



PB-ADVISOR: A private banking multi-investment portfolio advisor

Israel Gonzalez-Carrasco, Ricardo Colomo-Palacios*, Jose Luis Lopez-Cuadrado, Ángel García-Crespo, Belén Ruiz-Mezcua

Computer Science Department, Universidad Carlos III de Madrid, Av. Universidad 30, Leganés, 28911 Madrid, Spain

ARTICLE INFO

Article history:

Received 21 June 2011

Received in revised form 24 January 2012

Accepted 1 April 2012

Available online 25 April 2012

Keywords:

Semantic technology

Fuzzy logic

Recommender system

Investment portfolio

ABSTRACT

Private banking is a business area in which the investor requires tailor-made advice. Because of the current market situation, investors are requiring answers to difficult questions and looking for assurance from wealth managers. Private bankers need to have deep knowledge about an innumerable list of products and their characteristics as well as the suitability of each product for the client's characteristics to be able to offer an optimal portfolio according to client expectations. Client and portfolio diversity calls for new recommendation and advice systems focused on their specific characteristics. This paper presents PB-ADVISOR, a system aimed at recommending investment portfolios based on fuzzy and semantic technologies to private bankers. The proposed system provides private bankers with a powerful tool to support their decision process and help deal with complex investment portfolios. The system has been evaluated in a real scenario obtaining promising results.

© 2012 Elsevier Inc. All rights reserved.

1. Introduction

Private banking is a business area in which high net worth and/or high-income private individuals are offered tailor-made financial advisory, investment, and management services on a comprehensive, long-term basis [22] cited in [23]. The origins of the private banking sector can be traced back to London's goldsmith-bankers who, in the 17th century, were described as "Goldsmiths keeping Running Cashes" in other words, giving negotiable receipts in exchange for silver and other valuables [39] cited in [6]. In the 18th century, private banks targeted two distinct groups within London (UK). In the City, bankers such as Glyn Mills served the banking needs of merchants and manufacturers, whereas in the West End, bankers, such as Child & Co and Drummonds, served the aristocracy and gentry [6].

Today, private banking can be described in terms of the services offered, the market environment, and the target group [23]. The services offered in private banking include traditional banking services as well as new added value services such as financial planning and alternative investments [69]. The private banking services differ from the financial services offered to individual customers in general [2]. These types of services are often long-term investments which are heterogeneous and highly complex, making it difficult for consumers to acquire enough knowledge about the services to be able to understand and influence their situation. Compared to retail banking customers, private banking customers are unique in that they have large deposits and high economic status. Consequently, banking executives have found that private banking customers require exceptionally high and consistent levels of service quality [50]. In short, private banking can be defined as a "high contact" service, owing to the fact that customers' direct contact with service providers is relatively intense [50].

* Corresponding author. Tel.: +34 91 624 59 58; fax: +34 91 624 91 29.

E-mail addresses: israel.gonzalez@uc3m.es (I. Gonzalez-Carrasco), ricardo.colomo@uc3m.es (R. Colomo-Palacios), joseluis.lopez.cuadrado@uc3m.es (J.L. Lopez-Cuadrado), angel.garcia@uc3m.es (Á. García-Crespo), mbelen.ruiz@uc3m.es (B. Ruiz-Mezcua).

Back in 2005 the market environment in private banking was favourable. Financial markets have recovered since 2003, but clients are now more conservative [44]. In today's environment, obtaining top line revenue growth has become more difficult and achieving growth in client assets is becoming harder, with significant differences between onshore and offshore growth rates [44]. The target group of private banking is in practice often described in terms of the amount of the individual's wealth (core affluent, high net worth individuals, ultra high net worth individuals) and how they came by it (old rich versus new rich) [23]. Today, clients in private banking are becoming more sensitive to price and service quality and are better informed and less loyal to banking institutions and advisors [23]. Furthermore, private banking now finds itself in a more competitive environment with additional competition from newer business models such as family offices and hedge fund providers [43].

Although private banks world-wide in 2009 were challenged by shrinking margins, an overriding trend in profitability during this last year cannot be observed. Some markets with traditionally high margins are becoming more competitive, whereas others continuously show stable margins [8]. According to [60] with asset values down, lower trading volumes and clients focused on lower margin products, revenue prospects are severely reduced; thus, clients are expecting more from their wealth manager, asking difficult questions and looking for assurance. Moreover with the current economic recession, stakeholders' loyalty and support are very important to businesses [70].

Focused use of client relationship management (CRM) enabling tools and technology is now deemed to provide substantial competitive advantage. But CRM should support a true client-centric organization that addresses multiple channels with robust front-office technology tools [60]. For less wealthy clients, wealth managers are increasingly directing CRMs to follow specific advice-centric processes, thus, focusing their needs on recommendations and advisory systems. Following this trend, this paper presents PB-ADVISOR, a system based on fuzzy and semantic technologies, aimed at recommending investment portfolios to private bankers.

The paper consists of five sections and is structured as follows. Section 2 reviews the relevant literature. Section 3 discusses the main features of PB-ADVISOR, including the conceptual model, algorithmics and architecture. Section 4 describes the evaluation of the tool, including a description of the sample, the method, results and discussion. Finally, the paper ends with a discussion of research findings in Section 5, and in Section 6 concluding remarks are presented.

2. Literature review

Due to the increasing importance and maturity of Artificial Intelligence (AI), AI techniques and tools have been successfully used in a variety of business fields including marketing, accounting, management information systems and production management [11]. As a result, several works reflect the importance of AI as a support for financial issues. Within this area, there are several works that report interesting results: stock behaviour prediction (e.g. [12,61]), bankruptcy (e.g. [57]), credit scoring (e.g. [75,81]), financial crises and failures (e.g. [9,46]) and credit card fraud (e.g. [72,74]) to cite the most popular and recent cases.

In the field of investment recommendation and portfolio selection and composition, the attractiveness of the field has led to many other initiatives. As is known a portfolio is a distribution of wealth among several investment assets such as stocks, bonds, and their derivatives. In this area, the use of genetic algorithms (e.g. [13,41,42,52]), fuzzy logic (e.g. [31,36,53,54,59,63,73,77]), neural networks (e.g. [20,76,25,47]), decision support systems (e.g. [40,53,37,65]) among several other techniques has proven to be just as effective in financial portfolio selection.

Focusing on fuzzy logic, one of the components of PB-ADVISOR, several authors have recommended the incorporation of fuzzy theory into the interpretation of portfolio matrices with different applications: e.g. to optimize the selection of portfolio products [31], to obtain optimal proportions of the assets for constructing a portfolio that respects investor-preferences [36], for strategic management [53], to assist managers in reaching a better understanding of the overall competitiveness of their business portfolios [54], to facilitate the interpretation of portfolio matrices used for strategy alternative(s) formulation and selection [59], to solve the portfolio problem when security returns are bifuzzy variables [73] and to define new dynamic portfolio selection strategy in the stock market [77].

Given that the investments market is a very complex environment, returns cannot always be accurately predicted from historical data, as they are beset with ambiguity and vagueness [41]. Therefore, fuzziness is useful to introduce vague goals for the expected return rate and risk in such environments.

For a rational investor, the leitmotiv to ensure an increase in wealth is to diversify risk [56]. But in a world in crisis with asset values down, the work of private bankers has been dramatically altered: clients are expecting more from their wealth manager, asking difficult questions and looking for assurance [60]. To deal with this situation, private bankers need to seek alternative products to build a more diverse portfolio, including a wider range of products that cannot be controlled in a traditional way, thus requiring new recommendation systems centered on advice rather than trading. This system must be open to new products (real estate, gold, etc.) along with traditional ones (bonds, stock, etc.) in order to be able to produce more general and specific investment recommendations based on customer and product profiles. These recommendations must be made to the private banker, who will be responsible for transmitting this information to his or her customers; this system thereby gives his or her advice an added value. With the aim of responding to this need, this paper presents PB-ADVISOR, a tool based on fuzzy logic theory, semantic ontologies and expert systems.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات