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Application of Databases and Artificial Intelligence in the Automotive Industry: A Methodological – Research Framework

Summary: *This paper presents a methodological research framework for the application of databases and artificial intelligence (AI) in the automotive industry. The research examines how digitalization and AI-based technologies influence business models and financial performance, particularly through the integration of smart systems into modern vehicles. The paper outlines both quantitative and qualitative methods, including case studies of companies such as Tesla, BMW, and Ottometric Inc., as well as an analysis of capital market indicators. Special emphasis is placed on data collection techniques and their role in strategic decision-making. The study further explores the correlation between digital innovation and stock market valuation, demonstrating how advanced software solutions contribute to investor perception and company growth. By combining theoretical insights with real-world examples, this framework lays the foundation for further research into the financial and strategic implications of AI and databases in the automotive sector.*

Keywords: *digitalization, automotive industry, databases, artificial intelligence, business models, capital markets, data analysis, company valuation*

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INTRODUCTION

The automotive industry is undergoing one of the most dynamic transformations in its history, driven by digitalization, databases, and artificial intelligence (AI). The development of smart vehicles, autonomous systems, and advanced data analytics enables companies to enhance efficiency, optimize production processes, and improve customer experience. Connected vehicles generate vast amounts of data, whose proper processing and analysis are becoming key competitive factors in the market.

Digitalization is not only changing the technical aspects of vehicle production and maintenance but also has a far-reaching impact on business models and companies' financial performance. Automotive manufacturers are increasingly integrating software services into their products, transitioning from traditional vehicle sales to subscription-based and data-driven service models. These changes raise new questions regarding company valuation, investment in research and development, and the analysis of geopolitical and market risks.

The aim of this research is to provide a methodological framework for analyzing the impact of databases and artificial intelligence on the automotive sector. Through a review of existing research, capital market analysis, and practical industry examples, the paper explores how digitalization shapes modern business models and financial performance. Special attention is given to the methodology of data collection and analysis, as a crucial element in strategic decision-making in the automotive industry.

Methodological Research Framework

Researching the digitalization of the automotive industry through databases and artificial intelligence requires a multidisciplinary approach that combines scientific research methodology with capital market analysis. This paper utilizes a combination of quantitative and qualitative methods to gain a more accurate insight into how digitalization affects business models and financial performance.

Research Methods

The automotive industry is no exception and two research methods are used in this field as well:.

Quantitative Methods

Quantitative methods are research techniques based on numerical data and statistical analysis. The goal of quantitative research is to provide objective, measurable, and reproducible results that can be generalized to a broader population. These methods rely on standardized data collection techniques such as surveys, experiments, big data analytics,

and mathematical modeling. In the context of the automotive industry, quantitative methods may include the analysis of sales data, market trends, and company financial performance.

Specifically, in the automotive sector, quantitative methods include:

- **Secondary Data Analysis** – Using available sources such as financial reports from auto manufacturers, capital market data, stock exchange movements, and case studies of digital transformation in the industry.
- **Statistical Analysis** – Employing economic indicators and market metrics to assess the impact of digitalization investments on profitability and company valuation.

Qualitative Methods

Qualitative methods are research techniques aimed at understanding human experiences, perceptions, and social phenomena through descriptive and interpretative analyses. These methods include interviews, focus groups, case studies, and ethnographic research. Instead of focusing on numerical data, qualitative research emphasizes in-depth analysis and contextual understanding of issues.

Within the digitalization of the automotive industry, qualitative methods can be used to explore consumer perceptions of autonomous vehicles, analyze organizational change in companies, and examine the impact of AI technologies on the workforce.

In this industry, qualitative research may include:

- **Case Studies** – Analysis of specific examples of AI and database application in the automotive sector, including companies like Tesla, BMW, and Ottometric Inc. ***Resouce: (7)***

Advantages and Disadvantages of Quantitative Research

Advantages	Disadvantages
• Generalization and drawing general conclusions • Effective and efficient database analysis • Examining and identifying patterns, consequences, and relationships among phenomena • Objective and independent results • Readers like numbers	• Impersonal, "dry, and soulless" • No trace or presence of the respondent's voice • No sense of context or circumstances • The research is mostly initiated and controlled by the researcher

Resource: (7)

Advantages and Disadvantages of Qualitative Research

Advantages	Disadvantages
• Very detailed perspectives of the participants • The respondent's voice is felt and heard • A complete impression of the context and circumstances is gained • The opinions are based on the views and attitudes of the participants • Readers like stories and narratives	• Limited generalization and conclusion drawing • "Soft data" without numbers, series, trends, or charts • A high degree of interpretation • Reliance on participants is minimized • Researcher's expertise

Resource: (7)

Digital Methods of Data Collection

- **Sensor Systems and IoT Devices –** Modern vehicles are equipped with sensors that collect data on driving behavior, fuel consumption, driver actions, and more.
- **LiDAR and Radar Technologies –** These technologies enable the collection of spatiotemporal data in real time, which is especially important for autonomous vehicles.
- **Telemetry –** Used to gather data on vehicle performance under real-world operating conditions.
- **Digital Tools for User Behavior Analysis –** For example, through mobile applications, onboard infotainment systems, and platforms linked to user accounts.

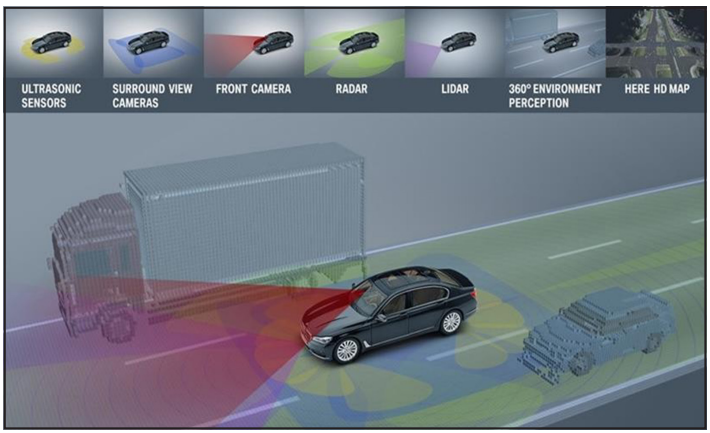

Figure 1: L4 Functionalities of Autonomous Vehicles

Source: (9)

Data Collection in Real Projects

At **Ottometric**, the company where the author of this paper is employed, a combination of digital and traditional data collection methods is used. The software developed within the company integrates:

- User behavior analytics,
- **LiDAR sensors** for spatial data collection,
- AI models for automated data processing and pattern recognition,
- **An agile software development approach** that enables iterative testing, where collected data is used for rapid hypothesis validation and informed technical and business decision- making.

BMW CarData – Telematics Data for Personalized Services

BMW uses its CarData system to collect telematics data from vehicles, such as speed, fuel consumption, and driver behavior. This data enables the personalization of services, including tailored offers for insurance and maintenance.

Nexar – Real-Time Data Collection via Onboard Cameras

The startup company Nexar utilizes cameras mounted on vehicles to collect real-time visual data. This data is used for road mapping, identifying traffic patterns, and improving road safety.

UDRIVE Project – European Driver Behavior Study

UDRIVE is a European project that collected data on driver behavior under real driving conditions across Europe. Sensors and cameras were used to gather data on speed, acceleration, mobile phone use, and other factors that influence road safety.

NODAR Technology – Deep 3D Data Collection for Autonomous Vehicles

NODAR's flagship product, Hammerhead™, uses a pair of wide-baseline stereo cameras to enable extremely accurate 3D spatial mapping at distances exceeding 1,000 meters. Unlike traditional LiDAR systems, NODAR's solution does not require additional sensors, relying instead on software-based auto-calibration. This significantly reduces system costs and increases reliability. This technology is used for:

- Detection of small objects (pedestrians, obstacles, lost cargo),
- Advanced automatic braking and collision avoidance,
- Operation in complex weather conditions (rain, fog, nighttime driving).

DIGITALIZATION AND ARTIFICIAL INTELLIGENCE IN THE CONTEXT OF CAPITAL MARKETS

The rapid pace of technological advancement is a global trend across all industries, including the automotive sector. Through the application of artificial intelligence (AI) and databases, technological progress increasingly influences production and logistics processes, as well as the overall perception of company value in capital markets. Companies that invest in digitalization are perceived as innovative, which undoubtedly leads to positive movements in their stock prices.

A prominent example is the company *Tesla*, which, although primarily an automaker, is often valued more as a technology company. Its market capitalization significantly exceeds that of competitors in the traditional automotive sector, precisely due to its strong application of AI in autonomous driving and advanced software solutions. This clearly demonstrates how technological superiority and innovation have become key factors in investment analysis.

It can be concluded that there is a direct correlation between the level of digitalization and a company's performance in capital markets. Companies that successfully implement AI solutions often become more attractive to investors, positively influencing their market position and valuation.

CONNECTIONS BETWEEN THE AUTOMOTIVE INDUSTRY AND STOCK MARKETS

Listing of Automotive Manufacturers on Global Stock Exchanges

Many large automotive companies are publicly traded companies, which means their shares are listed on stock exchanges:

- On the New York Stock Exchange (NYSE): General Motors (GM), Ford Motor Company, Tesla (NASDAQ)
- On the London Stock Exchange (LSE): Aston Martin, Jaguar Land Rover (part of Tata Motors – listed in India, but closely followed by the London market due to its operations)

This means that the business performance of these companies directly affects their stock prices – every innovation, malfunction, market shift, or introduction of AI systems immediately has consequences.

Most leading automotive companies are publicly listed and thus directly connected to the dynamics of capital markets. Their shares are traded on the most important global stock exchanges, and the stock prices of these companies often reflect technological progress and strategic moves.

For example:

- **Tesla (NASDAQ) –** often perceived more as a technology company than an automotive one, thanks to innovations in autonomous driving, battery technology, and software.
- **Ford and General Motors (GM) – NYSE;** although traditional manufacturers, they are also investing significant resources in digital transformation and fleet electrification.
- **Volkswagen and BMW –** listed in Germany on the Frankfurt Stock Exchange (FWB), with the market closely monitoring their AI and digital strategies.

Every announcement of new AI functionality, partnerships with IT firms, or successful implementation of digital solutions often causes a shift in stock prices.

Indices and Automotive Companies

Automotive companies are part of major stock market indices:

- FTSE 100 (UK) – which includes companies like Rolls Royce Holdings (not automotive, but transport), Aston Martin, etc.
- S&P 500 (USA) – Tesla, Ford, GM
- DAX (Germany) – Volkswagen, BMW, Mercedes-Benz Group

Movements in these companies often influence the entire index, especially when major changes occur (introduction of AI systems, new models, environmental technologies). For example, the rise in Tesla's stock often "pulls" the technology and automotive sectors of the index upward.

The Impact of AI and Digitalization on Valuation

Companies that successfully implement AI in their products and business models are perceived as innovative and capable of long-term growth. Investors increasingly focus on:

- The share of software and subscription revenues
- The number of AI patents and partnerships with technology firms
- The speed of innovation adoption (time-to-market)Tesla is the best example: although it produces significantly fewer vehicles than Toyota or Volkswagen, it often has a higher market capitalization precisely because of its perceived technological advantage.

The Chart 1 shows market capitalization (in billions of USD) and the percentage of revenue coming from software solutions for selected automobile manufacturers. Tesla leads both in market value and in the degree of digitalization of its business model, which further confirms the market perception of it as a technology company. In contrast, traditional manufacturers like Ford, BMW, and Toyota have a lower share of software revenues, although they are increasingly investing in AI and digital platforms.

The data are simplified and serve as an illustration of the impact of digitalization on the market valuation of companies.

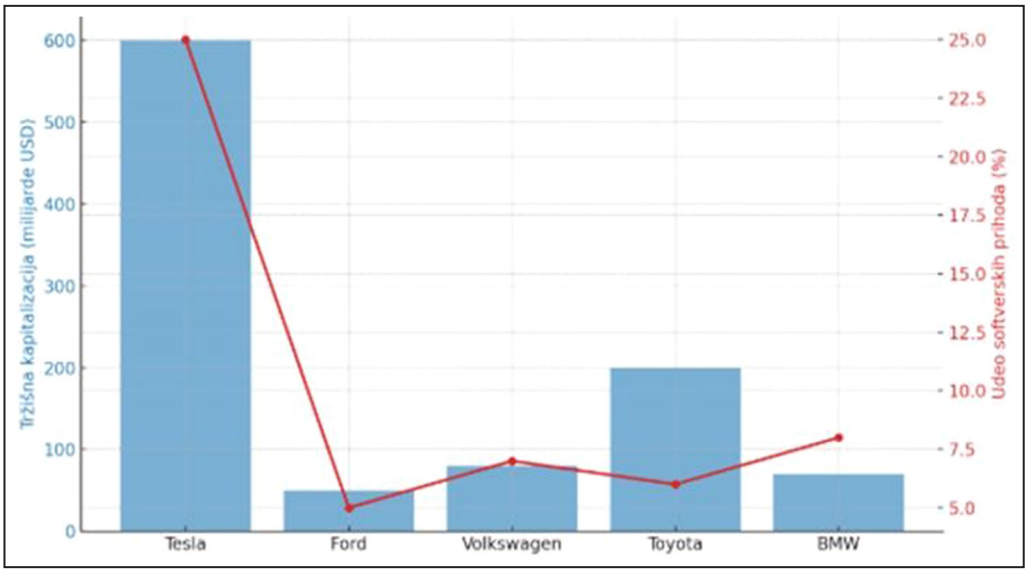

Chart 1: Comparison of Market Capitalization and Share of Revenue from Software Solutions among Leading Automotive Companies

Sources for the Chart: (14, 5, 1, 15, 16, 18).

Note: *The data are used for illustrative purposes to demonstrate the relationship between market value and digitalization through software revenues. The share of software revenues was estimated based on publicly available sources and internal assessments when official data were not explicitly published.*

Data Collection and Analysis of the Automotive Industry on Stock Exchanges

Stock exchanges and investment analysts use sophisticated systems for data collection and processing to monitor the performance of companies in the automotive industry. These data come from multiple sources:

- Financial reports (quarterly & annual reports) – publicly available documents submitted by companies to regulatory bodies (e.g., the SEC in the USA) and investors.
- Technical and fundamental indicators – including metrics such as the P/E ratio (price-to- earnings), EBITDA, ROE, as well as technical signals like trading volume, volatility, and stock prices.
- ESG indicators (Environmental, Social, Governance) – increasingly important for valuing auto companies investing in sustainable and digital technologies.

- News, AI sentiment analysis, and real-time releases – platforms like Bloomberg, Reuters, and Yahoo Finance use algorithms to gather and analyze news and social media to detect market expectations.
- Macroeconomic factors and geopolitical risks – such as supply chain disruptions, CO_2 emission taxes, or trade policies that directly impact the automotive industry.

Some of the specialized platforms analysts use to obtain sector-specific data include Refinitiv, Bloomberg Terminal, S&P Capital IQ, and FactSet. These platforms often offer automotive sector dashboards displaying stock movements, software revenue shares, unit costs, and market research by region.

By integrating data from these sources, stock exchanges and investment funds form predictions about company performance and valuation, directly influencing capital flows and investment decisions.

CONCLUSION

Digitalization of the Automotive Industry, driven by the development of databases and artificial intelligence, represents a fundamental transformation of a sector that has relied for decades on traditional manufacturing and sales models. Modern vehicles are becoming smart platforms that collect, analyze, and exchange vast amounts of data — changing not only technological processes but also entire business models.

This paper demonstrates how the application of quantitative and qualitative research methods enables a comprehensive insight into the ways digitalization impacts company performance, their position in the capital markets, and their valuation in the eyes of investors. Case studies and concrete examples, such as Tesla, BMW, and NODAR, illustrate how innovations in data collection and processing — whether through LiDAR, stereo vision, or telemetry — are shaping the future of the automotive industry.

A particular contribution of this work is the connection of theory from the fields of scientific research methodology and capital markets with practice in real industrial conditions. This establishes a solid framework for further work within the master thesis, which will deepen the analysis of the impact of digitalization on business strategies, company valuation, and investment decision-making.

The future direction of research will focus on measuring specific financial performances before and after the implementation of AI and digital technologies, applying advanced analytical tools, and assessing market reactions to innovations in the sector.

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PRETHODNO SAOPŠTENJE
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Primena baza podataka i veštačke inteligencije u automobilskoj industriji: Metodološki okvir istraživanja

Apstrakt: *Ovaj rad prikazuje metodološki okvir istraživanja primene baza podataka i veštačke inteligencije (AI) u automobilskoj industriji. Istraživanje se bavi time kako digitalizacija i tehnologije zasnovane na veštačkoj inteligenciji utiču na poslovne modele i finansijske performanse, posebno kroz integraciju pametnih sistema u savremena vozila. U radu su objašnjene kvantitativne i kvalitativne metode, uključujući studije slučaja kompanija poput Tesle, BMW-a i Ottometric Inc., kao i analiza pokazatelja sa tržišta kapitala. Poseban akcenat stavljen je na tehnike prikupljanja podataka i njihovu ulogu u strateškom odlučivanju. Dalje se istražuje korelacija između digitalnih inovacija i vrednovanja na berzi, pokazujući kako napredna softverska rešenja doprinose percepciji investitora i rastu kompanija. Kombinovanjem teorijskih uvida i primera iz prakse, ovaj okvir postavlja temelje za dalja istraživanja finansijskih i strateških implikacija AI i baza podataka u sektoru automobilske industrije.*

Ključne reči: *digitalizacija, automobilska industrija, baze podataka, veštačka inteligencija, poslovni modeli, tržišta kapitala, analiza podataka, vrednovanje kompanija*

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UVOD

Automobilska industrija prolazi kroz jednu od najdinamičnijih transformacija u svojoj istoriji, vođenu digitalizacijom, bazama podataka i veštačkom inteligencijom (AI). Razvoj pametnih vozila, autonomnih sistema i naprednih analiza podataka omogućava kompanijama da unaprede efikasnost, optimizuju proizvodne procese i poboljšaju korisničko iskustvo. Povezani automobili generišu ogromne količine podataka, čija pravilna obrada i analiza postaju ključni faktori konkurentnosti na tržištu.

Digitalizacija ne samo da menja tehničke aspekte proizvodnje i održavanja vozila, već ima i dalekosežan uticaj na poslovne modele i finansijske performanse kompanija. Proizvođači automobila sve više integrišu softverske usluge u svoje proizvode, prelazeći sa tradicionalne prodaje vozila na modele pretplate i pružanja usluga baziranih na podacima. Ovakve promene postavljaju nova pitanja u pogledu vrednovanja kompanija, ulaganja u istraživanje i razvoj, te analize geopolitičkih i tržišnih rizika.

Cilj ovog istraživanja je da pruži metodološki okvir za analizu uticaja baza podataka i veštačke inteligencije na automobilski sektor. Kroz pregled postojećih istraživanja, analizu tržišta kapitala i praktične primere iz industrije, rad će istražiti kako digitalizacija oblikuje savremene poslovne modele i finansijske performanse. Takođe, poseban fokus biće stavljen na metodologiju prikupljanja i analize podataka, kao ključni element donošenja strateških odluka u auto-industriji.

METODOLOŠKI OKVIR ISTRAŽIVANJA

Istraživanje digitalizacije automobilske industrije kroz baze podataka i veštačku inteligenciju zahteva multidisciplinarni pristup koji kombinuje metodologiju naučnog istraživanja i analizu tržišta kapitala. Ovaj rad koristi kombinaciju kvantitativnih i kvalitativnih metoda kako bi se dobio što precizniji uvid u uticaj digitalizacije na poslovne modele i finansijske performanse.

Automobilska industrija nije izuzetak, te se i u ovoj oblasti koriste dve metode istraživanja:

Kvantitativne metode

Kvantitativne metode predstavljaju istraživačke tehnike koje se zasnivaju na numeričkim podacima i statističkoj analizi. Cilj kvantitativnog istraživanja je da pruži objektivne, merljive i ponovljive rezultate koji mogu biti generalizovani na širu populaciju. Ove metode koriste standardizovane tehnike prikupljanja podataka, poput anketa, eksperimenata, analiza velikih skupova podataka (big data) i matematičkih modela. U kontekstu automobilske industrije, kvantitativne metode mogu uključivati analizu prodajnih podataka, tržišnih trendova i finansijskih performansi kompanija.

Kada je reč o automobilskoj industriji, kvantitativne metode se odnose na:

- Analiza sekundarnih podataka – Korišćenje dostupnih izvora kao što su finansijski izveštaji auto-kompanija, podaci o tržištu kapitala i berzanskim kretanjima, te studije slučaja digitalizacije u industriji.
- Statistička analiza – Upotreba ekonomskih indikatora i tržišnih pokazatelja kako bi se procenio uticaj ulaganja u digitalizaciju na profitabilnost i vrednost kompanija.

Kvalitativne metode

Kvalitativne metode su istraživačke tehnike usmerene na razumevanje ljudskih iskustava, percepcija i društvenih fenomena kroz deskriptivne i interpretativne analize. Ove metode uključuju intervjue, fokus grupe, studije slučaja i etnografska istraživanja. Umesto brojčanih podataka, kvalitativna istraživanja se fokusiraju na dubinsku analizu i kontekstualno razumevanje problema.

U okviru digitalizacije automobilske industrije, kvalitativne metode mogu se koristiti za analizu percepcije potrošača o autonomnim vozilima, studije organizacionih promena u kompanijama i istraživanje uticaja AI tehnologija na radnu snagu. Kvalitativne metode u auto industriji podrazumevaju:

- Studije slučaja – Analiza konkretnih primera primene AI i baza podataka u automobilskoj industriji, uključujući kompanije poput Tesle, BMW-a i Ottometric Inc.
- Stručni intervjui – Razgovori sa profesionalcima iz industrije o izazovima i prednostima digitalizacije u auto-sektoru.

Ove dve metode se često kombinuju u istraživanjima kako bi se postigao celovitiji uvid u određeni fenomen.

Prednosti i nedostaci kvantitativnih istraživanja

Prednosti	Nedostaci
• Generalizacija i izvodenje opštih zaključaka • Efektna i efikasna analiza baze podataka • Ispitivanje i uočavanje uzroka, posledica i veza medu pojavama • Objektivni i nezavisni rezultati • Čitaoci vole brojeve	• Bezlično, „suvo i bez duše” • Nema i ne oseća se reč ispitanika • Nema utiska o kontekstu i prilikama • Istraživanja su mahom inicirana i pod kontrolom istraživača

Izvor: (7)

Prednosti i nedostaci kvalitativnih istraživanja

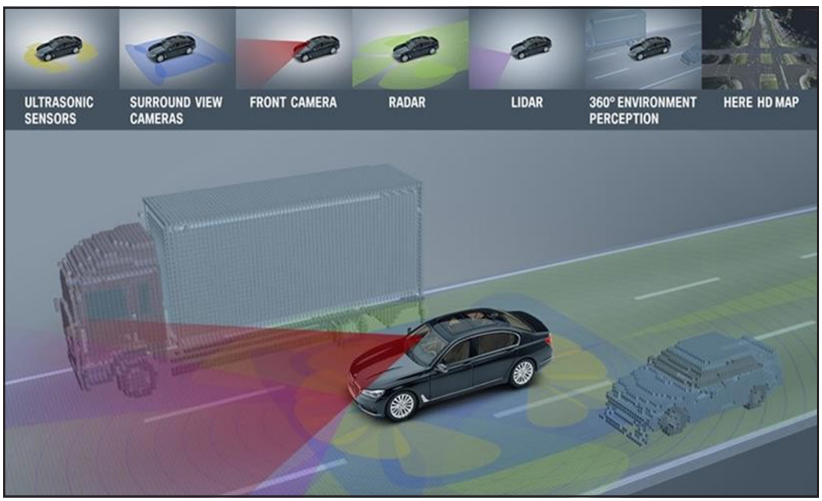
Prednosti	Nedostaci
• Veoma detaljne perspektive participanata • Oseća se i čuje reč ispitanika • Stiče se potpuni utisak o kontekstu i okolnostima • Stavovi se baziraju na mišljenju i stavovima participanata • Čitaoci vole priče i narative	• Ograničeno generalizovanje i zaključivanje • „Soft data" bez brojeva, serija, trendova i grafikona • Visok stepen interpretacija • Oslanjanje na participante se minimizira • Stručnost istraživača

Izvor: (7)

Digitalne metode prikupljanja podataka

Postoji nekoliko digitialnih metoda prikupljanja podataka:

- Senzorski sistemi i IoT uređaji – savremeni automobili su opremljeni senzorima koji prikupljaju podatke o vožnji, potrošnji goriva, ponašanju vozača itd.
- LiDAR i radar tehnologije – omogućavaju prikupljanje prostorno-vremenskih podataka u realnom vremenu, što je posebno značajno za autonomna vozila.,
- Telemetrija – koristi se za prikupljanje podataka o performansama vozila u stvarnim uslovima eksploatacije.
- Digitalni alati za analizu korisničkog ponašanja – npr. kroz mobilne aplikacije, onboard infotainment sisteme i platforme povezane sa korisničkim nalozima.



Slika 1: L4 funkcionalnosti autonomnih vozila.

Izvor: (9)

Prikupljanje podataka u realnim projektima

U kompaniji Ottometric, gde se autor rada zaposlen koristi se kombinacija digitalnih i klasičnih metoda. Softveri koji se razvijaju u kompaniji integrišu:

- Analizu ponašanja korisnika (user analytics),
- LiDAR senzore za prikupljanje podataka o prostoru,
- AI modele za automatsku obradu podataka i otkrivanje obrazaca.
- Agilni pristup razvoju softvera omogućava iterativno testiranje, gde se prikupljeni podaci koriste za brzu validaciju hipoteza i donošenje tehničkih i poslovnih odluka.

BMW CarData – Telematski podaci za personalizovane usluge

BMW koristi svoj sistem CarData za prikupljanje telematskih podataka iz vozila, kao što su brzina, potrošnja goriva i ponašanje vozača. Ovi podaci omogućavaju personalizaciju usluga, kao što su prilagođene ponude za osiguranje i održavanje.

Nexar – Prikupljanje podataka putem kamera u realnom vremenu

Startup kompanija Nexar koristi kamere montirane na vozila za prikupljanje vizuelnih podataka u realnom vremenu. Ovi podaci se koriste za mapiranje puteva, identifikaciju saobraćajnih obrazaca i unapređenje bezbednosti na putevima.

UDRIVE projekat – Evropska studija o ponašanju vozača

UDRIVE je evropski projekat koji je prikupljao podatke o ponašanju vozača u realnim uslovima vožnje širom Evrope. Korišćeni su senzori i kamere za prikupljanje podataka o brzini, ubrzanju, korišćenju mobilnih telefona i drugim faktorima koji utiču na bezbednost saobraćaja.

NODAR tehnologija - Prikupljanje dubinskih 3D podataka za autonomna vozila

Njihov vodeći proizvod, Hammerhead™, koristi par stereo kamera sa širokim rastojanjem (wide- baseline stereo vision) kako bi omogućio izuzetno precizno 3D mapiranje prostora na udaljenostima većim od 1000 metara. Za razliku od tradicionalnih LiDAR sistema, NODAR-ovo rešenje ne zahteva dodatne senzore, već koristi softversku auto-kalibraciju, što omogućava značajno smanjenje troškova i povećanje pouzdanosti sistema. Ova tehnologija se koristi za:

- detekciju malih objekata (pešaka, prepreka, izgubljenog tereta),
- napredno automatsko kočenje i izbegavanje sudara,
- rad u složenim vremenskim uslovima (kiša, magla, noćna vožnja).

DIGITALIZACIJA I VEŠTAČKA INTELIGENCIJA U KONTEKSTU TRŽIŠTA KAPITALA

Brzina tehnološkog napretka je globalni trend u svim industrijama, pa tako i u samoj automobilskoj industriji. Kroz primenu veštačke inteligencije (AI) i baza podataka, tehnološki napredak ima sve veći uticaj na proizvodne i logističke procese, te samu percepciju vrednosti kompanija na tržištu kapitala. Kompanije koje investiraju u digitalizaciju percipiraju se kao inovativne kompanije, što nedvojbeno rezultira pozitivnim kretanjem njihovih akcija na berzama.

Primer za gore pomenuto je komapnaija „Tesla", koja iako je proizvođač automobila, često se više vrednuje kao tehnološka kompanija. Tržišna kapitalizacija ove kompanije značajno nadmašuje konkurenciju iz tradicionalnog auto sektora, upravo zbog snažne primene veštačke inteligencije u autonomnoj vožnji i naprednim softverskim rešenjima. Upravo ovo je pokazatelj kako tehnološka superiornost i inovativnost postaju ključni faktori u investicionim analizama.

Može se zaključiti da postoji direktna veza između nivoa digitalizacije i performansi kompanije na tržištu kapitala. Kompanije koje uspešno implementiraju AI rešenja često postaju privlačnije investitorima, što pozitivno utiče na njihovu tržišnu poziciju i vrednovanje.

VEZE IZMEĐU AUTOMOBILSKE INDUSTRIJE I BERZI

Kotiranje proizvođača automobila na svetskim berzama

Mnoge velike automobilske kompanije su javno trgovačka društva, što znači da su njihove akcije uvrštene na berzama:

- Njujorškoj berzi – NYSE (New York Stock Exchange): General Motors (GM), Ford Motor Company, Tesla (NASDAQ)
- Londonskoj berzi – LSE (London Stock Exchange): Aston Martin, Jaguar Land Rover (deo Tata Motors – listiran u Indiji, ali prati ga londonsko tržište zbog poslovanja)

To znači da se poslovanje tih firmi direktno odražava na cenu njihovih akcija – svaka inovacija, kvar, pomeranje na tržištu ili uvođenje AI sis tema odmah ima posledice.

Većina vodećih automobilskih kompanija je javno listirana i time direktno povezana sa dinamikom tržišta kapitala. Njihove akcije se kotiraju na najvažnijim svetskim berzama, a cena akcija tih kompanija često pokazuje tehnološki napredak i strateške pomake:

- Tesla (NASDAQ) – često percipirana više kao tehnološka nego automobilska kompanija, zahvaljujući inovacijama u autonomnoj vožnji, baterijskoj tehnologiji i softveru.

- Ford i General Motors (GM) – NYSE; iako tradicionalni proizvođači, i oni ulažu značajna sredstva u digitalnu transformaciju i elektrifikaciju flote.
- Volkswagen i BMW – listirani u Nemačkoj na Frankfurtskoj berzi (FWB), s tim da tržište posebno prati njihove AI i digitalne strategije.

Svaka najava nove AI funkcionalnosti, partnerstva sa IT firmama ili uspešna implementacija digitalnih rešenja često uzrokuje pomak u ceni akcija.

Indeksi i automobilske kompanije

Automobilske firme čine deo velikih berzanskih indeksa:
- FTSE 100 (UK) – gde ulaze firme poput Rolls Royce Holdings (ne auto, ali transport), Aston Martin itd.
- S&P 500 (USA) – Tesla, Ford, GM
- DAX (Nemačka) – Volkswagen, BMW, Mercedes-Benz Group

Kretanja u ovim firmama često utiču na ceo indeks, pogotovo kada se dešavaju velike promene (uvođenje AI sistema, novi modeli, ekološke tehnologije). Na primer, rast Teslinih akcija često „vuče" tehnološki i automobilski sektor indeksa naviše.

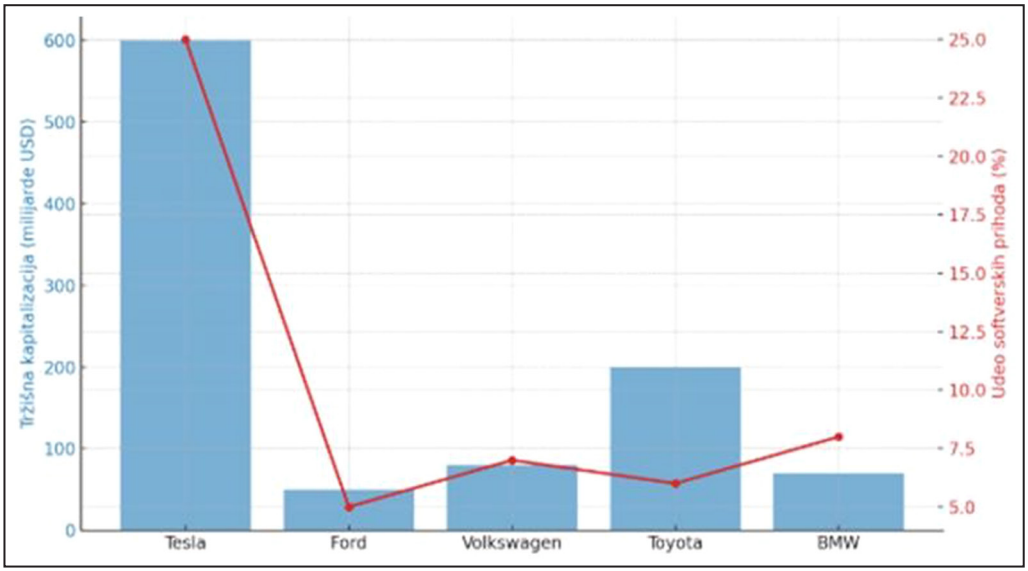
Uticaj AI i digitalizacije na vrednovanje

Kompanije koje uspešno implementiraju AI u svoje proizvode i poslovne modele percipirane su kao inovativne i sposobne za dugoročni rast. Investitori sve više gledaju na:
- Učešće softverskih i pretplatnih prihoda
- Broj AI patenata i partnerstava sa tehnološkim firmama
- Brzinu primene inovacija (time-to-market)

Tesla je najbolji primer: iako proizvodi znatno manje vozila od Toyote ili Volkswagena, često ima veću tržišnu kapitalizaciju upravo zbog percipirane tehnološke prednosti.

Grafikon 1 prikazuje tržišnu kapitalizaciju (u milijardama USD) i procenat prihoda koji dolazi iz softverskih rešenja kod izabranih proizvođača automobila. Tesla prednjači i po tržišnoj vrednosti i po stepenu digitalizacije poslovnog modela, što dodatno potvrđuje percepciju tržišta da je reč o tehnološkoj kompaniji. Nasuprot tome, tradicionalni proizvođači poput Forda, BMW-a i Toyote imaju niži udeo softverskih prihoda, iako ulažu sve više u AI i digitalne platforme.

Podaci su pojednostavljeni i služe kao ilustracija uticaja digitalizacije na tržišno vrednovanje kompanija.



Grafikon 1: Poređenje tržišne kapitalizacije i udela prihoda od softverskih rešenja kod vodećih auto-kompanija.

Izvori: (14, 5, 1, 15, 16, 18).

Napomena: *Podaci su korišćeni u ilustrativne svrhe radi prikaza odnosa između tržišne vrednosti i digitalizacije kroz softverske prihode. Udeo softverskih prihoda je procenjen na osnovu javno dostupnih izvora i internih procena kada zvanični podaci nisu eksplicitno objavljeni.*

Prikupljanje i analiza podataka o automobilskoj industriji na berzama

Berze i investicioni analitičari koriste sofisticirane sisteme za prikupljanje i obradu podataka kako bi pratili performanse kompanija iz automobilske industrije. Ovi podaci dolaze iz više izvora:

- Finansijski izveštaji (quarterly & annual reports) – javno dostupni dokumenti koje kompanije šalju regulatornim telima (npr. SEC u SAD) i investitorima.
- Tehnički i fundamentalni indikatori – uključuju pokazatelje kao što su P/E odnos (odnos cene i zarade), EBITDA, ROE, ali i tehničke signale poput obima trgovanja, volatilnosti i cena akcija.
- ESG indikatori (Environmental, Social, Governance) – sve važniji za vrednovanje auto- kompanija koje ulažu u održive i digitalne tehnologije.
- Vesti, AI sentiment analiza i objave u realnom vremenu – platforme poput Bloomberg, Reuters i Yahoo Finance koriste algoritme za prikupljanje i analizu vesti i društvenih mreža, kako bi detektovali tržišna očekivanja.

- Makroekonomski faktori i geopolitički rizici – kao što su poremećaji u lancima snabdevanja, porezi na CO_2 emisije ili trgovinske politike koje direktno utiču na automobilsku industriju.

Neke od specijalizovanih platformi koje analitičari koriste za dobijanje sektorskih podataka uključuju Refinitiv, Bloomberg Terminal, S&P Capital IQ i FactSet. Te platforme često nude specifične automotive sector dashboards, koji prikazuju kretanje akcija, udeo softverskih prihoda, troškove po jedinici i istraživanja tržišta po regionima.

Integracijom podataka iz navedenih izvora, berze i investicioni fondovi oblikuju predikcije o performansama i vrednosti kompanija, što direktno utiče na tokove kapitala i investicione odluke.

ZAKLJUČAK

Digitalizacija automobilske industrije, vođena razvojem baza podataka i veštačke inteligencije, predstavlja suštinsku transformaciju sektora koji se decenijama oslanjao na klasične proizvodne i prodajne modele. Savremena vozila postaju pametne platforme koje prikupljaju, analiziraju i razmenjuju ogromne količine podataka – čime se menjaju ne samo tehnološki procesi, već i kompletni poslovni modeli.

U radu je prikazano kako primena kvantitativnih i kvalitativnih metoda istraživanja omogućava sveobuhvatan uvid u načine na koje digitalizacija utiče na performanse kompanija, njihovu poziciju na tržištu kapitala, ali i na vrednovanje u očima investitora. Studije slučaja i konkretni primeri, poput kompanija Tesla, BMW i NODAR, ilustruju kako inovacije u prikupljanju i obradi podataka – bilo putem LiDAR-a, stereo vizije, ili telemetrije – oblikuju budućnost automobilske industrije.

Poseban doprinos ovog rada jeste povezivanje teorije iz oblasti metodologije naučnog istraživanja i tržišta kapitala sa praksom u realnim industrijskim uslovima. Time je postavljen temeljan okvir za dalji rad u okviru master teze, u kojoj će se dodatno produbiti analiza uticaja digitalizacije na strategije poslovanja, vrednovanje firmi i donošenje investicionih odluka.

Budući pravac istraživanja usmeriće se ka merenju konkretnih finansijskih performansi pre i nakon implementacije AI i digitalnih tehnologija, uz primenu naprednih analitičkih alata i procenu tržišnih reakcija na inovacije u sektoru.

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