through meetings they perceive as unproductive. Replacement of executives can be a ceremonial answer when a company is caught doing something illegal or improper. The message is that the company as a whole does not tolerate such behaviour.

- *Settings* and physical space may serve to represent power and even be used as a tool for the exercise of power and influence. An obvious example is executive offices, which may be designed to signal exclusivity and hierarchical power, or to signal openness and a willingness to listen. At a smaller scale, the position at the head of the meeting table or behind an imposing desk can be used to increase one’s power.

Pfeffer’s description of power tactics is interesting not only because he refers to a number of phenomena known from social psychology that may be exploited in power games. Many of the tactics described by Pfeffer will be found in a number of popular textbooks and courses directed at people who use power tactics in their daily work, such as managers, politicians and salesmen/saleswomen. This suggests that many of the tactics are in widespread use, that they are perceived to be effective, and that they may constitute a significant part of daily interaction within and between organisations.

The range of strategies and tactics available to an actor is to some extent context-dependent. The effectiveness of some tactics may depend on cultural factors. It also seems likely that the more you know about the strategies and tactics, the less are you likely to be influenced by them. Pointing out that a specific power strategy is being used may be the most effective way to make it ineffective or even backfire; people may realise that they are being manipulated and react adversely.

Two limitations of Pfeffer’s array of power strategies and tactics should be kept in mind. Because it is oriented towards psychological and social psychological theory and research, it is not clear how well it captures strategies and tactics that are used in power struggles between organisations or institutions. Secondly, the use of formal authority and legal means has not been given a prominent place in his discussions. We should be sensitive to the possibility that power struggles in a regulatory setting may involve a subtle interplay of juridical disputes and the use of informal (i.e. non-juridical) power tactics.

Secondly, this perspective is limited to episodes where well defined actors act to achieve specific objectives which require other people to act in specific ways. The other perspectives challenge these limitations. For instance, many researchers insist that power is a capacity, a potentiality which exists even if it is never displayed in the form of tactics applied in a specific episode.

Most of the power tactics are observable, in the sense that they involve overt, potentially observable actions in order to be effective. A study of the tactics in use may thus be a suitable starting point for researchers who want to explore phenomena related to power. However, characterising an action as the use of a specific power strategy or tactic, involves an act of interpretation. Others, including the actor herself, may contest our interpretations. Moreover, the interpretation of an action as the use of power may itself be a power tactic. The researcher can thus inadvertently take the role as a participant in a power struggle she claims to be observing. This kind of participating observation is not unscientific or immoral per se, but it calls for careful reflection on the role of the researcher.

7.3 Power as a resource

The most common way to think about power is probably to view it as a resource that some actors have, and which they can use to influence the actions of others. When taking this perspective, we usually think of well-defined actors such as individuals, organisations or governments. We also tend to think of these actors as goal-oriented. Moreover, we often assume that different actors can be compared with regard to their amount of power, at least within a certain domain.

Robert Dahl (1957) elaborated the idea that power is a capacity to influence the actions of other people. His starting point is an intuitive idea of power: "*A* has power over *B* to the extent that he can get *B* to do something that *B* would not otherwise do" (p. 203). The actors, *A* and *B*, may be "individuals, groups, roles, offices, governments, nation-states or other human aggregates" (p. 203). He suggests that a comprehensive statement concerning a power relation would include references to

a) the power base of *A*;
b) the means actually used by *A* to exert power over *B* in a specific situation;
c) the amount or extent of *A*'s power over *B*;
d) the scope of *A*'s power over *B*.

Applied to the relationship between a regulator and a regulated company, the *power base* of a regulator may include, e.g., the laws and regulations, the range of available policy instruments and sanctions, and the relationships of the regulatory authority with other powerful actors. We may think of the base as the set of resources that *A* may draw upon if *A* decides to exert power over *B* in a specific situation. The *scope* refers to the responses of *B* that can be influenced by *A*. A company's planning of hazardous operations is usually within the scope of a safety regulator, whereas its decisions on returns to investors usually are outside that scope.

7.3.1 An economic model of power

We will now outline a model of power and powerlessness proposed by Hernes (1978).[5] This model was published as a part of the first major research programme on power and democracy in Norway ("Maktutredningen").

The basic elements of Hernes' model are *actors* and *events* (Hernes, 1978:20). An actor may be, e.g., an individual, an organisation, an interest group or a national government. Hernes' model assumes that actors are goal-oriented. This implies that each actor deliberately chooses among alternatives and selects the option that he considers best in terms of his interests, given the knowledge that is available to him. Actors and events are linked in two ways. The outcomes of the events have different consequences for different actors.

[5] Hernes' work is strongly influenced by Coleman (1973).

Actors therefore have different *interests* attached to the events. Secondly, actors have different degrees of *control* of the outcomes.

The *power* of an actor may be understood as the sum or totality of the interests that he controls. The power of an actor includes control of the interests of *other* actors, because this is a resource she can exchange for control of her own interests. An organisation that buys a large volume of transport services is in control of the distribution of these contracts. This is a source of power, provided that several providers compete for the contracts. According to Hernes' conception of power, the buyer may exchange control with the distribution of contracts with control of transport safety in the services provided. The buyer may, e.g., include rigorous safety requirements in the contract conditions. The "machinery" of Hernes' model is thus the possibility that actors may exchange control with other actors in order to gain increased control of their own interests. Hernes treats influence as a commodity which may be exchanged in a market. He assigns values to control over events. This makes his work representative of efforts to conceive power in terms of economic concepts and principles[6], and thus to treat power as a resource.

To illustrate the reasoning in Hernes' book, we cite a representative set of implications of the model concerning conditions that may increase or decrease the power of an actor (Hernes, 1978:86-95):

a. The power of an actor is reduced to the extent that he controls little of interest to others.
b. The power of an actor is reduced to the extent that other actors control issues of great interest to him.
c. The power of an actor is reduced to the extent that he has little control of issues to be decided about or the procedural aspects of the decision process.
d. The power of an actor is reduced to the extent that he has little control of which other actors will take part in the decision process.
e. The power of an actor can be reduced to the extent that he is prevented from taking part in the decision process.

Hernes illustrates the implications of his model by a "class analysis" ("klasseanalyse"; Hernes, 1978:97-100). He starts with the claim that the central variable for analysis of the relationships between social classes is the degree of mutual dependence between superiors and subordinates at the workplaces: Inequalities between classes will be large if subordinates are highly dependent on one organisation for the satisfaction of their needs. Conversely, a more egalitarian society will emerge if superiors are highly dependent on their subordinates' support and willingness to cooperate. Hernes thus claims that technological developments which increase the need for competent and conscientious workers will increase the power of employees. Employees may also increase their power by unionizing. A union may reduce their dependability on their wages, which are controlled by their superiors, by accumulating a strike fund. A free labour market with a surplus of jobs will force the superiors to compete for workforce and reduce the power of superiors over their employees. These factors will depend on legislative conditions and their enforcement concerning issues such as freedom of association, freedom of speech, the right to change job, and prohibition of blacklisting. Hernes suggests that considerations such as these may be used to build a scale for class differences, with feudal societies towards one extreme and current Scandinavian societies towards the opposite end.

Hernes (1978) also uses the model outlined in the previous paragraph to account for *powerlessness* ("avmakt"). In his account, powerlessness is not always the same thing as lack of power. Powerlessness also occurs when actors are unable to use the control they have to take care of their interests.

Hernes (1978:137) uses the term "*false consciousness*" to refer to situations where some actors have an inaccurate understanding of how they are influenced by the actions of others, or when some actors give expressions to interests that differ from their "objective interests". The problem may be that the effects of

[6] A systematic discussion of similarities between the power model and economic concepts is given in Hernes (1978:124-126).

actions are complex and poorly understood. Powerful actors may see it in their interest to hide the effects of their actions from view of the public. One way to do this is to individualise the causation of a problem. Mass media may contribute to the formation and maintenance of false consciousness by diverting public attention from certain issues. Public documents may hide controversial issues under thick layers of bureaucratic discourse and nice intentions. Committees are often under pressure to deliver unanimous reports, and thus to suppress minority views.

Powerlessness can also occur in situations where the actors have an accurate understanding of their interests and how these interests are affected by the actions of others (Hernes, 1978:144-20). A *misrepresentation of interests* ("interesseforvridning") occurs if certain interests are underrepresented or not articulated due to a representative bias in arenas for decision-making. A misrepresentation of interests may be manifested not only by the ways interests are represented, but also by the issues that are not put on the agenda and by the circumstances that are never questioned. Institutional rules and practices may lead to a filtering of the interests that reach the attention of decision-makers. For instance, claims that can be substantiated with quantified information may have a stronger impact in many settings than claims that can only be documented in a qualitative manner. Markets are more sensitive to the needs of actors with a lot of money than they are to the needs of actors with little money. Moreover, markets are rarely sensitive to demand for options, e.g. the option to take the bus in case your car breaks down, or the option to buy your food in a local store the day you are no longer able to drive a long way to a large low-price shopping centre. Even the court system can be subject to representative bias, since actors with abundant money and legal expertise and a lot of time are in a better position to defend their interests than actors without such resources.

A third source of powerlessness is *limited knowledge about the consequences* associated with decision options (Hernes, 1978:152-164). Actors may have incorrect or insufficient knowledge about cause-effect-relationships relevant to their interests. This may even apply to actors that are otherwise resourceful, because the effects of actions in political and organisational settings are often difficult to predict. The expected positive effects may fail to materialise, or unwanted and unanticipated side effects may occur.

Finally, powerlessness may arise from unwanted *summation or interaction effects* that occur if each actor acts according to her perceived interests (Hernes, 1978:164-169). Even weak incentives may add to a huge effect if individual choices at one point in time change the conditions for choices at a later point in time. For instance, a weak preference among several persons for driving one's own car instead of taking the bus may cause buses to run less frequently, fares to rise etc., and thus cause even more people to abandon the bus. The arms race illustrates a variant of this phenomenon which may be labelled "systemic constraints" ("systemtvang"). Each party invests in arms to increase their safety, leading others to do the same, thus making everybody more unsafe and starting a new turn in a spiralling process. In this case, powerlessness occurs because one single actor is unable to change the contingencies for action on his own account. A way out of systemic coercion is collective action, where each actor accepts constraints on her own actions in order to achieve a better result for everybody. Car drivers may, for instance, accept constraints on driving in the rush-hours to reduce traffic congestions. This discussion points to the need for institutions that have the power to resolve situations where uncoordinated individual actions lead to powerlessness, and thus suggests a way to legitimise the power of social institutions.

Hernes' model seems to be representative for a dominant tradition in Norwegian research and discourse on power. There may be several reasons for this. The model "speaks the language" of social economists, and may thus borrow authority from an influential discipline. The model points toward operational interpretations to a family of questions which seem politically important, such as "who have most power", "who are the powerless", "have democratic institutions lost power during the last ten years" etc. The theory also proposes diagnosis and treatment for some sources of powerlessness.

Most people will probably perceive much of the reasoning associated with this model as compatible with common sense. This may also be considered a limitation of the model. It puts a lot of common sense into a fairly consistent system, but it fails to go much beyond common sense. Hernes' (1978) book is not likely to

surprise or provoke the readers. Its conception of power is limited. Hernes hardly refers to power in symbols and discourse, which is a major topic in current discourse on power.

Another problem is that Hernes defines “power” in terms of “control”. To most of us, these terms are very close in meaning. This threatens to make his definition circular. The model does not explain how actors gain control of events and issues in the first place; it just discusses how they can trade control in one area with control in another area. One may ask whether Hernes has provided a theory of exchange of control rather than a theory of power.

Because the model adapts economic reasoning to the exchange of control, it adopts a view of actors sometimes referred to as “economic man”, i.e. a rational, perfectly informed and self-interested creature with a stable and explicit set of goals who consistently acts so as to maximise the attainment of those goals. Hernes does discuss the implications of some possible deviations from these assumptions in conjunction with powerlessness. However, one may still argue that the core of the theory presumes a kind of actors that are somewhat different from those that have been observed in empirical studies in psychology, sociology and social anthropology.

Hernes uses the term "false consciousness" to capture situations where situations where an actor has an inaccurate understanding of how they are influenced by the actions of others, or when an actor gives expressions to interests that differ from her “objective interests”. This concept seems to imply that somebody is in a position to determine the "objective interests" of the actors that do not understand what is in their interest. This implication may be unpalatable to many from a political or ethical point of view, due to its paternalistic flavour. It may also be problematic for those who claim that interests are socially constructed, and therefore subject to competing interpretations.

7.3.2 Resource dependence and the external control of organisations

In the previous chapter, we presented an array of power strategies and tactics that can be used by actors in an intraorganisational setting. In this section, we shall introduce Pfeffer and Salancik’s (2003) analysis of power and power tactics in dealings *between* organisations.

The basic premise of Pfeffer and Salancik’s (2003; orig. ed. 1978) classic work on the external control of organisations is that no organisation is in complete control of the conditions of its own existence. Organisations have to interact with their environment to acquire the resources[7] necessary for their survival. Actors in control of these resources are in a position to exert social control of the organisation.

Pfeffer and Salancik propose an interesting distinction between organisational effectiveness and efficiency (2003:11). *Effectiveness* is thus “an *external* standard of how well the organization is meeting the demands of the various groups and organizations that are concerned with its activities” (2003:11). In contrast, organisational *efficiency* is an *internal* standard of performance, typically measured by the ratio of resources utilised to output produced. This distinction is important because efficiency is not a guarantee for organisational survival if the organisation fails to produce the outcomes that are demanded by powerful actors outside the organisation.

Another key concept is *constraints*. According to Pfeffer and Salancik (2003:14), “constraint is present whenever responses to a situation are not random”. They mainly use the term in connection with individual

[7] We did not find a formal definition of “resources” in the book, but it is clear that the authors use the concept in a broad sense, covering all kinds of inputs an organisation needs from its environment. They thus consider students a necessary resource for a university, and customers as a necessary resource for a business. This meaning of “resource” should not be confused with the meaning of the word in the title of this section (“Power as a resource”).

behaviour, pointing out that constraints can be manipulated to promote certain behaviours. Pfeffer and Salancik do assert that "organizational actions are constrained" (2003:19), but it is not clear whether "organizational actions" refers to individual actions in an organisational setting or to actions attributed to the organisation as a collective.

Pfeffer and Salancik view the organisation as "a coalition of groups and interests, each attempting to obtain something from the collectivity by interacting with others, and each with its own preferences and objectives" (2003:36). They thus view organisations as "quasimarkets, in which influence and control are negotiated and allocated according to which organisational participants are most critical to the organisations's continued survival and success". (2003:36). The role of management can thus be viewed as management of the organisational coalition, including resolution of the various conflicts among interests. The boundary of an organisation can be defined in terms of "its influence over activities compared to the influence of other social actors over the same activities of the same participants" (2003:37). Organisational effectiveness can only be defined with respect to the assessment of a particular group (e.g. owners, creditors, customers or employees), since different groups will have different demands to the organisation, and thus different criteria of effectiveness.

Interdependence exists in social systems and social interactions "whenever one actor does not entirely control the conditions necessary for the achievement of an action or for obtaining the outcome desired from that action" (Pfeffer and Salancik, 2003:40). According to this definition, a seller is interdependent with a buyer because the outcome of an attempt to sell depends on the contribution of both. *Outcome interdependence* exists when the outcomes achieved by A are interdependent with the outcomes achieved by B. *Behaviour dependence* refers to situations where the activities themselves depend on the actions of another actor. With regard to outcome interdependence, two actors are in a *competitive relationship* if the outcome achieved by A can only be higher if the outcome achieved by B becomes lower. The relationship can be characterised as *symbiotic* if the output of one is input to the other, so that it is possible for both to be better off or worse off simultaneously. The relationships between two actors can contain both competitive and symbiotic interdependence simultaneously.

Organisations have to be responsive to external demands in order to survive. Because demands may conflict, organisations cannot survive by responding completely to every environmental demand. One may then ask how organisations decide when to comply with, and when to attempt to avoid, demands from external actors. Pfeffer and Salancik propose that the following conditions affect the extent to which an organisation will comply with control attempts from a social actor (2003:44):

1. The focal organization[8] is aware of the demands.
2. The focal organization obtains some resources from the social actor making the demands.
3. The resource is a critical or important part of the focal organization's operation.
4. The social actor controls the allocation, access, or use of the resource; alternative sources for the resource are not available to the focal organization.
5. The focal organization does not control the allocation, access, or use of other resources critical to the social actor's operation and survival.
6. The actions or outputs of the focal organization are visible and can be assessed by the social actor to judge whether the actions comply with its demands.
7. The focal organization's satisfaction of the social actor's requests are [sic] not in conflict with the satisfaction of demands from other components of the environment with which it is interdependent.
8. The focal organization does not control the determination, formulation, or expression of the social actor's demands.
9. The focal organization is capable of developing actions or outcomes that will satisfy the external demands.

[8] 'The focal organisation' refers to the organisation that is subjected to control attempts.

10. The organization desires to survive.

Pfeffer and Salancik assert that the external control becomes more likely the more of the conditions are met.

What can organisations do to cope with external demands? First of all, they need to know their environment, to detect and interpret the demands posed by the environment. Pfeffer and Salancik (2003:88f) emphasise that organisations respond to an enacted environment, i.e. to what they perceive and believe about the world. They claim that the enactment process is largely determined by the existing organisational and information structures of the organisations.

Another challenge is to handle powerful external organisations that make conflicting demands. Compliance with the demands of one powerful external group may generate additional demands for various actions from that group, and it may restrict the organisation's ability to adapt to demands made by other groups in the future. Organisations use various techniques to cope with this dilemma (Pfeffer and Salancik, 2003, Ch. 5). *Secrecy or restriction of information* may be used to prevent those making demands from knowing what others are receiving, or even from finding out how well their own requests have been satisfied. As an alternative, an organisation may *explicitly play one group off against another*. The organisation may also *attend to demands sequentially*, submitting to the demands of one external group at a time. An organisation may *limit the access of various interest groups to the communication channels necessary to express a demand*, and thus avoid the necessity of explicitly refusing the demands of a strong interest group. Actors may also manage demands by *controlling the formation of demands or the definition of satisfaction.* Current trends in risk regulation, such as the use of functional requirements, acceptance criteria defined by operating companies, and references to industry standards, may open new possibilities for organisations to influence the formation of regulatory demands or the definition of satisfaction of regulatory requirements.

Pfeffer and Salancik (2003) extensively discuss the use of mergers, interorganisational cooperation through joint ventures, co-optation by means of interlocking boards of directors, and associations and cartels as means to handle interdependencies with suppliers and competitors. They also present several quantitative studies to substantiate their hypotheses. Pfeffer and Salancik claim that the main function of the board is to provide linkage with the environment. According to this argument, the inclusion of politicians in the board of a company could serve as a means for the company to influence politics, rather than vice versa.

An organisation may also use the larger social power of the state to benefit its operating environment (Pfeffer and Salancik, 2003, Ch. 8). Political outcomes often reflect the actions taken by organisations to modify their environments to suit their own interests. Organisations may attempt to establish favourable environments through *regulation*. Pfeffer and Salancik claim that regulation typically favours, or at least does not harm, the industry being regulated. For instance, they argue that occupational licensing of, e.g., dentists, lawyers and physicians serve to create a state-sanctioned monopoly, which leads to an increase in incomes of the professionals. They also claim that "regulation does not, in general, operate to benefit consumers or general public" (p. 210; see also Stigler, 1971). However, one of their examples concern weight-limits on trucks in the US. In this case, railroad companies lobbied to impose low weight-limits on trucks to limit the ability of trucks to compete with railways over long distances. Strict weight-limits were thus not to the benefit of the companies that were regulated (truck-owners).

Pfeffer and Salancik point out two limitations concerning the exercise of political influence by large organisations. First, large, diversified organisations may not have a unified structure of interests. Second, organisations may find it difficult to exercise influence in open arenas if they appear too powerful.

Pfeffer and Salancik (2003, Ch. 9) suggest that there are links between (1) the environment of an organisation, (2) selection and removal of executives, and (3) organisational actions with regard to the environment. They propose that

1. The environmental context, with its contingencies, uncertainties, and interdependencies, influences the distribution of power and control within the organization.
2. The distribution of power and control within the organization affects the tenure and selection of major organizational administrators.
3. Organizational policies and structures are results of decisions affected by the distribution of power and control.
4. Administrators who control organizational activities affect those activities and resulting structures (p. 228).

This mechanism is illustrated in **Figure 9**.

This mechanism suggests that powerful external actors may have an impact on the power distribution among departments within an organisation, and on the selection and removal of executives. This influence is indirect. External actors will usually not nominate executives, but they create a situation where certain parts of the organisation gain power because they have the key to securing critical resources. The distribution of power within the organisation may then have an impact on who are selected as executives, e.g. whether executives will have a background as lawyers, economists or engineers. Similarly, if the need for interorganisational coordination among competitors is pressing, executives may be more likely to be recruited from within the same industry.

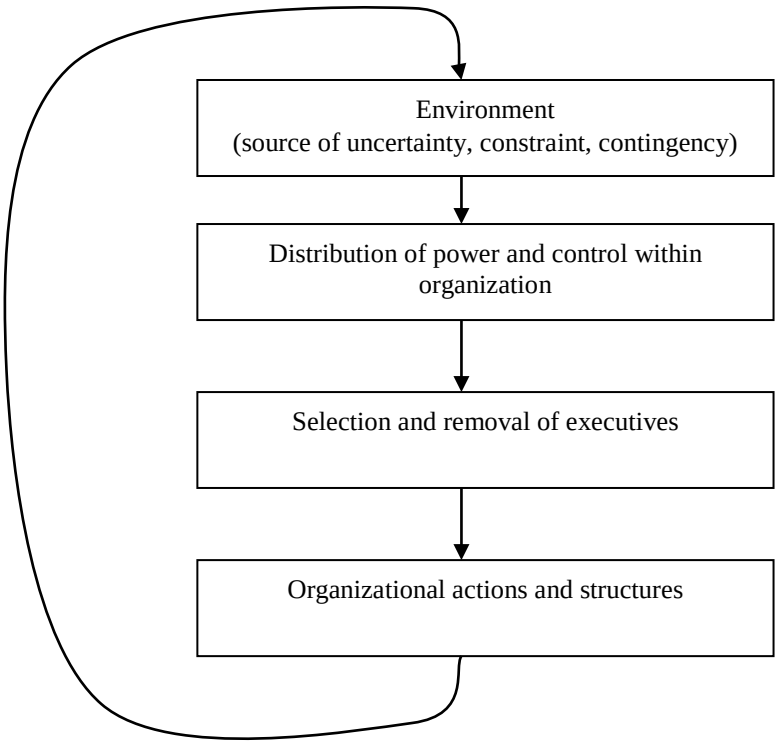

Figure 9. Mechanism by which organisational environments may affect organisations. Adapted from Pfeffer and Salancik, 2003, p. 229.

We will conclude this summary by citing a list of conditions that facilitate a social actor's[9] control of an organisation (Pfeffer and Salancik, 2003:260):

1) The possession of some resource by the social actor
2) The importance of the resource to the focal organization; its criticality for the organization's activities and survival
3) The inability of the focal organization to obtain the resource elsewhere
4) The visibility of the behaviour or activity being controlled
5) The social actor's discretion in the allocation, access, and use of the critical resource
6) The focal organization's discretion and capability to take the desired action
7) The focal organization's lack of control over resources critical to the social actor
8) The ability of the social actor to make its preferences known to the focal organization

Pfeffer and Salancik's book was theoretically important because it elaborated the notion of organisations as open systems. Whereas many authors embrace the notion of organisations as open systems on an abstract level, their analyses do not always go much beyond general characteristics of an undifferentiated environment as "turbulent" or "competitive". Pfeffer and Salancik discuss specific strategies to handle competing and often incompatible demands on an organisation. They do this within a framework which recognises sensemaking processes (the social construction of the environment) as well as power bases and power tactics. Thus they contribute to two perspectives on power; "power in action" and "power as a resource". They substantiate their theorising by several quantitative studies, mainly within a correlational paradigm.

Pfeffer and Salancik's work is not a general theory of power. It is specifically directed at situations where an external actor attempts to exert influence on an organisation. This makes their work pertinent to power issues related to the interaction between regulatory authorities and companies in the transport sector. Issues related to power at the interorganisational level may become more important as many organisations become increasingly fragmented due to outsourcing.

Pfeffer and Salancik's conception of the boundary of an organisation based on its range of influence may be useful in many contexts when dealing with industries characterised by extensive outsourcing, such as the transport sector.

It is now more than thirty years since the first issue of Pfeffer and Salancik's book appeared. The empirical work presented in the book represents a certain time and place. It should not be taken for granted that the external actors' attempts to control organisations and the organisations' responses will remain the same at other times and places. One may, for instance, ask whether outsourcing functions to rather small and powerless firms is increasingly used as a means for organisations to tighten the control of the outsourced functions. We would also expect companies to adjust their lobbying strategies as national authorities lose power to supranational bodies such as the European Union. It also appears that lobbying activities have become increasingly professionalised, to the extent that lobbying and influence on public opinion has become an industry in its own right.

7.4 Power in collaboration and networks

In the previous sections, we have concentrated on situations where one actor, often an individual, attempts to influence the actions of another actor. However, actors often achieve their objectives by collaborating and

[9] It is our interpretation that 'social actors' may refer to a broad range of entities, such as organisations, regulatory agencies, interest groups, and even individuals who possess a sufficient power base.

creating coalitions and alliances. To conceptualise this, we need to introduce additional theoretical perspectives.

7.4.1 The ugly and the pretty faces of power

First of all, the concept of power may take on different significance when we use it to analyse collaboration rather than a conflict of interests. A common way to conceptualise this distinction is to use the terms *power to* and *power over* (e.g., Clegg et al., 2006, Ch. 7; Goehler, 2009). "Power to" expresses the idea that power is facilitative, that it represents a capacity to do things that would otherwise be impossible. "Power over" emphasises the repressive aspect of power, i.e. the idea that power may restrict the scope of action for those that are subjected to it.

"Power over" is relational, i.e. it refers to a relationship between two actors (Goehler, 2000; Engelstad, 2005). This is well captured by Robert Dahl's initial definition, which we cited in the chapter: "*A* has power over *B* to the extent that he can get *B* to do something that *B* would not otherwise do" (Dahl, 1957:203). This definition clearly implies an asymmetric relation between two actors.

A well-known conceptualisation of "power to" is Parsons' definition of "power":

Power then is generalised capacity to secure the performance of binding obligations by units in a system of collective organization when the obligations are legitimized with reference to their bearing on collective goals and where in the case of recalcitrance there is a presumption of enforcement by negative situational sanctions – whatever the actual agency of that enforcement (Parsons, 1967, p. 308; quoted in Lukes, 2005, p. 31)

This definition enabled Parsons to reconcile the notion of "power" with the stress of functionalist social theory on social order and consensus, and with the tendency of functionalism to play down contradiction and conflict.[10] Parsons thinks of power as a circulatory medium, analogous to money (Clegg et al., 2006: 193ff). Thus both money and power depend on popular confidence in their currency; this it what provides them with legitimacy. There are, however, fundamental limitations to this power/money analogy. Power requires and is specific to a particular organizational context; whereas money can buy anything anywhere its value and legitimacy are recognised. Another difference is that anybody can use money to buy things, whereas power is reserved for those in a hierarchical position endowed with authority. A problematic aspect of Parsons' conception of power is that it presumes that authority and legitimacy derive in a "natural" manner from shared system goals. It tends to play down hierarchy and division, and ensuing conflicts of interest. Power is treated as legitimate by definition. It would appear that such a conception of power has limited utility for exploring social processes characterised by conflicts and opposing interests.

Goehler (2000) takes the distinction between ”power to” and ”power over” one step further. He uses the term ”transitive power” in the sense of ”power over". In contrast, he coins the term ”intransitive power” based on Hannah Arendt's (1958) notion of power as ”speaking and acting in concert” (cited from Goehler, 2000: 41). The terms ”transitive” and ”intransitive” are used in analogy to the grammatical distinction between transitive verbs, which refer to actions being done on somebody or something, and intransitive verbs, which refer back to the subject. According to Goehler, power is transitive when it refers to others, whereas it is intransitive when it refers back to itself.

Goehler points out that transitive power is not possible without counter-power – otherwise it would be reduced to pure force or violence. An actor A who wants to exercise power over B is well advised to take the B's counter-power into consideration. Moreover, the separation and balancing of different and often

[10] The discussion of Parsons' theories in this report is based secondary literature, in particular Clegg et al. (2006) and Hindess (1996).

complementary forms of transitive power is a prominent aspect of Western liberal democracies. For instance, elected officials exercise power on behalf of the electorate, whereas the electorate may exercise control by voting officials out of office. Common to all forms of transitive power is that they involve zero-sum games. An actor can only gain power if one or more other actors lose power.

Intransitive power is, in contrast, not a zero-sum game. It is self-referential, in the sense of "powerfulness" or "self-empowerment" (Goehler, 2000:45). The exercise of intransitive power involves an intensification of common action. This conception of power has commonalities with Parsons' conception of power as a circulating medium through which obligations are exchanged in a political system. However, according to Goehler (2000:46), Arendt understands power as an end in itself, rather than a means to attain external ends. Following Aristotle, she claims that humans are essentially communitarian beings. It is only within a community taking the form of political praxis that humans can realise their telos, i.e. their inner nature or ultimate purpose as human beings.

Goehler points out that intransitive power produces both an increase and a decrease in the actors' options (Goehler, 2000:49-50). It helps overcoming the limits of the zero-sum game of power, but at the same time sets clear limitations upon the exercise of transitive power. Goehler recognises that transitive power may play a considerable role in the historical emergence of a common space of action, which is a precondition for the emergence of intransitive power.

Goehler states that transitive and intransitive power correspond to the two basic functions of politics: regulation and integration (p. 52). By *regulation*, he understands all forms of goal-directed controls over actors' options in a political unit. This corresponds to the model of transitive power: Regulator A attempts to make the regulated actor B do something B would not otherwise do, either by restricting B's options or by making certain options appear desirable. The concept of *integration* points to the question as to what holds a society or community together. Goehler distinguishes between technical integration, which concerns the exercise of transitive power, and normative integration, which "can be understood as the process and results of citizens' permanently renewed orientations towards the basic values and principles of a political order (Goehler, 2000:52-53). Normative integration brings about the requisite identification and collective identity.

According to Clegg et al. (2006:102), Max Weber defined *power* ("Macht") in various but related ways in his writings. His most concise definition is that power is "the possibility of imposing one's will upon the behaviour of other persons", especially where this will is resisted by those over whom it is exercised. He also defined a narrower term *domination* ("Herrschaft") as "the probability that a command with a given specific content will be obeyed by a given group of persons" (Clegg et al., 2006:102).[11]

Weber (1971:91-104) pointed out that the likelihood that an order would be obeyed could rest on a variety of motives. A person may obey based on a rational consideration of his or her interests, based on habit, or based on a purely personal inclination to obey. However, he maintains, a relationship of domination that depends on such preconditions would not be very stable. A long term relationship of domination is therefore usually based on legitimacy among those who rule as well as those who obey. Weber claimed that there were only *three distinct bases for legitimate authority*:

1. *Legal authority*, i.e. domination founded on law. Weber considered bureaucracy the purest form of legal authority. In this case a person is not obeyed for reasons related to his person, but because a *legal provision* regulates who is to be obeyed, under what conditions, and to what extent.

[11] The translation of the German word "Herrschaft" to English is problematic, as the term seems to capture aspects of both "authority" and "rule" and "domination". Translating "Herrschaft" with "authority" may in some cases be misleading, as it may play down Weber's orientation towards conflict and dominance (Clegg et al., 2006). We will translate the general term "Herrschaft" with domination, and reserve the term "authority" for the narrower concept of legitimate authority.

2. *Traditional authority* is founded on a belief that the relationships of domination that exist from ancient times are sacred, i.e. not to be challenged or disrespected.
3. *Charismatic authority* is based on an emotional commitment to the person of a ruler and his charisma – which may range from magical powers or heroic deeds to eloquence and persuasiveness.

Weber's theorising on dominance is analytic rather than normative. He tries to analyse how stable relationships of dominance are established and maintained. He views legitimacy as a means to ensure the stability and robustness of a relationship of dominance. He is fascinated by the bureaucracy as an organisational form, but his point is not to defend specific forms or patterns of dominance.

The dichotomies discussed in this section, "power over" versus "power to", "transitive power" versus intransitive power", and "legitimate power" versus "non-legitimate power" seek to capture the ambivalent nature of power. Power may be facilitating, productive, legitimate and an end in itself – or it may be illegitimate, involve domination and/or be used against the interests of the subordinate or powerless. The main contribution of the three dichotomies is to give us concepts to analyse this dual or ambivalent nature of power, its "pretty" and "ugly" faces.

These dichotomies raise the issue of whether instances of power or its use can be neatly divided into two categories. Is it possible to have "power to" without "power over", intransitive power without transitive power, coordination without dominance? Clegg et al. (2006:191) maintain that power as such is neither "over" nor "to": "Power will always exist in a complex contingent tension between a capacity to extend the freedom of some to achieve something or other and an ability to restrict the freedom of others in doing something or other". Power is "over" or "to" depending on the specific situation and the position of the actor in question. Power is always both constraining and facilitating – but it may be constraining and facilitating in different degrees for different actors. This will be illustrated in the next section, which is concerned with the varieties of discipline.

7.4.2 Varieties of discipline

In the previous section we discussed the ambivalent nature of power – power as facilitating and productive, but also as restricting and repressive. This ambivalence clearly applies to discipline. Foucault (2008) described discipline as a power exercised over one or more individuals in order to provide them with particular skills and attributes, to develop their capacity for self-control, to promote their ability to act in concert, to render them amenable to instruction, or to mould their characters in other ways (Hindess, 1996:113). Discipline thus tends to be productive as well as repressive. It constrains those over whom it is exercised, but at the same time enhances and makes use of their capacities.

Foucault (2008) described how, in seventeenth century Europe, disciplinary techniques came to be seen as a generalised means of controlling and making use of human behaviour. Disciplinary techniques allowed the management of a population in its depths and details. They could be applied to education and training, military organisations, and the regulation of hospitals, prisons and other institutions of confinement. Discipline was seen as a technology, both in the sense that individuals and human aggregates are seen as a source of energy to be harnessed and put to use, but also in the sense that discipline should be based on a continual refinement of its own techniques. Foucault used the modern prison to illustrate the principles of discipline. However, he insisted that discipline (or "the prison-like") is a ubiquitous feature of modern societies; it is not restricted to schools, prisons and military camps.

Several features of discipline are thus demonstrated by the *panopticon* (Foucault, 2008). From a physical point of view, the panopticon was a prison with cell blocks situated around a central area or tower. Each cell was backlit with natural light so that the guards in the central room could observe the prisoners in the cells at any time, whereas the guards were invisible to the prisoners. The prisoners did not know whether or not they

were observed at any particular time. All they knew was that they were under the risk of being watched at any time.

The panopticon was not just a building or a surveillance system. It was an institution with a system of records and rules, comprising disciplinary power (Clegg et al., 2006:45). The routines and details of everyday working life was regulated through training and practices that sought to constrain human actions in accordance with established limits of behaviour and standards to be achieved. The panopticon was thus a machinery for behavioural engineering.

The utilitarian philosopher Jeremy Bentham proposed the panopticon as an optimal design for a poorhouse or prison (Clegg et al., 2006:43). His goal was to produce honest labourers, individuals who would think as liberal subjects, capable of calculating their best interests and acting on them. Because the inmates did not know if they were being observed, they would behave as if they were observed continuously for fear of being corrected and disciplined. Bentham thus promoted the panopticon as a particularly cost-effective instrument to convert vagabonds into liberal subjects adapted to a society based on the principles of utilitarianism.

According to Clegg et al. (2006:45-46), F. W. Taylor's work on *scientific management* (Taylor, 1911) "took utilitarianism from a program for dealing with the marginal and abnormal, the other, and transposed it into a program for dealing with the everyday and the normal, the worker. ... Whereas Bentham was concerned with bringing idle hands to work, Taylor's utilitarian calculus was oriented to the problem of making hands already at work even more productive, for the greatest good of national efficiency and for the better reward of both hands and the businesses that employed them." Scientific management required taking power and knowledge out the hands of the workers and placing them in the hands of management (Clegg et al., 2006:46).

The best known aspect of Taylor's work is his time and motion studies. He observed and analysed work performance in detail, in order to redesign it to achieve higher efficiency. An important premise was a radical division of labour between the mental labour of oversight and the manual labour of the production worker (Clegg at al., 2006:46). The time studies served to identify the fastest production rate among the workers, to understand how it was possible, to establish it as a standard for all employees, and to establish an appropriate production rate to use as a basis for incentive payment. This approach required tasks to be repetitious, with minimal task variability.

According to Clegg et al. (2006:49), "Taylor took the battle against lazy, imperfect, and other malfunctioning hands into the workshop. What was required was reform that would mean that the value of a thing or an action would be determined by its utility." At the same time, Taylor thought that scientific management enhanced the power of workers by making them into more efficient machines with an enhanced capacity to earn income. However, the value of the individual worker's task-related knowledge and experience was drastically reduced, since anyone could be trained to undertake the task using Taylorist methods.

Henry Ford's introduction of assembly line production advanced some aspects of scientific management, whereas other aspects were changed (Clegg et al., 2006:55-60). The elemental decomposition of job remained. However, the job pace was maintained through the speed of the assembly line, and not through piece-rate payment.

Within a few decades, taylorism with its discipline and emphasis on efficiency permeated into the world outside the workplace. Modern warehouses, for instance, are designed to maximise efficiency, and they discipline the customers by introducing self-service. Kanigel (1997:7) observed that "Taylor's thinking ... so permeates the soil in modern life we no longer realise it's there".

Henry Ford established a Sociological Department to ensure that only deserving workers received the high wages that Ford's factories were paying.[12] The Sociological Department visited the employee's homes and maintained extensive records on each employee. Workers who failed to live up to the standards of Ford Motor Company outside the workplace would first receive a warning, and they could subsequently be dismissed. The work of the Sociological Department extended the control of workers into their homes and their leisure time, and thus reflected the idea that it was not enough to control the movements of bodies at work. However, direct control of work performance through routines and through the physical and temporal constraints of the assembly line was still viewed as the obvious way to maximise productivity.

Taylor was also aware that informal groups on the factory floor could work against the productivity objectives of management. His answer was to suppress unwanted impact of informal group processes by taking direct control of individual behaviour. A more radical departure from the direct control of individual bodies was advocated by the Human Relations School (Clegg et al., 2006, Chapter 3). Its proponents argued that informal work group relations should be brought to sustain the formal systems. Formal systems should mesh with, rather than suppress the informal system. Special attention should be paid to motivation of the individual employee. The objective of the Human Relations School is not to abandon management control, but rather to create patterns of spontaneous obedience by aligning informal group processes with management objectives. As a consequence, an important task of managers became to harness informal groups and get them working for the organisations, to realign misaligned values in the organisation, or in other words: to build a culture of commitment. To achieve this, managers needed to develop sensitivity to group processes, communication skills and even clinical and counselling skills.

Mary Parker Follett (1918 and 1924; referenced in Clegg et al., 2006) was more explicit about power than most authors writing in the Human Relations tradition. She argued that power in organisations should be democratised to be brought in accord with American ideals of democracy. She distinguished between 'power with' (coactive power) and 'power over' (coercive power). Democracy should be participatory, because the experience of being participative was empowering and educative. An important part of her argument was that participation built the legitimacy of coactively constituted power (Clegg et al., 2006:75).

Many of the ideas proposed by Follett are captured in the notion "social capital", which has been defined as "the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghoshal, 1998:243, cited by Clegg et al., 2006:87). According to Clegg et al., social capital is commonly conceptualised in terms of three dimensions:

1. The structural dimension, i.e. overall patterns of connection, e.g. presence or absence of network ties, density, connectivity, hierarchy.
2. The relational dimension, i.e. assets created and leveraged through relationships, such as trust, trustworthiness, norms, sanctions, obligations, expectations, identity and identification.
3. The cognitive dimension refers to resources that provide shared representations, interpretation, and systems of meaning among parties.

The social capital concept depicts the employee as a "knowledge worker" who can potentially go to another employee, and therefore must be kept loyal by avoidance of coercion and by use of soft power (Clegg et al., 2006). It has been proposed that trust needs to be "managed" as a means of control, for instance by actively manipulating the goodwill of the employee by increasing her identification with the organisation. The emergence of the "knowledge worker" has also given impetus to "knowledge management", which Clegg et al. (2006:87-88) regard as the newest clone of scientific management, as it seeks to draw from the tacit

[12] The Sociological Department was established in 1914. In 1921 it was turned into the Service Department, described by Clegg et al. (2006:59-60) as "a private army of thugs and gangsters to terrorize workers and prevent unionization. Ford's service department would grow to be the largest police force in the world at that time. Its major work was spying such that no one who worked for Ford was safe from spies ... "

knowledge of individuals and the social capital of the group to construct new and improved routines. In this sense, knowledge management extends scientific management from the body to the brain.

In the preceding paragraphs we have outlined two competing approaches to discipline in the workplace. The first one, represented by scientific management, was directed at the control of the individual body according to a system of division of work, standardisation of task performance according detailed routines prescribed by management and piece-rate payment. The second one, represented by the Human Relations School, employed soft power and aimed to influence informal group processes and individual motivation. To what extent can we trace an impact from these two main traditions in the field of safety at the workplace?

One way to organise different approaches to safety at the workplace is to pit approaches directed at modifying individual behaviour against systems oriented approaches that involve adaptation of the technology and the organisation to the capacities and needs of the worker (Ryggvik, 2008a). The approaches directed at individual behaviour have adopted some features of scientific management, whereas the systems oriented approaches have adopted some ideas from the Human Relations School.

The Behaviour Based Safety (BBS) programmes adopted by various oil companies during the last two decades exemplify safety work directed at modifying individual behaviour (Engen and Lindøe, 2008; Ryggvik, 2008a). These approaches are often promoted by a claim that an overwhelming majority of accidents are caused by human error at the sharp end of the organisation, and that major accidents and minor accidents have similar patterns of causation (Ryggvik, 2008a). BBS typically involves the identification of critical behaviour, the definition of behavioural norms, observation and feedback. There are thus parallels to scientific management in the goal of prescribing and controlling individual behaviour, in the definition of behavioural norms, and the use of observation and feedback, and also in the way the approach is presented as scientific, empirical and quantitative. However, some BBS programmes include employee participation in the identification of critical behaviour and the definition of behavioural norms.

In contrast, the systems-oriented (sociotechnical or MTO[13]) approaches insist that causal analysis of accidents should go beyond human error and capture conditions that were conducive to human errors or conditions that made the system vulnerable to human errors. Systems should be designed in a way that minimises the likelihood of serious human errors, and that gives operators the opportunity to recover from errors. Technical and physical barriers should be introduced to minimise the likelihood of serious consequences of un-recovered errors. Proponents of systems-oriented approaches tend to emphasise the need for user-participation in systems development – not always for the sake of democracy per se, but rather in order to identify the best solutions and to promote user acceptance of the final system. These approaches appear to have been influenced both by the scientific management tradition (through their roots in ergonomics or human engineering) and by the human relations school (with regard to their emphasis on user participation and their insistence that technical systems should be adapted to the needs and capacities of the worker and not vice versa). The system-oriented approaches do attempt to influence human behaviour, but the preferred means to achieve this is to provide a technology which facilitates correct performance and constrains the user in order to reduce the likelihood of erroneous actions.

An account of a topic such as discipline and management can never be ”objective” or ”neutral”. The account above is characterised by its emphasis on the forms of power proposed or employed. Some readers who are familiar with the management literature, may find this account somewhat alien or unfamiliar, since many authors in management tradition do not discuss power explicitly, although their main purpose may be to teach managers how to control their employees in the most effective manner.

The pervasiveness of discipline also implies that we tend to take many of its accompanying premises for given. As Clegg et al. (2006:60-61) remark:

[13] MTO – Man – Technology – Organisation.

Taylor's way of framing scientific management normalized hierarchy and the functioning of rules and inscribed power as a less central concept, something not implicated in hierarchy or rules in use. In fact, its 'science' legitimated the normalcy of these to such an extent that power came to be seen only as a category of irrationality because to resist science, by definition, was to oppose reason.

Scientific management not only involved the detailed control of the actions of workers in the factories. It also had a pervasive influence on how we think about management, what we take as given, and what propositions are deemed to be meaningless or irrational. This is a prominent example of power in discourse, which is the topic of a later section.

To what extent have regulatory practices been influenced by the disciplinary approaches outlined in this section? The literature that we have studied is not explicit about this issue. There are obvious analogies. Regulatory authorities stipulate rules, observe compliance, and distribute sanctions. There has been a concern about making this process more efficient – for instance by delegating responsibility for inspection tasks to the regulated companies (internal control, enforced self-regulation) and requiring the companies to document their safety work in a way that facilitates regulatory control. It is tempting to think of enforced self-regulation (internal control) as an attempt to build a "regulatory panopticon", which enables the regulator to survey the safety work of the companies without being present with their own inspectors at all times. There are, however, limits to these analogies. The "classical" approaches to discipline (prisons, Taylorism) primarily targeted individuals, whereas safety regulation to an increasing degree targets formal organisations. There is also a significant difference in the scope for surveillance. Employers are usually able to monitor their employees more or less continuously in a number of ways. In contrast, regulatory authorities usually have to monitor the regulated companies on an intermittent basis. It seems clear, however, that the current regulatory regimes presuppose some kind of discipline in the regulated companies.

7.4.3 Principal-agent theory

Principal-agent theory is a formal approach to specifying how a principal (e.g. county authorities) hiring an agent (e.g. a car ferry operator) can design effective incentives under conditions of incomplete information about the agent's behaviour (Eisenhardt, 1989). It is assumed that the principal and the agent engaging in cooperative behaviour have different goals and/or different attitudes toward risk. The idea is to devise a contract that changes the rules of the game so that the self-interested, rational choices of the agent coincide with what the principal desires. A central concern is *moral hazard*, i.e. the possibility that the agent may act in ways that are not observable to the principal and that conflict with what the principal desires. The principal may, for instance, invest in information systems to monitor the behaviour of the agent, or turn to outcome-based contracts to align the interests of the agent with those of the principal.

Eisenhardt (1989:61-63) used the following propositions to convey the logics of principal-agent theory:

1. Information systems are positively related to behavior-based contracts and negatively related to outcome-based contracts.
2. Outcome uncertainty is positively related to behavior-based contracts and negatively related to outcome-based contracts.
3. The risk aversion of the agent is positively related to behavior-based contracts and negatively related to outcome-based contracts.
4. The risk aversion of the principal is negatively related to behavior-based contracts and positively related to outcome-based contracts.
5. The goal conflict between principal and agent is negatively related to behavior-based contracts and positively related to outcome-based contracts.
6. Task programmability is positively related to behavior-based contracts and negatively related to outcome-based contracts.

7. Outcome measurability is negatively related to behavior-based contracts and positively related to outcome-based contracts.
8. The length of the agency relationship is positively related to behavior-based contracts and negatively related to outcome-based contracts.

According to Eisenhardt, principal-agent theory indicates which contract is most efficient under varying levels of the variables included in the propositions. The first proposition suggests that the principal has two options when the agent's behaviour is not observable. The principal may either invest in information systems (e.g., an audit and inspection regime) to make the behaviour of the agent observable, or turn to an outcome-based contract to align the interests of the principal and the agent. The second proposition suggests that outcome-based contracts are less efficient if there is a high degree of outcome uncertainty, i.e. if outcomes are only partly a function of agent behaviour. The third proposition suggests that it becomes more attractive to pass risk to the agent by using an outcome-based contract if the agent is less risk averse. It also becomes more attractive to use an outcome-based contract if the principal is more risk averse, since the outcome-based contract passes risk to the agent (proposition 4). Proposition 5 suggests that, under the assumption of a risk-averse agent, a behaviour-based contract becomes more attractive if there is a little or no goal conflict between the principal and the agent. According to proposition 6, behaviour-based contracts become more attractive if appropriate agent behaviour can be specified in advance. Proposition 7 suggests that outcome-based contracts become less attractive if the outcome is difficult to measure.

Eisenhardt (1989) also outlined a closely related but less formalised research tradition, *positivist agency theory*. This research mainly deals with the principal-agent relationships between owners and managers of large, public corporations. Eisenhardt also reviewed seven empirical studies within the positivist tradition and five empirical studies within the principal-agent-tradition. She concluded that there was support for the principal-agent hypotheses linking contract form with (a) information systems, (b) outcome uncertainty, (c) outcome measurability, (d) time, and (e) task programmability (Eisenhardt, 1989:70). Support here implies that the principals tended to behave in accordance with the prescriptions of principal-agent theory.

The idea that “what you measure is what you get” pervades management theory and practice (e.g. Kaplan and Norton, 1992) to the extent that it may suppress alternative views on what stimulates good performance. One may ask whether the assumption that agent behaviour is opportunistic and driven by narrow self-interest may turn into a self-fulfilling prophesy when principals behave in accordance with this assumption. Such concerns may be less pressing if principal-agent theory is used to identify and remove undesirable effects of incentive structures rather than to use incentives as a source of power.

Another limitation of principal-agent theory is that it does not explicate the social processes that link certain incentive schemes and information schemes with effects on agent behaviour. This may not be a big issue when we consider contracts between individuals. However, when it comes to contracts between organisations, principal-agent theory seems to "black-box" the specifics of how different persons and groups in the principal and agent organisations adapt to the incentives. Forseth et al. (2011) found that drilling contractors on the Norwegian shelf did not inform drilling crews about the details of rate structures because they did not want to cause stress and shortcuts in situations where the operations had to stop and the rate was reduced to zero. This example suggests that some of the predictions that can be made using principal-agent theory may turn out to be self-falsifying if the actors involved decide that they do not want these predictions to come true.

It is not obvious where principal-agent theory fits in with the categorisation of theories of power used in this report. The analytic focus is the contract between the principal and the agent, but the theory takes into account the preferences of both parties (e.g. their risk appetite) as well as circumstances such as the observability of agent behaviour or the uncertainty of the outcome of the agent's efforts. The focus on observation and information systems as well as the use of incentives (i.e. penalties and rewards) resembles the disciplinary approaches reviewed in the previous section. However, principal-agent theory does not seem

to comprise an ambition to change the agent beyond the immediate effects of the contract, whereas the classic approaches to discipline tend to incorporate an ambition to "improve" or "mould" the persons that are subject to discipline. The idea of changing the rules of the game so that the self-interested, rational choices of the agent coincide with what the principal desires is another reason for discussing principal-agent theory in the context of power in collaboration and networks. Principal-agent theory may also be viewed as an extension of the economic model of power discussed in Section 7.3.1, since it prescribes how a principal can use his control of resources that are of interest to the agent as a source of power.

7.4.4 Actor-network theory

When power is created or augmented through collaboration, we may need to think of power as distributed in networks of actors, rather than as a resource located "in" a specific actor. Actor-network theory (ANT) is an example of how this can be done. Actor-network theory (ANT) is not a theory in a strict sense, i.e. a consistent body of statements from which one may derive testable hypotheses and then validate the theory through empirical research. One may rather think of ANT as a perspective on the mechanics of power and organisation (Law 1992). Society, organisations, agents and machines are all viewed as effects generated in *patterned networks of diverse materials*. The nodes in the network may be anything material, such as people, machines, animals, documents, talk, money, or computer terminals. To order such diverse materials into a patterned network requires resistance to be overcome. The social is not viewed as just a set of relationships between humans. Material objects participate in the social. The task of the researcher is to identify those networks of heterogeneous materials, and to explore how they come to be patterned to generate effects like organisations, knowledge or power.

Early studies in this tradition examined the production of scientific knowledge, asking "where does knowledge come from?" (e.g. Latour, 1987). Their answer was that scientific knowledge is "the end product of a lot of hard work in which heterogeneous bits and pieces – test tubes, reagents, organisms, skilled hands, scanning electron microscopes, radiation monitors, other scientists, articles, computer terminals, and all the rest – that would like to make off on their own are juxtaposed into a patterned network which overcomes their resistance" (Law, 1992:2). This account is radically different from the accounts given by most textbooks on scientific methods. Moreover, hardcore ANT proponents like to put the term "knowledge" in inverted commas because it always takes material forms, such as talks, conference presentations, papers or books (Law, 1992:2).

Another analytic principle of ANT is to treat humans and objects on equal terms. ANT rejects any a priory claim that either humans or objects determine the patterning of networks. Social relations may shape machines or vice versa in particular cases, but this is an empirical question which has to be examined in each particular case. Managers may have politics, but so may computers and buildings [14]. They are all capable of offering resistance. A manager may try to impose certain patterns of communication on an organisation, but so may also a building – for instance by separating people by distances or physical barriers, or by bringing them together at the coffee machine.

Law (1992:4) claims that "people are who they are because they are a patterned network of heterogeneous materials. If you took away my computer, my colleagues, my office, my books, my desk, my telephone I wouldn't be a sociologist writing papers, delivering lectures, and producing 'knowledge'". In the ANT perspective, an actor – be it a sociologist or his computer or a piece of paper – is also a network. This is the origin of the term "Actor-Network".

[14] The following definition of "politics", which was captured from *Encarta Dictionary: English (North America)*, may help readers make sense of this claim: "**politics (3): power relationships in a specific field**: the interrelationships between the people, groups, or organizations in a particular area of life especially insofar as they involve power and influence or conflict."

In everyday life, networks tend to be concealed from view. We think of our television sets and banks as single blocks as long as they act as single blocks. We take the effects they produce for granted. We change perspective only when networks stop acting as a single block. A financial crisis may cause us to think of our bank as a complex network of financial transactions. We realise that the bank's capacity to provide us with loans depends on this network, and that this network may break down. At another time, a breakdown in a data transmission may remind us that the bank is also an information transmission network.

Such simplifying effects are sometimes referred to as *punctualisations*. Punctualisations tend to occur when networks patterns are widely performed and can be taken for granted. Punctualisations allow us to count on networks as resources, i.e. as network packages which we can count on. The alternative to punctualisations is to deal with an endless complexity of networks. But punctualisations are always precarious, because networks may break down. We should therefore think of punctualisations as processes or effects. This implies that we should think of organisations and power as verbs, as something that happens, rather than as nouns, as something complete, autonomous or final.

The process that generates ordering effects is called *translation*. Translation implies transformation and the possibility that one thing (for example an actor) may stand for another (for instance a network). The networks that make up a punctualised actor are "borrowed, bent, displaced, distorted, rebuilt, reshaped, stolen, profited from and/or misrepresented" to generate effects such as agency, organisations or power (Law, 1992:6). A central task to ANT is the analysis of ordering struggle, of local processes of patterning, social orchestration and resistance that generate ordering effects such as devices, power and organisations.

ANT does not provide any a priory account of how translation can be achieved. This is left as an empirical question. According to Law (1992:6), "the empirical conclusion is that translation is contingent, local and variable", but some general findings emerge:

- Some materials are more durable than others and so maintain their relational patterns for longer. It is thus a good ordering strategy to embody a set of relations in *durable materials*. We may, for instance, embody a deal in a written contract.
- Some translations, such as letters of credit, military orders or cannon balls *combine duration and mobility*. This makes them useful for surveillance and control, i.e. for acting at a distance to create ordering through space. Latour uses the term *immutable mobiles* to label this class of materials and processes.
- Translation is more effective if it anticipates the responses or reactions of the materials to be translated. A *capacity to foresee outcomes* thus helps us create more robust networks.

At this point, it should be clear that ANT insists that *power* is a verb rather than a noun, a process rather than a fixed entity. In order to account for power, we should look for actors striving to align heterogeneous materials into patterned networks. Empirical findings suggest that we should look for durability and mobility in the materials used to build networks, and for a capacity to foresee outcomes. Thus, Law (1992:8) suggests a number of questions that we may ask concerning powerful actors:

What are the kinds of heterogeneous bits and pieces created or mobilised and juxtaposed to generate organisational effects? How are they juxtaposed? How are resistances overcome? How it is (if at all) that the material durability and transportability necessary to the organisational patterning of social relations is achieved? What are the strategies being performed throughout the networks of the social as a part of this? How far do they spread? How widely are they performed? How do they interact? How it is (if at all) that organisational calculation is attempted? How (if at all) are the results of that calculation translated into action? How is it (if at all) that the heterogeneous bits and pieces that make up organisation generate an asymmetrical relationship between periphery and centre? How is it, in other words, that a centre may come to speak for, and profit from, the efforts of what has been turned into a periphery? How is it that a manager manages?

In a short, informal paper, Law (1996) illustrates how we may think about power in an ANT perspective. He constructs an example based on real cases, a major scientific laboratory and its powerful manager. In a thought experiment, Law starts with the manager situated in his office, surrounded by things and people such as a conference table, easy chairs, personal computer, telephones, secretaries, airline tickets, invitations to speak, etc. He then asks "What happens if we take away these things and people, these heterogeneous materials, one by one?" When the computer has gone, the manager will lose his ability to calculate, and thus will not be able to manage the finances of the laboratory. He will also lose his capacity to write, and to remember as his word-processor and electronic diary and archives disappear. With his phone and fax goes the ability to act effectively over distance. When this game is completed, the once powerful manager is a naked ape.

This thought experiment illustrates the idea that power is an effect of networks of heterogeneous materials. In this sense, power always resides elsewhere; it is distributed through the arrangements of the organisation. The powerful manager is made by his organisational relations. The juxtaposed networks create *representations in one place*, and thus make the manager into a *centre of calculation* (Law, 2001) where everything can be seen. The networks also make the manager into a *centre of translation*, they produce effects in the periphery so that things happen when he gives orders. There is a circular flow of immutable mobiles out from the centre (in the form of commands and demands) and back to the centre (in the form of representations). Law (2001) suggests that the centre (the manager) 'profits' (metaphorically as well as literally) *because it secures a return*.

The ANT account, as summarised above, emphasises the precariousness of networks, and hence the provisional nature of organisations and power. Can ANT also account for long-lasting asymmetries of power? Law (2001) proposes an account in terms of *obduracy*[15], i.e. the capacity of certain kinds of distributions to sustain themselves when everything is in flow. Law suggests that obduracy of distributions is linked to the *delegation of strategy into durable materials* (2001:3-4). As an example he points to the management accounting system in a large organisation. This system is preoccupied with control, forward planning, productivity, delivery, trouble-shooting, target-setting, personal and organisational achievement, and meeting longer term goals. The delegation of these activities into a range of durable, non-human materials such as computers, office procedures and forms helps to secure obduracy and continuity.

According to Law, obduracy of distributions is also supported by *multiplicity*. This implies that if one mode of ordering, one way of patterning networks, runs into the sands, then another comes to rescue. Multiplicity involves acceptance of a certain degree of inconsistency, impurity or ambiguity. Asymmetries in distributions are also sustained by the way in which different strategies within such a multiplicity or pluralism *resonate* with one another.

Another aspect of power is *discretion* in the use of capacity for action (Law, 1991). A functionary may have considerable capacity for action, but he has little discretion in when to use this capacity. He may be said to function as a mere relay in system of control. In contrast, a policymaker may choose more freely whether or not to use her capacity for action in a given situation. Law suggests that we should think of this as a continuum rather than a simple dichotomy. Actors often exploit multiplicity (inconsistency, ambiguity, "discursive pluralism") to expand their latitude for discretion, i.e. their discretionary power.

ANT invites us to consider power from two perspectives. The first perspective is concerned with actors in the process of generating patterned networks. We may study their efforts to mobilise and align the bits and pieces of their networks and ask why they fail or succeed, how they overcome resistances, and how they sometimes manage to establish network that are relatively robust and durable. This is power in action. The

[15] In *Webster's New Twentieth Century Dictionary of the English Language*, "obduracy" is defined as "the quality or state of being obdurate", whereas "obdurate" is defined as "1. not easily moved to pity or sympathy; hardhearted. 2. hardened and unrepenting; impenitent. 3. not giving in readily; stubborn; obstinate; inflexible."

other perspective is to take an actor which we have reasons to consider powerful as a starting point, and try to discern the networks of heterogeneous materials that enable that actors' exertion of power. A crucial research question is then "*how is it that relations are stabilised for long enough to generate the effects and so the conditions of power"* (Law, 1991:172).

The most important contribution of ANT is probably that it provides a way to integrate heterogeneous materials in our analysis of social phenomena. Computers systems and networks, architecture, money and documents are no longer taken for granted or hidden in the background. We are invited to analyse those diverse materials as actants in their own right, with crucial properties such as durability, ambiguity, and a capacity to resist translation. The need for this perspective may become increasingly pressing as new ICT solutions are introduced and begin to push their own agendas on organisations and groups.

Another important contribution of ANT is its insistence that we should think of social phenomena such as power as a precarious product of patterned networks. The persistence of such phenomena thus calls for an explanation in terms of the properties of the materials included in the relevant networks and the ways they interact.

A third contribution of ANT is its focus on ambiguity and multiplicity of meaning and function. This emphasis stems from the concept of "translation", the idea that a punctualised actor can be borrowed, distorted, reshaped, profited from or misrepresented to fit into a network. Law (1991, 1996) pointed to openness to multiplicity of meaning both as a moral imperative and as a potential source of power.

The most important limitation of ANT is probably that it is *not* a theory in the strict sense. ANT lacks a formal machinery for deriving specific predictions or practical implications. The "theory" as such does not help us to give specific advice to an actor looking for ways to achieve a given objective. Neither does it help us assess the power of an actor or compare the power of different actors.

Saying that there is no fundamental difference between humans and object can be provocative. However, this is an analytical stance, not an ethical position (Law, 1992:4). ANT does not claim that we should treat people in our lives as machines. The point is that we may be able to detect patterns that would otherwise get unnoticed by treating humans and objects in the same way in our analyses.

A related issue arises because ANT insists that actors, including humans, are always networks. In principle, this leads to an infinite regression: In order to analyse a network, we would in principle have to look at the materials in that networks as networks in their own right, requiring a new level of analysis, and so on. In practice, researchers have to terminate their analysis at a suitable point, and take the actors for granted. However, researchers have to dispense with many established constructs in sociology and political science to remain loyal to the imperatives of ANT research (Latour, 2005). Another consequence of this stance is that ANT research can be difficult to communicate. Researchers may find themselves hyphenating nearly all nouns in their accounts because they want to keep the reader aware that they are punctualisations. At some point, this may create problems, because human communication apparently depends on punctualisations.

7.5 Power in symbols and discourse

We shall now turn to a perspective according to which power resides in discourse, i.e. in our use of language and symbols. Within a given domain of discourse, some statements appear meaningful and relevant and perhaps obviously true, whereas others appear meaningless or irrelevant. Knowledge entails constraints, regulation and the disciplining of practices (Hall, 2001). Power may be hidden in things that are tacitly assumed rather than displayed in what is stated explicitly.

7.5.1 Model monopoly and its paradoxes

Stein Bråten's concept "model monopoly" refers to a domain of discourse that is delimited in such a way that only one actor has access to a rich repertoire of relevant concepts and ideas, whereas the other actors are lacking such symbolic resources. His way to think about model power entails two interesting paradoxes.

Reasoning within a system-theoretical framework, Stein Bråten (2000:105) points out that *we need models to utilise information and withstand influence*. Models allow us to filter, order and make sense of information. Information is only useful to the extent that we have appropriate models which enable us to process and utilise it. A good model of another actor enables us to predict through mental simulation how the other actor will respond to possible actions from our part. We may view this as a source of power. Being able to predict the responses of another actor enables us to select the course of action which has the highest probability of producing the desired result. A good model is also capable of being further improved each time the actual outcome of an action diverges from the expected (simulated) outcome.

A *model monopoly* occurs when the domain or universe of discourse is delimited in such a way that only one actor has access to a rich repertoire of relevant concepts and ideas, whereas the other actors are lacking such symbolic resources. We may refer to the former actor as model-strong and the latter as model-weak. As an example, we may think of a group of risk analysts discussing the technicalities of a complex risk analysis of a plant based on new technology with a group of lay persons. The risk analysts are likely to be model-strong and the lay persons are likely to remain model-weak as long as the discussion is restricted to the technical aspects of the risk analysis. This may be the case even if the lay persons have more extensive knowledge than the risk analysts about the system that has been analysed and the vulnerability of its environment.

Being the weak part in a situation characterised by model monopoly obviously leads to powerlessness. One may even have extensive knowledge about the issues at stake, but still be unable to utilise this knowledge effectively in a dispute. Paradoxically, the opposite position, being the model-strong actor in a situation characterised by model monopoly, is not necessarily very attractive either. The model-strong actor may win the battle but loose the war due to the constraints inherent in his own model. Discourse has to be restricted to a single, dominating model for model monopoly to occur. Model monopoly implies that the model-strong actor has a monopoly on the model, but it also implies that the model has a monopoly on the model-strong actor. The actor is restricted to a single, closed perspective which excludes alternative interpretations of the situation. This may allow her to act quickly and vigorously. However, this apparent efficiency may come at the cost of a limited capacity to argue with oneself and a restricted action repertoire. Bråten (2000:144) suggests that this applies not only to individuals, but to groups and organisations as well.

This aspect of the theory of model power may be used to supplement the information perspective on organisational accidents (Turner, 1978; Turner and Pidgeon, 1997; see also Rosness et al., 2005:37ff or Rosness et al., 2010:69ff). In this perspective, an accident is viewed as the outcome of a breakdown in the flow and interpretation of information that is linked to physical events. Westrum (1993) noted that organisations are very different in their ability to react to problems. He coined the term "requisite imagination" to characterise organisations with a highly developed capacity to make use of information, observations or ideas wherever they come from. Requisite imagination also implies a capacity to interpret data in different ways, by applying more than one perspective. This interpretive capacity is exactly what is lost in a situation characterised by model monopoly.

Some model-strong actors have a genuine desire to share their power. How can they do this? Apparently, the obvious thing to do is to educate the model-weak actors. Surely, giving the model-weak actors access to at least some aspects of the model will reduce the power difference between model-strong and model-weak actors?

Here is the second paradox of Bråten's theory. According to Bråten (1983:25; 2000:105), attempts to share model power are likely to preserve or increase the power difference. There are at least two reasons for this.

First, the model has usually been developed to reflect the perspectives and interests of the model-strong actor. The model-weak actor is led to adopt the perspective of the model-strong actor, and this perspective is tacitly accepted as the only valid perspective on the issue at stake. The second argument is based on systems theory. Our capacity to control other people is to a great extent based on our ability to mentally simulate their responses to our actions. Such a capacity allows us to select an action which is likely to elicit the response we desire. By sharing parts of his model, a model-strong actor increases his control of the capacity of the model-weak actor to simulate other actors' reactions. Thus the power difference is increased. In Bråten's own words:

Ironically, the ultimate in control is reached if Beta' [i.e. the model-weak actor after an attempt to "educate" him] "succeeds" in adopting a model developed by Alpha at some previous stage. This gives Alpha the power of simulating even the simulations carried out by Beta'. Thus, while the intentions may be to decrease the gap in model capacity a steadily increasing gap may be actualized. (Bråten, 2000:108).[16]

The implications of the second paradox are far-reaching. It may apply to the critical action researcher who claims to promote democracy but ignores the impact of her own models and her potential for building a model monopoly. It may also apply to attempts to give lay people a voice in decisions on risk acceptance if these attempts require the lay persons to accept expert models of the domain.

There is a way around the second paradox of model monopoly. The key is to resolve the model monopoly by cancelling one or more of the conditions that promote it (Bråten, 1983:26; 2000:21). This can be done in several ways:

1. *Re-define the domain* (universe of discourse). A model monopoly is characterised by a strict delimitation of what issues, facts and arguments are considered relevant. Expanding these boundaries opens the domain for alternative problem definitions, facts and arguments.
2. *Introduce complementary or competing perspectives which offer alternative or transcending terms*. A model monopoly restricts discussion to a single "right" perspective and terms defined from this perspective. A restricted terminology restricts the discussion. Insisting that all arguments comply with highly abstract and technical definitions can be an effective means to exclude model-weak actors. Moreover, terminologies are not neutral. For instance, the terminology used in many areas of business economics reflects the interests of the owners rather than those of the employees.[17]
3. *Develop pertinent knowledge on the model-weak actors' own premises*. Knowledge is not, in general, neutral to group interests. Knowledge is usually developed for a purpose, and thus reflects the interests and perspectives of actors that develop knowledge or those that sponsor knowledge development.
4. *Evoke rival knowledge sources, or take a meta- or boundary position, crossing the boundaries of the domain.* Other knowledge sources may bring in alternative models and perspectives. Taking a meta-position may involve pointing out that the discourse is restricted to a single model or perspective, and ask whether alternative perspectives could be equally relevant. Taking a boundary position involves standing with one foot in each of two different models or perspectives.
5. *Be aware of your own tendency towards consistency and conformity with a monolithic perspective that silences the question horizon.* Some of our most cherished academic virtues, such as precise definitions, consistency and exclusion of irrelevant facts and arguments may at times promote a model monopoly. It can be difficult to detect one's own conformity with a monolithic perspective. The most important symptom is perhaps the apparent absence of tensions and the apparent ease with which contradictory evidence can be defined as irrelevant or reinterpreted to be in harmony with our model. Such apparent absence of tensions is not a very strong signal. The most effective way to

[16] The symbol Beta' refers to the same actor as Beta, but after an interchange has taken place. The distinction is used because the properties of Beta have been changed as a consequence of the interchange.
[17] As an example, wages are usually categorised as "costs", whereas dividends to the shareholders are categorised as "results". From an employee point of view, the opposite categorisation would be more valid.

break out is perhaps to seek challenges and resistance from persons that are likely to apply alternative models and perspectives.

Bråten (1983:26) suggests that whereas available data tend to confirm the theory, the model-power theory has a wonderful self-falsifying character. Actors that are made aware of the theory usually find ways to resolve model monopoly, and thus step out of a game which the model-weak actor is doomed to loose.

Resolving a model monopoly often requires a time-out from the confrontation with the model-strong actor (Bråten 1983:26). It takes time to identify alternative perspectives or knowledge sources, and perhaps even develop new knowledge. It may even take some time and reflection to realise that one is captured in a situation with model monopoly. This implies that the timing of decision processes may have an impact on the chance of detecting and resolving a model monopoly.

The theory of model monopoly is a genuine theory in the sense that it allows the derivation of non-trivial predictions. The second paradox, which concerns the consequences of attempts to share model power, has implications for a variety of efforts to promote participation and democracy. This is also the case with Braathen's suggested strategies for resolving a model monopoly. The theory of model monopoly is, however, not a general and comprehensive theory of power. Power may come from other sources than a model monopoly.

7.5.2 Power in discourse

An analytical shift in perspectives when it comes to power can be identified especially after the 1970s. From an actor-oriented analysis, the emphasis is directed to social institutions and domains. To put it bluntly, the sovereign (i.e. the head of state, the ruler) is "decapitated", but also the individual actor in general (Neumann, 2001:168). The core question becomes how specific interests are transformed into normative standards through discursive practices, i.e. through the ways in which we speak and write about things.

A central premise of this perspective is that social phenomena are socially constructed and that they are always in the making. Our ways of talking do not neutrally reflect the world, identities and social relations but play an active role in creating and changing them (Jørgensen and Phillips 1999). Furthermore, there are constant fights regarding definitions of society and identity. The mission for the discourse analyst is to follow these struggles and explore how a particular viewpoint gains hegemony, become taken for granted or naturalised (Jørgensen and Phillips 1999).[18]

The French sociologist Michel Foucault has been very influential within this school of thought. In the following we are going to summarise his contribution related to the discourse as a construct. Then we proceed with a brief introduction to Fairclough's critical discourse analysis, because he has elaborated on how to perform a critical discourse analysis in an empirical context.

Foucault's theory of power is multifaceted. In the first phase of his writing power is treated implicitly. In the next phase, consisting of "genealogical" works such as *Discipline and Punish* (1979) and *Power/Knowledge* (1980), he brings out power centre stage. According to Foucault, power is embedded in all social relations and *not restricted to specific actors or institutions* such as the king, the state, the church or the education system. Following this argument, the quest for power takes on new dimensions and calls for another way of thinking. Foucault set out to investigate how we come to understand the world as we do (Haugaard 2002). Very often the order of things appears as normal and unproblematic. According to Foucault, it is vital to

[18] To elaborate on and delineate between different traditions within the field of discourse analysis (e.g. discourse theory, critical discourse analysis, discourse psychology etc.) is beyond the scope of this section; see e.g. Wetherell, Taylor and Yates (2001) for an overview over major figures in discourse research, and Phillips and Di Domenico (2009) for an introduction to discourse analysis in organisational research.

explore tacit and taken-for-granted conditions which enable us to order things in the way that we do. His "trick" was to open his writing with a surprising statement or story in order to puzzle and sensitise the readers to their interpretative horizon. In this way, the reader is led to discover how it could be possible to have entirely different ways of ordering or ranking within a totality. Through sorting, ordering and ranking, some items, objects etc. are presented as more important and valuable. Often, however, we have internalised this without questioning it. An example from a field of study that has been greatly influenced by Foucault, illustrates this: Gender research has contributed with new insights on the gendering of many processes in society. Work related to masculinity is usually ranked higher than work that has a feminine connotation. This ranking is often taken for granted and seen as something natural. This is reflected in rewards systems and differences in status.

The term *discourse* is pivotal in understanding the arguments of Foucault. In French language the word discourse has several meanings (Le Petit Robert 1978):

1. Conversation or dialogue (ancient)
2. Speech made in front of an audience
3. Literary text with didactic purpose treating a subject or a method
4. Verbal expression of thoughts
5. Philosophical argument

Consequently discourse can be interpreted in several ways both in common language and in science. In the Foucauldian sense, discourse is a way of speaking and interpreting the world (or parts of the world) (Jørgensen & Phillips 1999). "Discourses are practices that systematically form the objects of which they speak" (Foucault 1972: 49). Phenomena are given meaning through the way we speak and write about them. As a consequence, discourse is also the technical term for the tacit knowledge which informs particular ways of making sense of the world (Haugaard 2000: 185). A central element in discourse theory is that a social phenomenon is never done or total – there are constant struggles going on and they have social consequences.

Instead of focusing on what people say, Foucault deals with *discourse as practice* by starting with pre-existing unities in order to break them up or 'deconstruct' them (Ritzer 1997: 39). Moreover, he looks for those unities in the population of discursive events, i.e. events that contribute to or cause discourse. A critical event or an accident can be a trigger for the unfolding of different discourses and regularities within a discourse, especially if it gets a lot of coverage in the media. Foucault disengages discursive events (as objects) from the people (subjects) who might engage in them. Ritzer (1997: 39) recapitulates Foucault's five-step process for the analysis of a field of discursive events:

1. Grasp the statement in the exact specificity of its occurrence
2. Determine its conditions of existence
3. Fix at least its limits
4. Establish its correlate with other statements that may be connected with it
5. Show what other forms of statement it excludes

Foucault tries to get at the regularities that exist within discourse. He then traces those regularities to several kinds of relationships – relations between statements, between groups of statements, and the relations between *statements and technical, economic, social and political events*. Discourse never consists of one statement, one text, one action or one source. The same discourse will appear across a range of texts, and as forms of conduct, at a number of different institutional sites within society (Hall 2004). Foucault uses the term *discursive formations* where a system of dispersion exists among statements and where there is regularity among elements such as objects, types of statement, concepts or thematic choices. Power works through regimes of knowledge that produce new discourses that shape the mentality and practices of the individuals. There is a permanent dispute between different discourses in order to define the categories and

phenomena in the world. When a particular discourse gains hegemony it means that a particular world-view or point of view prevails.

There are significant links between Foucault's analyses of discipline and his analyses of discourses. Disciplinary power is a core element in the writing of Foucault and he is particularly concerned with how the "ruled" come to take and internalise the view of the ruler. In his work on disciplinary power he relies on a specific symbol – Bentham's Panopticon – an architectural figure with cells and a tower in the centre (see Section 7.4.2). The activity in the cells can be observed constantly by the guards without the inmates knowing when they are observed (Foucault 1977, 2001). In Foucauldian sense the Panopticon is a power machine that produces truth about the subject as an object of knowledge (Haugard 2002), and this is illustrated with prisoners placed in a building consisting of prison cells that are subject to continual visibility. When the prisoners are aware of being subject to continual judgment, they come to subject themselves to the judgment of others by accepting their viewpoint.

There are also similarities between Actor-Network theory and Foucault's analysis of power and discourse. Both approaches are concerned with how order is imposed on ambiguous elements and how this ordering process and the possibility of alternative orders may become invisible.

7.5.3 Critical discourse analysis

Critical Discourse Analysis is an interdisciplinary approach that focuses on the ways social and political domination are reproduced by text and talk. Thus, there is a close connection between text and the social context where the text stems from. A central point in Norman Fairclough's critical discourse analysis is that discourse is a form of social practice that both reproduces and changes knowledge, identities and social relations, including power relations. Simultaneously discourse is shaped by other social practices and structures (Fairclough, 1992; Jørgensen & Phillips, 1999). This perspective is particularly interesting because of its focus on social change, but also its complex methodological repertoire for performing discourse analysis in an empirical field. Fairclough sets out to elaborate on "a social theory of discourse" (cited in Clegg et al., 2006: 302) where he connects linguistic approaches to the broader social context that was the heart of the matter for Foucault.

Critical discourse analysis as formulated by Fairclough (1995) advocates a text-oriented analysis, seeking to join together three different strands of analysis: *A) Text, B) Discursive practice and C) Social practice*. The starting point is a close reading and analysis of a specific text. Discursive practice concerns how the writer/storyteller draws on existing discourses and genres for producing a text, and how the receiver relies on existing discourses when interpreting the text. The analyst is concerned with how the discursive context influences the way the text is formulated and the way the text is consumed. The next level, social practice, is important in this particular framework. The aim is to examine how statements and propositions function to reproduce or challenge existing power relations and ideological systems of beliefs. In the spirit of Foucault, an important task for the analyst is to reveal "facts" and "truths" that are taken for granted or naturalised, and under which conditions such naturalisation take place.

In empirical studies, a critical discourse analysis has to be three-dimensional because every communicative statement involves three dimensions (Fairclough 1992): 1) The form of the text; that is, how it is structured and organised. 2) How the context has influenced the way the text was produced and consumed. 3) The examination of how propositions function to maintain, or disrupt, ideological systems, beliefs and norms. By this, what is taken-for-granted truths and under what circumstances are brought centre stage and challenged.

In his analyses, Fairclough (1995) draws on a rich set of analytic tools. It is beyond the scope of this section to give a comprehensive review of all his tools. Here we would like to point to two important grammatical elements: *transitivity* and *modality*. Transitivity concerns how processes and events are connected, or not connected, to subjects and objects. By using passive tense, for instance, the actor is absent and an event is

presented as a natural phenomenon. Modality has to do with the way actors connect with their statements. Modality can be expressed by intonation, and humour and satire can contribute to distance. The use of 'hedges' is a way of moderating one's message through words such as 'a little' 'somewhat'. Presenting interpretations as facts is another aspect of modality. To uncover how language conveys power, it is also important to study *images and metaphors* that are used to strengthen the arguments.

One of the major contributions of the perspective "Power in symbols and discourse" is the destabilisation of the concept of power and its ability to challenge the scope for how we understand and interpret power relations. This perspective provides a new lens for teasing out power and identifying power relations and power games. Power is now conceptualised as a phenomenon that is "everywhere" and not only restricted to individual actors or institutions. Power takes on new and fascinating dimensions, but becomes more problematic to grasp intellectually and capture empirically.

Discourse analysis provides a lens or a tool to analyse how meaning is socially constructed. Besides, it unveils how specific worldviews influence on how people think and act and the social consequences. Because discourse analysis is based on a rather complex framework, the analyst may have to concentrate on some parts of this framework when conducting an analysis. There are different ways of conducting a discourse analysis (Jørgensen and Phillips, 1999) and we have not elaborated on the differences between different subcategories, but briefly mentioned critical discourse analysis. An important demarcation between Fairclough and other scholars of critical discourse analysis is his focus on *social and cultural change* where the others are more concerned with *social reproduction.*

As with any new paradigm, discourse and discourse analysis have been subject to criticism. We will first summarise the critique of Fairclough and his sophisticated model of the relationship between critical discourse analysis and social change.[19] The most problematic part of critical discourse analysis is the boundary between discourse analysis and social practice. Second, how should one treat the dialectic between the discursive and the non-discursive? Precisely how does the non-discursive influence the discursive and vice versa? Often social practices serve as a backdrop for discursive practices in empirical analysis. Third, processes of group formation, subject and agency are only weakly conceptualised theoretically. This is a critique that also applies to discourse analysis in general. Finally, in critical discourse analysis there is often a lack of analysis of how the texts are consumed. Most discourse analyses consist of careful analysis of texts and miss out on the production and consumption of these texts.

Becoming familiar with discourse analysis allows one to join in a range of debates, discussion and dialogues which are increasingly pervasive within the intellectual community. Discovering new sets of tools for studying the social world helps one see our lives and our circumstances differently. Advocates of discourse analysis, however, are crystal clear about one premise: This is not a perspective that can simply be added on, separated from its theoretical and methodological basis (Jørgensen & Phillips 1999). The complete package includes

1. Philosophical premises of ontological and epistemological character
2. Theoretical models
3. Methodological guidelines for how to approach a research field
4. Specific techniques for analysing language

This implies that discourse analysis is much more than simply another technique for empirical analysis.

[19] The summary is based on the review of Jørgensen and Phillips (1999: 101-103).

7.6 A synthesising framework

In his book "Frameworks of Power" Clegg (1989) proposes a framework for analysis of power with the purpose to help sketching plausible narratives. The framework connects different theories and opens for the opportunity to take advantage of different perspectives. The different levels of the framework and the perspectives we have presented are rather dynamic and interlinked entities and the perspectives cannot be mapped directly to the framework. However, we find it useful to indicate where in the framework we see the strongest links to each perspective.

7.6.1 Clegg's conception of power

Clegg argues that there are at least three family groupings of theories clustered around loci of agency, dispositional and facilitative concepts of power. The *agency* concept of power refers to a type of power that is causal. The *dispositional* concept of power equates power to a set of capacities. The *facilitative* concept regards power in terms of its ability to achieve goals. The intention of the framework is to bring the three theoretical groupings of power into a set of ordered relationships with each other.

The outset for Clegg is that power is best approached through a view of more or less complex organised agents engaged in more or less complex organised games. He thinks of power as a phenomenon that can be grasped only relationally (Clegg, 1989: 207). Clegg argues that processes of power are central to organisation and organisation is central to processes of power; an understanding of either 'organisation' or 'power' entails a reciprocal conceptualisation of both terms. On this background, Clegg conceptualises power in terms of *processes which may pass through distinct circuits of power and resistance*. Accordingly both 'obedience' and 'resistance' are included in the frameworks of power. His concept of 'circuits of power' derives from Foucault's conception of disciplinary power and consists of processes for stitching-up particular configurations of state, economy and civil society (Foucault, 1977).

Clegg argues that power can be understood analytically as processes moving through three distinct *circuits of power and resistance* positioned at different levels. At the highest level are the *circuits of agency*. The two others are the *circuits of social integration and system integration*. The two latter circuits are seen in the context of their relationship to the agency circuit of power. They are conceptualised as the pathways through which fields of force are fixed and stabilised on *obligatory passage points*, also called *nodal points*.

We have indicated possible links between the framework and our perspectives in Figure 10 (Derived from Clegg, 1989, Figure 8.1, page 214) and explained and discussed more thoroughly below.

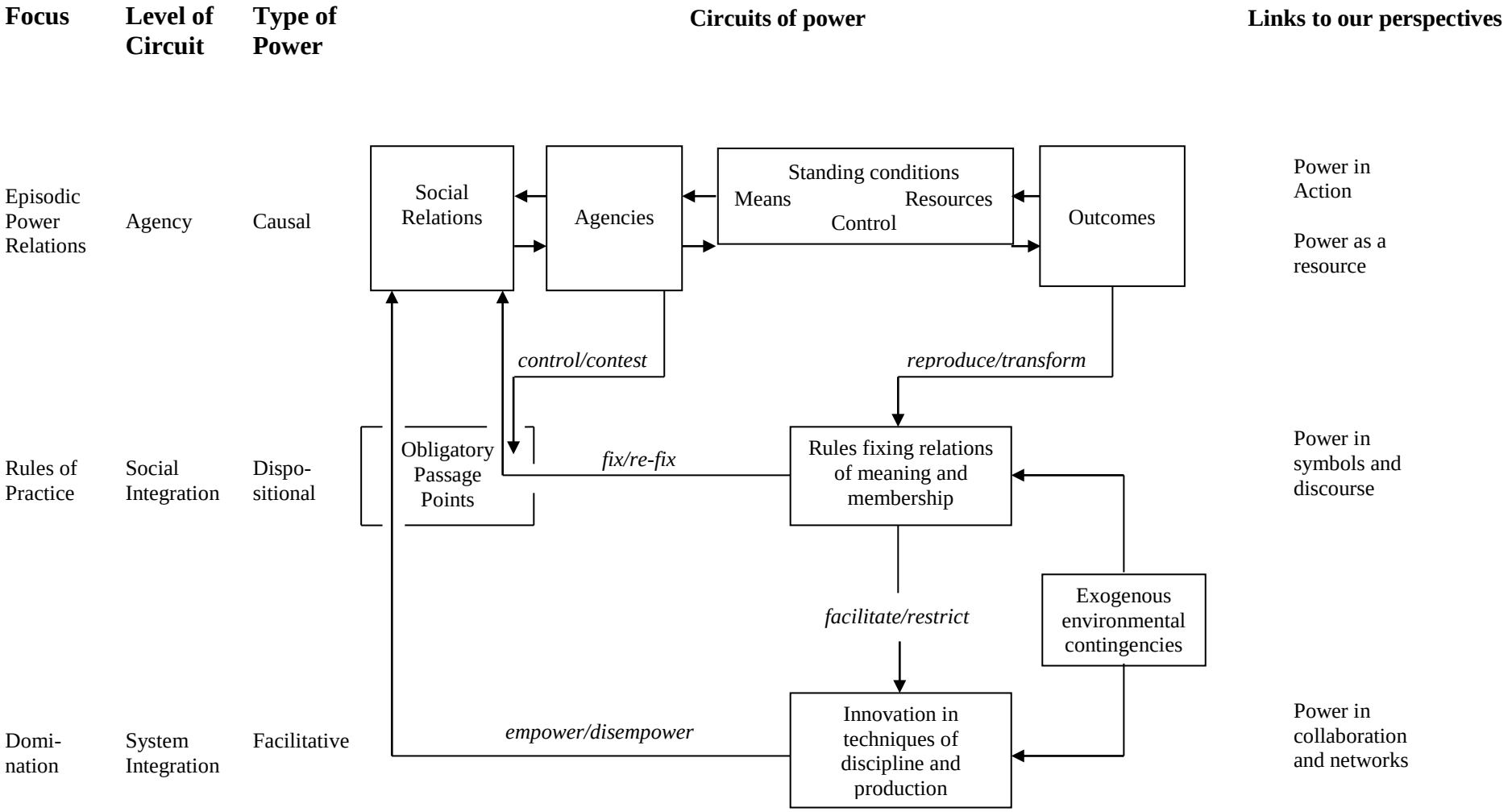

Figure 10. Associations between Clegg's analytical framework of power and our perspectives on power. (Adapted from Clegg, 1989, Figure 8.1, page 214).

7.6.2 Circuits of agency

Clegg stretches the concept of 'agency' to cover a number of different forms. Agency[20] is something which is achieved and it is achieved by virtue of organisation, whether of a human being's dispositional capacities or of a collective nature, in the sense usually referred to as 'organisations'. Agency may often refer to collective forms of decision-making. It may be vested in non-human entities as diverse as machines, germs, animals and natural disasters. These may be agencies under the appropriate conditions, as proposed by Actor-Network Theorists. Clegg is particularly concerned about organisational agency. He considers organisations as loci of decision and action.

Within circuits of 'agency', the type of power exerted is causal and the focus is directed at episodic power relations. This corresponds to the perspective of "power in action", where actors achieve their objectives against the preferences of other actors and where power is manifested in actions that take place at specific points of time. Power which proceeds at the circuits of agency level is the most apparent, evident and economical circuit of power, it is 'power over'. In this sense circuits of agency are also linked to the perspective of "power as a resource", i.e. something that an agency has or possesses. Agencies act so as to gain control of those events in which they have interests. The way in which actors gain control of those events that interest them is to give up control over those events over which they have little or no interests (Coleman, 1977:184). They engage in exchange such that each agency has control over events that interest that agency, subject to the resources with which that agent began: that is, the control over events held as a resource capacity at the outset.

Existing social relations constitute the identities of agencies, whether individuals or some collective loci of decision-making and action (Clegg, 1989:215). Agencies' causal power will be realised through the organisation of *standing conditions*. These require that agencies involved in so called 'arenas of struggle' are capable of utilising means in order to control resources which have consequential outcomes for their scope of action. Standing conditions may enable or restrict the causal powers of a specific agency in a specific episode.

Episodic power will invariably be accompanied by resistance (Clegg, 1989:215), which is indicated in Figure 10 by pairs of arrows connecting the boxes in the model of episodic power relations. Those pointing to the right indicate social relations constituting agencies, agencies utilising standing conditions, and standing conditions utilised by agencies causing outcomes. The arrows pointing to the left-hand side indicate resistance.

One example to illustrate circuits of 'agency' type of power can be the power relations between the employer and the employee. The employer controls money that the employee may be dependent on and that gives them power over the employees to make them work. The employee or workers' union might control work force or knowledge that the employer is dependent on. This might give them power to resist exploitation by the employer. The agents, money and work force or knowledge might depend on standing conditions and constitutive relations such as currency, agreements, contracts and laws and regulations. Choices of technology might define standing conditions such as relevance of and dependency on skills and knowledge.

[20] We found the following explanation of 'agency' in the Wikipedia-article "Agency (philosophy)": *In sociology and philosophy, agency is the capacity of an entity (a person or other entity, human or any living being in general, or soul-consciousness in religion) to act in any given environment. The capacity to act does not at first imply a specific moral dimension to the ability to make the choice to act, and moral agency is therefore a distinct concept. In sociology, an agent is an individual engaging with the social structure. Notably, though, the primacy of social structure vs. individual capacity with regard to persons' actions is debated within sociology.* This debate concerns, at least partly, the level of reflexivity an agent may possess. Retrieved 2015-10-30 from https://en.wikipedia.org/wiki/Agency_(philosophy)

7.6.3 Circuits of social integration and circuits of system integration

The two other circuits of power are the circuits of social integration and the circuits of system integration, which Clegg has derived from David Lockwood (1964). Through circuits of social and system integration stable relations of episodic power are reproduced. This account may help us understand how "power in collaboration and networks" and "power in symbols and discourse" may form or influence the settings in which "power in action" and "power as a resource" are unfolded.

The circuits of social and system integration are conceptualised as the pathways through which fields of force are fixed and stabilised on 'obligatory passage points' in the circuits of power (Clegg, 1989:224). Clegg uses the term fixing to convey the idea of a representation being developed and realised in a fixed form, as in a photograph. The term 'obligatory passage points' is used interchangeably with the term 'nodal points'. The two latter concepts are meant to refer to the construction of a conduit[21] through which traffic must necessarily pass. Power consists in part in the achievement of this positionality.

What the actual conduits will be cannot be specified in advance, but they will be contingent on what flows through the circuits. They constitute the field of force in which episodic agency conceptions of power are articulated. Fixing these fields of force is achieved through enrolling other agencies such that they have to traffic through the enrolling agencies' obligatory passage points. Hence, power involves not only securing outcomes, which is achieved in the episodic circuit of power, but also securing or reproducing the 'substantively rational' conditions within which the strategies espoused in the circuits of episodic power make contextual good sense.

As mentioned, Clegg considers organisation as essential to the achievement of effective agency. The reason is that he considers organisation to be the stabilizing and fixing factor in circuits of power. His concern is how the field of force in which power is arranged has been fixed, coupled and constituted in such a way that certain nodal points of practice are privileged, even under changing conditions. Nodal points can be seen as points of connection between agencies that function as channels through which traffic between them occurs.

The fixing, coupling and constitution may happen intentionally or unintentionally. The issue at stake is to identify the strategies and practices whereby, for instance, agents are recruited to views of their interests which align with the discursive field of force that the enrolling agency is able to construct. Agencies interested in maximising their strategicality must attempt to transform their point of connection with some other agency or agencies into a 'necessary nodal point': this would be a channel through which traffic between them occurs on terms which privilege the putative strategic agency. To achieve strategic agency requires a disciplining of the discretion of other agencies.

Within circuits of social integration the type of power is dispositional[22]. Social integration is understood in terms of relations of meaning and membership. The focus is directed at rules of practice and the circuit is conceptualised in terms of rules that fix and refix relations of meaning and membership. This part of the model provides a link to the perspective of "power in symbols and discourse". Whether relations of meaning can be fixed in organisationally stable forms across the many diverse sites of potential struggle will be highly dependent on *exogenous environmental contingencies*.

Clegg's conception of the links between the circuits of agency and the circuits of social integration incorporates many ideas from Actor-Network Theory. Clegg argues that a conception of rules is essential to an adequate understanding of power. Rules of practice are the centre of any stabilisation or change of the circuitry. According to Clegg, the characteristic mode of organisational change in the circuit of social

[21] According to *Encarta Dictionary: English (North America)*, the term "conduit" may refer to (1) a channel for liquid, (2) a protective cover for cable and (3) a conveyor of information.
[22] http://en.wikipedia.org/wiki/Dispositional: A **disposition** is a habit, a preparation, a state of readiness, or a tendency to act in a specified way

integration is what Meyer and Rowan (1977) term institutional isomorphism[23]. Certain fixtures of meaning are privileged and certain membership categories are aligned with these meanings. Consequently, a specific organisational field or an 'actor network' is constructed. An 'actor network' concerns the interrelated set of entities successfully translated[24] by an actor. The achievement of episodic power will consist,

- first in constituting a relational field by 'enrolling' other organisations' agencies;
- second, in the 'stabilizing' of a network of power centrality, alliances and coalition among agencies within the field;
- third, in the 'fixing' of common relations of meaning and membership among the agencies within that field, such that they are reflexively aware of their constitution as a field.

Clegg (p 204-205) discusses how networks of interests are actually constituted and reproduced through conscious strategies and unwitting practices constructed by the actors themselves. With reference to Callon and Law (1982) he states that interests appear as "temporarily stabilized outcomes of previous processes of enrolment". Enrolling others to one's conception is a strategy in which formulation of one's own and others' interests may play a strategic role. It is one of the devices whereby we attempt to stamp our agency on others and other things through constituting networks of power.

The 'circuits of system integration' are conceptualised in terms of techniques of discipline and production. The power passing through these circuits is of the facilitative type. The focus of attention becomes domination, i.e. empowerment and disempowerment of agencies' capacities. These capacities become more or less strategic as transformations occur that are dependent on changes in techniques of production and discipline. Clegg considers the two concepts of discipline and production as inseparable. Here we see parallels to the perspective of "power in collaboration and networks".

Clegg argues (p. 224) that the circuit of system integration cannot escape relations of meaning and membership. This circuit has to be fixed on obligatory points of passage through these if it is to have any effectiveness. The circuit of system integration functions as a potent source of resistance to the stabilisation of existing memberships and meanings by generating new techniques of production and new modes of discipline, which, if they are not already present within existing rules of practice, have the capacity to transform these. Existing structures of dominancy are thus in principle always open to subsidence, disruption and innovation.

The purposeful organisational agency must in the first instance depend on the subordination of the constitutive individual parts of the organisation. It is the ever variable achievement of this subordination which stands at the centre of any collective organisational agency. All forms of agency will be an achievement of control produced by discipline. With reference to Foucault (1977) and Weber (1978) Clegg uses the term "disciplinary practices" to render those micro-techniques of power which inscribe and normalise not only individuals but collective, organised bodies. One important example of disciplinary practices is surveillance in a broad sense.

Clegg finds that system integration, premised on disciplinary techniques of production, will be a potent source of transformation and strain, posing new conduits (channels), new obligatory passage points which extant stabilisations of social integration may find difficult to escape or resolve. It will do this primarily through the production of new organisational forms. System integration will thus be the loci of potential instability and transformation, developing through the specific forms constructed around the core techniques of production and discipline.

[23] In sociology, an **isomorphism** is a similarity of the processes or structure of one organization to those of another, be it the result of imitation or independent development under similar constraints. There are three main types of isomorphism: normative, coercive and mimetic. http://en.wikipedia.org/wiki/Isomorphism_(sociology)
[24] The term "translation" is used in a sense similar to the usage in Actor Network Theory.

According to Clegg, social change can also be a function of those changes in the process of innovation which always pose potential transformations for the extant structuring of empowerment and disempowerment, dependent upon extant techniques of production and discipline. The techniques are not only carriers of innovation but almost invariably bearers of domination. Thus domination will invariably be subject to processes of innovation which may as readily subvert as reproduce its functioning.

Accordingly, the circuit of system integration is altogether more dynamic and unstable than the circuit of social integration. System integration is a circuit of power which introduces a potent uncertainty and dynamism into power relations, by offering opportunities for empowerment and disempowerment, through the development of techniques of production and discipline. Agencies must be able to position themselves in order to control the 'nodal' or 'obligatory passage points' that system (and social integration) circuits potentiate. Techniques of production and discipline generate pathways through emergent issues which can, through the construction of networks of alliance and control by agencies, become a new set of standing conditions redefining both social relations and agencies' causal powers. Whether or not these are realised becomes contingent on the construction of those alliances and networks which can sustain the standing conditions.

7.6.4 Reification of power and resistance

According to Clegg the greatest achievement of power is its reification (p 207). This is when power is regarded as thinglike, as something solid, real and material, as something an agent has. Clegg argues that episodic power that makes only one circuit and does not enter into other circuits of power is not restricted compared to instances that involve the other circuits. On the contrary, it is effective and economical. The reason is that it has no need to struggle against relations of meaning and membership, nor to institute new disciplinary techniques of production or of force. To the extent that power stays purely within the episodic circuit it automatically reproduces the existing configurations of rules and domination because it challenges neither social nor system integration and thus cannot innovate. Such one dimensional power can overwhelm resistance that remains in that circuit.

Reified power will rarely if ever occur entirely without resistance. Power and resistance stand in a relationship to each other. Clegg refers to Barbalet (1985), who considers resistance to be "efficacious influence of those subordinate to power". Accordingly the power of an agent will always be less than the capacities that agent mobilised when attempting to achieve a specific outcome.

Clegg suggests that resistance to power may be of two kinds. One is 'organizational outflanking' (Mann, 1986). 'Organizational outflanking' is resistance to power that consolidates itself as a new power and thus constitutes a new fixity in the representation of power, with a new relational field of force altogether. The other type of resistance is the one that leaves unquestioned the fixity of the terms in which the power is exercised; it merely resists the exercise and not the premises that make the exercise possible. In this respect resistance is compatible with reification and the exercise of power. What is reified is the fixity of power terms, the representation which constitute it as such, centred on particular obligatory passage points.

With reference to Mann (1986), Clegg uses the concept 'organisational outflanking' to explain why the dominated tend to comply rather than to revolt. This is due to their lack of organisational resources to outmanoeuvre existing networks and alliances of power and because the dominated often have limited capacities to develop effective collective organisation for resistance. They are embedded within collective and distributive power organisations controlled by others and are thus frequently 'organisationally outflanked'. Effective agency invariably implies organisation of other agencies in a process implicit to 'translation'.

Clegg thinks of organisational outflanking in at least two related ways: one concerns the absence of knowledgeable resources on the part of the outflanked, the other concerns precisely the resources that the organisationally outflanked may know only too well. In the case of ignorance, the relatively powerless remain so because they are ignorant of the ways of power such as matters of strategy or fail to recognise the games going on. They may also lack knowledge of other similar powerless agencies or face difficulties in coordinating resistance for instance due to isolation or division by different means. Second, he argues that routine relations, agencies, means, standing conditions, and resources are likely to endure if the organisation of concerted action cannot be attempted or envisaged as a feasible form of resistance. The resources will be judged to be unavailable or insufficient to overwhelm extant circuits of power.

Even though Clegg positions circuits of agency at the highest level of the circuits, he argues that the agency is not an appropriate point of departure for an analysis of power. Instead he advises to start with social relations that constitute effective agency, particularly where it is organisational in form (Clegg, 1989, p 207). It is necessary that the relational focus considers the relational field of force in which power is configured. There is little point in constructing a priori abstract lists of specific resources as power resources (p. 209). Whether they are power resources depends on how they are positioned and fixed by the players, the rules and the game. This point is at the centre of the translation approach. The central questions become:

- How is the constituting, fixing and re-fixing of certain obligatory passage points secured?
- By what means is organisational outflanking, the central mechanism of social transformation, secured?

7.7 Discussion and conclusions

7.7.1 Four overlapping perspectives on power

When working with this report, it became clear that the four perspectives that we had identified were not mutually exclusive. A theory may contribute to more than one perspective and still be consistent.

This absence of clear-cut and mutually exclusive categories may be confusing at the outset, but it may also help us reflect on how the perspectives and theories are related. **Figure 11** provides an overview of the four perspectives on power and how some of the theories we have reviewed fit into the perspectives.

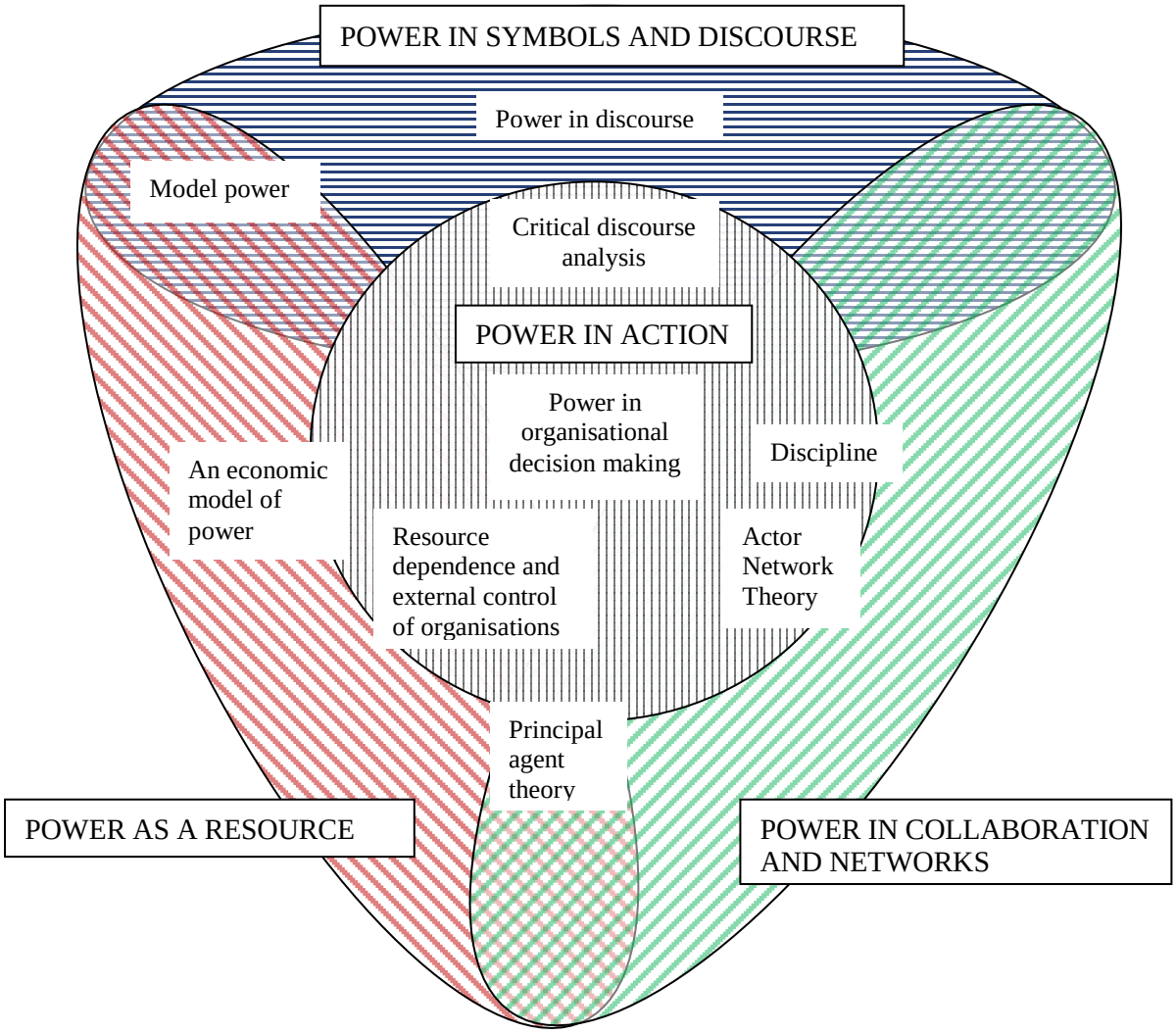

Figure 11. Theories mapped onto four overlapping perspectives on power.

The first perspective, "power in action", is represented by the circle in the centre of the figure. The three other perspectives, "power as a resource", "power in collaboration and networks" and "power in symbols and discourse", are represented by three ellipses. We have then mapped the different theories onto this representation of the perspectives:

- Pfeffer's outline of *power strategies and tactics in organisational decision making* fits right into the centre of "power in action".
- Hernes' *economic model of power* considers power as a resource which one actor can deploy to make another actor do something he would not otherwise do.
- Pfeffer and Salancik's work on *resource dependence and external control of organisations* views power as a resource, when it discusses resource dependences. However, Pfeffer and Salancik also discuss the strategies and tactics that organisations may use to manoeuvre when they are exposed to conflicting demands from external actors. Therefore this work fits into the perspective "power in action" as well.

- *Principal-agent theory* may be viewed as an extension of the economic model of power, as it prescribes how a principal may use his control of resources that are of interest to the agent as a source of power. At the same time, it may contribute to understanding power in collaboration and networks, because it proposes means to align the interests of different actors (the principal and the agent).
- Bråten's theory of *model monopoly* views power as a resource which enables one actor to dominate another actor. The theory is also concerned with power in symbols and discourse – one of the keys to establishing and breaking a model monopoly is to redefine the delimitation of the domain of discourse.
- The work on *discipline* by Foucault and others is clearly concerned with power in collaboration, but it also displays power in action.
- *Actor-network theory* analyses power in terms of networks of heterogeneous materials, but it is also concerned with power in action – i.e. the things actors do to fit together and stabilise networks which serve their purposes.
- *Foucault's work on discourse* is obviously concerned with power in discourse. In this context, power does not belong to a specific actor, and is thus not conceptualised as a resource which an actor can exploit to get another actor do things he would not otherwise do.
- Foucault's conception of power in discourse is part of the theoretical foundation for *critical discourse analysis*. Critical discourse analysis also aims to capture how specific discourses may reproduce and change knowledge, identities and social relations, including power relations.

We have not attempted to fit Clegg's model of *circuits of power* into a specific point in **Figure 11** because we read it as a synthesis which attempts to capture aspects of all four perspectives. The circuits of agency are concerned with power as a resource. The circuits of social integration capture aspects of power in discourse. The circuits of system integration capture aspects of power in collaboration. However, a direct mapping of Clegg's circuits of power on the four perspectives is a simplification, and it does not capture the way Clegg integrates the three circuits. For instance, Clegg's account of circuits of agency draws heavily on actor-network theory, which we have mapped to "power in collaboration and networks".

7.7.2 Power and the notion of 'environmental conditions for safety work'[25]

The term 'environmental conditions' (or 'framework conditions') is central in the research issues of the present project. Rosness et al. (2012) defined 'environmental conditions for safety work' as "conditions that influence the opportunities an organisation, organisational unit, group, or individual has to control the risk of major accidents and work environment risk". They further identified a set of theoretical resources for understanding environmental conditions for safety work. Four of the theories of power discussed in this memo are among the resources identified by Rosness et al. (2012). These four resources are summarised in **Table 2**. We have also included Granovetter's work on weak ties, as it is related to the perspective "power in networks and collaboration", as well as Vaughan's theory of normalisation of deviance, which is relevant to the perspective "power in symbols and discourse".

[25] In this project we use the terms 'environmental conditions' and 'framework conditions' interchangeably as (less than optimal) translations of the Norwegian term 'rammebetingelser'.

Table 2. Theoretical resources for understanding environmental conditions. Adapted from Rosness et al. (2012).

Theoretical resource	Scope	Relations between environmental conditions and risk	Implications for safety work
Discourse Foucault (1972)	How individuals, groups and organisations make sense of environmental conditions, and how they try to influence such sense-making processes.	The way actors deal with environmental conditions relates to the meaning they attach to those conditions. Discourses carry hidden assumptions that are often taken for granted.	Identify and question the hidden assumptions inherent in specific discourses.
Resource dependency Pfeffer and Salancik (2003)	Organisations dealing with conflicting demands from organisations in their environment.	Some demands from an organisation's environment may concern safety, whereas others may conflict with safety objectives.	Devise strategies that enable the organisation to give priority to safety requirements when they face conflicting demands from their environment.
Normalisation of deviance Vaughan (1996)	Organisations facing a mismatch between resources and production demands.	Adverse environmental conditions can lead an organisation to gradually accept serious anomalies as "normal".	Seek help from outsiders to challenge assumptions and norms that are ingrained in the culture.
Circuits of power Clegg (1989) Clegg et al. (2006)	Power mechanisms by which environmental conditions may influence the scope of actors to control risks.	Environmental conditions can constitute standing conditions influencing episodic power or exogenous environmental contingencies influencing dispositional and facilitative power.	Efforts to improve the scope of actors to keep risks under control may target the standing conditions well as exogenous environmental contingencies.
Principal-Agent Theory Eisenhardt (1989)	How to design effective incentives when principal and agent have different goals and agents have private information.	Reward structures may influence management attention, decision-making, and prioritisation of resources and efforts with regard to safety as well as reporting.	Remove or mitigate unwanted effects of current incentive systems.
Weak ties and the bridging of networks Granovetter (1973)	The significance of weak interpersonal ties in more extensive social networks	Weak ties can be critical for the mobilisation of knowledge and other resources because they bridge otherwise unconnected networks.	Build and maintain weak ties when the linking of otherwise unconnected networks is critical to safety.

By introducing the term 'environmental conditions for safety work' we have thus implicitly put power issues on the agenda and committed ourselves to a differentiated approach to such issues.

The list of theoretical resources above is not intended to be exhaustive. We may thus introduce additional theoretical resources to support the study.

7.7.3 Elaboration of research issues

In the proposed study, we will identify and explore important environmental conditions (framework conditions) for safety for actors involved in ensuring safe transport, including political and regulatory authorities. The ambition is not only to provide a list of actors and environmental conditions, but to propose mechanisms that might be exploited to improve framework conditions for transport safety.

The main problem to be addressed is the following: **How can companies and regulators work to create good framework conditions for safety in the context of global competition?** This question contains three dimensions: First, most actors are *receivers* of framework conditions, in the sense that they must adapt to framework conditions that are produced on a higher organizational or societal level. Second, they can utilize different strategies to influence and change these framework conditions. Third, most actors in the risk management chain will produce framework conditions that influence the work of other actors, i.e. they will also be *senders* of framework conditions themselves. All these three dimensions of framework conditions will be studied. Internationalization will in many ways be a particularly framework condition that has massive influence on other framework conditions.

The general problem to be addressed has been split into six initial research questions in the research proposal:

1. How do Norwegian companies work to create good framework conditions for safety in the context of increased competition from foreign transport actors?
2. What characterizes the framework conditions for safety in selected foreign transport companies operating in Norway?
3. How do national regulatory authorities work to create good framework conditions for safety within their respective industries? Does the internationalisation of regulation involve a drive toward a minimum standard of safety, or is there still leverage left for national regulators?
4. How can regulatory authorities and other policy makers address the interrelationships between different transport modes?
5. How can the various actors work and collaborate to influence the framework conditions for safety in the context of global competition and international regulation? This includes the roles of regulatory authorities, transport companies and their customers and unions. A particular emphasis will be made on the role of tendering processes and contracts as framework conditions for safety.
6. How can regulatory authorities cooperate and learn from each other to create good framework conditions for safety within their respective sectors and in the transport system as a whole?

We shall now discuss how each perspective on power can be used to elaborate the research questions:

The perspective *power in action* primarily supports the study of tactics used by people to achieve their objectives against the preferences of other actors in specific episodes. The perspective, as exemplified by Pfeffer (1992), is mainly relevant to the analysis of episodes that are delimited in time, and where it is possible to follow the actions in some detail. It is not clear whether our data material will include relevant episodes with this degree of detail. There is also a paradox attached to this perspective: A detailed analysis of power tactics may, if it is made available to the actors in a field, reduce the effectiveness of these tactics in the future. When analysing "power in action", it is necessary to consider what is/are the appropriate analysis level(s). Some of the tactics described by Pfeffer (1992) address things *individuals*, such as managers or salespersons, do to achieve their objectives. In contrast, Pfeffer

and Salancik's (2003) discussion of resource dependence primarily targets *interactions between organisations*.

The perspective *power as a resource* may lead us to analyse the current power resources of the actors and changes in such resources. Such an analysis may also include mechanisms that are conducive to *powerlessness*. One may also look for actors that have an interest in promoting transport safety, but who do not yet fully exploit their power resources for this purpose. Pfeffer and Salancik's theory of resource dependence may provide a useful link between the perspectives "power in action" and "power as a resource", since it includes a discussion of how organisations handle their dependencies on resources controlled by other organisations. This theory may prove particularly relevant to considerations of value chains and supply chains (Chapter 5).

The perspective *power in collaboration and networks* may lead us to consider how organisational responses to increased competition may disrupt or disarticulate former patterns of interaction and collaboration, how such disruption may affect transport safety, and how patterns of interaction that are essential to transport safety can be maintained or replaced during organisational change. Replacing traditional employer-employee relationships, e.g. by employing people in a staff recruitment agency rather than in the company where they work, may for instance put whistle-blowers in a situation with weaker legal protection, and thus keep people from voicing their safety concerns. In a more positive vein, this perspective may also lead us to seek ways in which what has been divided or disarticulated can be *reintegrated*. *Principal-agent theory* has been used in the petroleum industry to identify several possible challenges related to incentives in contracts between operators and contractors (Osmundsen et al., 2006, 2008). A similar analysis may be relevant to examine the possible effects of incentives in relationships between actors in the transport sector.

The perspective *power in symbols and discourse* draws attention to things that are taken for granted and tacitly assumed in a given discourse on one hand, and things that are excluded and considered irrelevant or ridiculous on the other hand. The perspective also draws attention to the processes by which discourses gain or maintain hegemony, and the processes by which hegemony is challenged. This perspective invites us to study how discourses conceal or disclose issues related to transport safety, and how safety-relevant discourses gain hegemony or are marginalised. An example of such an analysis can be found in Almklov et al. (2014), who argue that current trends towards self-regulation and international standards in safety management may be drivers for a shift in the distribution of power regarding safety, changing the conception of what is valid and useful knowledge. Case studies from two Norwegian transport sectors, the railway and the maritime sectors, were used to illustrate the proposition. In both sectors Almklov et al. observed increased prominence of discourses based on generic approaches to safety management and an accompanying disempowerment of the practitioners and their perspectives. It may also be of interest to consider if particular discourses play a part when some companies or sectors manage to maintain a high safety level in spite of intensive competition and small economic margins – for instance in civil aviation. A relevant attribute of discourses may be to what extent responsibility for transport safety is individualised and assigned to the sharp end of organisations (drivers, pilots etc.). It may also be of interest to study to what extent changes such as new organisation structures are presented as inevitable ("there is no alternative") or the result of a deliberate choice between several options.

Clegg's integrating framework may in principle be used to synthesise findings based on the previous perspectives. It also calls attention to *obligatory passage point* (or nodal points) through which traffic must necessarily pass. This concept may help us capture some of the aspects of organisational responses on increased competition. By denying its workers the legal status of employees in the organisation where they perform their work, an organisation may avoid some of the obligatory passage points defined by the Norwegian legislation and collective agreements. In this way the power base of employees, both as individuals and collectives, may be eroded. We may also consider whether the notion of *outflanking* can help shed light on these processes.

Table 3 provides specific examples of how the research issues above can be elaborated based on the four perspectives on power.

Table 3. Elaborations of research issues based on the four perspectives on power.

Research issue	Power in action	Power as a resource	Power in collaboration and networks	Power in symbols and discourse
1. How do Norwegian companies work to create good framework conditions for safety in the context of increased competition from foreign transport actors?	Are there specific power tactics that have been used successfully for promoting transport safety in interaction with customers and other stakeholders? How do companies in the transport sector act to create better economic environmental conditions for ensuring transport safety?	How do Norwegian companies handle possible conflicts between demands from the safety regulator and demands from customers? How strong are the trade unions in different sectors? What are their power resources? How are the local relations of power within different sectors? How are the economic framework conditions in each sector? Increased competition and outsourcing makes transport service providers interchangeable. How does this influence the resources to influence framework conditions? What are the key resources that serve as the power basis for different groups' ability to influence framework conditions (e.g. unions, access to decision-making arenas, control over resources/information etc.)	To what extent and how do Norwegian companies collaborate to promote transport safety? To what extent and how do they enrol other actors (e.g. trade unions) in such efforts? What do Norwegian companies do to preserve or strengthen organisational structures needed to ensure transport safety during organisational change (e.g. outsourcing)?	Can the hegemony of specific discourses account for good traffic safety performance in, e.g., aviation? What is the significance / impact of the reputation aspect in different transport sectors? Does risk perception play a role? To what extent do the companies mobilise external actors to scrutinise their safety work? Do prevailing discourses related to the identity of practitioners have an impact on safety (e.g. individualism, fatalism, possible contrasts between fishermen and pilots).
2. What characterizes the framework conditions for safety in selected foreign transport companies operating in Norway?	What characterizes the safety efforts of Norwegian regulatory authorities related to foreign transport companies? What characterizes the safety efforts of foreign transporters' own regulatory authorities for those operating abroad? How do owners of foreign transport companies balance safety measures and profitability in practice?	What are the key resources that serve as the power basis for different groups' ability to influence framework conditions (e.g. unions, access to decision-making arenas, control over resources/information etc.) What kind of sanctions do regulators have at their disposal when it comes to foreign transporters?	To what extent and how do foreign transport companies collaborate to promote transport safety? To what extent and how do they enrol other actors (e.g. trade unions) in such efforts? What characterizes the collaboration between Norwegian regulators and foreign transport companies when it comes to safety?	Do foreign transport companies operating in Norway have different safety management systems/philosophies? Do foreign transport companies operating in Norway experience confrontations between conflicting discourses related to transport safety? How do such confrontations affect safety?

Research issue	Power in action	Power as a resource	Power in collaboration and networks	Power in symbols and discourse
3. How do national regulatory authorities work to create good framework conditions for safety within their respective industries? Does the internationalisation of regulation involve a drive toward a minimum standard of safety, or is there still leverage left for national regulators?	Are there specific power tactics that have been used successfully for promoting transport safety in interaction with other stakeholders? Are there instances of power games between regulatory authorities and political actors? How do different national regulators join forces to change international regulations? Do such initiatives also include representatives of the industry?	What are the differences in power resources between regulatory agencies in different sectors? Are there differences in the authority to impose sanctions on foreign actors (e.g. ships under commodity flag)? Are there differences with regard to the information resources of the regulatory authorities? Rules and regulations can serve as a power base. When regulation becomes increasingly international, does this mean that national regulators move from primarily being senders of framework conditions, to primarily being receivers of framework conditions? What are the resources	How do national regulatory bodies collaborate with international bodies and other national regulatory bodies to promote transport safety? Can common international regulation account for the good safety record of civil aviation? How are the relations of trust between regulators and the regulated in the different transport sectors?	To what extent is «vision zero» (no fatalities, serious accidents etc.) a driving value for different regulatory authorities in Norwegian transport? What is the "state of affairs" regarding "vision zero" in different transport branches?
4. How can regulatory authorities and other policy makers address the interrelationships between different transport modes?	To what extent have policy makers facilitated cooperation between different regulatory authorities in transport?	To what extent are there established arenas and overarching bodies for policy makers which address more than one mode of transport?	What characterizes the collaboration between different regulatory authorities in transport?	To what extent and how is interrelationships between different transport modes integrated in regulatory and political discourses about transport safety and transport in general? Is growth in the less regulated or less safe transport modes referred to as inevitable or as a result of political choice?

Research issue	Power in action	Power as a resource	Power in collaboration and networks	Power in symbols and discourse
5. How can the various actors work and collaborate to influence the framework conditions for safety in the context of global competition and international regulation? This includes the roles of regulatory authorities, transport companies and their customers and unions. A particular emphasis will be made on the role of tendering processes and contracts as framework conditions for safety.	How are safety issues taken into account in tendering processes? How are transport users (public and private) emphasising safety in contracts and procurement?	What power resources can transport users and transport service managers use to promote transport safety?	How do interest groups (trade organisations and others) build and exploit contacts and networks to promote transport safety? Is the distance between senders and receivers of framework conditions increasing as a result of internationalization? (Geographic, organizational regulatory, w.r.t. model monopoly) Is the network of senders and receivers expanding due to internationalization? How does this influence the ability to influence framework conditions (new channels of influence, reduced opportunities for resistance ("motmakt"), leading to powerlessness for certain groups?) Is the network of senders and receivers more fragmented due to internationalization (conflicting or rapidly changing framework conditions)?	What are the main discursive differences regarding safety in different transport branches? Do such differences have consequences for collaboration across transport modes? Are there any signs of discursive hegemony regarding transport safety that can be related to one or a few transport modes?
6. How can regulatory authorities cooperate and learn from each other to create good framework conditions for safety within their respective sectors and in the transport system as a whole?	Have there been instances where regulatory authorities within different sectors have supported each other or worked against each other?	Are the roles divisions between different regulatory authorities unambiguous (e.g. the Norwegian Coastal Administration and the Norwegian Maritime Authority).	What arenas for collaboration exist today? What is the status with regard to network and bridging between regulatory authorities?	Do the regulatory authorities "speak the same language" (use compatible discourses)? Is any discourse hegemonic when regulators collaborate?

7.8 Conclusions

In this chapter we have summarised several theories of power that may prove relevant to a study of internationalisation in the transport sector. We have grouped the theories into four perspectives on power:

1. Power in action;
2. Power as a resource;
3. Power in collaboration and networks; and
4. Power in symbols and discourse.

Finally we have derived examples of how the research issues of the study can be elaborated, based in these four perspectives. These elaborations of the research issues support preparation of interview guides and coding schemes.

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