

ARTIFICIAL INTELLIGENCE BUSINESS VIABILITY INDEX

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Abstract

Businesses are exposed to market and operational risks that can lead to setbacks and potential business failures. In order to correctly identify and manage these risks, huge amounts of data must be analyzed and used as input for the decision-making process. In reality, companies do not have sufficient resources and skills for this process. If management were more data-driven, there would be fewer outages and more stability in companies.

The problem solution is to create an AI (artificial intelligence) solution with the capacity of using considerable amount of real-time market and business data and converting it into actionable management inputs that are available in real-time as basis for the business decision-making process.

The solution would improve the decision-making process in companies by ensuring higher capacity to make better use of the vast amount of data available. The more decisions are data driven, and the more potential market and operational risks are identified (and managed), the more the respective decision making business and the economic ecosystem are stable. The beneficiaries are business customers, employees, investors, business owners, public bodies and society in general. Fewer defaults and better economic performance are preferable to economic and social instability.

The proposed solution leverages the AI concepts to analyze market and business operational data in real-time and derive actionable business management fundamentals in the same timeframe as data is analyzed.

Machine learning, supervised learning and unsupervised learning concepts are used along with deep learning neural network solutions to learn from market and business behavior patterns and use the derived knowledge to support management decision-making process. The essence is to incorporate a huge amount of available data and leverage the interrelationships between different data sources to derive a summary actionable basis for real-time decision making.

The planned AI business support system is designed to achieve the following tactical objectives:

- creation of an analytical report on the respective business activities and market conditions;
- if relevant, generation of risk scenario-based alerts to review and change the course of business action;
- if relevant, production of performance recognition notes to emphasize whether the business is market oriented and successfully run;
- generation of solutions to address the risk scenarios when identified;
- forecasting the outcomes of the solutions offered;
- allowing business representatives to enter business-specific data into the system and to create the forecasts based on these additional inputs.

The proposed solution uses machine learning and artificial neural network tools to ensure the achievement of tactical objectives. From a technical point of view the system is able to perform the following activities:

- it learns the patterns of business practices in the given business sector;
- it learns site-specific issues that affect operations at a particular geographic location;
- it learns the business practices of the particular analyzed business entity;
- it evaluates the business practices of certain companies on industry and location-specific issues;
- it decides if there are specific risks that need to be communicated;
- using the available data inputs and considering potential customer additions, the system forecasts the possible development scenarios for the respective business unit, including corporate finance analytics as well as concepts such as net present value, weighted average cost of capital, internal rate of return, return on investments, customer acquisition costs, breakeven analysis etc.;
- the generated development scenarios could be communicated as solutions to identified risks or as further reinforcement of a positive development scenario.

The solution is made usable without any special competencies needed. Respective menu systems are provided to navigate the application. In case no considerable amendments needed the operational cost are negligible for the system use. As the system uses data for its operation the data needs to be updated and this cost is relevant to the cost of securing updated data.

Customization cost and time of the solution depends on the extent and essence of customization. In case of replacement of data sources from one “similar” data to another, the customization is efficient and the respective code is provided to users. The same applies if some data sources need to be excluded (not all data may be available in similar format in all regions). In case customization relates to adding essential functionalities to the solution the cost and time is dependent on the specific new requirements proposed.

As a result of application of the described system the bankruptcy rate is expected to fall 10% within three years of active system usage while the general insolvency would be expected to improve 25% within the same timeframe.

The Business Viability Index AI support system should be developed in such a way that it is reusable and therefore should have as few dependencies as possible on other specific software solutions. The corresponding documentation should enable reusability and be supplemented.

The system should be made scalable and integrable with other systems. It is essential that the data used in the system described here is available in other systems with which the present solution is intended to be integrated. For some data entries, the input data formats could be partially changed, some entries could be omitted without significant effect on the system result. The corresponding documentation for describing the interoperability must be created and supplemented.

The output of the AI support system, the specific advice, risk warnings, scenario forecasting as well as analysis results should only be available for use by the analyzed company. The results will not be displayed publicly or used as a basis for legal proceedings or categorizations.

The risks of the solution are wrong and misleading evaluations to particular companies' operational statuses, misleading forecasts produced and inappropriate development scenarios communicated. These risks have been mitigated via extensive testing of the solution and evaluation of the results received from testing. Experts and industry professionals are being involved in evaluation process judging AI technology trustworthiness.

Keywords: artificial intelligence, business viability, data integration