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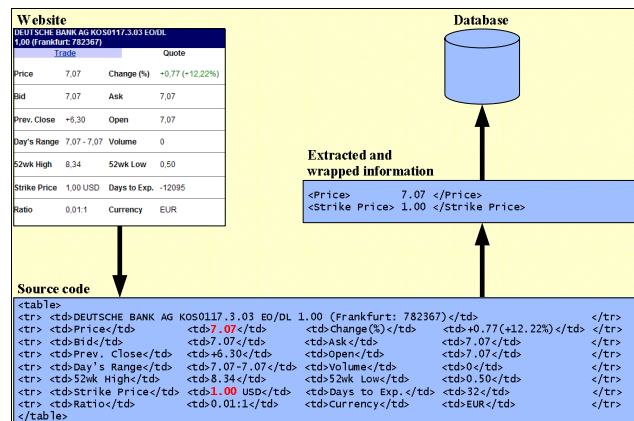# # 4 (May 20, 2003)[1]

Automatic Extraction of Derivative Market Prices from Webpages using a Software Agent[2]

Patrick Bartels[3] and **Michael H. Breitner**[4]

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[3] Research fellow and lecturer (bartels@iwi.uni-hannover.de).

[4] Full Professor for Information Systems Research/Business Administration (breitner@iwi.uni-hannover.de).

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Patrick Bartels[1] and Michael H. Breitner[2]

Universität Hannover, Institut für Wirtschaftsinformatik, Königsworther Platz 1,

D-30167 Hannover, Germany

Some current research of derivative pricing is dedicated to artificial neural networks to generate market prices (see Breitner (2000 and 2001)) instead of analytical prices developed by Black, Scholes and Merton (1973) or Cox, Ross and Rubinstein (1979). Needed data are usually taken from commercial finance databases. This paper presents the software agent PISA[3] extracting quotes from webpages to generate cost free quote databases. Such databases provide time series for the training of neural networks. Extrapolating series with neural networks enables all kinds of forecasting. Interpolating data obtained enables, e. g., a comparison of derivative prices from different issuers and a synthesis of market price functions. This paper presents a comparison of selected programming languages to find the most suitable for the given tasks. The components of PISA are described in detail. The paper closes with examples for the extraction process.

Keywords: Software agent, market prices, derivatives, artificial neural networks.

I.   Introduction

Increasing importance of foreign currency transactions requires an appropriate hedging against possible risks. This gets more and more important since the volatility of the five biggest currencies is still increasing. The uncertainty about exchange rates makes handling of future contracts difficult. Using options and other derivatives enables hedging against upcoming risks by redistributing them to other agents. Therefore both sides need a reliable derivative pricing model. Today's pricing models mostly base on the Black/Scholes/Merton-model or the Cox/Ross/Rubinstein-approach. These models depend on some unrealistic assumptions, e. g. regarding true-market-conditions. Alternative current research focuses on using artificial neural networks to estimate market prices instead of analytical prices. This approach needs a sufficient dataset for training the neural networks. The dataset is usually taken from commercial databases which must be paid. Here, an alternative approach to get this input dataset using software agents extracting the information from the Internet for free is presented. Beside for

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[1]   Research fellow and lecturer, email: bartels@iwi.uni-hannover.de, phone: ++49 511 762-4979, fax: ++49 511 762-4013.
[2]   Full professor for Information Systems Research and Business Administration, email: breitner@iwi.uni-hannover.de, phone: ++49 511 762-4901, fax: ++49 511 762-4013.
[3]   PISA = Partially Intelligent Software Agent