Using AI-Powered Competitive Forecasting to Drive Strategic Decision-Making and Market Dominance

Masterarbeit

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Outline

1. Introduction
1.1. Motivation

"What we want is a machine that can learn from experience"
- Alan Mathison Turing, London 1947 -

Companies are under increasing pressure to keep pace with the competition in an era of booming technological growth and market volatility. More than ever, business success depends on your ability to predict market trends and create unique campaigns, so the vast amounts of data that have been hiding their fangs are starting to count. The advent of AI, on the other hand, is proving to be a game-changer in the field, as AI's capabilities not only outperform traditional forecasting practices in data analysis, but also surpass them in their potential power for pattern recognition and predictive modelling. A new era in strategic decision making started by using ML algorithms, NLP and advanced analytics. Companies are able to analyse petabytes or exbytes of structured and unstructured data to uncover insights and patterns that humans could not understand without manual analysis. With this capability, it is possible to more accurately predict market dynamics, competitor actions and consumer trends, which could provide a significant advantage over the competition. But there are barriers to deploying AI-based competitive forecasting systems. Companies looking to adopt this complex and fast-moving set of technologies over the next few years face a minefield of technological, financial, human and ethical challenges that can foil successful implementation and deployment.

The purpose of this master thesis is to explore the complex field surrounding AI and competitive forecasting - in particular, how can companies navigate these new AI technologies given all the obstacles they face? what strategies should we implement in order to be able to access some of the benefits they offer. This study is qualitatively driven and guided by the following main research questions:

1. What are the main obstacles that companies face when adopting AI technologies for competitive forecasting?
2. What are the strategies for companies to overcome these challenges?
3. How can AI-powered competitive forecasting lead to greater market dominance?

This thesis was inspired by a passion for strategic management and an innovation-oriented mindset. At a time when the emergence of technology is changing business paradigms, it is essential to be able to define a strategic advantage with AI. Thus, the incorporation of technology with zealot-user effect interaction and organisational dynamics in AI adoption form a rich area for research, which is very much in line with my aspiration to develop smart strategies while addressing novel business challenges.

This thesis also makes significant theoretical contributions to many areas of research in technology and information systems management. It contributes to and advances the theory of technology adoption and diffusion in companies, in particular by identifying challenges specific to AI technologies. This research thus helps to shed light on puzzling questions such as how companies seek incremental strength against each other - through AI-based competitive forecasting systems, and more generally allows for a much deeper appreciation of the typically difficult process of mobilising complex emerging technologies within established routines.

Second, it contributes to the field of strategic management by exploring how machine-learned recommendations can illuminate and support strategy formulation. Reflecting a resource-based view of the firm, this thesis explores the possibility that AI could be a mechanism to augment, rather than replace, human capabilities in both competitive analysis and strategy formulation, and to add more confidence/nuance to the ongoing discourse on the impact of technology on organisational strategy.

Third, this study contributes to the increasingly rich field of research on ethical and responsible AI innovation. By recognising the ethical dilemmas associated with the use of AI, with a focus on data privacy and bias in algorithmic decision making, as well as transparency in general, this work serves to contribute to an understanding of how frameworks for the responsible use of AI in business environments can be further developed. Finally, this work is intended to be potentially useful to the field of CI - in shaping how AI will change traditional research associated with market analysis and competitor monitoring. It explores the opportunities for AI to improve both the accuracy and speed of competitive forecasting, as well as the potential pitfalls of relying too heavily on AI-driven insights.

This thesis uses mixed methods, combining a systematic review of the literature and data from expert interviews. It provides a comprehensive overview of AI-enabled competitive intelligence, combining insights from academic literature and industry reports with real-world experiences of the desired challenges and best practices for implementation.

This thesis is intended to be general across different industries and organisational sizes, as the challenges - and opportunities - of AI adoption differ from one organisational context or industry to the next. Although the central context is competitive forecasting, it has implications for the broader adoption of AI in any part of a company's operations where machines augment human decision making.

As such, these task sets play an important role in this thesis and contribute in several key ways:

I. A roadmap to frame the challenges of competitive forecasting in a new light for AI implementation

II. Recommendations for successful strategies, based on both theoretical insights and anecdotal experience

III. A comprehensive look at the ethics of AI-driven competitive intelligence and suggested guidelines for its responsible implementation

IV. Implications of AI-based competitive intelligence for strategic management

The thesis thus attempts to fill the above gaps by focusing on three main areas - as AI can be applied to any area of strategic management or innovation, it is hoped that a holistic approach will improve our understanding, at least in relation to competitive forecasting.

1.1. Research Structure

The structure of this master thesis is as follows. After the relevance of the problem and the resulting research questions have been determined, including the motivation, the theoretical background of this paper is presented in chapter two.

This section highlights some of the key tools and strategies that can be used to optimise strategic management in decision making. This thesis will focus on the importance of forecasting and CI in strategy development. It will also review some of the theories that tell us how companies strategise and the role of data/analytics. The thesis also explores various theories of competition and competitive advantage. This section also explains CI practices and frameworks for analysing competitors and how forecasting gives a company an competitive advantage. AI will be an introductory session on artificial intelligence and machine learning, focusing more on the types of approaches relevant to forecasting.

Section 3 gives an overview over the research methods I used in my thesis. At first it is described how the academic and industry literature will be reviewed, including. The aim was to provide an overview of existing research and practice. Second, the expert interviews and questionnaire are described in detail with the following information: structure and key questions in the qualitative interview guides.

In section 4 I explore in depth the specific AI algorithms used for forecasting, including a review of natural language processing methods for analysing competitor communications and market sentiment. I also give an overview about the software tools and basic platforms that are essential for working with AI forecasting applications. After that, the benefits that AI-powered forecasting offers will be described, e.g. higher accuracy of increased inputs or real/dynamic time forecast output. This will be illustrated with case studies and evaluation of the expert interviews and queostionnaire. Finally the challenges of using AI-powered competitive forecasting technologies are discussed. Key challenges to implementing AI forecasting, including data quality/availability, integration with existing systems, and ethical considerations such as algorithmic bias, will be explored. Potential solutions and best practices will be detailed.

In section 5 I discuss my research questions. I explore the difficulties in implementing AI-powered forecasting and how AI-powered competitive forecasting changes the dynamics of strategic decision-making and planning. To this end, I will present an exemplary best practice implementation process. I then explore how companies can use the benefits of AI-powered forecasting to expand their market dominance. I will also discuss the limitations of this thesis and methodological limitations and suggest promising avenues for future research in competitive AI forecasting. This chapter ends with a presentation of the contribution of this thesis to theory and practice

Finally, section 6 will summarise the main themes and findings on how AI forecasting can drive strategic decision making and competitive advantage.

2. Theoretical Background
2.1. Strategic Management & decision-making

Strategic management plays a key role in ensuring the continuity of businesses through efficient processes. It involves the formulation and implementation of strategic decisions that guide a company in defining where it wants to be in the long term. Strategic management is essential for

better utilise these technologies for more effective, responsible and strategic decision-making processes at the organisational level.

6. Conclusion

The thesis examined AI-driven competitive forecasting as an evolving technical discipline that can inform strategic business planning and help organisations stay ahead of the curve. The results show that while opportunities are emerging, pitfalls await organisations in this new landscape.

Perhaps the most common issue across all sectors relates to data availability and quality. AI models are only as good as the data on which they are trained, and so the next step is data management, which acts like the oil in this AI vehicle process. Adding to the difficulty, as AI predictive modelling tools mature and provide more accurate predictions, organisations need to integrate them into existing systems/decision processes, which usually requires significant organisational change management. While there are ethical concerns around data privacy, algorithmic bias or the use of AI adds another layer of complexity. This is a careful line for organisations to walk, as they have a lot of power in their hands with AI, which can enable very unethical solutions, especially when it comes to sensitive competitive information. Some AI models, given this 'black box' nature, are difficult to unravel and binary predictions are then impossible, while others make it impossible for business stakeholders who rely heavily on these technologically driven predictions, but have a lot of scepticism or unfamiliarity attached to them.

Nevertheless, the thesis highlights a number of practices that seem to hold promise for effective execution. This seems like a step too far, and an incremental approach with simpler models that can demonstrate value before imagining more complex setups may be in order. It allows organisations to address meaningful business problems where AI can deliver a clear return on investment, and avoid chasing ML just because everyone else says they now have an artificial intelligence strategy. This focus on the partnership between AI and humans is a powerful factor in making great decisions, underlining not only that humans are analogue and emotional creatures at heart, but also the need for interdisciplinary teams where the fraternity between AI skills - pure roles versus domain knowledge/business acumen - justifies compromise.

There is a huge opportunity for AI-driven competitive forecasting to lead to market leadership. Companies that are able to harness these technologies can gain significant advantages in strategic decision-making and market positioning. AI can analyse large volumes of data at lightning speed, uncovering hidden patterns and generating new competitive insights to help companies react more quickly and nimbly in their markets by providing real-time forecasting capabilities or developing scenario models. Ultimately, this could lead to more optimal pricing, variability in customer demand and questions about inventory levels, with the ability to respond more quickly. In addition, AI forecasting can catch brewing competitors or market disruptors long before they become the next big thing, making strategic positioning not about hindsight, but about foresight with a heads-up on potential threats. When it comes to serving the customer, superior demand forecasting can also lead to better personalisation and inventory management.

This capability will only become more powerful as AI technology evolves into a competitive forecasting model in the coming years. To realise this potential, however, it will be essential that implementation is done in a thoughtful way, balancing technical capabilities with business needs and ethical considerations. Data quality, integration and data ethics are ongoing challenges that

companies will need to address while continually responding to changing market dynamics or technology.