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# Ontology Based Repository for Specifying Investment Advisory Services as a Knowledge Product

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# ONTOLOGY-BASED REPOSITORY FOR SPECIFYING INVESTMENT ADVISORY SERVICES AS A KNOWLEDGE PRODUCT

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## Abstract

*This paper presents a repository for the product design of investment advice in wealth management using an ontology-based knowledge representation and service marketing methods; the repository is exemplified through a prototype implemented in Protégé. The aims of the repository are: (1) to support the specification of investment advisory services as knowledge products based on service modules, (2) to enable a solution-oriented product strategy serving behavioral customer segments and to facilitate external communications about service characteristics, (3) to foster a common ground for the internal communication between marketing experts and investment advisors, and for this purpose (4) to provide a visual representation of investment advisory services with service blueprints for a collaborative product specification.*

*The specification of investment advice uses service modules, which combine investment process and advisory process for representing both the financial know-how and the interaction between customer and advisor. Consequently marketers can model and analyze the core features of investment advice.*

*The repository supports the success factors for the service to be designed, being a differentiated product, the overall quality of the service, product fit, internal marketing and the use of technology. Recognizing investment advice as a knowledge product permits the transformation of advisory support systems into a shared knowledge base.*

*Keywords: Investment Advice, Knowledge Representation, Product Management, Service Blueprinting.*

## 1 RECOGNIZING INVESTMENT ADVICE AS A KNOWLEDGE PRODUCT

The first wave of online brokerage brought a new generation of customers who were better informed, who did not need any advisory services and took advantage of the internet for fast transaction processing at low cost. Yet this trend was fostered by booming conditions in the financial markets, which offset at least partially wrong decisions and lack of financial knowledge. Declining markets reminded investors harshly of the importance of a properly developed investment strategy. Thus, the so-called second wave of online investors is more concerned about a systematic approach and long-term investments. Technological aspects are less important to these customers, while they recognize their need for advice. Consequently the market for pure-play internet brokerage with active traders is getting too small; Charles Schwab is an example for targeting investors who are ready to move beyond self-directed investing (2003): "There is an opportunity to provide guidance at a different price point with a different kind of objectivity." This difference in prices paid for discount versus full-service brokerage showed implicitly that there is a market for investment advice (Schneider 2000 p. 72). Nevertheless, customers are only willing to pay explicit advisory fees if the service represents an objective guidance for their investment decisions, taking into account their personal situation (Severidt 2001 p. 26, 197). Therefore, offering a fee-based service also requires a conceptual shift: investment advice has to be transformed from a sales activity for financial instruments into solution-oriented consulting. As a consequence, investment advisory services need a comprehensive, self-contained product management. *Service marketing* offers the concepts and methods necessary, but in order to shape product design and other elements of the marketing mix for investment advice, it is critical that all persons involved have a shared vision of the service, i.e. be working with the same concepts of the service, based on customer needs and expectations (Zeithaml et al. 2003 p. 222). From the customer's perspective, the core benefit of investment advisory services lies in the know-how behind the advice he gets from his advisor, thus managers and marketers of investment advice should recognize it as a knowledge product. *Knowledge management* stresses that knowledge is a key factor to the success of products and services, and consequently, its usage should be analyzed, guided and supported (Davenport et al. 1998).

However, suggesting a knowledge-oriented product design and applying service-marketing methods for investment advisory services entails several hitherto unsolved challenges, as it requires close collaboration between marketers and investment advisors: *Marketers* can contribute their know-how in service marketing and product design. Yet it is insufficient to treat investment advice as a single activity; instead, marketers need a better understanding about the service itself. *Service modules* (Mommensen-Ghosh 2003) enable standardization, differentiation and a modular specification of advisory services without constraining individual customization. Service modules combine the investment process and the advisory process for representing the actual service based on information, methods and interactions involved. This differentiated approach allows marketers to model investment advisory services and to apply their methods for service design. Putting these specifications in a repository supports marketers in their product management tasks and at the same time the repository can be used as a knowledge base for an advisory support system. Thus, *Investment advisors* can take advantage of a shared repository too, if they are willing to contribute their knowledge as domain experts and to adhere to the service specification as well. Hence, the repository "must serve two somewhat conflicting goals: rules enforcement and professional empowerment. First, because professionals often resist regimentation, the software forces [the individual professionals] to provide information in a consistent format, to comply with corporate rules and external regulations, and to originate the information necessary to monitor quality costs and trends for the organization's overall operation. Second, the software captures and distributes to professionals all the knowledge the company has built up over time so they can do their jobs better or more efficiently." (Quinn et al. 1998 p. 195)

The *purpose of this study* is to develop a repository for the product design of investment advisory services in wealth management using an ontology-based knowledge representation and service

marketing methods for specifying service modules, as exemplified through a prototype implemented in Protégé. The product specification of investment advice is based on service modules, which combine the investment process and the advisory process for representing both the financial know-how and the interaction between customer and advisor as the core features of investment advice. The aims of the repository are:

- to support the specification of investment advisory services as knowledge products based on service modules which can be used in an advisory support system,
- to enable a solution-oriented product strategy serving behavioral customer segments and to facilitate external communications about service characteristics,
- to foster a common ground for the internal communication between marketing experts and investment advisors, and for this purpose
- to provide a visual representation of investment advisory services with service blueprints (Schostack 1984) for a collaborative product specification.

## 2 LITERATURE REVIEW

(Evers et al. 2000 p. 22, 52; Brandt 2002 p. 108) define *investment advisory services* as a problem- and customer-specific process of information transmission; advice is a ‘council’ where solutions and decisions are made in collaboration. In general, the content of investment advisory services is any information relevant to the decision-making of the advisor. This content can be categorized according to the aim of the information imparted. As a result, all decision-relevant information given to a customer can be classified either as general investment-relevant facts such as quotes and interest rates, or as information which takes the investor-specific situation into account, hence comprising a judgment (Brandt 2002 p. 87,90).

*Advisory intensity* describes how much advisory services are related to a financial service or required for taking a financial decision. (Golder 2002 p. 52) lists three main factors influencing the need for advice, thereby determining the advisory intensity: the *complexity* of the financial instrument consists of the characteristics and variants of the product. The *experienced risk* of the investor is a blend of the objective and subjective risk associated with the investment decision. Finally, the customer’s education and the contact frequency with the advisor affect the level of his *individual knowledge*. On the other hand, advisory intensity can be considered from the point of *resource allocation* of the financial institution. (Benkenstein et al. 2001 pp.81-82) show how target advisory intensities are assigned to market segments of private clients according to their income and wealth. However, looking again at the constituents of advisory intensity shows that the need for advice is not merely linked to a monetary segmentation. For the same reason it is understandable that (Severidt 2001 p. 148) could not observe a strong relationship between the number of advisory interactions and the number of transactions. Consequently, an empiric study in Germany showed that it is insufficient to invest blindly in advisory quality and intensity (Hoock et al. 2003). For individual customers, the increased advisory intensity only elevated costs, but failed to generate the expected revenue, causing the overall cost income ratio to worsen. Even for private banking customers, the additional advisory efforts were only partially successful, as 70 percent of wealthy customers show a behavior similar to individual customers. Hence, (Hoock et al. 2003) concluded with a list of measures for improving the cost income ratio, suggesting to review the customer segmentation based on their revenues and behaviors, as well as to increase revenues with partial price augmentations and innovative pricing models.

(Harrison 2000 p.96) discusses the *product strategy* of financial services using a distinction between core features and additional features of products. According to the *product concept*, the product is comprised of several levels, each adding more customer value and serving as a means of differentiation. While (Harrison 2000 p. 98) remains very abstract in her examples for investment advice, (Gemes et al. 2003 Fig. 3 p. 6) illustrate their definition of service excellence with several

concrete service elements. Nevertheless, both examples are insufficient for a comprehensive product strategy and still too vague for applying service-marketing methods.

Investment advice is an *information product* that can take advantage of information technology for its diversification by product bundling and product versioning (Zanner 2002 p. 3). *Bundling* combines existing service components to an individual solution for the customer. *Versioning* means developing different versions of the same product for selected customer groups. Bundling offers greater value to the customer, combined with the convenience that they would have received by purchasing each service independently. (Zeithaml et al. 2003 p. 225) mention Charles Schwab as a master in this approach, bundling different types of trading-related services for designated market segments. Another reason for bundling and versioning products is to increase customer loyalty: If the bundle of services creates a unique, customized value proposition for the customer, he is not only less likely to switch to another institution but is also less price sensitive (Shapiro et al. 1999 p. 73-78). Moreover, bundling is also a method for price discrimination (Severidt 2001 p. 72), thus bundling considerations are closely related to the pricing of the product or bundle. An adequate bundling or unbundling of service modules can facilitate the marketing communication and hence the value perception of the advisory product (Bernet 1998 p. 383): The services integrated within a bundle together often convey additional messages which positively influence the customers' utility assessment, e.g. by offering 'comprehensive solutions'. On the other hand unbundling the services and offering them in a product and pricing kit can signal that the product offerings are capable of meeting individual needs despite the standardization of their elements.

(Schöse 2002) identifies the importance of *service quality* for marketing financial services. He gives an overview on existing methods for the quality management and quality measurement of financial services and enhances the gap-model described in (Zeithaml et al. 2003) to the specific needs for quality management of financial services. However, (Schöse 2002) does not cover the specific characteristics of investment advisory services. Consequently, the methods mentioned there are not discussed concerning their capability of capturing the quality aspects of investment advice. (Evers et al. 2000) distinguish three *quality dimensions* of advisory services: The service quality of peripheral services covers such things as friendly, well-trained staff and nice facilities. The quality of the interaction considers the fact, that the customer is always involved in the production of the advice. Thus, this interaction influences both the quality of the final result and the perceived quality of the service. Finally, the quality of the contents itself also contributes to the overall quality of the advice. (Evers et al. 2000) criticize that the measurement of the quality of advisory services is too often narrowed down to the framing aspects of the service, and not to the advice itself. Thus product managers of advisory services lack the methods of measuring important aspects of their product.

*Regulations and case law on information and advisory duties* are another source stipulating service quality for investment advice. For example, the regulations on 'object-adequate' and 'investor-adequate advice' in Germany are giving concrete indications on the actual contents necessary to conform with the information- and advisory duty, (Severidt 2001 p.26; Brandt 2002 p.76). The German concept is close to the concept of suitability as defined in the United States, which is also called the 'know-your-customer'-rule (U.S. Security and Exchange Commission 2001).

The approach suggests designing an ontology for investment advisory services as to create the common language for investment advisors and marketers. (Gruber 1995) defines *ontology* as an explicit specification of a conceptualization. The latter is an abstract, simplified view of the world that we wish to represent for some purpose. Despite inconsistencies in the usage of the term, ontologies are quintessentially content theories (Chandrasekaran et al. 1999): "Ontology is a representation vocabulary, often specialized to some domain or subject matter." Ontologies consist of terms, their definitions, and axioms relating them (Gruber 1995). Hence, ontologies delineate a common vocabulary for experts who need to share information in a domain. More concrete, (Noy et al. 2001) define ontology as "a formal explicit description of concepts in a domain of discourse (classes (sometimes called concepts)), properties of each concept describing various features and attributes of the concept (slots (sometimes called roles or properties)), and restrictions on slots (facets (sometimes

called role restrictions)). An ontology together with a set of individual instances of classes constitutes a knowledge base.”

### 3 METHODS

The repository aims to recognize investment advice as a knowledge product while enabling marketers to apply their service-marketing methods. Therefore, the pivotal element is a product specification that meets the requirements of both disciplines. First, the approach of service modules is presented, which has been adopted for this purpose, followed by the fundamentals of service marketing and knowledge management.

The repository is based on *service modules* (Mommsen-Ghosh 2003), which combine the investment process and the advisory process to a product specification and representation of the actual service. The basic building blocks of service modules are: Information Elements (IE), describing the information the customer gets, Methodical Instructions (MI) representing the know-how involved and Interaction Possibilities (IP), representing the interactions between customer and advisor.

- “*Information elements* either represent the information that is the result of the advisory service in the contents template (Output), or the input information necessary to produce the contents. The characteristics of information elements are expressed in a meta description, which captures the structure of the information element, the value of the information, (value being the actual content), and the unit in which the value is expressed.
- *Methodical instructions* that are used for the contents elaboration describe models and approaches from portfolio management theory and their application in investment advisory services. A methodical instruction represents the know-how that is involved. Thus, it can be an asset management method or a model from financial market theory. Methodical instructions combine input information to a given output information, which is specified by the contents template.
- *Interaction possibilities* define the interaction partners, the communication channel and the usage of tools for the elaboration and communication of the advisory contents. Moreover, they succeed in determining and recording the contribution of the customer.” (Mommsen-Ghosh 2003)

*Advisory tools* vary from simple presentations to programs for complex mathematical simulations and statistical analyses. In the concept of service modules, they can be broken down and represented by information resources, financial models and methods. Advisory tools can be used either as a part of a service module, e.g. when the advisor interprets the results of the tool, thereby enhancing the service brought to the customer; or they can be sold as an isolated module, e.g. when the tool is put at the customers’ disposal via the internet.

Service modules serve as the conceptualization to understand the knowledge involved in investment advisory services. “*Knowledge* is a fluid mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. ... In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms. (Davenport et al. 1998)” (Nonaka 1998) distinguishes *explicit* knowledge which is formal and systemic, in contrast to *tacit* knowledge which is highly personal, hard to formalize and therefore difficult to communicate. *Knowledge assets* are those bodies of knowledge that the organization employs in its process to deliver value. However, (Schreiber 2000) stresses the nature of knowledge as a potential for action: Knowledge can realize its value only when it is used; what knowledge is depends on the context of use.

The repository of service modules presented in this paper corresponds to an internal *knowledge repository*, where the “knowledge embodied in documents – memos, reports, presentations, articles, and so forth – and put into a repository where it can be easily stored and retrieved.” (Davenport et al. 1998 p. 146). A prototype has been implemented using *Protégé* (Stanford Medical Informatics 2003), which is a tool that allows the user to construct domain ontologies, to customize knowledge-acquisition forms and to enter domain knowledge. In this prototype, the service modules approach provides the taxonomy by which all knowledge assets are structured. (Fridman Noy et al. 1997)

acknowledge that a proof-of-concept prototype can serve as an evaluation of the conceptual coverage or practical usefulness of the ontology.

Since service modules in the repository reflect the actual information contents and process elements of investment advice, *service-marketing methods* become applicable for advisory services, although being an information product. Products and services vary in their characteristics available for the customer during the purchase evaluation, and service marketers use these attributes to choose the appropriate marketing methods. Looking at the properties of a service available for an assessment leads to the following distinction (Zeithaml et al. 2003 p. 36): *Standard products* have chiefly product attributes that a consumer can determine before purchasing a product. *Experience products* can be discerned only after purchase or during consumption. Thus, the customer is facing ex ante an uncertainty, which can be reduced by repetitive experiences with the same product or service. *Confidence or credence products* have characteristics that the consumer may find impossible to evaluate even after consumption and therefore the uncertainty persists. (Schneider 2000 pp. 129-133) applies the same categorization on financial services, considering the uncertainty of the customer due to the *information asymmetry* between him and the advisor.

*Service blueprinting* is a method used in service marketing originally introduced by (Schostack 1984). A service blueprint is “a picture or map that accurately portrays the service system so that the different people involved in providing it can understand and deal with it objectively regardless of their roles or their individual points of view. ... A service blueprint visually displays the service by simultaneously depicting the process of service delivery, the points of customer contact, the roles of customers and employees, and the visible elements of the service. It provides a way to break service down to its logical components and to depict the steps or tasks in the process, the means by which the tasks are executed, and the evidence of service as the customer experiences it.” (Zeithaml et al. 2003)

#### **4 SPECIFYING INVESTMENT ADVICE AS A KNOWLEDGE PRODUCT**

The first step necessary in order to recognize investment advice as a knowledge product is to *identify its knowledge constituents*. They originate both from investment process and advisory process, being the main dimensions of service modules. The knowledge of the investment process consists of commonly available knowledge, which can be found in the literature on asset management, company-specific knowledge, which is, for example, the result of an in-house research department, and/or the individual knowledge of the investment advisor. Sometimes the knowledge is wrapped in a financial instrument, whereby the company-specific knowledge is the key in providing the competitive advantage for an innovative financial product. The know-how of the investment process is mainly *explicit*, i.e. it is codified somewhere in a system. The knowledge of the advisory process is far more *tacit*, meaning that it resides in the personal capabilities and experiences of the advisor. However, recent efforts in customer relationship management (CRM) contributed twofold to the comprehension of the advisory process: First, operational CRM procedures enhanced the codification of explicit knowledge of the interaction between customer and advisor. Second, understanding customer behavior by means of analytical CRM added to the level of explicit knowledge about the customer.

The second step is to represent this knowledge by *modeling service modules in the repository*. Service modules use investment process and advisory process as the main conceptualizations. Product managers and investment advisors or business analysts responsible for the process modeling of advisory services will specify the investment advice collaboratively. It begins with *selecting an investment process*. If a corporate investment process is not established yet, a common process has to be agreed upon as a starting point. It can be either a unification of the current practices of the advisors or the implementation of a desired target process. The modeling process consists of two phases, which are iteratively revised. First, the investment process is dissected to create the overall catalogue structure. For the prototype repository, the process based on (Garz et al. 2000 Fig. 1 p. 11) was chosen and translated into a class hierarchy in Protégé. These classes represent the steps required for an entire coverage of the investment process and are the scaffold for the service module specification. Second,

the details for the actual service modules are added as instances of the process steps, i.e. output information elements and the methodical instructions for their elaboration are specified. Subsequently the necessary input information elements and interaction possibilities can be derived from them. These instances of service modules allow the product manager to create different versions, as there are many options and contextual considerations influencing the level of detail and sophistication given to each step.

So far, the specification of service modules has been illustrated from a static perspective. Yet process design is an essential part of service specification, and *service blueprinting* provides the methodical support to model the advisory process. There is no lexicon of symbols that is commonly used or accepted for service blueprinting; (Zeithaml et al. 2003 p. 242) draws all activities as rectangles, while (Schöse 2002 p.108) distinguishes actions drawn as rectangles and dialogues depicted as hexagons. Figure 1 is a screenshot illustrating the service blueprint for the service module ‘Strategic Asset Allocation Review’. The diagram starts with the triggering event for the advisory service, depicted as a yellow circle. The flow of activities is generally drawn from left to right, and activities visible to the customer are positioned on the top of the diagram. The chosen notation represents methodical instructions as squares and interaction possibilities as hexagons, imitating the symbols used by (Schöse 2002 p.108). Some activities represent another service module necessary as input and they are distinguished by rounded rectangles. For instance, when reviewing the strategic asset allocation the advisor has to verify the customer profile. This methodical instruction is a typical example for the collection of input information, which the advisor has to find out in an interview. If the course of discussion reveals that it is necessary to review the customer’s goals and needs, this service module has to be elaborated as an input. In consideration of the physical evidences involved in a service, both advisory tools and artifacts are shown on the service blueprint.

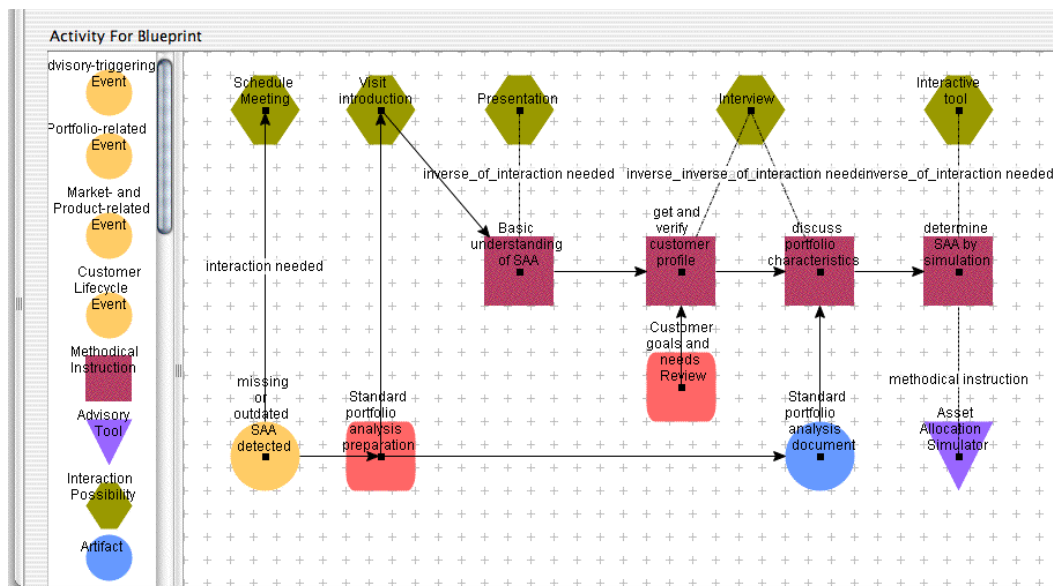


Figure 1 Service blueprint for service module ‘Strategic Asset Allocation Review’

Service blueprinting illustrates that even in highly customized services, many aspects of service provision can be made routine. “Both technology and improved work processes structure important elements of service provision and also facilitate goal setting. It is important to recognize that standardization does not mean that service is performed in a rigid, mechanical way. Customer-defined standardization ensures that the most critical elements of a service are performed as expected by customers, not that every action in a service is executed in a uniform manner.” (Zeithaml et al. 2003 p. 254)



In the last step, the focus shifts to the perspective of *selling advisory services*, where bundling and versioning of investment advice are used to create products for targeting behavioral customer segments. *Behavioral customer segmentation* categorizes investors according to their need for investment advice, and (A.T. Kearny 2002 p. 2) stresses its increasing importance: A growing sophistication of customers results in a growing demand for complex products and an increasing involvement in investment decisions. Changing preferences for receiving advice concur with an increasing delivery of investment advice and transaction capabilities across multiple channels.

*Versioning* of service modules can be used to create and maintain value tiers in the product offering among which customers can choose their intensity and customization of investment advice. (Shapiro et al. 1999 p. 61,64) describe the necessity to use versioning in order to adjust price and quality so that: "you can sell the same thing to customers with significantly different levels of willingness to pay. ... The key issue in designing an information product line is to pick the right dimensions on which to adjust the quality."

Service modules need to be offered as *bundles*, as it would be unfeasible to sell each service module separately. Thus marketers have to decide which service modules to combine and then to determine their respective quantity within the bundle, creating offerings customized for behavioral customer segments. In addition to bundling considerations familiar from a marketing perspective as discussed in the literature review, it is necessary to analyze service modules regarding two main influences, being constraints from the investment process and customer-specific aspects. Not every service module can be added arbitrarily to a bundle, because the investment process predetermines its range of occurrence. For example, it would not make sense to revise weekly a long-term decision such as strategic asset allocation. The investment process is a decision process in which steps can be categorized in three groups, representing frequency types of service modules:

- *Monitoring service modules*: In order to control the development of the portfolio, certain investment process steps need to be repeated regularly. Changing market conditions or customer's settings need to be tracked and revised, therefore monitoring service modules ensure that also gradual changes do not slip-in unnoticed. Examples are the annual review of the strategic asset allocation or the quarterly review of the tactical deviations. Hence, the frequency of monitoring service modules is governed by the time horizon of the decision.
- *Event-driven service modules*: There are service modules that are only used under certain circumstances. In contrast to monitoring activities, the consequences of event-driven service modules are more disruptive or far-reaching. For private customers, typical events for this type of service modules arise from the customer life-cycle (cf. Harrison 2000 p. 71), such as changes in marital status or retirement. Given their occasional character, these service modules usually do not span a period of time. Therefore, event-driven modules are seldom bundled with monitoring modules, as their occurrences and duration usually do not match. Instead, event-driven modules are often versions of the service modules, e.g. a customer analysis for evaluating the possibilities of early retirement in contrast to the annual review. Yet event-driven modules can be bundled if they address the same event or closely related concurrent events.
- *Transaction-driven service modules*: The closer the decisions of the investment process are to the actual buying and selling of financial instruments, the more the frequency of these modules becomes transaction-driven. In order to define bundles of advisory services encompassing transaction-driven service modules their quantity needs to be estimated, even if the marketed bundle includes an unlimited number of these modules.

## 5 COMBINING SERVICE MARKETING AND KNOWLEDGE MANAGEMENT FOR SPECIFYING INVESTMENT ADVISORY PRODUCTS

The product specification of investment advice requires a close collaboration between marketers and investment advisors in order to combine the know-how of service marketing with the knowledge of

the investment advisors regarding both investment and advisory process. (Harrison 2000 p. 114) references an empirical study, which identified the following success factor for the product design of financial services: (1) a differentiated product, (2) the overall quality of the service, (3) its product fit and internal marketing, and (4) the use of technology. The next section will illustrate how service modules offer the conceptual basis for a differentiated product specification. The second section discusses the contribution of the repository to the remaining factors from the perspective of service marketing, whilst the technological aspects lead to the knowledge management perspective and the benefits for investment advisors in the third section. The conclusion summarizes the factors influencing the product strategy for a knowledge-oriented product design of investment advice based on service modules.

### 5.1 Why use service modules for specifying investment advice?

Service modules specify investment advisory services in terms of information, methods and interactions. Therefore the repository gives both marketers and investment advisors a modeling tool to specify the usage of knowledge in investment advice, this being the *core benefit* of their service within a comprehensive product concept.

Service modules provide a differentiated specification which gives service marketers new ways of analyzing the relationship between *complexity and divergence* for investment advice. Without any differentiation clue about the constituents of investment advisory services, (Schöse 2002 p. 106) considered advice being a very few activities (a small number of steps indicates a low complexity) with a great divergence within each of the steps. By using service modules the complexity and divergence can be assessed for each module separately. As service marketers use these two characteristics to classify service types, they can reconsider for each service module if it is a standard, experience or credence product. Both characteristics and the classification influence the measures service marketers choose for product management and pricing (Schneider 2000 p. 133), therefore service modules allow an improved *method selection and application*. Moreover, the distinction of monitoring event-driven and transaction-driven service modules provides additional insights for creating bundles of advisory services that target specific behavioral customer segments and investment styles, thereby supporting the design of *differentiated products*.

### 5.2 How does the repository facilitate a collaborative product design between marketers and investment advisors?

While service modules enable the concept for the standardization of investment advice based on process descriptions, service blueprinting provides the methods for implementing service modules during the product design phase. Both knowledge management (Davenport et al. 1998 p. 98) and service marketing (Zeithaml et al. 2003 p. 222) stress the importance of *common language and concepts* of all participants to transfer knowledge or to design service offerings respectively. The collaborative specification based on service modules and service blueprinting improves the *overall quality of the service*, being a second important success factors for the product design of financial services (cf. Harrison 2000 p. 114).

(Schöse 2002 p. 106) suggests using service blueprinting to plan the service delivery, as it enables the financial institution to specify the central elements of an advisory interaction and the targeted depth of the advice. Service blueprints allow marketers to better comprehend the value proposition offered by the service modules. Therefore the visual representations serve also as *value maps* (Reidenbach et al. 1995 p. 147), i.e. to chart all activities relating to critical customer interfaces with a specific product in order to assess the value delivery system. Thus it is critical to pay particular attention to those dimensions of value regarded as important by the market. (Severidt 2001 p. 26,197) pointed out the importance of individuality and objectivity, and (Mommsen-Ghosh 2003) illustrated how to derive quantitative estimators for these value-drivers based on service modules. In a shared repository, investment advisors and marketers compile together the particular strengths of the knowledge behind

the companies offering financial advice, thereby demonstrating the power of its collective knowledge base. Hence, the cooperation based on service modules and in a common repository fosters both *product fit and internal marketing*, this being a third success factor (cf. Harrison 2000 p. 114).

### 5.3 How does the approach support knowledge management for investment advisors?

Investment advisory support systems are undergoing an integration process, which can be characterized in four different stages according to a knowledge management perspective:

*Stage (1): Supporting knowledge transfer of financial know-how in internal research and portfolio management systems from central asset management to investment advisors.* (Quinn et al. 1998 p. 190-192) illustrates this stage: A few financial specialists working at the headquarter use information systems to collect and analyze the data that are relevant to investment decisions. They also use software to distribute the resulting investment recommendations to the brokers at retail outlets who create further value by customizing the center's advice in order to meet the needs of individual clients. At the same time, the center can electronically monitor local operations for quality and consistency. Hence, financial institutions can leverage and combine the intellectual competence of the human experts and the know-how in their systems software.

*Stage (2): Integration of CRM functionality.* Recent examples of support systems (Odyssey 2003; Oracle 2003; Reuters 2003; Siebel Systems Inc. 2003) are supporting the decentralized customization of advisory-relevant information with integrated systems combining the functionality of CRM systems (supporting the advisory process), portfolio management systems (supporting the investment process), and market data. This trend is based on the awareness that investment process and advisory process are too much interwoven in investment advisory services to be supported by isolated systems.

*Stage (3): Marketers and investment advisors create a repository of service specifications, being a meta description based on service modules; service modules are exported as the integrative taxonomy.* Creating a separate repository enables marketers to take part in the process of service specification beyond their current contribution to CRM systems. They develop the product strategy for service modules, while investment advisors contribute as domain experts. For marketing purposes meta descriptions of the service and the knowledge asset would suffice, but investment advisors need the actual contents in a knowledge repository as a part of their advisory support system. Therefore, the service modules are exported as the taxonomy scaffolding, the integration of investment process and advisory process.

*Stage (4): Advisors share their knowledge assets as actual contents into an integrated platform.* In the previous stages the knowledge transfer is dominated by the idea of distributing the know-how of a specialized center to remotely working advisors. Hence, stage (4) expands the perspective targeting to transform the advisory support system into a shared knowledge base so that advisors can share their knowledge assets. By allowing them to feed for example their spreadsheets and presentations as content into the advisory platform, the advisory support system becomes an exchange basis within and among advisory teams and across locations, transferring knowledge quickly and efficiently throughout the organization. (A.T. Kearny 2002 p. 7) points out a bank which discovers "that the teams with the best sales numbers did not have the most 'star producers', but rather the greatest cross-team interaction – evident in the thorough planning of joint client calls and detailed post-call debriefings. These team members understood each other's styles, fully capitalized on each other's strengths and mitigated individual shortcomings."

Because the possibilities to codify knowledge are limited (Davenport et al. 1998 p. 68), it is recommendable to accompany stage (4) with organizational measures for building a learning organization (Garvin 1998 p. 52/53): Investment process and advisory process are the central parts of service module specification which assist *systematic problem solving*. Low formal requirements to enter knowledge assets foster the *experimentation with new approaches*, while regular workshops for face-to-face exchange of experiences across locations and team discussions within each location assure the quality of the contents in peer reviews. These personal interactions help advisors to *learn*

from their own experiences as well as from the experiences and best practices of others; moreover these interactions are necessary in order to learn the tacit secrets, and to convert tacit knowledge into explicit knowledge (cf. Nonaka 1998 p.30 on socialization and articulation).

## 6 A REPOSITORY TO SUPPORT A COMPREHENSIVE PRODUCT STRATEGY FOR INVESTMENT ADVICE

The repository for investment advice contributes to a comprehensive product strategy along the factors identified by (Harrison 2000 p. 99):

- *Customers.* Recognizing investment advice as a knowledge product and using service modules to specify its contents allows marketers and advisors to develop investment advisory services for behavioral customer segments. Investment and advisory process put the customers' decision problem and information needs at the center of the service. Therefore the approach is focusing on individuality and objectivity as being the main dimensions representing value for the customer, and assigning resources based on the drivers of advisory intensity. Moreover, bundling and versioning of service modules further enhances the capabilities for closely targeted offerings.
- *Competitors.* (Weatherill et al. 2003) concluded in their global wealth management survey that the industry will polarize between producers and distributors. They noted that for those wealth managers pursuing the distributor model the depth of client knowledge and the ability to meet their needs will be the primary differentiator. The suggested approach enables the financial institution to achieve such a competitive advantage due to their collective knowledge base.
- *Technology.* The main contribution of the repository consists in a shared system that allows both marketers and investment advisors to develop their common vision and language of investment advice. Using service modules as the underlying concept can serve as a guide for the forthcoming integration of advisory support systems.
- *Legislation.* Understanding and managing the individuality and objectivity of the advice is also the key to address compliance requirements. Combining the repository with an advisory support system ensures that the service specification is translated into the advisors' daily work practices.

This study presented concepts and methods suitable for shaping investment advice as a solution-oriented, customer-driven knowledge product. Future research will examine how adding a rule-based system could contribute twofold to improve the repository: First, to guide the product design in order to further support the specification of investment advice; and second to facilitate valuation and pricing of the resulting product. David Pottruck, former head of marketing and current CEO of Charles Schwab, states that marketers need to develop products that are relevant to customers (2003): "Financial service firms have ... a treasure of data about their customers... [and therefore] it is just inexcusable for us to be offering products and services that are completely irrelevant to the situation."

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