4-10-2008

The Strategic Potential of Information Imperfections: An Information Strategy Framework for Seeking InfoRent

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芽|Sprouts Working Papers on Information Systems ISSN 1535-6078

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Abstract
Information imperfections, and asymmetrical information in particular, have primarily been regarded as impediments to the economic efficiency of markets; they have seldom been explored as opportunities to earn economic rents. This article builds an information strategy framework by elaborating on the strategic opportunities that exist for firms in markets that fail to satisfy the perfect information condition of neoclassical economic theory. We propose â InfoRentâ as a new economic rent type that results from exploiting the inherent opportunities of incomplete and asymmetrical information and introduce a fundamental difference in information strategy decisions: firms can either resolve or consolidate instances of information imperfections in markets. These generic information strategy decisions are then synthesized into four theoretical propositions on InfoRent-earning possibilities for firms. Finally, these propositions are tentatively tested through a sector study that examines the Dutch leisure travel industry through the lens of the information strategy of one of the key players in this industry, tour operator TravelCom.

Keywords: infoRent, information imperfection, information strategy, market transparency

Permanent URL: http://sprouts.aisnet.org/5-5

Reference: Truijens, O., Huizing, A. (2005). "The Strategic Potential of Information Imperfections: An Information Strategy Framework for Seeking InfoRent," University of Amsterdam, Netherlands . *Sprouts: Working Papers on Information Systems*, 5(5). http://sprouts.aisnet.org/5-5

The Strategic Potential of Information Imperfections:

An Information Strategy Framework for Seeking *InfoRent*

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Abstract: Information imperfections, and asymmetrical information in particular, have primarily been regarded as impediments to the economic efficiency of markets; they have seldom been explored as opportunities to earn economic rents. This article builds an information strategy framework by elaborating on the strategic opportunities that exist for firms in markets that fail to satisfy the perfect information condition of neoclassical economic theory. We propose 'InfoRent' as a new economic rent type that results from exploiting the inherent opportunities of incomplete and asymmetrical information and introduce a fundamental difference in information strategy decisions: firms can either resolve or consolidate instances of information imperfections in markets. These generic information strategy decisions are then synthesized into four theoretical propositions on InfoRent-earning possibilities for firms. Finally, these propositions are tentatively tested through a sector study that examines the Dutch leisure travel industry through the lens of the information strategy of one of the key players in this industry, tour operator TravelCom.

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INHOUDSOPGAVE

"*A strategy that does not either create or exploit an asymmetry constituting an advantage must be rejected*." – R.P. Rumelt [42, p.203]

Introduction

A recent special issue of this journal [11] reaffirms that economics has improved our understanding of various topics in Information Systems (IS), such as the economic value of information and information technology (IT) [28] and inter-organizational information sharing [12, 20]. The footing of its rigorous definitions, clearly specified behavioral assumptions and existing theoretical propositions posits economics as a steady reference discipline that could continue to increase the level of maturity in the IS discipline.

Nevertheless, the theoretical contributions of economic perspectives on the role of information are scattered and far from comprehensive. For instance, traditional competitive equilibrium analysis suffers from the legacy of the 'perfect information' condition: it "is not robust to slight alterations in the informational assumptions" [53, p.21]. It treats information perforce as free good or as equal to any other commodity. However, information is, in fact, not a free good, nor does it fulfill "the definitional or conceptual requirements of commodity (…) and insisting that information is commodity obscures many essential properties of information as well as consequences of information exchange" [7, p.42]. In addition, the stringent conditions of efficient market theory by definition preclude firms from realizing above-normal economic returns, i.e. rents[1]. The rigor of neoclassical theory thus limits its ability to contribute to our understanding of the rent-earning potential of imperfect information.

Nonetheless, economic theories that do deviate from the perfect information condition have been developed [23, 25, 53, 58]. Theorizing on the consequences of information imperfections for economic actors, these theories predominantly focus on various forms of information asymmetry in transactions and markets, such as agency problems, moral hazard, adverse selection and signaling [2, 17, 52, 53]. As such, economic theory not only helps explain why information imperfections occur, it also clarifies when their occurrence could be exploited and what countermoves could be devised to avoid such exploitation. However, they unilaterally regard imperfect information as an impediment to economic efficiency, mainly raising the agency or transaction costs involved. The *strategic* opportunities of information imperfections for firms are only occasionally touched upon [e.g. 15, 60]. Finally, there are economic theories that do recognize the strategic potential of information, as for instance the Resource-based View (RBV) [e.g. 8] and Industrial Organization (IO) Economics [e.g. 36]. They have, however, both neglected to define an information-related rent type, and focus exclusively on either the product markets or factor markets of firms and thus ignore the strategic importance of information in a complementary perspective.

Taken together, economics' service record with regard to explaining the strategic potential of information imperfections for firms is –to put it mildly– moderate: an information-related rent type fitting the so-called 'information society' has yet to be defined; no comprehensive explanation for information-based performance differentials between firms exists, and an understanding of how and why firms deal with information imperfections in their search for economic rents is lacking. Therefore, our aim is to enrich the relationship between economics and IS by introducing the concept of *InfoRent* as a new economic rent type and by constructing an information strategy framework that addresses these shortcomings. In constructing this understanding, we gratefully draw on various complementary insights from economic theories touched upon above, specifically efficient market theory, the RBV and IO-Economics.

In the remains of this article, we introduce the information strategy framework and *InfoRent*. We elaborate on the decision-making involved in implementing an information strategy by proposing a fundamental difference in ways to address information imperfections and to influence the degree of market transparency. These generic information strategy decisions lead to four *InfoRent*-propositions that represent trade-offs around the opportunities for firms to earn *InfoRent*. These propositions are then tested in an empirical sector study of the Dutch leisure travel industry through the lens of tour operator TravelCom[2]. We examine the extent to which TravelCom displays behavior aimed at seeking, realizing and appropriating *InfoRent* by mapping its information strategy on the distinguished theoretical propositions. We conclude by highlighting our theoretical and managerial contributions and the opportunities for future research.

Information Strategy Framework

The Efficient Market Hypothesis (EMH) [e.g. 6, 10, 60] specifies the conditions of market equilibrium under which markets are economically efficient and rents are precluded in the long run. In efficient markets, strategic decisions of firms are not, and cannot be, rewarded with above-normal returns. In real life, however, markets that satisfy the conditions underlying the theoretical ideal of the 'perfect market' do not exist and thus firms can, and do, earn rents. Nevertheless, an understanding of the EMH-conditions is a useful preliminary to an analysis of the profit potential of various markets [60] in that the EMH *inversely* explains the existence of rent opportunities: market *in*efficiencies that a market party identifies, appropriates and sustains could generate rents.

The EMH-conditions can be divided into three main categories: perfect competition, complete markets and perfect information. In the literature different rent types have been attributed to

different types of market failure, or rather cases in which one of these conditions is violated. In *imperfectly competitive* markets (i.e. markets that fail to satisfy conditions such as numerous buyers and sellers, homogeneous products, no market power and no barriers to entry) firms can earn Ricardian [41] and monopoly [32] rents by owning scarce resources or by raising barriers to competition respectively. In *incomplete markets* (i.e. markets that fail to satisfy conditions such as markets for all commodities, no public goods, no transaction costs, and no economies of scales or production) firms can earn Schumpeterian rents [44] by risk-taking and entrepreneurial insight, or quasi-rents [26] by investing in making idiosyncratic or dedicated assets available to others. These rent types not only clarify what market imperfections –mostly different forms of scarcity– underlie different types of superior performance, they also explain different ways for firms to realize rents.

At present, however, rent types that relate to dissatisfying the perfect information condition have not been pinpointed, let alone defined[3]. We therefore lack a proper understanding of the nature of the market imperfection that underlies information-related rent types and ways in which such rents could be earned by firms. In order to address this inadequacy, we introduce the concept of *InfoRent*[4] as a new rent type that can be earned specifically under the condition of imperfect information. In case the perfect information condition is not met and price is *not* a 'sufficient statistic' [21], information imperfections exist in markets. In the presence of information imperfections, a market party will earn *InfoRent* when it is less imperfectly informed relative to other market parties and is able to implement a strategy that renders these differences so that it positively affects the firm's ability to maximize the economic value of its productive services.

InfoRent thus accentuates the occurrence of information imperfections as rent opportunities that firms can explore and exploit. Figure 1 outlines the information strategy framework that can help firms exploit information imperfections and earn *InfoRent*.

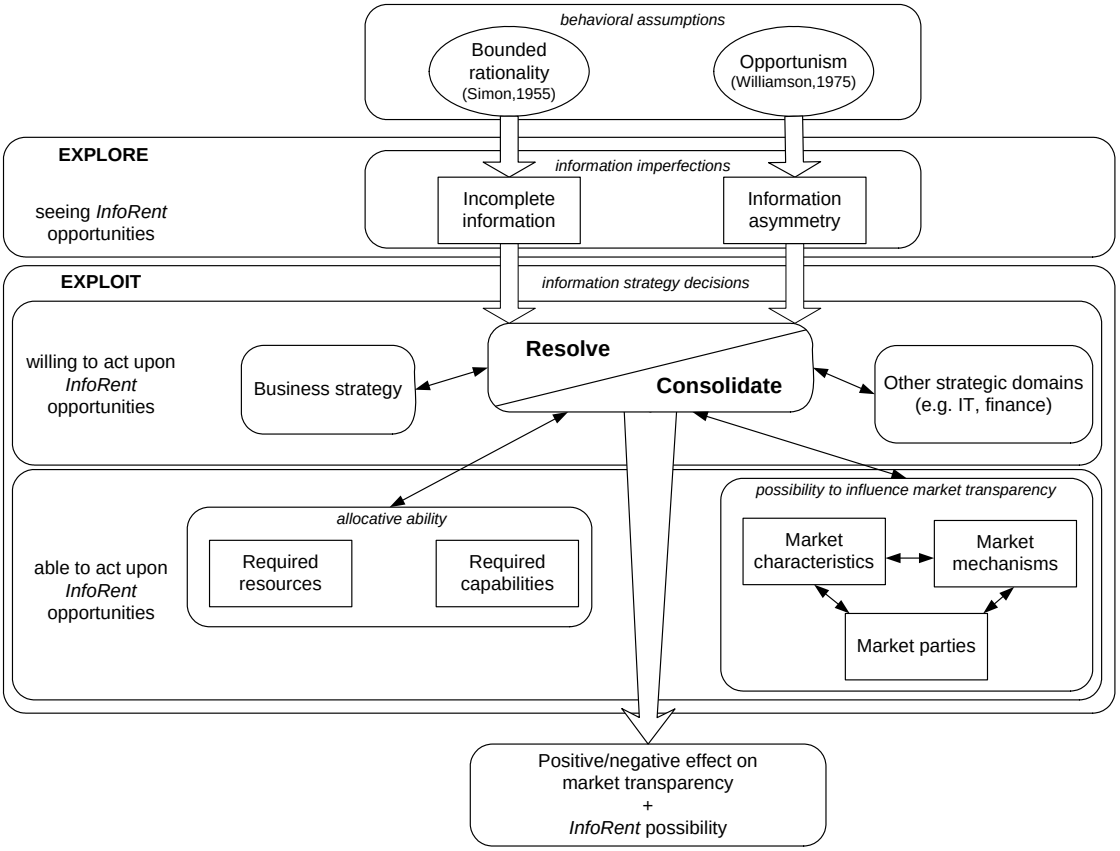

Figure 1 Information strategy framework

Theoretical Background

In this section, we elaborate on the theoretical background of the framework in terms of its underlying behavioral assumptions, the two types of information imperfections that are distinguished, and the two generic information strategy decisions.

Information Imperfections

We distinguish two types of information imperfections in the framework: incomplete information and information asymmetry. The theoretical origins of these information imperfections relate to two common behavioral assumptions in economic theory: bounded rationality and opportunism. With regard to the former, Simon [46, 47, 48, 49, 50, 51] postulates human economic behavior to be intendedly rational but only to a limited extent. This kind of rational behavior is contained by access to information and neuro-physiological capabilities in the uncertain and complex external environments in which humans exist. Bounded rationality explains humans' limited rational information behavior, known as *satisficing*[5]: searching for a solution that meets the decision-maker's aspiration levels which is therefore acceptable. "Instead of a complete search for all relevant information, the decision-maker only tries to attain a subjectively satisfying, yet *incomplete level of information*" [56, emphasis added]. The behavioral assumption of bounded rationality can thus account for the occurrence of incomplete information in the decision-making of economic actors.

Economic actors are additionally assumed to display opportunistic behavior on occasion. Williamson [58] defines opportunism as "self-interest seeking with guile involving self-disbelieved threats and promises in order to realize individual advantages, which includes lying, stealing and cheating, but more often less blatant forms of deceit. More generally, opportunism refers to the *incomplete or distorted disclosure of information*, especially calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse" [59, p.47 emphasis added]. Information imperfections therefore occur even when parties have identical information and, a fortiori, if information differences exist. However, it is not until the information asymmetry is coupled with (a) the high costs of achieving information parity and (b) the proclivity of parties to behave opportunistically that an information asymmetry[6] subsists.

Recognizing both sources of information imperfections, they can now be defined as the instances in which economic actors do *not* instantly have complete and perfect information about all relevant aspects of market transactions and production, exchange and distribution activities, including market opportunities, available technology, costs of production under alternative production arrangements, the quality of goods produced and, critically, the intentions of their fellow actors; and any new information is *not* instantly disseminated to all market parties at no cost. Taken together, bounded rationality and opportunism account for the dual nature of information imperfections, which can be described accordingly by two interrelated types: incomplete information and information asymmetry. Bounded rationality explains the existence of incompletely informed economic actors, which are a necessary condition to informational differences between actors. The actual *InfoRent* opportunity resides in the opportunism that comes into play to use the information asymmetry to an individual actor's economic advantage. Firms can encounter *InfoRent* opportunities in any market, regardless whether they are (strategic) factor [8] or product markets, Business-to-Business or Business-to-Consumer markets. In their information strategy, firms decide whether and how to address these opportunities in their search for *InfoRent*.

Information Strategy Decisions

In defining what we mean by information strategy decisions, we draw on an economics-based understanding of strategy. Traditionally, strategy scholars that are concerned with business strategy draw heavily on economic theory [24, 43], in particular on the Resource-based View of the Firm and IO-Economics. Our definition of information strategy falls back on the common divide in the strategy literature between *exploration* and *exploitation* [27, 57, p.230] and Penrose's [38, p.32] tripartite *seeing, willing* and *being able* perspective on strategic decision-making. Analogous to the economic notion of strategy as continuous search for sustainable rents [19, 31, 32], we define information strategy as a continuous search for sustainable *InfoRent* in

which the firm explores, identifies and decides whether and how to exploit instances of incomplete information and information asymmetry in the factor and product markets that are relevant for implementing its business strategy. Increasingly, exploration for new capabilities for survival in dynamic environments and exploitation of existing capabilities for success in competitive environments are seen as necessary complements for developing (knowledge-based) strategies [e.g. 61]. Analogously, external environment scanning (seeing and willing) stressed by IO-Economics [39, 40] and internal capability development (willing and being able) stressed by the RBV [8, 9] are seen as complementary determinants of profit performance [55], collectively covering the four elements of a SWOT-analysis [3]. As a result, the information strategy framework focuses on a firm's strategic factor and product markets for discovering the rent-earning potential of information imperfections, and takes into account within-firm aspects as well as the surrounding competitive environment of the industry.

Exploring *InfoRent* Opportunities

In exploring or seeing opportunities to earn *InfoRent*, firms need to identify practical manifestations of information imperfections. This involves identifying both instances of incomplete information and information asymmetry in the strategic factor and product markets.

From the individual firm's perspective, instances of *incomplete information* occur when the firm makes exchange-related decisions without being able to dispose of *all* the potentially relevant information required to make the economically most efficient decision (satisficing). In factor markets, a firm faces such instances for example when it lacks information about the availability, prices and quality of resources at the different resource suppliers, or the intentions of firms competing for the same resources. In product markets, these instances of incomplete information could for example include a lack of information about customer demands, their price and quality sensitivity and the intentions of competitors and potential entrants.

Instances of *asymmetrical information* are found in the occasion that an economic actor has private information that is costly to draw level for other actors, and the private information is used to the individual benefit of the actor having the advantage. From the individual firm's perspective, information asymmetries can only be identified taking into account other market parties and take practical shape as either an information advantage or information disadvantage. Whereas the classic examples of information asymmetry in the insurance and used-automobile industry (adverse selection or the 'lemons' problem [2] and moral hazard [e.g. 5]) illustrate how informational advantages are hazardous to economic transactions, more recent contributions exemplify how information advantages can be strategically exploited in product markets as for instance in product diversification [36] and R&D [1, 14]. We not only adhere to the latter view, we also add that information advantages are not restricted to product markets, but can also be exploited in strategic factor markets. An example would be when a firm is able to make an accurate expectation of the future value of specific management or R&D skills to be acquired on labor markets while others underestimate the return potential of such skills [8].

Exploiting *InfoRent* Opportunities

In the exploit-part of their information strategy, firms need to decide whether they are willing and able to exploit the identified *InfoRent* opportunities. This entails a choice on whether and how to address the instances of information imperfections in the strategic factor and product markets identified in the explore-part. A firm decides (a) whether the firm is anxious to exploit the identified instances of information imperfections (*willing* to act upon *InfoRent* opportunities) and (b) whether it is possible and worthwhile to dedicate resources and capabilities to address the instances of information imperfection (*able* to act upon *InfoRent* opportunities).

The *willingness* of a firm to act upon *InfoRent* opportunities and its intended effect on market transparency is partly influenced by choices in adjacent strategic domains, such as business strategy, finance and IT. For instance, firms pursuing a cost leadership strategy can be expected to regard increased price transparency as desirable, while firms with good reputations and large marketing budgets could regard increased transparency of price, product, and quality differences as particularly undesirable. Market opaqueness allows such firms to influence the perception of consumers since their comparison is not objective, but subject to interpretation.

The *ability* of a firm to act upon *InfoRent* opportunities is influenced both by its allocative ability, i.e. the extent to which it can acquire the resources and capabilities required to implement its decision, and the possibility to influence a market's transparency given its idiosyncrasies. These idiosyncrasies include for instance the number and diversity of market parties, the level of resource or product homogeneity, the degree of regulation or formalization of transactions and the proclivity of market parties to behave opportunistically. Markets characterized by many different opportunistic market parties, a high level of differentiation and a low degree of formalization in transactions are intrinsically more opaque than highly regulated markets for homogeneous goods with fixed prices. In the theoretical framework, we account for such idiosyncrasies under three headers: the market characteristics, market mechanisms, and possible (counter)actions and opportunistic attitudes of other market parties.

All of the above considerations in the exploit-part can be captured in a fundamental difference in information strategy decisions: firms either *resolve* or *consolidate* an instance of information imperfection. A firm that decides to resolve instances of information imperfection dedicates extra resources and capabilities, such as information, IT and analytical skills in order to become more completely informed about particular aspects of strategic factor and product markets,

while a firm that decides to consolidate does not. This simple difference enables to describe a firm's information strategy as a set of generic resolve/consolidate decisions. Collectively, these decisions determine to what extent a firm is able to actually earn *InfoRent*.

InfoRent Propositions

In a competitive market, the possibility for a firm to earn *InfoRent* involves trade-offs since it co-depends on other parties' information strategies. More specifically, it partly depends on the extent to which the information strategy decisions of other market parties leave room for instances of incomplete information and information asymmetry, and partly on the willingness and ability of the firm to seize the opportunity and exploit it to its own benefit. Notably, not all information strategy decisions directly aim for *InfoRent*. The four *InfoRent* propositions below (P1 to P4) provide a theoretical overview of information strategy decisions and the subsequent possibility for a firm to earn *InfoRent*.

P1: A firm can seize an opportunity to earn InfoRent by:

(a) privately resolving an instance of incomplete information into an information advantage, either individually or in cooperation with other market parties, or

(b) consolidating an instance of information advantage over other market parties, either individually or in cooperation with other market parties.

Firms can decide to (a) actively create an instance of information advantage or (b) protect and exploit an existing instance of information advantage. In strategic factor markets, private or strategically disclosed information could enable a firm to make a more accurate expectation of the future value of a resource than other market parties. This expected value differences might not be reflected in the price of the resource acquired, therefore the firm

can earn *InfoRent* in case the resource proves to be undervalued as a result of the other market parties' information disadvantage [cf. 8]. In product markets, a firm can earn *InfoRent* in case its private or strategically disclosed information allows it to maximize the value of the productive service of its resource bundles, while the information disadvantage hinders other market parties' value maximization.

P2: A firm can (consciously) ignore an opportunity to earn InfoRent by:

(a) consolidating an instance of incomplete information, and thus *not* privately resolving it into an information advantage, either individually or in cooperation with other market parties.

Since some of the information strategy decisions require a firm to dedicate extra resources and capabilities, implementing an information strategy can involve costs. These costs are associated with the resources and capabilities that need to be acquired or developed, and employed. Firms can decide that it is impossible, insufficiently worthwhile or too costly to dedicate resources and capabilities to create an information advantage over other market parties compared to the expected *InfoRent* that could be appropriated with the advantage. In strategic factor markets, the cost incurred could exceed the expected future value of a resource. Similarly, the expected benefit in value maximization in product markets could not outweigh the costs associated with implementing the information strategy decision required to realize this benefit. In either case, this implies that an instance of incomplete information is left as an *InfoRent* opportunity for other market parties.

P3: A firm can tolerate other market parties to earn InfoRent by:

(a) consolidating an instance of information disadvantage that they have relative to other market parties, either individually or in cooperation with other market parties, or

(b) resolving an instance of information advantage by sharing their private information with other market parties, either individually or in cooperation with other market parties.

A firm can decide to (a) consolidate an information disadvantage, for it is impossible, not worthwhile or too costly to draw level the disadvantage that allows the market party with the advantage to earn *InfoRent*. Possibly, the resources or capabilities required to draw level the disadvantage are unavailable, the opportunistic practices of the market party with the advantage might be very unlikely too be given up, or the benefit of resolving the disadvantage might not compensate for the costs incurred. Alternatively, a firm can decide to (b) resolve an instance of information advantage for the sake of strategic cooperation with other market parties (e.g. strategic alliances, franchises or joint ventures). The *InfoRent* that is earned with the information advantage can then be divided amongst the cooperative market parties. A possible motive to resolve an information advantage is the expectation to increase the total amount of *InfoRent* that can be earned from the combined information of individual market parties.

P4: A firm can reduce the InfoRent that other market parties earn by:

(a) privately resolving an instance of information disadvantage that they have relative to other market parties, either individually or in cooperation with other market parties.

Typical examples of firms that attempt to reduce or draw level instances of information disadvantage are for example price/product comparison websites or information-based intermediaries (infomediaries or web-aggregators [29, 62]). These firms can reduce or even entirely evaporate the benefit of private or strategically disclosed information of other market parties by aggregating information and facilitating comparisons of resources of different suppliers in strategic factor markets or products/services of different firms in product markets. Firms that are able to resolve information disadvantages are in a position

to pressure other market parties to give up (part of) their *InfoRent*, therewith possibly creating an information advantage for themselves.

The total amount of *InfoRent* a firm can appropriate with its information strategy is thus determined by the amount of *InfoRent* appropriated and sustained by each of the information strategy decisions in strategic factor and product markets, minus the costs incurred with the implementation of these individual decisions. On top of this, a firm needs to be aware of the extent to which their information strategy changes the nature, or 'rules', of competition in a market and the possible counteraction it evokes at other market parties. In addition, regulatory authorities such as market or governmental authorities (e.g. SEC) are in a position to limit the amount of *InfoRent* firms can appropriate. These institutions can decide to publicly resolve instances of incomplete information or information asymmetry either by law or regulation supported by 'watchdogs'. These regulatory measures are generally aimed at reducing the amount of *InfoRent* that can be earned by firms in order to increase economic and social welfare.

Research Methodology

In order to test the four theoretical propositions on *InfoRent* we present the results of a sector study of the Dutch leisure travel industry conducted during the years 2001-2003. The travel industry is suitable for empirically testing the propositions for two reasons. First, since the industry is information-intensive, information strategy decisions can be expected to be highly relevant aspects of a firm's strategy and business model. Second, the industry's low degree of informational transparency, indicated by a high level of price dispersion [34] and the growing number of *infomediaries*, leaves room for firms to influence the market's transparency and to actually earn *InfoRent*. These two industry characteristics increase the likelihood of

encountering a variety of information strategy decisions and underlying considerations to test the four theoretical propositions.

The sector study included an in-depth case study at three successive market parties in the value chain: an airline, tour operator TravelCom and a travel comparison website. In these organizations 25 semi-structured interviews were held with managers in various positions ranging from managing director, financial director, IT/information manager to managers in sales, purchase and marketing. The initial firm contact and the available highest-ranking manager were first interviewed to determine the strategic factor and product markets that were crucial for the firm's business. For each of these markets, the corresponding managers were identified and contacted for an interview. These interviews were structured in accordance with the theoretical framework and addressed the manager's role in the context of the overall firm, some key figures and their perception of the firm's strategic spearheads, the information imperfections that they identified in the market they were responsible for and their analysis of the corresponding information strategy decisions. The interviews were complemented by written documentation such as company reports, annual reports, industry rules and guidelines, and information from the company website and intranet, allowing data triangulation. All available data were transcribed, coded with a coding scheme that was derived from the theoretical framework and analyzed using a software tool (Atlas.ti) for qualitative data analysis. The coded data were ordered in conceptually-ordered displays [35] to relate and confront both corresponding and contradictory sayings on information imperfections and information strategy decisions in a particular market (full details on the method and coding scheme can be found in [54]).

The findings of the case study are presented in the subsequent section as a synthesized sector study through the lens of tour operator TravelCom. We adopt TravelCom as the focal organization for our sector analysis for it is at the center of the sector's competitive arena: surrounded on its strategic factor and product markets by market parties that are confronted with and react to its information strategy. The specific choice for TravelCom is justified by its status as the most information-oriented travel organization within the largest Dutch travel concern with an above-average net margin of 7%, while the industry's average is 1 to 2%. If, in fact, these above-average returns can be (partly) related to TravelCom's information orientation [cf. 33], this would have to show in a general trend in its information strategy decisions to actively seek *InfoRent*.

The Leisure Travel Industry: A Sector Study

A number of different market players operate, transact and interact in the Dutch leisure travel industry, collectively making up the value chain (see Figure 2 for an overview).

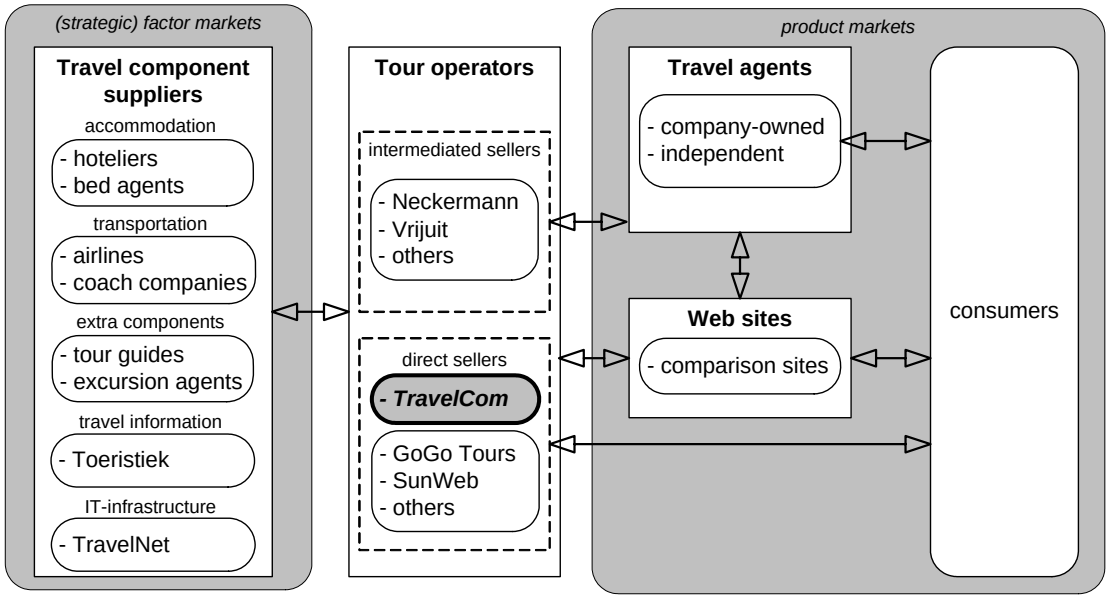

Figure 2 Industry players in the Dutch leisure travel industry

On the supply side, various travel component suppliers offer transportation, accommodation and additional components (e.g. excursions, guided tours). Information supplier Toeristiek provides objective travel information and TravelNet facilitates the technical infrastructure for the industry. Tour operators produce package tours by allotting, coordinating and combining individual travel components allocated at various factor markets. The markets for charter flights, scheduled flights and accommodation are the core constituent components and thus considered as the strategic factor markets for tour operators. As a distributor of package tours, tour operators sell their travel products on the product market for package tours. These strategic factor and product markets are discussed in turn below.

Charter flights

The strategic factor market for charter flights has many buyers –for the most part tour operators– on the demand side, and many sellers –airlines operating a charter service– on the supply side. The set of supplying airlines is relatively stable as a result of the considerable entry barriers raised by low profit margins and high initial equipment investments; however, mergers and acquisitions occur on a regular basis. The level of product differentiation is limited. Product offerings differ in terms of fares, the range of destinations, route (direct or indirect), departure/arrival schedule and onboard service. The market mechanism to match supply and demand is based on contract negotiations between tour operators and airlines about seat allotments. Tour operators can allot a certain volume of seats on a flight to a particular destination, for certain flight days, over a period during the season. The allotment negotiations revolve primarily around the seat price, which is fixed for about 85% and variably depends on the allotted volume, the level of risk-taking[7], the flight days and their distribution over the season, the total demand for a particular destination, and discounts, promotions and commission for the remaining 15%. There are no industry-wide or generally accepted standards to determine

the price of an allotment, nor will tour operators reveal to each other their negotiated allotment prices. Ideally, the negotiations complete well before the season's start to allow airlines to request the required take-off and landing slots at airports. In reality, however, tour operators tend to stretch their allotment negotiations beyond the slot request deadline in order to cheaply obtain the last remaining seats on a flight. As a consequence, tour operators have only limited information about the probability that an airline will service a destination in the coming season.

Scheduled flights

The strategic factor market for scheduled flights does not significantly differ from the market for charter flights in terms of the market parties involved –most airlines offer both charter and scheduled services– or the level of product differentiation. However, their market mechanisms differ distinctly. The majority of airlines publish their schedules and commercial fares in GDS's (Global Distribution Systems, such as Galileo, Sabre or Amadeus) in order to make them available for booking by tour operators, travel agents and consumers. However, tour operators allotting large volumes of seats are in a position to negotiate discounts on the published commercial fare. Unlike the negotiations about charter flights, tour operators can rely on the commercial tariffs listed in GDS's as a reference point in their price negotiations. Generally, tour operators will not disclose any information on the discounts or allotment prices they negotiate. Despite the increasing amount of airlines[8] that circumvent GDS's (e.g. EasyJet, RyanAir), the completeness of flight and fare information is not impeded since direct selling airlines generally publish their flights and commercial fares on their company websites. Furthermore, the future existence of scheduled flights to particular destinations is less uncertain than charter flights: they not solely depend on the demand for travel components by tour operators, but also on consumer demand. Summarized, the market for scheduled flights can be

considered as more transparent than the market for charter flights due to the publicly available information on flights and fares in GDS's and company websites.

Accommodation

The strategic factor market for accommodation includes the markets for hotel rooms, apartments and beds. Amongst one another, these markets differ minimally in terms of market characteristics, mechanisms and degrees of market transparency. The market for accommodation can be characterized as diverse and complex. The number of accommodation suppliers is extremely large and the level of product differentiation is high: price and quality levels can differ tremendously among accommodation suppliers. Accommodation is directly sold to consumers, via agents and to tour operators as components for package tours. Analogous to seat allotments for flights, tour operators negotiate contracts for bed allotments with various accommodation suppliers. The volume of beds allotted, the period during the season and the level of risk-taking are the main determinants of the allotment price. In determining the price/quality ratio of accommodation, tour operators can rely on the commercial fares as a reference point in the negotiations on quoted prices, which include discounts for large allotment volumes. The commercial fares are generally published in brochures of accommodation suppliers and on websites. The main difficulty lies in assessing the quality of accommodation and the quality of service, since these are subject to personal preferences and on-site experience, and no standardized quality rankings across countries, or quality guarantees are available (star-rankings are incomparable over countries). Information on the quality of accommodation can be obtained through subscription to Information supplier Toeristiek. Toeristiek's research team regularly visits holiday resorts and accommodations worldwide in order to check whether the published information in brochures matches the actual situation. These checks include for

instance the walking distance to the beach or pool, the exact room size, wheel chair accessibility and the quality and availability of guest facilities such as showers, child seats and lockers.

Package tours

As distributors of package tours, tour operators set prices and volumes of package tours depending on the expected sales, the negotiated purchase price of the various components and the acceptable profit margins within the aimed target group. The five largest tour operators represent 80% of the Dutch market, while numerous small independent tour operators – unregistered at either of the branch organizations[9]– represent the remaining 20%. The level of product differentiation is high in the sense that large differences exist in tour operators' product offerings. The common market mechanism to sell package tours to consumers is through the use of intermediating travel agents. These intermediated tour operators sell roughly 50% through company-owned agents and the rest through other (independent) agents. Direct sellers circumvent the use of intermediating travel agents as much as possible in order to reduce their sales costs and to be in direct control of its sales and interaction with customers.

Besides tour operators and travel agents, other market parties have emerged on this product market: increasingly travel comparison websites and travel component suppliers attempting to disintermediate tour operators claim a *raison-d'être* [18]. Travel comparison websites provide insight in the fares of individual flights, accommodations and package tours through online access to multiple professional booking systems. However, these websites provide either insight in the all-inclusive prices, which traditionally are publicly available, or in the fares of individual components, which allows consumers to compose their own package tours. As a consequence of the considerable economies of scale, tour operators are able to offer better all-inclusive prices than the aggregate price of these same components bought separately by consumers. In addition,

the attempts at disintermediation by travel component suppliers are bounded by several financial hurdles, such as the lack of economies of scale, the relatively high costs of small amounts of financial transactions, and a lack of market reach and brand name that reduce the competitive edge of travel component suppliers in an industry where net margins are already wafer-thin.

TravelCom

TravelCom is one of the three subsidiary companies of the largest Dutch travel organization. With around 200 employees (excluding travel agency personnel), approximate annual returns of 100 M€ accounted for by around 200.000 vacationers, TravelCom is the fifth largest tour operator in the Netherlands. It focuses on offering package tours for groups in the form of organized round trips at cultural locations and city trips. TravelCom intends to maximize its net margin by generating the highest possible returns on invested capital. At current, the success of this objective shows in a positive net margin of 7%, compared to the industry's average of 1 to 2%. We argue that this difference can be partly explained by TravelCom's business strategy and partly by the choices in its information strategy. Therefore, the essence of TravelCom's business strategy is first briefly characterized. We then focus on TravelCom's information strategy in the strategic factor and product markets described in the previous section to assess how their decisions map on the theoretical *InfoRent* propositions.

TravelCom's Business Strategy

Whereas the majority of tour operators primarily focus on realizing economies of scale in purchasing travel components, TravelCom has a demand-side orientation. This orientation is tantamount to a concentration of effort to capture and analyze information about its customers' needs and preferences for travel products. A number of data capturing tools, a data warehouse,

and CRM-like tools and analysis techniques facilitate the storage and analysis of information on past and current booking behavior of customer groups and the results of customer satisfaction surveys (average response rate 40%). This demand-side information allows TravelCom to adapt their product offering to suit the needs of its customers in around a dozen labels that focus on a variety of narrowly defined target groups (e.g. active 55^{+} seniors, adventurous young people, sports-lovers, Christians or single travelers). Each label is approached with a tailor-made service proposition, marketing approach and corresponding distribution channel.

In its marketing strategy, TravelCom employs multiple distribution channels to promote and sell its products. As a direct seller, TravelCom relies both on its company-owned retail outlets (approximately 25 in number spread over the Netherlands), and on its call center, online booking facilities, direct mailings and advertisements in newspapers and magazines. The company-owned travel agencies account for around 80% of the total returns. TravelCom takes an active approach in directly marketing its travel products to specific target groups based on previous bookings and information gathered from customer contact (e.g. click behavior on its website, interaction with the call center, reactions to direct mailings). The combination of a multi-channel and direct marketing approach allows TravelCom to quickly respond to unforeseen fluctuations in travel demand compared to its brochure-based competitors.

TravelCom's Information Strategy

Table 1 provides an overview of TravelCom's information strategy, showing the strategic factor or product market in which the information imperfections were identified, the source, type and specific instance of imperfection, TravelCom's decision to either resolve or consolidate it and the corresponding strategic assumption with regard to *InfoRent*.

Market (factor/product)	Source of imperfections	Type of imperfection	Instance of information imperfection	Decision	Strategic assumption
Charter flights *(factor market)*	negotiation-based market mechanism	information disadvantage (vis-à-vis airlines)	Existence of charter service to particular destinations for the coming season	consolidate	Tolerate others to earn *InfoRent* by avoiding the market for charter flights (P3a)
	no standards to calculate allotment prices	information disadvantage (vis-à-vis competing tour operators)	Allotment prices that competing tour operators negotiate at airlines	consolidate	Tolerate others to earn *InfoRent* by avoiding the market for charter flights (P3a)
Scheduled flights *(factor market)*	negotiation-based volume discounts	information disadvantage (vis-à-vis competing tour operators)	Quoted fares that competing tour operators negotiate at airlines	resolve	Reduce the *InfoRent* of others by estimation through comparison with own allotment volumes (P4a)
	negotiation-based volume discounts	information advantage (over competing tour operators)	Quoted fares that TravelCom itself negotiates at airlines	consolidate	Seize *InfoRent* opportunity by not disclosing information on its quoted fares (P1b)
Accommodation *(factor market)*	amount and variety of supply	incomplete information	The range of available accommodation worldwide	resolve	Seize *InfoRent* opportunity by gathering information from local agents and hosts, and attending professional meetings (P1a)
	difficulty of quality assessment	incomplete information	The quality, and quality of service of accommodation	resolve	Seize *InfoRent* opportunity through accommodation visits, satisfaction surveys and a subscription to Toeristiek (P1a)
	negotiation-based volume discounts	information disadvantage (vis-à-vis accommodation suppliers)	Quoted allotment prices that competing tour operators have negotiated	resolve	Reduce the *InfoRent* of others by estimation through comparison with its own allotment volumes (P4a)
	negotiation-based volume discounts	information advantage (over competing tour operators)	Quoted allotment prices that TravelCom itself negotiates at accommodation suppliers	consolidate	Seize *InfoRent* opportunity by not disclosing information on its quotes prices (P1b)
Package tours *(product market)*	potential of CRM not recognized; intermediation by travel agents	incomplete information	Consumer demand for package tours	resolve	Seize *InfoRent* opportunity by registering and analyzing booking history and customer contact information (P1a)
	advertising all-inclusive prices	information advantage (over consumers and competing tour operators)	The price composition of package tours	consolidate	Seize *InfoRent* opportunity by differentiating products from competitors (P1b)

Table 1 TravelCom's information strategy decisions

Charter flights

TravelCom's decision to tolerate others to earn *InfoRent* on the strategic factor market for charter flights directly relates to the market's relative lack of market transparency. Neither the airline, nor competing tour operators have an incentive to disclose information about the aggregate amount of seats requested at the airline for a particular destination, or the allotment prices that tour operators have negotiated in their contracts with airlines. In case they would, TravelCom –in fact any individual tour operator– could exploit this information to its advantage in the allotment negotiations. This lack of transparency has made TravelCom decide to avoid the use of charter flights as travel component in their package tours as much as possible and to use flights from scheduled service carriers instead. As a consequence, TravelCom tolerates other market parties to earn *InfoRent*, however not to the detriment of TravelCom itself. On the other hand, TravelCom spares itself the costs of implementing an information strategy that attempts to appropriate the available *InfoRent*.

Scheduled flights

In the strategic factor market for scheduled flights, the main source of market opaqueness is the quoted fares (i.e. price including large volume discounts) that tour operators negotiate at airlines. Similar to the market for charter flights, this information is not disclosed, however it can be estimated by analyzing the commercial fares listed in GDS's. Over the years, TravelCom has built up experience in making these estimates by analyzing the volumes and trends of competitors in previous seasons, comparing this estimated volume with their own allotment volume and calculating the discounts that relate to this difference. TravelCom attempts to realize *InfoRent* in negotiating with airlines on scheduled flights by complying with the custom of not disclosing its negotiated quoted fares and estimating others' quoted fares.

Accommodation

Besides the lack of insight in price that is common in all of TravelCom's strategic factors markets, an additional source of market opaqueness in the strategic factor markets for accommodation is the difficulty of quality assessment. Whereas some tour operators believe it is the accommodation provider's responsibility to provide correct information on the quality of its accommodation, TravelCom actively seeks to gain this insight itself by relying on three information sources: accommodation visits and experiences by local agents and hosts, results and trends from customer satisfaction surveys providing detailed information on the perceived accommodation quality, and objective information on accommodation provided by a subscription to Toeristiek. TravelCom actively creates and sustains this information advantage, since it enables to ensure high quality accommodation and to optimally adjust the acquisition of travel components to the preferences of its intended target groups.

Package tours

In the product market for package tours TravelCom faces a lack of insight in consumer demand for package tours, basically faced by any tour operator. The majority of tour operators are at the very beginning of developing the resources and capabilities to structurally collect and analyze information about consumer demand. Possibly, tour operators have underestimated the potential of CRM technologies in this regard, or intermediating travel agents have complicated the process of collecting consumer data. TravelCom seizes this *InfoRent* opportunity and does register and analyze booking histories of its existing customer-base through CRM and data warehouse techniques. It derives customer profiles from these data distinguishing socio-demographics, holiday needs, booking behavior and attitudes towards destinations or type of travel. Compared to most competing tour operators, TravelCom has a long history (over 15 years) in analyzing customer information. Moreover, its direct sales strategy puts it in full control of the process of capturing and analyzing the required information. When in fact TravelCom is able to derive better expectations about consumer demand than competitors, it forms an attractive party for airlines in the seat allotments negotiations. Moreover, it allows TravelCom to optimize on economies of scale in both flight

and accommodation allotments, and to be able to take the appropriate level of risk-taking in its contracts, therewith lowering the allotment price. TravelCom regards this competence and the information advantage that results from it as one of the major drivers of its success.

In order to guard itself against the increasing price-based competition TravelCom advertises its products with an all-inclusive price and inhibits price comparisons of its products with competing products through product differentiation. This makes it impossible for consumers and travel comparison websites to retrieve the prices of the individual travel components that make up the package tour. TravelCom seizes an *InfoRent* opportunity by forcing consumers to pay attention to the content, quality and service level of the package tour, not only the price of the individual components. Consumers are invited to make a subjective quality-based comparison, instead of a purely objective price-based comparison. TravelCom can then rely on a relatively large marketing budget and an established reputation for offering up-market package tours.

Synthesis

Table 2 shows the extent to which TravelCom pursues *InfoRent* with its information strategy. Reflecting on the four propositions distinguished earlier, TravelCom can be characterized as a pure *InfoRent*-seeker. The mapping of TravelCom's information strategy decisions on the four *InfoRent* propositions reveals that the primary focus of its information strategy is seizing opportunities to earn *InfoRent* (P1a or P1b). In all of its strategically relevant factor and product markets, TravelCom actively engages in creating and sustaining information advantages, and in capitalizing on them.

Strategic assumption		Imperfection	Decisions	Markets (# of instances)
Seize *InfoRent* opportunity	P1a	incomplete	resolve privately	- Accommodation (2x) - Package tours (1x)
	P1b	advantage	consolidate	- Scheduled flights (1x) - Accommodation (1x) - Package tours (1x)
Ignore *InfoRent* opportunity	P2a	incomplete	consolidate	---
Tolerate others to earn *InfoRent*	P3a	disadvantage	consolidate	- Charter flights (2x)
	P3b	advantage	resolve	---
Reduce the *InfoRent* of others	P4a	disadvantage	resolve	- Scheduled flights (1x) - Accommodation (1x)

Table 2 Information strategy decisions per InfoRent proposition

TravelCom's management ascribes their commercial success principally to their information advantage in the product market for package tours. We agree with their view, but we additionally distinguish a secondary focus in TravelCom's information strategy that becomes apparent on its strategic factor markets. Undeniably, TravelCom's business strategy is driven by its focus to capture the value of customer information where competitors have been structurally unaware, underestimating or incapable of grasping the opportunities of using customer information and CRM techniques to improve business. As the financial director stated: "Other tour operators simply do not have the customer information that we have built up. They have never been aware of the value of knowing your customers." Even though the industry increasingly recognizes the importance and value of this information, TravelCom has a 15-year lead in developing the skills to gather and analyze customer information and adjusting its business strategy and organization accordingly. The head of Information Management explained: "Our success is not an incident, but a direct result of our commercial strategy. The sustained competitive advantage draws to a large extent on our knowledge of our customers-base and everything that results indirectly from it. (…) Knowing our customers enables us to effectively adapt our purchase policy of travel components. In the end, it's all about the customer, not the product."

The secondary focus that we distinguish in TravelCom's information strategy is twofold: (a) to avoid markets that are inherently opaque, and (b) to reduce the amount of *InfoRent* others earn. TravelCom's

decision to avoid the market for charter flights is not just guided by its expectation not to earn *InfoRent* itself; more importantly, it expects others to earn *InfoRent* at its detriment. Therefore, they tolerate others to earn *InfoRent* (P3a), but at the expense of competing tour operators that do decide to use charter flights as component in their package tours. Finally, the information strategy in both of its strategic factor markets is aimed at reducing the *InfoRent* that others can earn (P4a) by preventing them to sustain any information advantages. Overall, we conclude from the analysis that TravelCom's information strategy confirms our initial expectation of being an *InfoRent*-seeker based on its reputation as information-oriented and its 5 to 6% above-average net margin.

TravelCom's management team is well aware of the importance of its information strategy and the subsequent impact on its business. The financial director affirms: "In general, this view [on information strategy and its impact on business] is emphatically present in our thinking. We know that some markets are transparent, how this impacts the price fixing and how it influences our possibilities." He added, however, that the information strategy framework adds more scrutiny and completeness to the analysis of market transparency, specifically to the analysis of the transparency degree of TravelCom's factor markets. TravelCom's current explicit focus on *InfoRent* opportunities in its product markets overshadows the *InfoRent* opportunities it explores and identifies in its strategic factor markets. The defensive or reactive information strategy decisions and the absence of examples of information strategy decisions that relate to proposition P2a (ignore *InfoRent* opportunities) indicate that for TravelCom earning *InfoRent* in strategic factor markets is more suppositious than a conscious choice. If it would be TravelCom's deliberate choice to unilaterally focus on its product markets based on the expected amount of *InfoRent* it could earn, we would expect several consciously ignored *InfoRent* opportunities (P2a) in strategic factor markets in Table 2. Since this is in fact not the case, it points to a lack of attention for *InfoRent* opportunities in strategic factor markets.

The framework not only forces managers to be aware of and pay attention to the strategic potential of information and information imperfections by describing what *InfoRent* opportunities entail, it also yields strategic decision-making on how such opportunities can be seized and to what extent a firm actually pursues the available *InfoRent* in opaque markets. In addition, it points to capability development in firms with regard to the (informational) resources and capabilities that are required to implement an *InfoRent*-seeking strategy.

Moreover, the TravelCom case has enlightened the information strategy framework in various regards. It shows that a range of market and firm specific causes of market opaqueness can be classified under the headers of either *incomplete information* or *information asymmetry*. Similarly, it shows how a range of idiosyncratic considerations can be caught in the dichotomy of two fundamental information strategy decisions: *resolve* or *consolidate*. Next, the case exemplifies how market characteristics, market mechanisms, and the opportunistic attitude of other market parties determine the *possibility* for a firm's to influence a market's transparency. For example, a large number or variety of market parties, extensive product differentiation, composite products/services and a lack of a quality assurance system are some of the market characteristics that make a market inherently opaque. Similarly, a lack of standardized or formalized transaction processes and universally agreed upon models for price-making obfuscate market mechanisms. Also, other market parties' opportunistic behavior can take shape in not disclosing sensitive information or conflicting information strategy interests. Furthermore, the study shows the importance of a firm's allocative ability to implement information strategy decisions. In case (informational) resources and capabilities need to be acquired or developed, an additional trade-off is introduced whether the expected benefit outweigh the costs incurred.

Finally, the TravelCom case illustrates that information strategy should be seen as an indispensable part of the business-IT alignment issue that is so central to the IS discipline. TravelCom's business strategy, information strategy, and its supporting IT strategy are highly aligned. The information strategy

framework underlines this tripartite nature of the strategic alignment issue [30], instead of the traditional dyadic view on business-IT alignment [22]. There is not only a mutual relationship between a firm's information strategy and business strategy, but also between its information strategy and IT strategy. A firm's information strategy is influenced, restricted and facilitated by its business strategy *and* its IT strategy. Information strategy decisions can co-determine a firm's IT strategy and new technologies influences a firm's willingness and possibilities to earn *InfoRent* (e.g. travel comparison websites).

Conclusions and Further Research

The theoretical underdevelopment of the rent-earning potential and strategic exploitation of information imperfections can be attributed to the legacy of the perfect information condition of the EMH in the related fields of Organizational Economics, Strategic Management and IS. At best, the strategic implications of information imperfections have been signaled, but have never been comprehensively worked out in theory. The information strategy framework addresses the absence of these insights that needlessly impoverishes our understanding of the current 'information society' [e.g. 16]. Where firms in the 'information society' increasingly depend on information for their business, information strategy will be crucial, partly overlapping or even coinciding with business strategy, in particular in information-driven firms (e.g. *infomediaries* and web aggregators [29, 62]). Therefore, theories of business strategy and IT strategy should be enriched by a theory of information strategy.

The information strategy framework developed here is a first step towards such a theory of information strategy. It provides an understanding of the rent-earning capacity of information imperfections, an information-related rent type called *InfoRent* and four *InfoRent* propositions explaining generic ways of strategically dealing with information and information imperfections. It shows how a firm can create and sustain information advantages, can acquire and develop the resources and capabilities to do so, and, as a consequence, can earn *InfoRent*. Moreover, it allows us to test the extent to which a firm can actually be characterized as an *InfoRent*-seeker.

Seeing the information strategy framework as a first impetus in overcoming the legacy that the perfect information condition has left behind implies that many research opportunities remain. The first opportunity relates to the difficulty of quantifying the exact share of a firm's rents that can be labeled as *InfoRent*[10]. Part of TravelCom's success can be ascribed to its unique position as a direct seller using multi-channeling in its marketing. However, several direct-selling competitors exist within the travel industry that are significantly less successful. We hold that a firm's capability to explore and exploit information imperfections and its capability to combine this into a superior overall business strategy makes the difference. In general, the more information-intensive a firm is, the more business strategy overlaps with information strategy, the larger part *InfoRent* has in a firm's overall rents. This assumption, however, needs further investigation, for instance by conducting sector studies in information-intensive and less information-intensive industries other than the travel industry[11]. In this way light could be shed on the issue of aligning business, information, and IT strategy as well as on the existence and nature of *InfoRent*-seekers. Other research opportunities include for instance the further incorporation of process and competitive dynamic aspects of information strategy and the sustainability of *InfoRent*. Finally, two major challenges reside in examining the consequences of including interpretation and sense-making aspects of information into the information strategy framework and to explore the integration of the developed theoretical insights into existing theories of the firm in Organizational Economics and other economic theories that address the role of information in economics (e.g. Information Economics).

These and other topics need to be explored in order to further enhance our understanding of information in economic life and to systematically take into account the economic and strategic consequences of ignorance, asymmetrical information and market opaqueness. If so, economics will continue to improve the level of maturity in the IS discipline.

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Notes

[1] The strict economic definition of rent holds that rents are "returns in excess of a resource owner's opportunity costs, which is defined as the revenue that a resource (bundle) can generate when put to an alternative use in the firm or the price which it can be sold for" [19, p.22].
[2] The name of the firm TravelCom is fictitious as agreed upon in a condition of anonymity.
[3] In addition, the criteria for successfully adding a new rent type remain largely implicit.
[4] In the economic literature, the concept of 'information rents' has been narrowly applied to the analysis of incentive contracts and principal-agent relationships [4, 15]. Even though the general notion of the terms coincides with the meaning in this stream of literature, we adhere to the term *InfoRent* (instead of information rent) in order to consciously differentiate from this narrow notion and focus on any situation including the principal-agent setting in which information yields rents.
[5] Besides Simon's interpretation of satisficing, other interpretations exist [45]. Nelson and Winter, for instance, distinguish between a limited information model, in which there is uncertainty about knowing which state of the world is true and a model in which decision-makers have limited cognitive abilities which preclude knowledge of which states are possible [37, p.174].
[6] Williamson [58, p.31] designates this condition as information impactedness; we adhere to the widespread concept of information asymmetry.
[7] Several forms of risk sharing exist that divide the risk and costs of not filling allotted seats between the airline and the tour operator.
[8] Essentially, low-cost carriers avoid the costs involved with publishing their fares in a GDS.
[9] The ANVR (Dutch Union for Travel Organizations), or SGR (Council of Guarantee Fund for Traveling Money).
[10] The problem of quantifying the exact part of a certain rent type in a firm's overall rents is not exclusive for *InfoRent*; it is equally relevant for all distinguished rent types.
[11] In general, more sector, or industry level, studies should be conducted in IS [13].

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Working Papers on Information Systems | ISSN 1535-6078

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