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Walking between decision models: analogising in strategic decision making

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Abstract

Purpose – The purpose of this paper is to explore the characteristics of situations where managers analogise, and when they change to a different decision model; examine how the analogies are evoked, what characteristics they have and how they are used, and add to the understanding through taking a qualitative approach.

Design/methodology/approach – This is an illustrative case study of a new market entry attempt by a medium-sized manufacturing firm based on interviews and analytical dialogues with management team members.

Findings – The paper finds that decision makers analogise when cause/effect-relationships are unclear, and change decision models when the analogy has helped to formulate a theory of the nature of the problem or a recipe for handling the situation. They evoke analogies by automatic recognition, using internal and external sources, for transfer within and between domains. The use of analogy occurs in problem setting, problem solving, action and sensemaking modes.

Research limitations/implications – Misunderstandings can occur in dialogue between researchers and decision makers. Future interpretive research should consider participant observation and conceptual modelling. A computational study might incorporate situational differences, roles, and the issues identified in this study.

Practical implications – Awareness of the prevalence of analogy in decision making can help practitioners critically evaluate the analogies used and consider multiple perspectives on problematic situations.

Originality/value – The paper adds to the literature by taking a qualitative approach to analogising. The findings offer some support to prior research using laboratory and analytical approaches, while suggesting reconsiderations and offering new insights.

Keywords Decision making, Management strategy, Cause and effect analysis

Paper type Research paper

Introduction

In a flurry of meetings, changes, rumours and deadlines, managers must make decisions in the best interests of their firms even though situations are fuzzy, and information is missing, vague or ambiguous. If rational models are of little help (Nutt, 1999), bounded rationality too sequential (Mintzberg *et al.*, 1976), and the Garbage Can a convenient place to dump unexplained variance (Langley *et al.*, 1995), how can we understand the decision models they use?

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One answer is that experience allows managers to acquire a repertoire of patterns, which they apply to new situations without detailed analysis (Newell and Simon, 1972; Simon, 1987; Khatri and Ng, 2000). Unlike prescriptive and systematic benchmarking of industry best practices (Camp, 1989; Walgenbach and Hegele, 2001), the essence of analogical thinking is to understand a new situation using a familiar pattern (Gentner and Holyoak, 1997). Although popular writings endorse analogising for dealing with strategic change (Slywotzky and Morrison, 1999), most previous business research treats it as a bias that distorts managerial perceptions (Schwenk, 1984; Duhaime and Schwenk, 1985; Stumpf and Dunbar, 1991; Simon and Houghton, 2002). However, there are recent suggestions that analogising is the way practitioners think (Gavetti and Rivkin, 2005; Stalk, 2005) and that we should recognise that it can be powerful. According to Gavetti *et al.* (2005, p. 693):

Analogical reasoning gives managerial cognition a significant hand in strategy making, and it emphasizes aspects of strategy making like pattern recognition, judgment, and even wisdom – aspects that, in our view, are prominent among practicing strategists but are understated in the academic literature on strategy.

The observation that most theoretical insights in management cognition stem from controlled environments (Oliver and Roos, 2005) is valid also with respect to analogising, although the agent-simulation approach of Gavetti *et al.* (2005) complements earlier experimental studies (Isenberg, 1988; Dahl and Moreau, 2002; Bolton, 2003). Gavetti *et al.* (2005) examine competitive positioning based on analogising across industries. Conceptualising analogising as a deliberate, computational response to objectively determinable stimuli, they suggest that analogies are most powerful when based on distinctive industry features and in situations where several high-level policy decisions are interdependent. Gavetti *et al.* (2005) also indicate that breadth of experience appears more beneficial than depth of experience, and that strict adherence to analogy may be dysfunctional if the representation of the setting is poor.

These indications, and the dominance of experimental and analytical approaches in previous business studies, raise questions about how practitioners in real organizations use analogies, and in what situations analogising is useful from their perspective. The many suggestions that decision models are used in an interrelated way (Munro and Mouritsen, 1996; Boland and Collopy, 2004; Sinclair and Ashkanasy, 2005) indicate that such research requires a theoretical framework that enables the extraction of different decision models, including analogies, and a method for tracking their use in problematic situations with varying characteristics.

Through adopting a qualitative approach, the purposes of this paper are to:

- explore the characteristics of situations where managers analogise, and when they change to a different decision model; and
- examine how the analogies are evoked, what characteristics they have and how they are used.

This theory illustration case study (Lukka, 2005, p. 384) relies on a decision model framework by Häckner and Nilsson (1999) and concerns EXPO, a medium-sized sawmill attempting to enter a new market. According to Lukka (2005), a theory illustration case study should establish the plausibility of a specific theoretical perspective (the decision model framework), by showing its ability to illuminate a previously unappreciated

aspect of practice (analogising). In addition, a qualitative case study of this type allows exploration of complex decisions in environments where different actors may be considering different kinds of information, under different types of circumstances.

The paper reviews previous research on management cognition and analogy-making from computational and interpretive perspectives (Lant and Shapira, 2001). The paper then presents a conceptualisation of analogising, and the Häckner and Nilsson (1999) decision model framework. After describing the research methods employed, the paper describes and analyses the EXPO case. A discussion then follows, which includes delimitations and suggestions for future research. The main conclusions of the paper are summarized in its final section.

The computational perspective

One fundamental assumption in the computational stream of research is that managers confront an objective, verifiable environment, posing demands for decisions based on analysis of cause/effect-relationships, costs and benefits (Boland, 1979; Boland and Pondy, 1983, 1986). Thus, managers scan and notice (Starbuck and Milliken, 1988) information cues which are processed through experience-based mental models (Gentner and Stevens, 1983), sometimes labelled as representations (Gavetti *et al.*, 2005), and as knowledge structures or schemas (Walsh, 1995; Oliver and Roos, 2005). The models are based on sets of propositions and causal rules, amenable to computational simulation (Greca and Moreira, 2000). A substantial body of research in this tradition demonstrates that mental models filter environmental signals, thus influencing sense and decision making (Gavetti and Levinthal, 2000; Tripsas and Gavetti, 2000; Lant and Hewlin, 2002).

Conceptual and experimental contributions concerning discrepancies between rational decision models and managerial thinking dominate previous computational work. Drawing on Steinbruner (1974) and Schwenk (1984) propose that decision makers use analogies from simple situations to guide problem definition in difficult situations (Stumpf and Dunbar, 1991; Farjoun and Lai, 1997), potentially resulting in unsuccessful strategic decisions (Duhaime and Schwenk, 1985). If so, one plausible explanation is that the relationship between environmental complexity and the complexity of cognitive structures follows an inverted U-shaped pattern (Schroder *et al.*, 1967; Hedberg and Jönsson, 1978). The complexity of mental models grows with environmental complexity until a critical level, where the cognitive complexity gradually declines with increasing environmental complexity. Simon and Houghton (2002) suggest that entrepreneurs in small, young firms are especially likely to reason erroneously, while relying on analogies based on personal and external sources. As demonstrated in Bolton's (2003) laboratory experiment involving business students, such analogies may have persistent effects on judgment.

In addition to the study by Gavetti *et al.* (2005), there is some evidence that analogies may have positive effects. In an experimental study of how executives and students solve a business case, Isenberg (1988) shows that executives' analogical reasoning is integral to their success. Dahl and Moreau (2002) demonstrate that the originality of new product design can benefit from analogy making, although an external prime in early development may impair such development. The computational perspective is concerned with the accuracy of perceptions, and suffers from a shortage of evidence from natural environments (Oliver and Roos, 2005).

The interpretive perspective

The interpretive research tradition focuses on how managers make sense of information in organizations (Lant and Shapira, 2001). Inspired by the sociology of knowledge (Berger and Luckman, 1967), this tradition considers sensemaking a social process (Weick, 1995) where decision makers interact to collectively construct decisions. Problems are not “out there”, but created in social settings, where decision makers draw upon mental models (Johnson-Laird, 1983) when exchanging views about what is going on (Boland, 1979; Boland and Pondy, 1983, 1986). Over time, this influences the mental models as interpretations are taken for granted as reality (Berger and Luckman, 1967). From this point of view, mental models are specific, dynamic and holistic representations of reality (Johnson-Laird, 1983; Greca and Moreira, 2000).

Isabella (1990) finds that managers use analogies to make sense of announced organizational changes. Vidaillet (2001) describes analogising among public sector professionals trying to define an ill-structured, complex problem situation supposedly involving a toxic cloud. Her results indicate that the analogies reflect the analogy makers’ professional roles. In their discursive analysis of a management team in the aircraft industry, Kokk *et al.* (2005) also find that variety in experience, attention and roles among team members contributes to the collective construction of strategic decisions.

From studies of decision makers in real-world settings, Klein (1998) derives a recognition-primed decision model according to which analogical reasoning concerning the typicality of a situation underlies recognition of goals, cues, expectations and a course of action. According to the model, decision making is automatic and based on situation awareness. Practising professionals seem to prefer experiential improvisation to problem solving (Schön, 1983). Experience endows the decision maker with a repertoire of examples, images, understandings and actions. Making sense of a new situation is facilitated by seeing-as and doing-as. By reflecting on similarities, new hypotheses develop and increase the repertoire (Tzonis, 2004). The interpretive perspective emphasizes plausibility rather than accuracy (Weick, 1995; Weick *et al.*, 2005) arguing that in real situations accuracy is limited (Mezias and Starbuck, 2003) and what counts is learning and the ability to make sense of situations in actionable ways. Very little interpretive research specifically addresses analogising in business firms.

Analogising

This paper is based on a symbolic interactionist perspective (Blumer, 1969), according to which decision makers selectively highlight aspects of situations that have meaning for them, interpret those aspects with others, and socially construct action on this basis. In this process information processing and sensemaking occurs simultaneously (Lant and Shapira, 2001, p. 6) although action is more than a response to some predetermined stimuli (Boland, 1979). When decision makers analogise, they draw on the similarity between two mental models (Holyoak and Thagard, 1995, p. 33), making it possible to understand a novel situation in terms of a familiar one (Gentner and Holyoak, 1997). The basis for analogising is therefore internal, although deliberate attempts to capitalise on its potential can possibly be supported by external conceptual models such as cognitive maps (Huff and Jenkins, 2002) or rich pictures (Boland *et al.*, 1994). Comparison, i.e. the evaluation of similarities and differences, is an integral part of analogising.

Analogy can be distinguished from other forms of similarity through an examination of whether objects or relations are shared between the source and the target (Gentner and Holyoak, 1997). When relations are shared, there is structural similarity. For example, the relationship between the sun and a planet compares to the relationship between two magnets. When objects are shared, there is superficial similarity. For example, the sun may superficially resemble a magnet. Novices' representations of problems tend to contain surface features whereas experts include structural features (Marchant *et al.*, 1993). Hence, the defining characteristic of analogising is the transfer of an explanatory structure from a source domain to a target domain. Analogy is therefore different from literal similarity, where both structure and relations are shared, and from a merely superficial appearance match (Gentner and Holyoak, 1997).

The similarity between the domains of analogical transfer varies along a scale from within-domain to between-domain analogies (Tsoukas, 1991), where the latter case entails an intersection between analogy and metaphor (Gentner and Holyoak, 1997). An example of within-domain analogising would be to compare the relationship between a puppy and a dog to the relationship between a kitten and a cat. An example of between-domain analogising would be to say that electrons are to the nucleus what planets are to the sun.

The decision model framework

Drawing on Simon (1960), Perrow (1967), Thompson (1967) and Häckner and Nilsson (1999) assume that different decision models are useful in different problematic situations. Like many others (Mason and Mitroff, 1973; Iselin, 1989; Nutt, 1989; Fernandez and Simon, 1999), they distinguish between structured and unstructured problems. The degree of structure is defined as the degree of cause/effect-knowledge and access to an established procedure for decision making. A second well-established dimension is the degree of complexity. Häckner and Nilsson relate complexity to the number of factors considered and their inter-relationships (Rivkin, 2000), arguing that high complexity is associated with unclear preferences (Thompson, 1967) and environmental change (Hedberg and Jönsson, 1978). There is theoretical support for linking experiential judgment and trial-and-error to low analysability. Dating back to Perrow (1967), Thompson (1967) and Daft and Macintosh (1981), evidence suggests that optimisation will fail in such situations. Instead, decision makers rely on hunches and experimentation, processing small amounts of qualitative information. In a study of technological development in semiconductor manufacturing, Macher (2006) concludes that both dimensions influence problem-solving performance.

According to the framework, well-structured situations of low complexity call for computing, wherein the values of a limited number of variables are inputs for simple, often computerised calculations, for example concerning insurance tariffs and premiums. As complexity increases, the problem situation calls for analysing. The number of factors and connections requires sophisticated support for computation. When the problematic situation is complex and unstructured, this calls for envisioning. A strong belief in some absolute value guides evaluations of the correctness of actions (Klein and Hirschheim, 1991). According to the framework, analogising is likely in unstructured, simple, situations (Figure 1)[1].

The literature review indicates that our knowledge is limited when it comes to the sources, characteristics and uses of analogy, including the situational conditions

Source: Häckner and Nilsson (1999, p. 52)

Figure 1.
The decision model
framework

surrounding analogising. The literature review also reveals an emphasis on laboratory and experimental approaches in previous research. This paper addresses both these gaps. Firstly, the paper adopts the Häckner and Nilsson (1999) decision model framework, which explicitly recognises analogy as one decision model among others, while enabling analysis of situational conditions. Secondly, the paper takes a qualitative approach to analogising, by exploring it in a case study of a new market entry attempt.

Research methodology

EXPO was an interesting research site due to high-management tenure (depth of experience) and extensive exports to several European countries (breadth of experience). The firm had an explicit participation interest, which was considered to improve fulfilling the research objective of capturing action-oriented theories in use (Jönsson and Lukka, 2006; March, 1994, p. 58; Argyris, 1977). The study concerned EXPO's recent attempt to enter the Norwegian timber market. This attempt was completed during the study. Recentness is important for recollection (Huber and Power, 1985), and recollection of concrete events is more reliable than recollection of past opinions or beliefs (Glick *et al.*, 1990; Golden, 1992). The strategic content of the EXPO case, and its differing problematic situations on management control and operational levels, made it suitable for an illustrative case study (Lukka, 2005, p. 384), using the decision model framework. The team had four actors (decision makers) in this context: the chief executive officer (CEO), the chief financial officer (CFO), the production manager (PRM) and the purchasing manager (PUM). The team members were interviewed twice.

The actors were asked to tell stories about their new market entry attempt (Nilsson, 1995; Häckner and Nilsson, 1999; Ambrosini and Bowman, 2002). Each interview started with open questions allowing the actors to describe the market entry effort without interference. The first question was; "Would you please describe what occurred and how you reasoned in relation to this issue?" The interviews proceeded with specific supplementary questions determined using theoretical pre-understandings (Nilsson, 1995) and interview items from studies with a similar scope (Bergström and Lumsden, 1993). The questions were pre-tested on two SME managers in two iterations. The extent to which specific questions were asked depended on the extensiveness of storytelling responses.

The results of initial interviews influenced the format of follow-up interviews. The interviews were tape-recorded and transcribed.

Interpretations were formed in a two-way interactional process involving the actors and the researcher (Kawalek and Jayaratna, 2003). The first step was a dialogue with each actor to discuss the meaningfulness of the decision model framework as peers. The dialogues invited the actors to engage in theorising over firm practices (Kreiner and Mouritsen, 2005) with the researcher mediating between theory and the actors' stories (Pettersen and Mellemvik, 2005, p. 55). Each actor was introduced to the decision model framework in Figure 1. The actors' opinions were requested on whether the decision model framework could be used to characterise the new market entry attempt. They were encouraged to question the framework. Additional dialogues were held individually after six months to follow up the analysis thus far and to capture the completion of the market entry.

The second step was to analyse the data at a distance from the actors (Boland and Pondy, 1983) by identifying the problematic situations mentioned during interviews and coding them by decision models. It was possible to extract single models in use, combinations, and shifts in model use. The following criteria were used:

- *Computing*. A simple routine situation where numerical decision models are used to calculate a correct answer. An example would be the calculation of insurance premiums.
- *Analogising*. A situation where it cannot be known a priori that the choice made will be the best possible one. Afterwards it will be impossible to conclude whether another alternative would have been superior. Decision models are judgmental, based on experience and similarity. An example would be a staffing decision after screening based on formal merits.
- *Analysing*. For the purposes of this paper, analysing refers to a difficult situation where complex and numerical decision models are used to break a problem down into its component parts. An example would be the design of a plant, aided by a queuing system based on operations research.
- *Envisioning*. A complex, fuzzy situation, where decision models require inspiration and creativity. An example would be strategy development for a firm with profitability problems and low-staff motivation.

The data were coded twice with a significant amount of time between coding occasions. Differences were coded as combinations between decision models. Tentative patterns were discussed with colleagues in seminars.

Case study and analysis: EXPO's new market entry attempt

This section provides a description of the formulation and implementation of the process, marking instances of analogising by brackets. The section then presents the results of the analytical dialogues (the first step in analysis) and interpretations of interview transcripts (the second step in analysis) concerning each actor. The results of analytical dialogues indicate iterations between decision models, which are difficult to track. The section presents those results in terms of the main patterns found. A more elaborate illustration of how the team moved between decision models then follows, based on the second step in analysis concerning the CEO.

Case description

EXPO had failed in previous attempts to enter the Norwegian market. Early in the year, a consultant with experience in this market approached EXPO, proposing collaboration on the export of planed wood to Norway. The consultant would act as a sales agent. Although EXPO had excess production capacity, the CEO was resistant to the proposal due to past difficulties in the market (analogising). The proposal coincided with group pressure to enter the Norwegian market and it was accepted.

Prices were determined early, when visiting customers. “Informal estimates” were made based on prices for similar products in other markets (analogising). Meetings with customers helped the CEO to form an impression of suitable prices. Calculation was simple and based on discussions of expected sales price, less the cost of raw material.

There was hesitation in the team due to past difficulties with payment collection in the market (analogising). The owner group allocated production for purposes of export to Norway to another plant. Because of previous delivery planning difficulties there, the PRM at EXPO was made responsible for delivery management. Customers demanded a large variety in terms of product sizes, causing administrative problems. EXPO anticipated difficulties due to product variety, based on their experience with a high volume of small orders from customers in Norway (analogising). The production was transferred to EXPO. In the spring, sales were exhibiting strong expansion, reaching a stable peak in the summer of four shipments per week.

When the price of whitewood increased, the CEO conferred with colleagues and competitors, realising that the sales volume and prices were too low (analogising). An attempt was made to increase the sales prices to Norway to a level corresponding more closely to other markets. This resulted in a decline in sales. The management team continuously reminded the CEO of the past losses (analogising). Payment difficulties arose with an important customer. Intense collaboration to collect payments and coordinate with delivery planning followed (analogising). The team worked together to quickly cancel deliveries, collect payments and “keep an eye on” the customer. Beginning in the late autumn and winter, sales declined and around the turn of the year they came to a stop. Retrospective calculations showed a positive contribution margin.

The chief executive officer

In the CEO's opinion, there were few factors involved in the market entry decision. The number of factors increased, as production involved another facility. He hesitated to draw conclusions about the degree of structure but stated that one could easily underestimate the difficulty of entering this market. The business idea (envisioning), calculations (computing) and experience (analogy) all mattered, although in different stages. Computing (calculating the contribution margin) was the least important. He emphasized the need for an image of future market development, formulated gradually in conversations with those in his network. Thereafter, analysis of required product characteristics became interesting. Computing was simple, after the use of other models. The use of decision models seems to follow a complex pattern with the following dominant traits: envisioning – analogising – analysing – computing.

Table I summarizes the problematic situations and decision models involved, according to interview transcripts concerning the CEO (in Figure 2, the letters A-G from Table I illustrate movement between decision models). The low-capacity utilisation for planed wood triggered within-domain analogising coupled with envisioning.

Table I.
Problematic situations
and decision models
according to CEO

<i>Initial market representation</i>	<i>Norwegian lumber market has poor debtors and a demand for high product variety</i>	<i>Additional decision models</i>
Problematic situations	Use of analogy	Envisioning (market entry part of EXPO's market plan)
Low capacity utilisation for planed wood (A)	Competitor strategy to offer planed wood results in more even profitability throughout business cycle	
Selection of distribution channel (B)	Use of sales agent an important difference between present attempt and previous firm-specific experience from target market	
	Firm-specific experience from another market suggests local long-term partner is a successful approach	
Pricing (C1, C2)	Firm-specific experience of same product category in other markets. Risk margin higher in target market	Computing (contribution margin calculations)
Production and delivery management (D)	Competitor pricing in target market and customer conversations	
	Firm-specific experience from target market suggests that the market is administratively complex due to product variety	
Conflict with sales agent and attempted price change (E)	Firm-specific experience from other markets suggests that sales volume drops if price level is unclear	
	Firm-specific experience from other markets suggests sales objectives must be determined in advance and followed up on	
	Competitor pricing and volumes in target market suggests prices in target market are wrong	
Delivery cancellation and payment collection (F1, F2)	Firm-specific experience from target market suggesting close internal collaboration important to avoid losses	Computing (accounts receivable management)
Evaluation (G)	Firm-specific experience from target market suggests sales volume would have been higher if entry had occurred during peak season	Computing (calculations)
	Firm-specific experience from other markets suggests market entry was too hasty. Market entry requires long-term commitment and dependability through business cycle	
	Firm-specific experience from other markets suggests need for thorough research to find a sales channel. Important difference that sales channel in target market came to easily (like on the dance floor, it cannot be too easy then it is not interesting)	
Ex-post market representation	<i>Norwegian market different from other European markets since sales volume objectives cannot be determined in advance (the Arabs of Scandinavia)</i>

Figure 2.
Walking between decision
models: the CEO

When selecting the distribution channel, analogising caused doubts but EXPO proceeded due to group pressure. Prices were determined using firm-specific experience from other markets and by analogy to the competition. During implementation, firm-specific experience from the target market triggered anticipation of production difficulties due to product variety. Firm-specific experience from other markets and analogising to the competition made it possible to assess the agent's performance as problematic. Analogies to firm-specific experience from the target market and accounts receivable management enabled successful prevention of losses. The CEO retrospectively analogised to the target market and other markets when evaluating the attempt. The initial representation of the market as associated with poor payment performance remained unchanged in retrospect.

The results concerning the CEO suggest a highly complex pattern of movements between the decision models in the decision model framework. Numerous instances of analogising are coupled with envisioning and computing.

The chief financial officer

According to the CFO, there were a number of factors to consider, but complexity was reduced because of successful firm-specific experience of similar deliveries to another market. Initially the CFO found the degree of structure low throughout the effort. Later he claimed that over time there was a movement from the unstructured side of the framework towards a high degree of structure and low complexity.

Despite envisioning early in the process, firm-specific experience from the market resulted in doubts. The CFO found linkages between all models, although analogising was most important. He related analogising and envisioning mainly to formulation, with informal calculation sketches (computing) before implementation. The following pattern seems to characterise the main decision model use: envisioning – computing – analogising.

Table II summarizes the problematic situations and decision models involved, according to interview transcripts concerning the CFO. The results suggest envisioning in response to low-capacity utilisation. Production and delivery planning were linked to firm-specific experience from the target market and from other markets, and to computing in relation to a desired capital investment. Pricing relied on firm-specific experience and on calculations. EXPO paid close attention to the

Table II.
Problematic situations
and decision models
according to CFO

QROM
3,2

<i>Initial market representation</i>	<i>Norwegian lumber market has poor debtors and a demand for high product variety</i>		
Problematic situations	Use of analogy	Additional decision models	Comment
Low capacity utilisation for planed wood		Envisioning (group strategy to improve value-added by moving downstream in value chain)	Unclear decision model use
Production and delivery planning including capital investment requirement	Firm-specific experience from target market suggesting high product variety (pharmacist's recipes) Firm-specific experience from other markets with similar product requirements indicates that EXPO has capability to handle production and deliveries to target market	Computing (ROI)	Group decision to make capital investment in another facility due to unfulfilled ROI at EXPO
Pricing	Firm-specific experience from previous new market entries	Computing (calculations)	
Customer management	Firm-specific experience from target market suggesting poor payment performance among customers, requiring close attention to accounts receivable Firm-specific experience from target market shows high product variety. Volume to target market higher than previously, thus reducing problem	Computing (accounts receivable management)	
Production and delivery management	Firm-specific experience from other markets with similar product requirements improve firm capability		

(continued)

Price adjustment	Firm-specific experience from other markets with same products suggests prices can be raised after introduction	Computing (accounts receivable management)
Delivery cancellation and payment collection	Firm-specific experience from target market, showing poor payment performance among customers	Computing (calculations)
Evaluation	Firm-specific experience from target market suggesting price sensitivity Firm-specific experience from other markets with same products suggests target market is different Competitor prices and volumes in target market seem better, creating confusion	
Ex-post market representation	<i>Market unchanged since previous attempt. Pattern is different from traditional export markets where a low price entry strategy can be followed by price adjustments as demand increases and business relationships stabilise</i>	

Table II.

accounts receivable, due to their knowledge about the customers as poor debtors. Production and deliveries were managed because of firm-specific experience from the target market and other markets. An attempted price increase failed due to reliance on firm-specific experience from other markets. The firm's sensitivity to payment disturbances had improved because of firm-specific experience from the target market, and facilitated fast cancellation of deliveries. In addition to *ex-post* evaluation based on calculations, the CFO retrospectively analogised to explain and justify the outcome, using experience from the target market, other markets, and the competitors' performance in the target market.

The production manager

The PRM stated that EXPO used all decision models. He suggested that envisioning, analogising and analysing was important early on and that "a positive contribution margin is a prerequisite", but it turned out to be difficult to further discuss situational characteristics and decision model use. One interpretation is that the models were interrelated and used in parallel.

As shown in Table III, many problematic situations discussed by the PRM were also highlighted by the CEO or the CFO (low capacity utilization, production planning, delivery management and payment collection), corroborating those patterns of decision model use. Concerning the additional situations mentioned, the PRM-related inventory control to firm-specific experience regarding annual sales trends, and product mix as well as product quality decisions to firm-specific experience from other markets.

The purchasing manager

The PUM mentioned a limited number of problematic situations. The factors to consider were few, but important and difficult to interpret. Envisioning was important initially but more so for the owner group than at EXPO. The PUM downplayed the role of analysis claiming that the management team was resistant based on past failures. Computing was used for evaluation. The process entailed a movement from the lower towards the upper part of the framework. This suggests the following sequence of main decision models: envisioning – analogising – computing.

As indicated in Table IV, the PUM referred to a modest number of problematic situations and the results did not reveal initial or *ex-post* representations of the target market. One likely explanation is that the PUM's role, as responsible for purchasing in the group, made his work distant from market strategy. The situations that concern the selection of a distribution channel, delivery management and payment collection corroborate the results from interviews with his fellow team members. His mentioning of the acquisition of a production plant, along with his evaluation of this market entry effort, both reflect a group perspective.

Discussion

The results support suggestions that decision models tend to be interrelated and used in parallel (Munro and Mouritsen, 1996; Boland and Collopy, 2004; Sinclair and Ashkanasy, 2005; Gavetti, 2005). Despite this, the conversations with the management team members support the relevance of the decision model framework (Häckner and

<i>Initial market representation</i>		<i>Norwegian lumber market has poor debtors and a demand for high-product variety</i>	
Problematic situations		Additional decision models	Comment
Low capacity utilisation for planned wood		Use of analogy Competitor strategy to offer planned wood results in more even profitability throughout business cycle	
Production planning and capital investment		Firm-specific experience from lumber deliveries to various markets (delivery management)	Group decision to make capital investment in another facility Group decision to make PRM responsible for production and deliveries including second facility
Delivery management and inventory control		Firm-specific experience concerning sales volumes throughout the year (inventory control)	
		Firm-specific experience from other markets suggests an initially broad product range can later be replaced by a focus strategy to avoid price competition	
Product mix		Firm-specific experience from German market suggested acceptable quality level in Norwegian market	
Product quality		Firm-specific experience from target market suggesting close attention to accounts receivable prior to deliveries	Computing (accounts receivable management)
Payment collection		Firm-specific experience from other markets suggests mutual internal coordination develops gradually (sales agent)	
Evaluation of sales agent and new market entry attempt		Firm-specific experience from target market suggests that market differs from other markets as sales peak heavily from May to September (market entry)	
		Firm-specific experience suggests that the first year in a new market is loss-making	
Ex-post market representation		<i>Norwegian market is different from other European markets since sales go directly to end-users</i>	

Table III.
Problematic situations
and decision models
according to PRM

Table IV.
Problematic situations
and decision models
according to PUM

Problematic situations	Use of analogy	Additional decision models	Comment
Acquisition of production facility Selection of distribution channel	Use of sales agent differs from firm-specific experience from other markets, suggesting middlemen are costly and slow down information flow	Envisioning (compliance with group strategy)	Group decision
Delivery management	Norwegian market differs from firm-specific experience in other markets, of delivering truckloads of a single product quality		
Payment collection	Firm-specific experience suggests poor payment performance in target market		
Evaluation	From a group perspective, firm-specific experience from target market made the new market entry effort "like towing a car with the handbrake applied"	Computing (calculations)	

Nilsson, 1999). The results reveal diversity in decision models, although analogies dominate.

There is a tendency towards an upward movement over time in the decision model framework (Figure 2). Results that conclude with a downward movement toward analogising reflect the decision makers' propensity to use analogies retrospectively to reflect on the outcome. One interpretation is that the upward movement in the framework, towards computing, occurs when a theory of the nature of the problem is established. Thus, it would seem that during offensive new market entry, analogising and envisioning provide the context for computing and/or analysing.

Several situations require judgment, as it cannot be known a priori that decisions taken will be successful (Thompson, 1967). However, the decision makers do not characterise the situations as complex (Rivkin, 2000; Hedberg and Jönsson, 1978). In contrast to Gavetti *et al.* (2005), who link analogising to complexity, the findings indicate that the transfer of an explanatory structure from one situation to another is most likely when causation is unclear (Perrow, 1967; Thompson, 1967; Daft and Macintosh, 1981). Gavetti *et al.* (2005) examine analogising in simplified situations where a limited number of factors are taken into account. Highly complex situations, where representations are likely to be simplified (Schroder *et al.*, 1967; Hedberg and Jönsson, 1978), may require envisioning rather than analogising. This would explain the suggestion that close adherence to analogy is costly when representations are poor (Gavetti *et al.*, 2005).

There is a common core in the characterisations of the market entry. For example, all decision makers characterise the new market entry as initially tied to envisioning followed by, or in parallel with, analogising. One interpretation is that envisioning is confounded by analogy, as the representation of the market is unfavourable. However, the decision makers partially emphasise different problematic situations (Blumer, 1969), evoking different analogies. One interpretation is that differences are due to the decision makers' roles. Although relatively broad, the account of the CEO tends to lean towards sales, and market issues. The CFO adds calculations and metrics used. The PRM's account tends to be dominated by problematic situations (and analogising) concerning the product and its production. The PUM stresses the owner group. One possible explanation is that roles affect the experience that develops (Schön, 1983) and the managers' mental models (Johnson-Laird, 1983). The mental models guide the analogies that the decision makers make, and the decision models they use (Vidaillet, 2001; Kokk *et al.*, 2005).

Many analogies are firm-specific while some have external sources (Gavetti *et al.*, 2005; Simon and Houghton, 2002). The sources of the firm-specific analogies are experience from the target market or from other markets. Experience from the target market seems influential during implementation. While within-domain analogies dominate, there are also between-domain analogies (Tsoukas, 1991). This indicates that analogising is more multi-faceted than previously thought (Newell and Simon, 1972; Klein, 1998). The source (firm-specific or external) and transfer (within-domain and between-domain) dimensions combine into a typology of analogies (Figure 3).

Further to the within-domain analogies, firm-specific between-domain analogies (e.g. pharmacists' prescriptions) capture the essence of firm-specific experience in a certain domain (production and delivery management). The external between-domain analogies are expressions that are part of everyday language, without a referent in the business context. The results point towards a communicative use of analogy, related to

Figure 3.
A typology of analogising

		Source	
		Firm-Specific	External
Transfer	Within-Domain	Experience from target market Experience from other markets	Competitor strategies in the target market Competitor strategies in other markets
	Between-Domain	Expressions that capture the essence of firm-specific experience in a domain	Metaphorical expressions without reference to business context

persuasion, with the competition rather than firm-specific experience as its source. However, firm-specific experience in a given domain can also develop into between-domain analogies used in team communication.

Factors in a certain decision situation are problematic because they do not match with the decision makers' representation of such situations (Klein, 1998). When decision makers define situations as problematic, the definitions trigger representations with possible solutions (Schön, 1983). As found by Vidaillet (2001), such representations are stored and based on experience (firm-specific or external). In contrast to Gavetti *et al.* (2005) who claim that decision makers focus their reasoning on subsets of factors in a given problematic situation, and that these subsets form representations, it seems that representations determine the factors noticed (Weick, 1995), the decision models used and the courses of action proposed (Klein, 1998).

In certain situations, analogical reasoning brings about commitment to fast action. The decision makers are attentive to delivery planning and payment collection and committed to counteracting the pattern from before. The linkage between commitment and analogy (Schwenk, 1984) seems most pertinent when based on firm-specific experience. The results also reveal a retrospective use of analogy for justification and reflection, when the decision makers reflect on the outcome and how to achieve an improvement. These results support suggestions that analogies are useful for sensemaking (Schön, 1983; Ashforth and Fried, 1988; Isabella, 1990).

Table V distinguishes between four modes of analogising. Analogies in a problem-setting mode assist decision makers to assess a situation as problematic and to formulate a theory of the nature of the problem. Analogies in a problem-solving mode provide a recipe for how to handle a specific situation. Analogies in these modes draw on firm-specific experience or external sources. In an action mode, analogical reasoning brings about commitment to action. The action mode seems based on

Mode	Explanation
Problem setting	Situation does not match decision maker's representation of typical conditions in such a situation
Problem solving	Decision maker's representation suggests characteristics of the problem Decision maker's representation of past situations suggest how to handle target problem
Action	Experience from similar situation triggers joint commitment and action
Sensemaking	Experience from other situations is used to make sense of an outcome

Table V.
Modes of analogising

firm-specific experience. It may be that commitment is tied to emotion, and that emotional reactions arise when analogies are close to the decision makers. The results also suggest a retrospective sensemaking mode where analogies serve for justification and reflection. The sensemaking mode draws on firm-specific experience or external sources. Possibly, between-domain analogies are useful for retrospective justification.

The results illustrate that when managers analogise they transfer an explanatory structure from one representation of a situation (source) to another (target), as they consider source and target situations to be similar (Gentner and Holyoak, 1997). In the case of EXPO, with its high-management tenure and breadth of new market entry experience, this process seems automatic rather than deliberate. This pattern calls into question the image of analogising as a deliberate response to an objective business environment, based on a calculus of pay-off functions (Gavetti *et al.*, 2005). It is the recognition (Klein, 1998) of a familiar pattern that triggers an experiential, automatic, response among the decision makers.

The delimitations of this theory illustration case study might serve to direct future research. First, the decision model framework provides one simplified view of the work of decision makers. For example, information systems specialists might argue that analysis forms part of the overall process. Second, the study shows the intricacy of extracting and tracking decision model use in a process constituted by many situations. While storytelling was important here, misunderstandings may occur when the logic of academia meets the logic of the field (Jönsson and Lukka, 2006), through theoretically informed interviews. Ideally, an analysis of analogising would be contextualised in the teleology (Knight, 2007) of a decision-making process. A richer understanding of decision model use might arise from participant observation. Third, there is a range of modelling techniques (Bougon, 1983) which could underpin attempts to analogise in a strategic decision-making framework. A computational study might incorporate situational differences, roles, and the variables introduced here. In either case, situations where decision makers lack experience from the decision situation or its domain would make a fruitful study environment.

Conclusions

Managers analogise when cause/effect-relationships are unclear. Although this finding echoes the writings of influential theorists from the 1960s, there are two reasons why it is important to reaffirm its value for a better appreciation of the situations where practitioners analogise. Firstly, previous work addressing analogising in strategy tends to overlook the degree of structure as one dimension of problematic situations. Secondly, the linkage between analogy and poorly structured situations suggests caution with respect to popular claims endorsing analogy to cope with complexity and rapid change. The decision makers strive towards analysability and change decision model when the analogy has helped to formulate a theory of the nature of the problem and, sometimes, a recipe for handling the specific situation.

This qualitative case study also illustrates how, in complex environments, the different professional roles of team members contribute to differing interpretations of which problematic situations are salient, and which decision models are important. Different circumstances also offer different contextual dimensions, which serve as cues for analogising. Decision makers assess problematic situations using cognitive

representations, which develop their characteristics from experience. Roles delimit experience to certain areas.

Analogies seem to be a part of the repertoire of experienced managers, which they automatically evoke by recognition when encountering triggering cues. This contradicts the computational assumption that decision makers deliberately determine situational characteristics as a basis for analogical transfer.

The study provides new evidence that analogies range across a spectrum from within-domain analogies based on previous firm-specific experience to metaphorical between-domain analogies, and that analogising occurs in different modes. From a computational perspective, the distinctive characteristics (Gavetti *et al.*, 2005) that make an analogy between source and target relevant are most probable concerning intended rational use of within-domain analogies. From an interpretive perspective, between-domain analogies may come into play when issues have power or status implications, or when preferences differ.

Note

1. The graphical depiction of the decision model framework with dotted lines illustrates that decision models are not necessarily used separately (Nilsson, 1998; Häckner and Nilsson, 1999).

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