ARTIFICIAL INTELLIGENCE-BASED DECISION SUPPORT MECHANISMS IN JUDICIAL INFORMATION SYSTEMS

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Abstract

Background/Aims: The principle of legal certainty, a fundamental element of the rule of law, requires judicial procedures to be consistent, transparent, and predictable. With the acceleration of digitalization, the use of autonomous systems in judicial processes is increasing. The aim of this study is to examine the effects of the Artificial Intelligence-Based Decision Support System (DSS) deployed in the Ministry of Justice UYAP execution units in Turkey on the principle of legal certainty in administrative and judicial transactions from a Management Information Systems (MIS) perspective.

Materials/Method: The study utilizes a case analysis approach, focusing on a machine learning (FastText) model that classifies 849,334 documents in execution offices into 161 different legal categories. It demonstrates how transparency, error minimization, and continuous learning loops in the system architecture increase judicial predictability by reducing the arbitrariness and personnel errors associated with manual document classification. Conversely, prediction deviations in minority classes (class imbalance), concept drift in the algorithm caused by legislative changes, and Optical Character Recognition (OCR) errors are discussed concerning the risks they pose to the principle of legal certainty.

Results: Findings indicate that while the autonomous system, operating with an overall accuracy rate of 78.27%, increases operational efficiency, algorithmic transparency and auditability mechanisms play a critical role in establishing individuals' trust in the legal system. **Conclusion/Implications:** In conclusion, artificial intelligence integration is a powerful tool for ensuring consistency in the judiciary. However, to minimize technological risks, it is emphasized that algorithmic auditing standards must be redefined within the scope of the legal certainty principle.

Keywords: Legal Certainty, Artificial Intelligence, Judicial Information Systems, Algorithmic Predictability, Execution Law.

KEY PROTECTION MECHANISMS FOR TRANSACTION SIGNING IN MOBILE BANKING: A SECURITY AND PERFORMANCE ANALYSIS

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Abstract

Mobile banking applications have become a primary channel for financial transactions, making the security of transaction signing mechanisms a critical concern. At the core of these systems lies the protection of private keys used in asymmetric cryptographic operations, where the signing of transaction hashes with user-held keys ensures both authenticity and non-repudiation. However, the security level of this process varies significantly depending on how and where private keys are stored on mobile devices. This paper presents a comparative analysis of key protection mechanisms available on modern mobile platforms, including hardware-backed solutions such as Android StrongBox, Trusted Execution Environment (TEE), and iOS Secure Enclave, alongside software-based keystores. We evaluate these mechanisms across two dimensions: security, examining resistance to key extraction, reverse engineering, and runtime attacks; and performance, measuring signing and verification latency under realistic mobile banking transaction scenarios. Our experimental evaluation is conducted on real devices across both Android and iOS platforms using ECDSA and RSA algorithms. The findings provide empirical evidence to guide developers and financial institutions in selecting appropriate key protection strategies that balance security requirements with user experience, in alignment with regulatory frameworks such as BDDK guidelines and PSD2.

Keywords: Mobile banking security, transaction signing, private key protection, asymmetric cryptography, digital signature

ISTANBUL AS A HUB FOR FOREIGN-CAPITAL COMPANIES: A MULTIPLE-CASE ANALYSIS OF BOSCH, SIEMENS AND TOYOTA

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Abstract

This article examines how Istanbul is evaluated as a hub for foreign-capital companies at the city level. The purpose of the study is to assess the investment inclination of foreign-capital companies operating in Istanbul in relation to geographical accessibility, human resources, local resources and environmental conditions. The study is grounded in Dunning's eclectic paradigm, location choice theory, the resource-based view and the human capital literature. Using a quantitative research design, 364 valid questionnaire responses collected in the context of Bosch, Siemens and Toyota were analyzed. The data were evaluated through descriptive statistics, Pearson correlation and multiple linear regression; three expert interviews were thematically summarized to support the contextual interpretation of the quantitative findings. The results show that Istanbul's investment attractiveness cannot be explained by geographical location alone. When human resources, local resources, environmental conditions and geographical accessibility are evaluated together, they explain investment inclination more consistently. Regression results indicate that human resources are the strongest predictor. Local resources and environmental conditions rank second, while geographical accessibility is significant but has a comparatively lower explanatory weight. The study concludes that Istanbul is a strong regional hub for foreign investors, but it also carries risks related to costs, bureaucratic procedures and institutional predictability that must be managed carefully.

Keywords: Foreign direct investment, Istanbul, foreign-capital companies, geographical accessibility, human resources, investment inclination

COMPARING TURKISH AND ENGLISH USER DISCOURSE ON IN-VEHICLE INFOTAINMENT SYSTEMS: A THEMATIC DIFFERENCE ANALYSIS BASED ON USER-GENERATED CONTENT

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Abstract

Background/Aims: This study examines whether user-experience problems in in-vehicle infotainment systems are represented differently in Turkish- and English-language user-generated online content while accounting for differences in corpus composition and sampling.

Materials/Method: After preprocessing and noise pruning, 10,286 documents (1,392 Turkish; 8,894 English) were jointly modeled in a single multilingual BERTopic solution using paraphrase-multilingual-mpnet-base-v2 embeddings, shared UMAP (random_state=42), and HDBSCAN clustering. Thus, both languages occupied the same topic space rather than being modeled separately and matched post hoc. Researcher review yielded a final analytic corpus of 4,916 documents (619 Turkish; 4,297 English). Turkish documents were drawn mainly from other online sources (52.8%), automotive forums (28.0%), and brand/model communities (15.5%), whereas English documents came mainly from brand/model communities (50.6%) and electric-vehicle communities (43.8%). Exact-platform overlap was minimal. Robustness was evaluated with 5,000-repetition corpus-size-balanced and source-type-matched resampling.

Results: In the primary corpus, language group was strongly associated with macro-theme (Cramer's V=0.586) and meso-category distributions (V=0.798). Corpus-size balancing did not attenuate these associations (median V=0.718 and 0.847). Matching both sample size and shared source-type composition reduced but did not eliminate differentiation (macro median V=0.480, 95% empirical interval [0.447, 0.512]; meso median V=0.639 [0.615, 0.662]). Turkish-language content more often emphasized aftermarket hardware, multimedia integration, installation, and compatibility, whereas English-language content more often emphasized physical/tactile controls, embedded vehicle functions, and system reliability.

Conclusion/Implications: Substantial thematic differentiation remained after source-type matching, indicating that sampling imbalance alone does not explain the findings. However, because exact-platform overlap was minimal, language and platform effects cannot be fully disentangled. The results should therefore be interpreted as differences between Turkish- and English-language online corpora rather than direct cultural differences.

Keywords: In-vehicle infotainment systems; User-generated content; BERTopic; Multilingual topic modeling; Thematic difference analysis; Automotive human-computer interaction.

DEVELOPMENT AND VALIDATION OF THE SMART UNIVERSITY INFORMATION SYSTEMS SCALE (SUISS)

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Abstract

The rapid diffusion of digital transformation, artificial intelligence, business analytics, and integrated information systems has significantly changed the way higher education institutions manage academic, administrative, research, and strategic processes. Universities increasingly rely on digital platforms such as electronic document management systems, student information systems, research project management systems, academic performance systems, learning management systems, and decision support technologies. As these systems become more integrated and intelligent, they evolve from operational tools into strategic organizational capabilities that support institutional effectiveness, innovation, and data-driven decision-making. Despite this transformation, the literature lacks a comprehensive and validated instrument capable of measuring the smartness and digital maturity of university information systems. This study aims to develop and provide an initial validation of the Smart University Information Systems Scale (SUISS). The proposed Smart University Information Systems (SUIS) concept is defined as an integrated set of data-driven, automation-enabled, and artificial intelligence-supported systems that facilitate academic, research, administrative, and managerial processes within higher education institutions. Based on a comprehensive literature review and expert evaluations, five dimensions were identified: Smart Process Automation, Smart Decision Support, Smart Research Management, Smart Academic Services, and AI-Enabled Intelligence. Following established scale development procedures, an initial item pool was generated and refined through expert assessment. A pilot survey was then conducted with academic staff members from higher education institutions. Exploratory Factor Analysis (EFA) was employed to examine the underlying factor structure and assess construct validity. Preliminary findings support the proposed multidimensional structure and indicate satisfactory reliability levels for the scale. The study contributes to the Management Information Systems literature by introducing the SUIS concept and proposing a measurement tool for assessing smart university information system capabilities. The findings are expected to support future studies on digital transformation, artificial intelligence adoption, and smart university ecosystems in higher education.

Keywords: Smart University Information Systems, Digital Transformation, Artificial Intelligence, Higher Education, Management Information Systems

EXPLAINABLE MACHINE LEARNING FOR CARBON EMISSION CLASSIFICATION: A COMPARATIVE STUDY USING TREE-BASED MODELS AND PERMUTATION FEATURE IMPORTANCE

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Abstract

Climate change and the continuous rise in greenhouse gas emissions have necessitated the development of sophisticated analytical tools to support environmental sustainability and facilitate evidence-based policy formulation. Although machine learning techniques, particularly tree-based models, have demonstrated superior predictive performance in environmental data analysis, their inherent complexity often hinders practical adoption, making interpretability a critical requirement for user trust. To address this research gap, this study systematically compares the classification performance of four prominent tree-based machine learning algorithms—Decision Tree, Random Forest, Gradient Boosting, and HistGradientBoosting—for categorizing carbon emission data into low, medium, and high levels. The models are comprehensively evaluated using a range of metrics, including accuracy, F1-score, Log Loss, and ROC-AUC. Furthermore, Permutation Feature Importance is employed as a robust Explainable Artificial Intelligence technique to investigate the decision-making mechanisms of the models and identify the most influential input variables. The experimental results demonstrate that boosting-based algorithms, particularly HistGradientBoosting, achieve the highest classification performance, exhibiting superior discrimination capabilities. Furthermore, the Explainable Artificial Intelligence analysis reveals that country and industrial sector information act as the primary drivers of carbon emission classifications, followed significantly by seasonal variations captured through the month feature. These findings highlight the efficacy of integrating high-performance machine learning architectures with transparency-enhancing techniques to develop more reliable and interpretable environmental decision-support systems. This research contributes to the expanding body of knowledge on explainable machine learning for carbon emission modeling and provides actionable insights for the practical implementation of intelligent platforms in industrial carbon footprint management, scenario analysis, and environmental reporting processes.

Keywords: Machine Learning, Carbon Emissions, Environmental Sustainability, Explainable Artificial Intelligence, Decision Support Systems.

FACTORS INFLUENCING BOOKING INTENTIONS THROUGH ONLINE TRAVEL AGENCIES: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Background/Aims: Online Travel Agencies (OTAs) have become essential intermediaries in the tourism ecosystem, offering flight tickets, hotel reservations, and holiday packages through websites and mobile applications. As transactions have shifted from physical agencies to digital platforms, understanding what drives consumers' booking intentions has become a critical concern for both researchers and practitioners. Despite a rapidly growing body of empirical work, the literature remains fragmented across theories, variables, and national contexts. This study aims to systematically synthesize the factors influencing booking intentions through OTAs and to identify the theoretical frameworks, antecedents, mediators, moderators, and methodological approaches that characterize this research domain.

Materials/Method: A systematic literature review was conducted following the SPAR-4-SLR protocol and the PRISMA guidelines. The Scopus and Web of Science databases were searched using keyword combinations covering OTA-related and booking-intention-related terms. The initial search yielded 1,737 records; after duplicate removal and title and abstract screening, 318 articles were retained for full-text review, and 144 peer-reviewed articles published between 2006 and 2025 met all inclusion criteria. Two independent reviewers coded each article using a structured extraction scheme, and the data were analyzed through descriptive statistics and thematic analysis.

Results: The Technology Acceptance Model (27.1%), the Unified Theory of Acceptance and Use of Technology (13.2%), and the Theory of Planned Behavior (6.9%) were the dominant theoretical frameworks. Trust, perceived usefulness, website quality, perceived risk, and electronic word-of-mouth emerged as the strongest determinants of booking intentions. Quantitative designs dominated (85.4%), with surveys and structural equation modeling being most common, while research was concentrated in China, India, and the United States.

Conclusion/Implications: The review consolidates ten categories of antecedents and seven groups of mediating variables, offering practitioners guidance on trust-building, website quality, and social proof, and highlighting gaps in qualitative, longitudinal, and emerging-technology research.

Keywords: online travel agency, booking intention, systematic literature review, consumer behavior, trust, electronic word-of-mouth

DECISION SUPPORT RESEARCH IN TURKISH HEALTHCARE: A BIBLIOMETRIC AND TEXT MINING ANALYSIS BASED ON WEB OF SCIENCE DATA

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Abstract

Decision support systems have become increasingly important in healthcare due to the growing availability of digital health data, the expansion of artificial intelligence applications, and the need for evidence-based clinical and managerial decision-making. This study examines decision support research in the Turkish healthcare context through a bibliometric and text mining approach. Bibliographic records were retrieved from the Web of Science Core Collection on 22 July 2026 using a topic-based search strategy combining decision support, healthcare, and Turkey/Türkiye-related terms. The final dataset consisted of 44 records published between 2012 and 2026. Python was used for data processing, descriptive bibliometric analysis, citation analysis, keyword frequency analysis, TF-IDF-based text mining, N-gram analysis, and exploratory K-Means clustering. The analysis focused on publication trends, influential studies, publication outlets, author keywords, dominant textual concepts, and thematic orientations in literature. The findings indicate a visible increase in publication activity after 2020, with 70.5% of the records published between 2020 and 2026. The dataset received 457 citations in the Web of Science Core Collection, with a mean citation count of 10.39 per publication. Keyword analysis highlights decision support systems, clinical decision support systems, artificial intelligence, machine learning, electronic health records, disease-risk modeling, and personalized medicine as prominent concepts. Exploratory text mining suggests four broad thematic orientations: AI-based prediction, diagnosis, and classification; operational and managerial decision support for healthcare resource planning; electronic health records, genomic risk, and intensive care; and clinical decision support with nursing, ethical, and quality-related dimensions. Overall, the study shows that decision support research in Turkish healthcare has evolved into a multidimensional field that includes clinical, technological, managerial, ethical, and operational perspectives.

Keywords: Management Information Systems, Decision Support Systems, Clinical Decision Support Systems, Bibliometric Analysis, Text Mining, Web of Science

USE OF GENERATIVE ARTIFICIAL INTELLIGENCE APPLICATIONS IN TÜRKİYE: EXAMINING LARGE LANGUAGE MODEL USE THROUGH THE BREADTH OF DIGITAL APPLICATION USE

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Abstract

Background/Aims: Generative artificial intelligence (GenAI) applications are increasingly becoming part of everyday digital life, yet population-based evidence on the use of large language model (LLM) applications remains limited in Türkiye. This study examines patterns of LLM use and whether regular use is associated with the breadth of individuals' routine digital application use.

Materials/Method: Data were drawn from the Turkish General Social Survey 2024 (TGSS 2024). The LLM-use item was included in rotation forms R2 and R3; 1,478 participants provided valid LLM responses, while 1,421 had complete data for the main relational analyses. Digital application-use breadth was measured as the number of five application types used at least approximately monthly: virtual assistants, maps/navigation, search engines, health/exercise applications, and translation applications. Data cleaning, recoding, analysis, and visualization were conducted in Python. Analyses included descriptive statistics, cross-tabulations, chi-square tests, Cramér's V, Spearman rank correlations, and sensitivity checks.

Results: Among participants with valid LLM responses, 72.4% reported no use, 8.9% limited use, and 18.7% regular use, defined as several times per month or more. Regular LLM use increased markedly with digital application-use breadth, rising from 0.0% among those using none of the five application types at least monthly to 53.8% among those using all five. A clear association emerged between digital application-use breadth and regular LLM use ($\chi^2(5) = 332.591$, $p < .001$, Cramér's $V = .484$). The same pattern was evident when LLM use was examined across its original eight frequency categories, with a positive Spearman correlation of $\rho = .528$ ($p < .001$). Similar results were obtained when alternative usage thresholds and application sets were tested. Regular LLM use also varied by age and education, while differences associated with gender and urbanization were comparatively smaller.

Conclusion/Implications: The findings indicate that LLM use is closely connected to the diversity of everyday digital engagement. Digital repertoire therefore appears to be an important dimension for understanding emerging inequalities in the use of generative AI.

Keywords: Generative artificial intelligence; large language models; digital repertoire; digital inequality; digital application use

TIME SERIES ANALYSIS AND FUTURE PROJECTION IN THE TURKISH AND GLOBAL BEEKEEPING SECTORS: A DECISION SUPPORT APPROACH FROM THE PERSPECTIVE OF MANAGEMENT INFORMATION SYSTEMS

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Abstract

The sustainability and productivity of agricultural production are becoming increasingly dependent on advanced data analytics and predictive decision support systems. The beekeeping sector, due to its dynamic structure influenced by climatic, economic, and biological conditions, presents a significant application area for data-driven analysis and future projections. This study analyzes long-term historical data regarding the Turkish, global, and Turkish organic beekeeping sectors from a Management Information Systems (MIS) perspective. It aims to evaluate production trends using robust time series methods and establish a decision support approach to assist sector stakeholders in policy-making.

The research utilizes Turkish data (1991–2025) on enterprises, colonies, honey and beeswax production, and yield; global data (1961–2024) on colonies, production, and yield; and Turkish organic beekeeping data (2004–2021) on producers, colonies, and honey production. Initially, descriptive and comparative time series analyses examine the long-term development of the Turkish and global sectors. Turkey's global position and the developmental differences between traditional and organic beekeeping are evaluated comparatively to identify underlying structural shifts. Subsequently, future projections for selected indicators are generated using appropriate time series forecasting models, including machine learning-based algorithms. By comparing model performances, the study identifies the most suitable forecasting approach for decision support purposes.

The findings are expected to demonstrate that changes in colony and enterprise numbers do not always align with per-colony productivity, revealing that evaluations based solely on production volume are insufficient to explain sectoral performance comprehensively. Ultimately, the developed MIS-focused decision support approach provides an analytical framework for productivity forecasting, trend monitoring, resource planning, and future-oriented strategic decisions, thereby contributing to the broader digitalization goals within the agricultural industry.

Keywords: Management Information Systems, Time Series Analysis, Decision Support Systems, Beekeeping, Forecasting, Data Analytics

CYBERSECURITY INCIDENT REPORTING IN THE ERA OF DIGITAL REGULATION: A COMPARATIVE STUDY OF NIS2, DORA, AND SEC

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Abstract

Background/Aims: Cybersecurity incidents have made incident reporting an increasingly important component of cybersecurity governance. This study compares the incident reporting approaches of NIS2, DORA, and the U.S. SEC, focusing on incident types, sectoral distribution, reporting timelines, and regulatory differences.

Materials/Method: comparative secondary-data design was employed using publicly available data from ENISA, the European Supervisory Authorities (ESAs), SEC EDGAR, and the Verizon Data Breach Investigations Report. Descriptive analysis was used to compare incident patterns and reporting requirements across the regulatory frameworks.

Results: ENISA data covering 4,875 incidents show that public administration accounted for 38.2% of incidents and DDoS attacks for approximately 77%. DORA data include 3,383 major ICT-related incidents, with system failures accounting for 51% and the credit sector representing the largest share. Verizon data covering 22,624 breaches indicate ransomware involvement in 48% of breaches. NIS2 and DORA emphasize rapid, staged regulatory reporting, whereas the SEC focuses on material cybersecurity disclosures within four business days.

Conclusion/Implications: The findings demonstrate that NIS2, DORA, and SEC represent distinct but complementary approaches to cybersecurity incident reporting. NIS2 emphasizes broad cybersecurity resilience, DORA focuses on digital operational resilience in the financial sector, and the SEC framework emphasizes materiality, transparency, and investor protection. The study concludes that cybersecurity incident reporting has evolved from a technical compliance activity into an important mechanism of cybersecurity governance, operational resilience, risk management, and corporate accountability. However, differences in incident definitions, reporting thresholds, and data collection methodologies limit direct comparisons of incident counts. The study contributes to the literature by integrating regulatory comparison with empirical cybersecurity incident data and highlights the need for standardized incident classifications and comparable reporting variables in future cross-regulatory research.

Keywords: Cybersecurity incident reporting; cybersecurity and management; cybersecurity regulation; cyber resilience; regulatory compliance; incident disclosure

EXAMINING SMARTPHONE SECURITY BEHAVIOR AMONG MANAGEMENT INFORMATION SYSTEMS STUDENTS

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Abstract

Background/Aims: The widespread use of smartphones has exposed users to a range of cybersecurity and privacy threats. The increasing speed, volume, and sophistication of attacks by malicious actors seeking to obtain personal and sensitive data demonstrate that mobile device security cannot be addressed through technical measures alone. Accordingly, enhancing users' security awareness and promoting secure mobile usage behaviors have become increasingly important. This study aims to examine smartphone users' mobile security behaviors and assess their levels across different dimensions of mobile security.

Materials/Method: In line with the aim of the study, an existing measurement instrument was adapted into Turkish, and the adapted scale was administered to a sample of 229 university students as part of a pilot study. Following the adaptation process, the Cronbach's alpha coefficient of the scale was calculated as 0.843, indicating a high level of internal consistency.

Results: The results reveal notable differences in the extent to which students adopt mobile security practices. Specifically, students demonstrated greater awareness and precautionary behavior toward messaging- and connectivity-related threats compared with other areas of mobile security. In contrast, behaviors related to privacy and security, password management, and proactive security remained at relatively low or moderate levels. Overall, the findings indicate that users are more likely to adopt security measures against direct and visible threats, whereas routine and preventive security practices are not adopted to the same extent.

Conclusion/Implications: The results indicate that enhancing mobile cybersecurity requires not only increasing awareness of potential threats but also integrating secure behaviors into users' everyday mobile usage habits. Furthermore, the study highlights the importance of assessing mobile security behaviors across different dimensions to better understand users' security-related tendencies. The findings are expected to contribute to the development of mobile security awareness and education programs at universities, as well as to the design of applications and mobile devices that promote and support secure user behaviors.

Keywords: Smartphone Security, Mobile Security Behavior, Cybersecurity Awareness.

EMPLOYEE AWARENESS OF EMPLOYERS' USE OF DIGITAL TECHNOLOGY AND ARTIFICIAL INTELLIGENCE: A MACHINE LEARNING AND EXPLAINABLE ARTIFICIAL INTELLIGENCE ANALYSIS

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Abstract

Background/Aims: The growing use of digital technologies and artificial intelligence (AI) to plan, monitor, and evaluate employee activities has made employee awareness increasingly important for managerial transparency. This study aimed to classify employees' awareness of their employers' use of digital technologies and AI as low or high and to explain the features contributing most to this classification.

Materials/Method: Eurobarometer microdata comprising 26,404 participants were used. After the selection criteria were applied, the analytical sample included 11,271 participants. The analysis used 25 categorical independent features representing digital skills, perceptions of technology, socio-demographic characteristics, and the work context. The target variable was derived from QB4, which measures awareness of employers' use of digital technologies and AI to create work schedules, monitor activities, or evaluate performance. The data were divided into 80% training and 20% test sets, stratified by country and target class. One-hot encoding was applied after the train–test split. Logistic regression, random forest, extra trees, histogram gradient boosting, and CatBoost were compared, and the model was selected using the five-fold cross-validation F1 score from the training set.

Results: The selected histogram gradient boosting model achieved an F1 score of 0.649 and a ROC-AUC of 0.800 on the independent test set. Global SHAP analysis identified current-job digital proficiency, general perceptions of robots and AI in the workplace, country, the perceived impact of recent digital technologies and AI on the current job, future-job digital proficiency, and the view that AI and robots negatively affect communication among colleagues as the most influential features.

Conclusion/Implications: Low awareness should be examined by jointly considering individual digital skills, perceptions of technology, and the broader work context. The findings can support the identification of groups requiring clearer organizational communication and targeted digital-skills initiatives, but the model should not be interpreted causally or used for individual employment decisions.

Keywords: employee awareness, digital technology, artificial intelligence, machine learning, explainable artificial intelligence

A MANAGEMENT INFORMATION SYSTEMS PERSPECTIVE ON RESEARCH INFRASTRUCTURE TRANSFORMATION: DEVELOPING THE PROJECT-PARTNERSHIP TRACKING and MONITORING SYSTEM (propTMS)

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Abstract

Background/Aims: Türkiye National Observatories began providing services in 2023 under Law No. 6550 on the Support of Research Infrastructures, entering an institutional transformation process. In carrying out its R&D activities, the center must ensure effective financial and managerial sustainability and convert its accumulated knowledge into societal and economic benefit. Tracking and monitoring national and international project and collaboration calls, one of these requirements, becomes time-consuming and error-prone because funding institutions publish calls on different platforms, in different formats, and without a systematic schedule. These constraints create an information management problem, preventing decision-makers and researchers from receiving accurate information.

Materials/Method: To meet this requirement, a web-based Project Partnership Tracking System was developed using the Python programming language. Selenium was used to crawl dynamic web pages, while BeautifulSoup was used to parse the extracted HTML content, with a keyword-based pre-filtering procedure applied to the relevant links. To eliminate the information noise arising from calls addressing different fields being intermixed within the same source, a filtering mechanism based on positive and negative keywords was implemented. Regex were used to extract application deadlines from the text, and the MD5 algorithm was employed to prevent duplicate records. The system's scheduled execution was managed through APScheduler, and user interaction was provided via a Flask-based web interface.

Results: Testing showed that the system captured current calls without omission, the filtering algorithm successfully eliminated irrelevant content, and the automated email notification system functioned effectively to prevent the target audience from missing application deadlines.

Conclusion/Implications: Beyond the software product itself, this study demonstrates, through a concrete example, how the discipline of Management Information Systems (MIS) can contribute a perspective, methodology, and managerial decision-support value-spanning from the accurate definition of the problem to the selection of a solution method within institutional systems undergoing this kind of interdisciplinary, multi-stakeholder transformation process with clearly defined constraints.

Keywords: management information systems, process management, research infrastructure, process automation

THE ROLE OF MANAGEMENT INFORMATION SYSTEMS IN BUSINESS PROCESS REENGINEERING OF A RESEARCH AND DEVELOPMENT CENTER

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Abstract

Background/Aims: Enterprises may undergo fundamental business process reengineering (BPR) driven by operational, tactical, and strategic constraints imposed by external stakeholders. This study examines the transformation experienced by Türkiye National Observatories, a research and development (R&D) center characterized by multi-stakeholder, interdisciplinary activity domains, geographic dispersion, and complex-system properties exhibited through its multiple subsystems, following a change in its legal status. The study aims to reveal how internal and external stakeholder requirements were reflected in business processes during this transformation, and the role of Management Information Systems (MIS) in this process.

Materials/Method: This study adopts a practitioner-researcher approach, in which the authors were involved as process architects. Internal and external stakeholder requirement analyses were first conducted, and the resulting requirements were aligned with the institution's strategic goals&objectives. Based on the identified requirements, business processes were examined from the enterprise to the operational level, and the as-is and to-be states of each process were compared. As a result of this comparison, various types of processes (e.g., discontinued, customized/adapted, and newly created) were classified. The resulting processes were visualized using activity diagrams to construct workflow charts.

Results: It was found that external stakeholder constraints required existing processes to be adapted, simplified, discontinued, or newly created. In this transformation, MIS established the bridge between strategic goals and operational business processes by conducting process analysis from the enterprise level to the operational level, and processes were structured to generate outputs for the KPIs defined alongside the transformation.

Conclusion/Implications: The findings show that, in the transformation process of a complex R&D center, MIS assumed a role extending beyond the provision of technical support to serve as a socio-technical bridge between strategy and operations. Enterprise Architecture Design efforts are ongoing, and the applied approach and methods are expected to offer a model applicable to other research infrastructures undergoing similar transformations.

Keywords: business process reengineering, process management, enterprise architecture design, systems analysis and design

PREDICTING BUSINESS PROCESS DELAYS FROM EVENT LOGS USING A MACHINE LEARNING-BASED DECISION SUPPORT APPROACH

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Abstract

Delays in business processes may reduce operational efficiency and hinder timely managerial decisions. Event logs generated by enterprise information systems can support the identification of cases at risk of delay while the process is still ongoing. This study predicts decision delays using machine learning and evaluates the resulting risk scores for predictive decision support. The analysis used the BPI Challenge 2020 Domestic Declarations dataset and included 7,968 cases recorded in 2018. A delay was defined as a case in which the first decision after administrative approval exceeded seven days; 318 cases (3.99%) met this criterion. The models used transaction amount, time to administrative approval, number of prior events, and the month, day of the week, and hour of administrative approval as predictors. Logistic Regression, Random Forest, and XGBoost were compared using five-fold stratified cross-validation on the training data, while class imbalance was addressed through cost-sensitive learning. Given the low prevalence of delayed cases, PR-AUC was used as the primary evaluation metric. Random Forest achieved the highest cross-validation PR-AUC of 0.219. On the held-out test set, the training-derived decision threshold yielded a ROC-AUC of 0.715 and a PR-AUC of 0.245, with 27.3% precision and 23.4% recall for delayed cases. Permutation importance analysis showed that month, day of the week, and hour made the largest contributions to prediction. These calendar-related patterns should not be interpreted as causal effects or direct evidence of workload-related bottlenecks. The findings indicate potential for risk-based case prioritization; however, the observed precision-recall trade-off limits interpretation of the model as a stand-alone alerting mechanism. Because validation relied on stratified random partitioning within a single year, temporal generalizability remains to be examined using chronologically separated training and test periods.

Keywords: Business Process Analytics, Predictive Decision Support, Machine Learning, Random Forest, Predictive Process Monitoring

EVALUATING LLM ARCHITECTURES FOR ERP PROCUREMENT: THE ROLE OF RETRIEVAL AND AGENT-BASED PLANNING

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Abstract

The problem addressed in this study is the complexity and technical knowledge-intensive nature of ERP procurement processes. Therefore, this study was conducted to investigate how the performance of different LLM-based architectures varies in ERP procurement processes. Four LLM-based architectures (LLM-Only, RAG, Agent, and Hybrid) were tested in an open-source ERP procurement module using 25 prompts designed to assess various capabilities, and their performance was compared across several metrics. Each architecture was tested in the same ERP environment using the same prompts. Each prompt was repeated five times, resulting in a total of 1,500 runs across three different LLM families — GPT-4o-mini, Claude Haiku 4.5, and Qwen3 8B — to examine whether the observed findings remained consistent across different LLMs.

Across all three LLM families, retrieval-enabled architectures reached higher task completion rates (91.2-96.0%) than LLM-Only and Agent architectures (60.8-68.0%). RAG and Hybrid also achieved 100% vendor selection accuracy and substantially higher policy compliance. Statistical analyses demonstrated that both retrieval-enabled architectures significantly outperformed the non-retrieval architectures, while no significant overall task-completion difference was observed between RAG and Hybrid or between LLM-Only and Agent.

The most striking finding of the study was that the most complex architecture did not necessarily produce the best results. Within the procurement scenarios evaluated in this study, the retrieval capability provided by RAG was associated with greater performance improvements than the reasoning and planning capabilities provided by the Agent architecture. According to these findings, LLM-based systems can achieve high performance in procurement processes within an open-source ERP system when relevant organizational knowledge is provided.

Keywords: Enterprise Resource Planning; Large Language Models; Retrieval-Augmented Generation; Agentic AI; Procurement

AN EXPLAINABLE MACHINE LEARNING FRAMEWORK FOR CUSTOMER CHURN PREDICTION AND CUSTOMER SEGMENTATION USING SHAP AND K-MEANS

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Abstract

Customer churn prediction has become a critical task for telecommunication companies due to its direct impact on customer retention and business profitability. While numerous machine learning approaches have been proposed for churn prediction, many existing studies primarily focus on predictive performance without providing sufficient model interpretability or actionable customer insights. To address these limitations, this study proposes an explainable machine learning framework that integrates supervised classification, feature selection, explainable artificial intelligence (XAI), and customer segmentation within a unified pipeline.

The proposed framework was evaluated using the Telco Customer Churn dataset. After comprehensive data preprocessing, including missing value treatment, categorical feature encoding, feature scaling, and Synthetic Minority Over-sampling Technique (SMOTE) for class imbalance handling, six supervised machine learning algorithms were implemented and compared: Logistic Regression, Decision Tree, Random Forest, Extra Trees, AdaBoost, and Extreme Gradient Boosting (XGBoost). Recursive Feature Elimination with Cross-Validation (RFECV) and Boruta were employed to identify the most influential predictors. Model interpretability was achieved through SHAP (SHapley Additive exPlanations), providing both global and local explanations of prediction outcomes. Furthermore, K-Means clustering was applied to segment customers into distinct behavioral groups, enabling business-oriented interpretation of churn patterns.

Experimental results demonstrated that Random Forest achieved the best overall predictive performance, while SHAP analysis consistently identified customer tenure, monthly charges, contract type, and total charges as the most influential factors affecting churn. The customer segmentation results supported these findings by revealing distinct customer groups with substantially different churn risks. The consistency between feature selection, explainable AI, and customer segmentation demonstrates the robustness and interpretability of the proposed framework, providing valuable decision support for customer retention strategies in the telecommunications sector.

Keywords: Customer Churn Prediction, Explainable Artificial Intelligence, SHAP, Machine Learning, Feature Selection, K-Means Clustering, Customer Segmentation.

THE ECOLOGICAL VALIDITY PROBLEM IN NEUROMARKETING RESEARCH: A SYSTEMATIC REVIEW FROM THE LABORATORY TO REAL CONSUMER BEHAVIOR

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Abstract

Consumer neuroscience and neuromarketing combine consumer behavior with neuroscience. Neuromarketing research generates inferences about market behaviour from neurophysiological responses measured under tightly controlled conditions. This systematic review examines the extent to which ecologically valid research designs support these inferences. In line with PRISMA 2020, an evidence search was conducted using the OpenAlex tool until August 29, 2026, with 14 query families covering consumer neuroscience, neuromarketing tools, naturalistic environments, choice, purchase, and market outcomes. Scopus and Web of Science indexes were prepared for protocol replication, and a total of 2,642 query records were aggregated across 1,700 unique publications. 43 full-text searches were performed on 273 records that passed automated prioritisation, and 25 articles representing 24 independent datasets were reviewed. The articles were coded for context, stimulus realism, task, distinction between real or consequential and hypothetical choices, intention or actual behaviour, tool, multimodality, behavioural and self-report measures, external market connection, sample, duration, and design constraints. The median sample size for analysis was 32 (interquartile range 25–46). 32% of the studies used multimodal measurement, 64% used behavioural measurement, 76% used self-report, 28% involved real or consequential choice, and 24% linked to external sales or market outcomes. The findings indicate that authentic market stimuli are more prevalent than real context and economic outcomes. Virtual reality enhances contextual richness but does not spontaneously generate real economic outcomes. Neuroprediction, however, can provide strong realism of external market outcomes despite laboratory measurements. Based on this synthesis, the Neuromarketing Ecological Validation Framework (NEVF) has been proposed as a five-dimensional profile comprising stimulus, context, behaviour, outcome realism, and measurement naturalness. NEVF is not a psychometrically validated scale, but rather a transparent design and reporting framework. Furthermore, dimension-based reporting has been suggested.

Keywords: Neuromarketing, ecological validity, consumer neuroscience, real behavior, systematic review, NEVF

PREDICTING CUSTOMER CHURN ON E-COMMERCE PLATFORMS USING EXPLAINABLE ARTIFICIAL INTELLIGENCE: A MARKETING ANALYTICS APPROACH TO CUSTOMER RETENTION STRATEGIES

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Abstract

In e-commerce, customer churn is a strategic marketing problem due to the inability to directly observe customer abandonment in non-contractual relationships and the increasing reliance on predictive analytics for retention decisions. This study develops a current and reproducible explainable artificial intelligence approach to predict customer churn from a marketing and CRM perspective and to explain the reasons for these predictions. Publicly available data generation code for CRROS customer behaviour simulation covering the period January 1, 2024 – March 31, 2026, was reapplied with fixed random seeds, and customer-level modelling data was generated from 8,000 customer profiles, 250,000 interactions, and 24,520 transactions. Following the source modelling logic, customer churn was defined as remaining above the 80% threshold of the time-to-last purchase distribution, and 1,595 customers (19.94%) were classified as churn. To prevent target leakage, recency variables, which directly define churn (customer loss), were removed from the purchase-status model's inputs. Logistic Regression, Random Forest, and XGBoost were compared using stratified five-fold cross-validation and a hold-out test sample separated from the 20% training period, and Accuracy, Precision, Recall, F1, ROC-AUC, and PR-AUC were reported. SHAP generated explanations at both the global and customer levels. In the hold-out results, Random Forest yielded the highest accuracy (0.668), Logistic Regression the highest customer churn sensitivity (0.881), and XGBoost the highest ROC-AUC (0.560). The global SHAP analysis highlighted total engagement, engagement/purchase ratio, monetary value, and purchase frequency. However, the inclusion of non-actionable variables, such as age and location, in the explanations indicates that XAI should be used not only for strategy generation but also for model governance and suitability auditing. The study proposes a Predict–Explain–Verify–Act cycle and suggests that data quality and the definition of customer churn may be more decisive than algorithmic complexity.

Keywords: E-commerce, customer churn, explainable artificial intelligence, customer retention, marketing analytics, SHAP

THE CITATION DYNAMICS OF THE OPEN SOURCE SOFTWARE LITERATURE: AN EMPIRICAL ANALYSIS ON WEB OF SCIENCE DATA

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Abstract

Despite the widespread prevalence of Open-Source Software (OSS) within the global scientific ecosystem, scholarly understanding of the factors that determine the citation impact of academic publications in this field remains significantly limited. This study empirically examines the bibliometric, methodological, and structural variables that influence the average annual citation count (AACC) of OSS-focused articles. Within the scope of this research, 260 original research articles extracted from the Web of Science (WoS) Core Collection through a rigorous filtering process were analyzed in comprehensive detail. The investigation systematically evaluates the impact of several key variables on annual citation averages, including the primary writing purpose, research methodology, purpose-methodology consistency, purpose-result alignment, journal citation indicator (JCI), quartile, index type, publication year, abstract length, publication country, and research field. Empirical findings demonstrate that articles focusing on the "innovativeness" dimension of software achieve statistically significantly higher annual citation averages than traditional, "cost-oriented" studies. Methodologically, while "purpose-methodology consistency" significantly enhances citation success, "purpose-result alignment"—whether a study successfully achieves its initial objective—exhibits no decisive impact on citation performance. Furthermore, the choice of research design affects citation outcomes, with qualitative studies differentiating significantly from quantitative and mixed-method approaches. Structurally, positive and significant relationships were identified between citation counts and the JCI, journal quartiles (Q1–Q4), and specific WoS index types. In contrast, abstract length, publication country, and research field generate no statistically significant differences in citation performance. Finally, a positive yet weak correlation exists between publication year and citation rates, suggesting a slight citation advantage for newer research. In conclusion, researchers aiming to maximize their academic impact are advised to prioritize innovative software capacity over cost benefits, maintain rigorous methodological consistency, and target Q1–Q2 journals.

Background/Aims: Despite the widespread prevalence of Open-Source Software (OSS) within the global scientific ecosystem, scholarly understanding of the factors that determine the citation impact of academic publications in this field remains significantly limited. This study empirically examines the bibliometric, methodological, and structural variables that influence the average annual citation count (AACC) of OSS-focused articles.

Materials/Method: Within the scope of this research, 260 original research articles extracted from the Web of Science (WoS) Core Collection through a rigorous filtering process were analyzed in comprehensive detail. The investigation systematically evaluates the impact of several key variables on annual citation averages, including the primary writing purpose, research methodology, purpose-methodology consistency, purpose-result alignment, journal citation indicator (JCI), quartile, index type, publication year, abstract length, publication country, and research field. Empirically, the study

compares the effects of different research designs, assessing how qualitative, quantitative, and mixed-method approaches differentiate in terms of academic impact.

Results: Empirical findings demonstrate that articles focusing on the "innovativeness" dimension of software achieve statistically significantly higher annual citation averages than traditional, "cost-oriented" studies. Methodologically, while "purpose-methodology consistency" significantly enhances citation success, "purpose-result alignment"—whether a study successfully achieves its initial objective—exhibits no decisive impact on citation performance. Furthermore, the choice of research design affects citation outcomes, with qualitative studies differentiating significantly from quantitative and mixed-method approaches. Structurally, positive and significant relationships were identified between citation counts and the JCI, journal quartiles (Q1–Q4), and specific WoS index types. In contrast, abstract length, publication country, and research field generate no statistically significant differences in citation performance. Finally, a positive yet weak correlation exists between publication year and citation rates, suggesting a slight citation advantage for newer research.

Conclusion/Implications: State In conclusion, researchers aiming to maximize their academic impact are advised to prioritize innovative software capacity over cost benefits, maintain rigorous methodological consistency, and target Q1–Q2 journals.

Keywords: Open-Source Software, Scientific Impact, Citation Analysis, Bibliometrics, Web of Science

EXPERIMENTAL EVALUATION OF AN IoT-CONTROLLED ACTIVE THERMOELECTRIC COOLING SYSTEM FOR PHOTOVOLTAIC PANELS

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Abstract

In photovoltaic (PV) panels, increased operating temperature can negatively affect long-term reliability and service life by reducing electrical conversion efficiency and accelerating thermal aging and degradation processes in panel components. This study develops an Internet of Things (IoT)-supported active thermoelectric cooling system to control PV panel temperature and experimentally evaluates its performance. The developed prototype consists of a 10 W monocrystalline PV panel, a thermoelectric cooler, temperature and electrical measurement sensors, and an ESP32-based control and monitoring system. The thermoelectric cooling system is automatically activated when the panel temperature exceeds a predetermined threshold, while panel temperature and electrical parameters are monitored in real time. Experimental results show that active cooling reduces the panel temperature by

approximately 7 °C and improves its electrical performance. However, when the energy consumed by the thermoelectric cooler is considered, the system exhibits a negative net energy gain under short-term operating conditions. This finding demonstrates that considering only the instantaneous increase in PV output power is insufficient when evaluating active cooling systems. Previous studies have also reported that high operating temperatures accelerate various degradation mechanisms in PV modules and adversely affect their long-term reliability. Therefore, the temperature reduction achieved by the proposed system may provide a potential long-term benefit beyond the short-term energy balance by limiting thermal aging and potentially extending panel service life. The results indicate that energy consumption, temperature regulation, and long-term reliability should be considered together when assessing the applicability of thermoelectric cooling in PV systems. The developed IoT infrastructure also enables real-time performance monitoring and temperature-based automatic control, providing a practical framework for intelligent thermal management of PV panels.

Keywords: Photovoltaic panels, thermoelectric cooling, Peltier elements, Internet of Things, thermal aging, service life

TEMPERATURE-RELATED ALL-CAUSE MORTALITY IN TÜRKIYE (2016–2024): A HYBRID M|D DISTRIBUTED LAG NON-LINEAR MODEL AND 81-PROVINCE FIXED-EFFECTS PANEL ANALYSIS

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ABSTRACT

Background/Aims: Ambient temperature significantly influences mortality; yet nationally representative estimates for Türkiye remain absent due to the limitations in the monthly mortality data, which severely bias conventional distributed lag non-linear models (DLNMs). We addressed this gap by evaluating national and climate zone-specific temperature- mortality relationships across Türkiye's topographically diverse regions.

Materials/Method: In this study we applied a Monthly|Daily (M|D) Poisson likelihood framework to 108 months of national all-cause mortality data (TÜİK, 2016–2024) paired with ERA5 daily temperatures, correcting the temporal aggregation bias inherent to monthly mortality data. A secondary 81-province fixed-effects panel (2016–2022) with XGBoost/SHAP feature importance evaluated spatial heterogeneity across warm, cold, and temperate climate zones.

Results: The national minimum mortality temperature (MMT) was 17.64°C (62.8th percentile). The cold attributable fraction (AF = 5.06%) substantially exceeded the heat AF (1.31%), establishing a 3.9:1 cold-to-heat mortality ratio. Cold risk peaked at lags 7-10 days and persisted through 18 days; heat risk concentrated at lags 0-3 days. Models accounted for COVID-19 and Kahramanmaraş earthquake excess mortality. Province-level modeling demonstrated significant heat attenuation in warm zones and male-specific vulnerability to cold waves and diurnal temperature range in cold zones. SHAP analysis indicated cold zone membership as the primary driver of between-province mortality variance.

Conclusion/Implications: Utilizing a bias-corrected M|D likelihood framework, this study provides the first national temperature- mortality baseline for Türkiye. Findings demonstrate a predominant cold burden, spatial thermal adaptation, and sex-specific cold vulnerabilities, providing key empirical evidence for calibrating zone-specific heat/cold early warning systems and disaster medicine preparedness plans in Türkiye.

Keywords: Temperature; Mortality; Models, Statistical; Risk Assessment; Public Health; Türkiye

PROJECT TYPE AS A CONTINGENCY IN IT PROJECT MANAGEMENT: A COMPARATIVE CASE STUDY OF FOUR BANKING TECHNOLOGY PROJECTS

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Abstract

Background/Aims: Information technology projects in banking differ substantially in their technological, organizational, and operational characteristics, yet project management practices are often applied as if they were universally uniform. This study examines how different IT project types influence the configuration and intensity of project management mechanisms and asks which project characteristics require different governance and control emphases.

Materials/Method: A comparative multiple-case study design was used to analyze four banking technology projects: a core banking technology transformation, a primary data center migration, a card-system integration, and an end-user migration to an open-source platform. Empirical evidence was drawn from contemporaneous project records, including project plans, decision records, technical documentation, risk and rollback plans, testing and acceptance records, and transition documentation. The cases were compared across planning, risk management, testing, stakeholder and vendor coordination, transition management, and operational continuity.

Results: The analysis shows that these mechanisms are present across all four projects, but their relative importance, scope, and intensity vary according to physical dependency, integration complexity, vendor intensity, reversibility, and operational criticality. Projects with high operational criticality and limited reversibility require stronger transition, rollback, and continuity mechanisms. Integration-intensive and vendor-dependent projects place greater emphasis on coordination, interface management, testing, and acceptance processes. Project type therefore affects not only methodology choice but also the practical configuration of governance and control mechanisms throughout the project life cycle.

Conclusion/Implications: The study supports a contingency perspective in IT project management by showing that project management practices should be configured according to project-specific technological, organizational, and operational characteristics rather than treated as universally uniform. The findings provide practical guidance for managers responsible for complex technology initiatives in banking and other highly regulated industries.

Keywords: IT Project Management, Project Type, Banking, Contingency Perspective, System Integration, Technology Transformation

PERCEIVED REALITY IN AI-GENERATED VIDEOS: A TEXT-MINING AND COMPUTATIONALLY ASSISTED THEMATIC ANALYSIS OF USER COMMENTS

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Abstract

Advances in generative video technologies are increasingly blurring the perceptual boundary between authentic and AI-generated visual content. This study examines how users perceive, distinguish, and respond to AI-generated videos in a natural social-media environment. A computationally assisted thematic analysis and text-mining approach was applied to publicly available top-level comments collected from three highly viewed “Real or AI?” YouTube Shorts containing 11 authenticity judgments and more than 6.8 million cumulative views. Following data cleaning, the final analytical corpus consisted of 1,302 user comments. The analysis combined lexical text mining, rule-assisted multi-label thematic coding, perceptual-cue analysis, high-confidence reconstruction of self-reported discrimination performance, cross-video comparisons, and temporal modeling. Within the multi-label coding framework, detection confidence/mastery (14.13%) and misclassification/fooled responses (11.37%) emerged as the most prevalent reality-related themes, followed by difficulty/uncertainty (4.99%) and perceptions of increasing AI realism (3.61%). Users reported relying particularly on physical and environmental consistency, visual perfection, lighting, motion, and rendering artifacts when distinguishing AI-generated from authentic videos. High-confidence self-reported discrimination performance could be reconstructed from 196 comments; however, performance did not differ significantly across the three videos, Kruskal–Wallis $H(2) = 4.683$, $p = .096$. Temporal analysis showed that fear/anxiety decreased over the comment lifecycle (OR = 0.770, $p = .006$), whereas technological admiration increased (OR = 1.324, $p = .027$). Overall, the findings indicate that users engage with AI-generated video through a combination of perceptual judgment, informal detection heuristics, confidence, uncertainty, and evaluative responses. The study suggests that increasingly realistic AI-generated video is becoming not only a technological challenge but also a perceptual and epistemic one, as users must increasingly determine when and why visual evidence should be trusted as real.

Keywords: AI-generated video, perceived reality, text mining, thematic analysis, epistemic uncertainty.

FROM GENERATIVE AI TO ACADEMIC PRODUCTIVITY: A SYSTEMATIC REVIEW OF ACADEMIC COMPETENCE DEVELOPMENT

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Abstract

Generative artificial intelligence (GenAI) supports literature work, academic writing, idea generation, and research-related tasks. However, faster task completion does not necessarily demonstrate lasting academic competence development. Following PRISMA 2020 for study selection and reporting, this systematic review examines connections among GenAI use, academic competence, and academic or research productivity. Web of Science and Scopus yielded 91 records. After removal of 22 duplicates, 69 records were screened and 24 full-text reports were assessed. Reappraisal against the original eligibility criteria for population, GenAI specificity, and outcomes excluded 10 reports, leaving 14 studies for narrative synthesis. Conceptual and adjacent educational publications were retained as supporting literature. Eligible studies examined academics, researchers, postgraduate researchers, or their workflows and provided empirical competence- or productivity-related evidence. The evidence base included surveys, interviews, mixed-methods studies, autoethnography, and applied workflow evaluations, reflecting considerable methodological and contextual heterogeneity. Findings most often concern writing support, time savings, literature work, and workflow efficiency. A course-based comparison combined lower student-recorded writing time with higher rubric-assessed quality, but instruction and condition order limited causal attribution. Competence-related evidence concerns research methods, writing, critical evaluation, confidence, and autonomy. Most evidence consists of cross-sectional associations, qualitative accounts, or self-reported experiences. The reviewed corpus does not establish sustained independent competence development or a temporal pathway in which such development mediates later productivity. Participants describe inaccurate outputs, verification work, ethical uncertainty, and overreliance concerns. The evidence supports task assistance more clearly than accelerated, lasting competence development. These findings indicate that institutional guidance should emphasize critical verification, transparent use, and research-task-specific training alongside efficiency gains. Future studies should distinguish assisted performance from retained skills, use delayed independent and transfer assessments, and test competence development as a potential mechanism linking GenAI use to academic productivity.

Keywords: Generative artificial intelligence, academic competence development, research skills, academic productivity, systematic review.

THEMATIC EVOLUTION OF DIGITAL PLATFORM RESEARCH IN THE MANAGEMENT LITERATURE: A STRUCTURAL TOPIC MODELING ANALYSIS

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Abstract

Background/Aims: Digital platforms have become a central object of management research, but accounts of how the field's agenda has shifted rest largely on narrative reviews or keyword counts, which cannot link themes to document metadata or test change statistically. This study identifies the latent thematic structure of platform research in the business and management literature and estimates how each theme evolved between 2018 and 2025.

Materials/Method: Articles and reviews indexed under ASJC 1404 (Management Information Systems) in Scopus and retrieved with a platform-focused query were collected (n = 446); 429 remained after cleaning. Structural Topic Modeling was applied with publication year specified as a spline. The number of topics was set to 10 on the basis of topic-size balance, the absence of duplicate or residual topics, and the interpretability of representative documents; held-out likelihood proved unstable across sampling windows and was therefore not used as a criterion.

Results: Ten interpretable topics emerged, ranging from 7.0% to 16.9% of the corpus. Three showed significant temporal change. Content moderation and machine-learning detection rose (β = 0.013, p = .008), as did technology acceptance, trust and consumer intention (β = 0.012, p = .040), whereas platform ecosystems and complementors declined (β = –0.015, p = .015). The remaining seven topics were stable, and no topic pair exceeded the correlation threshold.

Conclusion/Implications: Scholarly attention is shifting from platform architecture and complementor economics towards what circulates on platforms and how users respond to it. Combining topic modelling with statistical effect estimation offers a testable alternative to narrative accounts of field evolution and identifies governance and content-level questions as the emerging research frontier.

Keywords: Structural topic modeling, Digital platforms, Bibliometrics, Text mining, Content moderation, Platform governance

NATIONAL / PUBLIC RESOURCE PLANNING AND SOCIETY 5.0*

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Abstract

In today's rapidly evolving world, advancements in information and communication technologies have not only transformed private sector production and service processes but have also compelled radical changes in the operating principles of public administration, budgetary discipline, and state mechanisms. Traditional bureaucratic structures increasingly fall short of meeting the dynamic needs of modern societies due to structural issues such as data silos, sluggish decision-making processes, and systemic inefficiencies in resource allocation. At this critical juncture, the emergence of new managerial paradigms at the intersection of public administration, public finance, and Management Information Systems (MIS) has become inevitable.

Enterprise Resource Planning (ERP) systems, which enable the management of corporate resources through an integrated software architecture, have achieved significant operational success in the private sector by focusing primarily on profitability and customer satisfaction. However, the nature of public administration is fundamentally rooted in unique dynamics, including non-profit orientation, public interest, social justice, strict regulatory compliance, and the overall maximization of social welfare. In this context, the National/Public Resource Planning Platform (NRPP/PRP) emerges through the synthesis of ERP logic with public sector philosophy, integrating concepts such as Government Resource Planning (GRP), e-Government, Municipal Resource Planning (MRP), the Internet of Things (IoT), Artificial Intelligence (AI), and Big Data.

In the literature, GRP refers merely to the public sector's internal bureaucracy, while traditional PRP covers standard budgetary processes; terms such as "Integrated" or "Holistic" prove insufficient to describe the platform's full philosophical and managerial scope. The proposed platform represents a macro-scale implementation and decision-support ecosystem that incorporates the Society 5.0 philosophy and environmental sustainability.

This study aims to examine the platform model—covering both its theoretical and practical aspects—within the framework of the Society 5.0 vision and the Information Systems discipline, demonstrating how its AI-supported infrastructure directly serves the goal of human-centric and technology-driven societal well-being.

Keywords: National/Public Resource Planning Platform (NRPP/PRP), Enterprise Resource Planning (ERP), Management Information Systems (MIS), Society 5.0, Artificial Intelligence (AI)

* This study was written by adapting the doctoral thesis, titled “An Analysis Aimed at Improving Budget Revenue Performance: The Non-Life Insurance Sector,” to the discipline of Management Information Systems (MIS) and the Society 5.0 perspective.

DIGITAL TRANSFORMATION, BUREAUCRACY, AND MERIT: DIGITAL COMPETENCE AND MANAGEMENT INFORMATION SYSTEMS EXPERIENCES OF PUBLIC MANAGERS

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Abstract

Background/Aims: Digital transformation in public institutions is not limited to technological infrastructure; it also requires the re-evaluation of managerial processes, human resources, and organizational functioning. This study aims to examine public managers' experiences of digital transformation in relation to digital competence, artificial intelligence, digital decision support technologies, and the relationship between bureaucracy and merit.

Materials/Method: A qualitative research approach was adopted. Semi-structured interviews were conducted with 12 middle-level managers working in the public sector. The data were analyzed using thematic analysis to identify recurring patterns in managers' experiences and perceptions.

Results: The findings indicate that digital transformation is shaped not only by the adoption of technological systems but also by employees' adaptation to digital systems, digital competence, compliance with digital processes, and organizational process reorganization. In this context, merit is associated not only with knowledge, skills, and experience but also with digital competence and the capacity to adapt to change. Bureaucracy is perceived as having a dual role: it provides standardization, control, and sustainability, while excessive and rigid bureaucratic structures may slow organizational processes. These findings indicate that digital competence increasingly complements traditional merit criteria in managerial practice. These considerations are relevant to sustainable public sector digitalization and organizational performance.

Conclusion/Implications: The study highlights the need to consider digital transformation, bureaucracy, and merit as interconnected dimensions rather than independent elements. Effective digital transformation in public administration requires technological adaptation together with digitally competent managers, merit-oriented managerial practices, and bureaucratic structures that preserve accountability and control while supporting organizational adaptability.

Keywords: Digital Transformation, Artificial Intelligence, Digital Competence, Bureaucracy, Merit, Public Administration

THEMATIC STRUCTURE AND EVOLUTION OF TÜRKİYE-AFFILIATED MANAGEMENT INFORMATION SYSTEMS RESEARCH: A STRUCTURAL TOPIC MODELING APPROACH

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Abstract

Background/Aims: Research on Management Information Systems (MIS) in Türkiye has relied largely on descriptive bibliometrics such as citation counting and keyword frequency, which cannot reveal the latent content structure of the literature or link it statistically to metadata. This study identifies the latent thematic structure of Türkiye-affiliated MIS research, estimates how these themes evolved between 2016 and 2025, and examines their association with scholarly impact.

Materials/Method: Records classified under ASJC 1404 (Management Information Systems) in Scopus, affiliated with Türkiye and published in English as articles or reviews, were retrieved (n = 860); 848 remained after cleaning. Structural Topic Modeling was applied, with publication year specified as a spline and citation impact as a within-year percentile-based binary covariate, avoiding the confounding of citation accumulation with article age. Twelve topics were selected on the basis of held-out likelihood, residuals, semantic coherence, exclusivity, term overlap, and interpretability.

Results: The twelve topics were evenly distributed (6.6%–9.8%). The largest were organisational behaviour and employee attitudes (9.8%), optimisation and metaheuristic algorithms (9.8%), multi-criteria decision making in logistics (9.0%), and deep learning based data representation (8.9%). Deep learning ($\beta = 0.015$, $p < .001$) and digital technology adoption ($\beta = 0.008$, $p = .002$) rose significantly, whereas service quality and financial behaviour ($\beta = –0.007$) and knowledge management and innovation ($\beta = –0.006$) declined. Deep learning was also more prevalent among highly cited articles ($\beta = 0.046$, $p = .002$), the only topic combining both properties.

Conclusion/Implications: Türkiye-affiliated MIS research comprises a method-driven core and a behavioural wing, with recent weight shifting towards data-intensive artificial intelligence. Combining topic modelling with statistical effect estimation moves beyond descriptive bibliometrics and informs research policy and graduate curriculum design.

Keywords: Structural topic modeling, Bibliometrics, Management information systems, Text mining, Machine learning

FACTORS AFFECTING CHATBOT CONTINUANCE INTENTION IN EDUCATIONAL INSTITUTIONS

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Abstract:

AI-powered chatbots are increasingly used to scale student support in open and distance education, but deploying one does not mean students will keep using it. This study examines what determines continuance intention among 468 students who had used the chatbot operated by the open and distance education faculty of a state university. Drawing on the Information Systems Success Model, the Technology Acceptance Model and the Expectation-Confirmation Model, and extending them with three constructs drawn from the AI chatbot service quality literature, we model six chatbot properties as acting on continuance intention through perceived information usefulness and satisfaction. Data were analysed with partial least squares structural equation modelling. Perceived information usefulness carries more weight than satisfaction ($\beta = 0.639$ versus $\beta = 0.304$; $\Delta = 0.335$, $p = 0.024$) and is driven mainly by query understanding ($\beta = 0.381$), interaction continuity ($\beta = 0.263$) and ease of use ($\beta = 0.249$). A nested comparison shows the chatbot-specific dimensions adding most to perceived usefulness and to continuance intention, and the general acceptance variables adding most to satisfaction. No accessibility effect was detected. Controlling for prior chatbot experience and age moves no path by more than 0.012. The model accounts for 84.8% of the variance in continuance intention, a figure the common method diagnostics indicate is inflated to an unknown degree. Language understanding and informational accuracy separate a chatbot students keep using from one they abandon, and a comparison with 232 aware non-users finds functional risk higher among users, contrary to a selection account of non-use.

Keywords: Chatbot, continuance intention, perceived information usefulness, AI service quality, open and distance education, PLS-SEM

AUTOENCODER-BASED IOT NETWORK ATTACK DETECTION

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Abstract

The rapid proliferation of Internet of Things (IoT) technologies has led to the continuous connection of diverse devices to networks and the generation of large volumes of data. While this development offers significant opportunities in terms of convenience and automation, it also exposes IoT environments to a wide range of cybersecurity threats. Consequently, the accurate detection of anomalous network behavior and potential attacks has emerged as an important research area in IoT security. This study aims to examine the applicability of autoencoder-based deep learning approaches for attack detection in IoT networks and to compare the performance of different autoencoder architectures. The study utilizes a dataset containing benign and malicious network traffic collected from real IoT devices. Different autoencoder approaches are applied to the dataset, and their ability to learn underlying patterns in network traffic and distinguish malicious activities is evaluated using various performance metrics. The analytical process includes data preprocessing, model training, and performance evaluation, with emphasis on comparing different architectures using the same data structure. The findings indicate that autoencoder-based models provide applicable approaches for representing IoT network traffic and supporting attack detection. The results further suggest that architectural design can influence model performance and that different autoencoder variants may offer distinct advantages, particularly in learning complex patterns. Rather than relying on a single model, the comparative evaluation of different deep learning architectures may therefore provide greater value for IoT security applications. Overall, this study offers an empirical assessment of deep learning-based attack detection in IoT security and provides a comparative perspective for future model development. It is expected to contribute to a better understanding of the strengths and limitations of different autoencoder architectures and provide a methodological basis for developing security solutions in IoT environments.

Keywords: Internet of Things, Information Security, Deep Learning, Autoencoder, Intrusion Detection.

PATIENT RISK PREDICTION USING MACHINE LEARNING IN ELECTRONIC HEALTH RECORDS

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Abstract

This study aims to predict the risk of hospital readmission within 30 days after discharge among patients with diabetes using machine learning methods based on electronic health records. The UCI Diabetes 130-US Hospitals dataset, containing demographic, clinical, and treatment-related information, was used. During preprocessing, missing and inconsistent data were addressed, categorical variables were transformed, and data cleaning procedures were performed. Following these processes, 98,052 cleaned records were obtained.

The target variable was derived from the *readmitted* field. Patients readmitted within 30 days after discharge (<30) were defined as the positive class, whereas patients readmitted after 30 days (>30) or not readmitted (NO) were classified as the negative class. Six machine learning models were compared: Logistic Regression, Random Forest, XGBoost, LightGBM, CatBoost, and Explainable Boosting Machine.

Class imbalance was addressed using class weighting without synthetic data generation. Model performance was evaluated using stratified 5-fold cross-validation, and out-of-fold predictions were used to determine decision thresholds while preventing data leakage. In addition, sigmoid-based calibration was applied to improve the reliability of predicted probabilities. The models were evaluated using ROC-AUC, F1-score, and Brier Score.

The findings demonstrated that LightGBM achieved the highest mean ROC-AUC during cross-validation. Following decision threshold tuning, LightGBM also achieved the highest F1-score and the lowest Brier Score in the calibration analysis. These findings indicate that LightGBM provided the most balanced overall performance for predicting 30-day hospital readmission risk within the scope of this study. However, external validation using independent datasets and prospective clinical evaluation are required before the model can be implemented in clinical decision support systems..

Keywords – Electronic health records, readmission prediction, diabetes, machine learning, calibration, decision threshold tuning

DESIGNING DIGITAL BUSINESS MANAGEMENT PROCESSES IN THE AGE OF AGENTIC ARTIFICIAL INTELLIGENCE

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Abstract

Agentic artificial intelligence systems differ from conventional artificial intelligence applications through their ability to define goals, plan tasks, use digital tools, adapt to environmental changes, and make autonomous decisions within specified boundaries. This development requires organizations to reconsider existing business processes in which artificial intelligence is primarily employed as a decision-support tool. This study aims to examine how digital business management processes should be designed in the age of agentic artificial intelligence and to propose a conceptual process model based on human–AI collaboration. A conceptual research method based on a systematic literature review is adopted. Studies addressing digital business management, business process management, agentic artificial intelligence, human–AI collaboration, and AI governance are synthesized to identify the principal dimensions of process design. The proposed model comprises defining strategic objectives, decomposing processes and tasks, allocating responsibilities between humans and AI agents, determining the authority and autonomy boundaries of agents, establishing data and system integration, introducing human oversight points, monitoring performance, and enabling continuous improvement. Transparency, explainability, cybersecurity, privacy, accountability, and post-error intervention are also incorporated into the model as cross-cutting governance components. The study argues that merely adding agentic artificial intelligence to existing processes as a technical tool is insufficient. Instead, digital business management processes should be redesigned around human oversight, organizational responsibility, and controlled autonomy. The proposed conceptual model is expected to guide organizations in assessing their readiness for agentic systems and integrating these systems into digital business processes in a secure, controllable, and strategically aligned manner.

Keywords: Agentic artificial intelligence, digital business management, business processes, process design, human–AI collaboration, AI governance.

AI-SUPPORTED RECRUITMENT AND DISABILITY INCLUSION: A QUALITATIVE STUDY OF EMPLOYERS' PERCEPTIONS

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Abstract

The rapid development and growing use of artificial intelligence (AI)-supported applications in human resources are substantially changing recruitment processes and the ways in which candidates are evaluated. While this transformation offers new opportunities for greater efficiency and standardisation in recruitment, it may also create various risks for employable candidates whose characteristics differ from conventional expectations. In the case of candidates with disabilities, in particular, questions of accessibility, discrimination, and algorithmic bias have become increasingly relevant. Indeed, under the European Union Artificial Intelligence Act (EU AI Act), AI systems used for recruitment and personnel selection are classified as high-risk systems, underscoring the sensitivity of the issue for both society and organisations. Nevertheless, studies examining employers' views on how AI-supported recruitment practices may affect access to employment for persons with disabilities remain limited. This study therefore aims to examine AI-supported recruitment practices from the perspective of the participation of candidates with disabilities in employment processes and to explore employers' perceptions of these practices. The study employed a qualitative research design and conducted semi-structured interviews with six human resources managers who actively use AI-supported HR applications. The interviews were analysed using thematic analysis, resulting in five main themes: efficiency and standardisation, accessibility, algorithmic bias and risk of discrimination, human oversight, and organisational readiness. Participants indicated that AI-supported systems can accelerate recruitment processes and may help reduce individual bias. Moreover, the failure of algorithms to adequately account for disability-related differences and accessibility problems associated with digital assessment tools were identified as significant risks. The findings also suggest that organisational HR policies, managers' awareness of disability, and institutional approaches to inclusion play a determining role in recruitment processes. Overall, participants' views demonstrate that the use of AI in recruitment should consider not only technological efficiency but also accessibility, organisational practices, and human oversight.

Keywords: Artificial intelligence, algorithmic bias, employment, organisational behaviour, disability inclusion

CLASSIFICATION OF TOMATO LEAF DISEASES UNDER REAL-FIELD CONDITIONS USING CNN, VIT, AND HYBRID MODELS

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ABSTRACT

In recent years, early and accurate detection of plant pathologies has become critical to prevent severe agricultural economic losses worldwide. This study presents a comprehensive comparative evaluation of eight distinct deep learning architectures, comprising conventional convolutional neural networks and advanced Vision Transformer models—specifically ResNet50, ViT-Large, AlexNet, Hybrid-ViT, VGG16, MobileNetV2, ViT-Base, and an optimized Ensemble model—for the automated classification and diagnosis of tomato leaf diseases. Crop diseases pose continuous threats to global food security, requiring highly robust and automated computational diagnostic tools. This study aims to bridge the existing gap in literature by thoroughly benchmarking how modern attention-based and convolutional architectures handle complex agricultural image classification tasks under strict experimental controls and standardized parameters. To eliminate performance bias stemming from random weight initialization and ensure high academic reliability, all eight architectures were subjected to a rigorous multi-seed evaluation framework utilizing five distinct random seed values (42, 123, 456, 789, and 2026). Experiments were conducted on a curated, augmented dataset partitioned precisely into 70% training, 15% validation, and 15% test subsets using optimized AdamW optimization and early stopping mechanisms. Experimental findings reveal that Vision Transformer-based models substantially outperform traditional CNN counterparts on complex phytopathological features. Specifically, the ViT-Large architecture attained the highest average test accuracy of 82.91% with a peak performance of 85.93%, whereas the ViT-Base model achieved a remarkable average test accuracy of 82.59% (ranging from 80.65% to 84.81% with a low standard deviation of 0.0148), demonstrating exceptional training stability, robust Macro F1-scores, and high consistency across all individual seed iterations. These outcomes confirm that transformer frameworks provide superior representation learning for fine-grained plant disease recognition, offering scalable, high-performance decision-support solutions for modern precision agriculture, smart farming, and automated crop management systems.

Keywords: Tomato Leaf Diseases; Vision Transformer; Deep Learning; Multi-Seed Evaluation

REGIONAL AND HOUSEHOLD DIFFERENCES IN WELL-BEING EFFICIENCY IN TÜRKİYE: A METAFRONTIER DATA ENVELOPMENT ANALYSIS

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Abstract

The transformation of economic resources into individual and family happiness is a complex process that is strongly influenced by socioeconomic status, demographic characteristics, regional conditions, and household structure. Accordingly, this study examines how regional variation and household structure affect the efficiency of translating economic resources into individual and family happiness in Türkiye.

The analysis uses data from the 2021 Turkish Family Structure Survey (TAYA), which provides information on family and individual well-being across 12 regions of Türkiye. Households are classified into two groups: families with children and families without children. Data Envelopment Analysis (DEA) is employed to construct comparative efficiency measures, using income as the input and family happiness and individual happiness as outputs. In addition, ANOVA results indicate that households with and without children and regions do not have equivalent conditions in relation to economic resources and well-being. Therefore, the analysis is extended through a metafrontier DEA framework to evaluate both group-specific efficiency and differences relative to a common national frontier.

The findings reveal that households with children attain a Technology Gap Ratio (TGR) of 1.000 across all regions, while their group and metafrontier efficiency scores range from 0.445 to 0.484. In contrast, households without children have TGR values ranging between 0.795 and 0.830, indicating a greater gap between their group-specific frontier and the national metafrontier. Nevertheless, households without children exhibit higher Group Technical Efficiency (GTE = 0.544–0.584) than households with children (GTE = 0.445–0.484), suggesting relatively stronger performance within their own group-specific conditions. Regionally, the largest structural limitation among households without children is observed in Southeastern Anatolia (TGR = 0.795), whereas Istanbul records the lowest overall metafrontier efficiency (Meta-TE = 0.442). Overall, the results demonstrate that the efficiency of transforming economic resources into well-being varies considerably across household structures and regional contexts in Türkiye.

Keywords: Metafrontier DEA, TAYA, Well-Being

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A CONCEPTUAL EVALUATION OF THE RELATIONSHIP BETWEEN DIGITAL BUSINESS MANAGEMENT AND LEADERSHIP

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Abstract

Digital business management refers to the integrated management of business processes, organizational resources, data, and stakeholder relationships through digital technologies. Successful digitalization requires not only technological infrastructure but also leadership capable of creating a digital vision, managing organizational change, and fostering a supportive culture. This study aims to conceptually examine the relationship between digital business management and leadership and identify the leadership dimensions that support the effective management of digital business processes.

The study employed a conceptual review method. National and international studies on digital business management, digital transformation, leadership, digital leadership, organizational culture, technology management, and change management were examined. The prominent concepts, theoretical approaches, and managerial explanations in the relevant literature were comparatively evaluated according to their relevance to the research topic. The information obtained was classified under the themes of digital strategy, organizational change, digital competence, data-driven decision-making, and ethical technology management. These themes were synthesized through an integrated approach to explain the main dimensions of the relationship between digital business management and leadership.

The evaluation revealed six interrelated dimensions: developing a digital vision and strategy, managing organizational change, creating a digital organizational culture, improving employees' digital competencies, promoting data-driven decision-making, and ensuring the ethical and responsible use of technology. Leadership provides strategic direction for digital initiatives and facilitates the integration of digital technologies into organizational processes. Technological investments alone are insufficient unless supported by effective leadership, employee participation, organizational learning, and a culture open to innovation.

Leadership is a fundamental organizational capability for the effective implementation and sustainability of digital business management. Leaders must align technology, people, processes, data, and organizational objectives. The dimensions identified in this study will provide a theoretical foundation for future empirical research and help researchers and organizations develop leadership practices appropriate for digital business environments.

Keywords: Digital business management, leadership, digital technology, organizational culture, organizational innovation, technology management.

A SYSTEMATIC REVIEW OF PRESENT AND FUTURE AI TOOLS IMPLEMENTATION ON SCIENTIFIC RESEARCH

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Abstract

This review offers a general overview of the current state of AI tools in scientific research practice and to clearly indicate how these tools may be utilized in the process of research to make it more efficient without any compromises in terms of its originality, transparency, and accountability. While this review concentrates on AI in scientific research workflows, there is some evidence about educational AI presented to demonstrate problems of integrity and verification at high level. Such review became necessary due to the impact of Artificial Intelligence (AI) as an instrument that reshapes research practices such as research workflow, referencing, academic writing, data processing, data analysis and preparation of the manuscript. It is stressed that AI does not undermine research integrity; however, unreliability of the process and risks that researchers typically face become evident in case of wrong tool application or improper prompting along with uncritical output, lack of proper disclosure, inadequate verification of the source, which might be addressed through structured use and task appropriateness. Research method of this review incorporates AI tools use in research, their advantages and failure modes. The review also covers topics like problem formulation and gap identification, data gathering and preprocessing, analysis using statistics and machine learning, language and structure correction, formatting and references management, and tools for lowering similarity. In its conclusion, the paper states that AI tools can reduce the burden of administrative tasks, making iterative analyses faster, helping with clearer communication, and facilitating discovery through pattern identification and hypothesis generation. Possible directions for future work include improvements in auditability and provenance in AI assisted processes, and information about changes in institutional and journal policies regarding research assistance.

Keywords: academic language, AI-assisted writing, insufficient disclosure, data analysis, scientific rigor

DEVELOPMENT AND PILOT EVALUATION OF A TF-IDF AND COSINE SIMILARITY-BASED INTELLIGENT MATCHING WEB PLATFORM FOR INTERNS AND EMPLOYERS

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Abstract

Internships are an important component of higher education because they enable students to develop their professional knowledge and skills in practice. However, students may experience difficulties in accessing internship postings compatible with their qualifications, while employers need to identify suitable candidates from large application pools. These issues increase the need for digital support mechanisms in internship processes. In this study, a web-based intelligent matching platform was developed to compare student CVs and employer internship postings on a text basis. On the platform, CV and posting texts were subjected to natural language processing preprocessing; the texts were vectorized using TF-IDF, and candidate suitability scores were generated using cosine similarity between the resulting vectors. The system was developed using React.js and Tailwind CSS-based user interface, Python- and Node.js-supported backend components, a PostgreSQL relational database, and MinIO object storage infrastructure.

The developed prototype was examined through a pilot user evaluation involving 16 students/internship candidates and 5 employers, business representatives, or human resources officers. The overall mean evaluation score was 4.25 out of 5 for student participants and 4.34 out of 5 for employer/HR participants. Students gave the highest rating to their willingness to use the platform in their internship search process, whereas employer participants gave the highest rating to the ease of viewing applications and reviewing candidates. The findings indicate that the platform was positively received by both user groups; however, the explainability of matching results, notification mechanisms, and candidate process management functions need to be improved.

Keywords: Intern-employer matching, recommender systems, natural language processing, TF-IDF, cosine similarity, user evaluation

DESIGN AND DEVELOPMENT OF A RESERVATION-INTEGRATED SMART THERMOSTATIC RADIATOR VALVE RETROFIT SYSTEM FOR A PUBLIC GUESTHOUSE

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Abstract

Background/Aims: Legacy central heating systems in public buildings usually lack room-level control, which leads to overheating and wasted energy, particularly in cold climates. This study aimed to design, develop and field-deploy a low-cost retrofit that integrates off-the-shelf smart thermostatic radiator valves (TRVs) with a hotel property management system (PMS) to provide occupancy-based, room-level heating control in a 56-room university guesthouse in Erzurum, Türkiye.

Materials/Method: A design-and-development approach was followed. 110 Zigbee TRVs and 10 gateways were coupled with a Node.js/MSSQL application server that polls reservation records every 10 minutes, classifies each room into one of four occupancy states (occupied, pre-arrival, pre-departure, empty) and assigns device-referenced setpoints. A verification–correction loop and a nine-type notification layer support unattended operation. Deployment was phased: an 11-room pilot from January 2026 and full coverage in March 2026. An energy baseline was built from 35 monthly gas bills matched with pro-rata heating degree-days under ASHRAE Guideline 14, and 5-minute valve-position telemetry was used for functional verification.

Results: The platform produces more than 837,000 records per month at full coverage. Valve-position series confirmed end-to-end response to reservation-driven state transitions and physically meaningful behaviour: in occupied rooms, morning valve position was lower on the east façade (74.1%) than on the west façade (81.4%; $p = 0.027$). The single-variable baseline met all Guideline 14 criteria ($R^2 = 0.947$; CV(RMSE) = 14.7%; NMBE ≈ 0), and a multivariable model ($R^2 = 0.954$) decomposed consumption into space-heating (≈69%), occupancy-driven (≈22%) and fixed (≈9%) components. Post-retrofit savings are not yet claimed; a full heating season is required.

Conclusion/Implications: The five-module architecture and the field-calibration lessons (sensor-offset compensation, confirmed-reservation pre-heating, automatic setpoint-drift repair) are transferable to other public buildings whose occupancy is known in advance through reservation or scheduling systems.

Keywords: smart thermostatic radiator valve; Internet of Things; occupancy-based control; energy retrofit; ASHRAE Guideline 14; public buildings

A MODEL PROPOSAL FOR COMPARING THE BEHAVİORAL INTENTIONS OF MANAGEMENT INFORMATION SYSTEMS AND COMPUTER ENGINEERING STUDENTS TOWARD TECHNO-ENTREPRENEURSHIP

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ABSTRACT

Background/Objectives: Rapid technological advancements make techno-entrepreneurship vital, requiring educational programs that actively cultivate positive student attitudes toward innovation. This study proposes a conceptual research model and develops a measurement scale to compare the behavioral intentions toward techno-entrepreneurship between Management Information Systems (MIS) students (whose curriculum bridges IT and business) and Computer Engineering (CE) students (whose curriculum is strictly IT-focused).

Materials/Methods: Based on a comprehensive literature review, an initial item pool of 87 items across 14 factors and 10 demographic questions was created. Expert evaluations for content validity reduced this to 62 items across 11 factors. A pilot study was conducted using an online 5-point Likert scale survey with a sample of 47 volunteer students (25 females, 22 males) from the MIS and CE departments at Atatürk University. Reliability and item consistency were evaluated using Cronbach's alpha coefficients.

Results: The initial 62-item scale yielded a Cronbach's alpha coefficient of 0.947. During reliability refinement, four low-performing items were removed, leading to the exclusion of the "Social Values" factor due to its low reliability (α= 0.508). The finalized scale comprises 58 items across 10 factors (including Creativity, Income Expectation, Job Search Anxiety, Managerial Knowledge, Technological Knowledge, Managerial Ability, Entrepreneurial Networking Abilities, Entrepreneurial Anxiety, Risk-Taking, and Techno-Entrepreneurial Intention). The overall Cronbach's alpha for the finalized 58-item scale reached 0.945, exceeding the standard threshold ($\geq$ 0.7) required for subsequent factor analysis and Structural Equation Modeling (SEM).

Conclusion/Implications: The pilot study successfully establishes a highly reliable 10-factor, 58-item measurement instrument tailored for evaluating techno-entrepreneurial intentions. By applying this model in future comparative studies between MIS and CE students, academic institutions can gain insights into curriculum effectiveness, align educational strategies with industry requirements, and foster tech-driven entrepreneurial mindsets.

Keywords: Techno-Entrepreneurship, Behavioral Intention, Management Information Systems, Computer Engineering, Scale Development, Model Recommendation

A FLEXIBLE SAP-BASED FRAMEWORK FOR ELECTRONIC EXPENSE VOUCHER MANAGEMENT SUPPORTING DIGITAL TAX TRANSFORMATION

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Abstract

The increasing adoption of electronic applications in tax processes requires enterprise information systems and electronic document infrastructures to operate together. In this context, integrating electronic expense voucher processes with existing SAP workflows requires related steps, including processing source documents, creating electronic documents, transmitting them to the Turkish Revenue Administration (GİB), and monitoring submission results, to be handled in an integrated manner. This study presents a flexible solution developed to provide end-to-end digital document management for e-Expense Voucher processes within the SAP environment.

The solution enables electronic expense vouchers to be created based on source documents generated in the SAP Financial Accounting (FI), Materials Management (MM), and Sales and Distribution (SD) modules. Company information, document types, tax type codes, series information, XML field mappings, currency and unit mappings, and integration information can be defined through customizing structures. Generated document data are prepared in XML format and transmitted to GİB through a private integrator, while GİB responses are monitored as document statuses in SAP. Thus, source data from different SAP modules can be used within the electronic document process, and electronic communication with GİB can be centrally managed through SAP.

The e-Expense Voucher Cockpit enables document selection, individual or bulk submission, XML viewing, document output generation, error control, and access to source documents. Reporting, status inquiry, and log applications support monitoring submitted documents and process errors. As a result, e-Expense Voucher processes can be centrally managed within SAP, while manual intervention throughout the process is reduced. Overall, the study demonstrates how integrating electronic expense voucher processes into the SAP environment can support the digitalization of tax processes through a flexible and centralized approach.

Keywords: Digital Transformation; Enterprise Resource Planning; Electronic Document Management; Tax Compliance; SAP ERP; Electronic Expense Voucher

PLATFORM-INDEPENDENT ELECTRONIC SIGNATURES IN ENTERPRISE SYSTEMS

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Abstract

Electronic signature adoption in enterprise information systems has outpaced the standardization of how it is implemented. Most organizations still stitch together separate, application-specific signing components, each tied to a particular certificate authority or signature format. Many relied on client-side launch mechanisms such as Java Web Start (JNLP); once Oracle deprecated it in 2017 and removed it from Java SE 11 a year later, browsers stopped supporting the plugin model, and these signing clients stopped working. Private keys held on smart cards cannot legally be exported, so a server-only signing model was never a realistic fix. This paper presents a platform-independent electronic signature architecture built as a reusable .NET Standard core library, not another one-off integration. At its core sit three signature formats defined by the European Telecommunications Standards Institute (ETSI): XML Advanced Electronic Signatures (XAdES), CMS Advanced Electronic Signatures (CAdES), and PDF Advanced Electronic Signatures (PAdES), with multi-file packages handled through Associated Signature Containers (ASiC). Client-side signing runs on smart cards and hardware security modules (HSM). On the server side, REST and SOAP/WS-Security interfaces, Online Certificate Status Protocol (OCSP) and Certificate Revocation List (CRL) checks, and long-term validation (LTV) archival signing complete the picture. Turkey's most widely used signing library offers a comparable .NET implementation, but only for CAdES and XAdES; this architecture covers all four formats from a single codebase, validated through unit and integration testing across smart-card and HSM infrastructures. The payoff shows up in what organizations no longer have to do twice. Centralizing signature logic in one core instead of duplicating it per application cuts integration and maintenance costs, shortens document approval cycles, and keeps signing interoperable with external platforms such as government e-invoicing services. For enterprise information systems retiring manual, paper-based approval workflows, it offers a practical, standards-compliant reference model rather than another isolated tool.

Keywords: electronic signature; digital transformation; software architecture; computer security; information systems; interoperability

DESIGN OF AN ON-PREMISE AND ACTIONABLE CYBER THREAT INTELLIGENCE MODEL BASED ON X DATA USING LARGE LANGUAGE MODELS

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Abstract

This study is derived from the first author's master's thesis. The proliferation of cyber threats necessitates Security Operations Centers (SOC) to adopt proactive defenses rather than reactive countermeasures. Open-source intelligence (OSINT) from X (Twitter) provides critical early warnings, yet processing this unstructured and noisy stream remains challenging. Furthermore, commercial cloud-based Large Language Models (LLMs) introduce severe data sovereignty and privacy risks when handling proprietary threat data. This research aims to design an autonomous, end-to-end Cyber Threat Intelligence (CTI) framework that operates strictly on-premise to preserve data sovereignty while generating actionable intelligence.

The architecture employs Selenium for targeted dynamic web scraping, extracting raw security streams using threat-specific keywords. After automated text preprocessing and sanitization, local semantic inference is conducted via the Meta LLaMA 3 (8B) model using Ollama. To overcome stochastic structural deviations inherent to LLMs, an original "Autonomous JSON Hardening Protocol" was developed. To eliminate speculative confidence scoring, a multi-persona consensus mechanism and dynamic N-scaling algorithms were integrated.

Evaluated against a curated ground-truth dataset of 62 verified security events across 665 independent LLaMA 3 iterations, the model achieved 100.00% Recall, 76.79% Precision, 79.03% Accuracy, and an 86.87% F1-Score. The proposed JSON Hardening Protocol identified 64 malformed syntax errors and rectified them with a 100% recovery rate, preventing pipeline stalls. The system successfully prioritized 64.5% of incidents as "High Risk," accurately extracting CVE identifiers and threat actor entities.

The findings prove that open-weights LLMs deployed on restricted local hardware can fully safeguard corporate data sovereignty (GDPR/KVKK) while matching analytical standards. By automating Tier-1 triage and generating localized operational action plans, the framework mitigates analyst alert fatigue and substantially reduces Mean Time to Respond (MTTR).

Keywords: Cyber Threat Intelligence, Large Language Models, Open Source Intelligence, Data Sovereignty, Decision Support Systems, Artificial Intelligence.

ALGORITHMIC TEAMWORK IN THE WORKFORCE: A SOCIODEMOGRAPHIC ANALYSIS OF THE USE OF GENERATIVE AI FOR PROFESSİONAL PURPOSES IN TURKEY

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Abstract

This study explores sociodemographic factors associated with professional use of generative artificial intelligence (GenAI) among employed individuals in Turkey. The framework draws on "algorithmic teamwork." This concept treats GenAI as a collaborator in knowledge production and decision-making, not only as an automation tool. The analysis uses microdata from the 2025 Household Information and Communication Technology Usage Survey by the Turkish Statistical Institute (TÜİK). The analytical sample includes 10,776 currently employed individuals. The dependent variable is binary. It indicates whether a respondent used a GenAI tool for work-related purposes in the last three months. Independent variables are gender, age, education, household size, income, and region. Binary logistic regression was estimated with Generalized Linear Models. TÜİK population weights were applied. Marginal effects were calculated to express percentage differences in the likelihood of professional GenAI use. Findings show that gender, age, education, household size, income, and region are statistically significant. College graduates are 11.2% more likely than high school graduates to use GenAI professionally. Elementary school graduates are 16.7% less likely. The likelihood is lower among older age groups. The highest income group is 6.9% more likely than the lowest. Workers in Central and Eastern Turkey are 2.2% and 3.6% less likely than those in the West. Large households of six or more are 2.8% less likely. The gender effect is significant but weak. Men are 0.6% more likely than women. Overall, the findings suggest that the traditional digital divide has evolved into an asymmetric "AI Divide." This divide appears to favor young, highly educated, high-income knowledge workers. The study recommends inclusive AI literacy programs, regional investment, and accountability frameworks for human–AI collaboration.

Keywords Generative AI, Algorithmic Teamwork, AI Fragmentation, Technology Adoption, Binary Logistic Regression

INTEGRATION OF ELDERLY INDIVIDUALS INTO DIGITAL ECOSYSTEMS: ECONOMETRIC AND MACHINE LEARNING ANALYSIS OF FACTORS AFFECTING E-GOVERNMENT USAGE

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Abstract

The rapid acceleration of digital transformation has successfully transitioned public administration, healthcare, and social services onto digital platforms. However, this evolution frequently introduces a critical socio-economic challenge known as the "digital divide," which disproportionately affects elderly individuals. The purpose of this study is to identify the sociodemographic and economic factors influencing the likelihood of elderly individuals aged 65 and over adopting e-government services in Turkey. The study utilized the nationally representative microdata set from the 2025 Household Information and Communication Technology Usage Survey compiled by the Turkish Statistical Institute (TÜİK). To capture both linear relationships and non-linear feature importances, a hybrid methodology combining Binary Logistic Regression—estimated via Generalized Linear Models (GLM) using official population weighting coefficients (FERT_FAKTOR)—and Random Forest classification was implemented. The empirical findings indicate that educational attainment, income level, urban settlement type, and gender have statistically significant effects on the e-government adoption of senior citizens. In particular, increases in educational level and household income dramatically boost digital integration, while advanced age, female gender, and rural location deepen exclusion. Descriptive statistics reveal that active e-government usage among senior citizens remains critically low at 26.1%. The econometric estimations and algorithmic feature importance rankings consistently demonstrate that educational attainment is the paramount catalyst for digital public service adoption among older adults, followed by income and demographic variables. The research findings highlight that physical infrastructure accessibility alone is insufficient; digital literacy constraints and interface complexity are the primary determinants of the elderly digital divide. From a Management Information Systems (MIS) perspective, these results underscore an urgent need to adopt gerontological design principles in public administration architectures to ensure digital inclusion for aging societies.

Keywords Digital Divide, Elderly Individuals, E-Government, Machine Learning, Binary Logistic Regression

ELECTRIC VEHICLE POLICIES AND PUBLIC REACTIONS: A SENTIMENT ANALYSIS OF X (TWITTER) DATA USING BERTURK

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This paper is derived from the author's master's thesis.

Abstract

Background/Aims: The transition to electric vehicles (EVs) is not only a technological transformation in transportation but also a policy issue involving environmental sustainability, economic accessibility, charging infrastructure, and public acceptance. This study aims to examine public reactions to electric vehicle policies in Türkiye through X (Twitter) data and identify the main themes associated with positive, negative, and neutral sentiments.

Materials/Method: Data were collected from X (Twitter) for 01 January 2014–10 October 2025 using Python and Selenium. A total of 30,363 tweets were collected, and 28,596 remained after cleaning and preprocessing. Sentiment classification was performed using a BERTurk-based approach. A pseudo-labeled dataset of 4,091 tweets was divided into training, validation, and test sets at ratios of 80%, 10%, and 10%. Two Turkish BERT models were compared using Accuracy, Weighted F1, and Macro F1. LDA, word-frequency analysis, and hashtag analysis were also applied to identify major discussion themes.

Results: The dbmdz/bert-base-turkish-cased model achieved 0.7488 Accuracy, 0.7527 Weighted F1, and 0.7085 Macro F1 on the independent test set and was selected for final analysis. Overall, positive sentiment was dominant. However, economic costs and taxation, as well as battery, range, and technical characteristics, were associated with relatively high negative sentiment. LDA identified five main themes: economic costs and taxation; technology, production and market development; charging infrastructure and energy services; domestic production and TOGG perception; and battery, range and technical characteristics.

Conclusion/Implications: The findings indicate that public acceptance of EVs is shaped by multiple dimensions rather than technological development alone. Economic affordability, reliable charging infrastructure, technical performance, domestic production, and user experience should be considered together in EV policy design. The study demonstrates the value of social media analytics and Turkish natural language processing for data-driven evaluation of technology policies.

Keywords: Battery electric vehicle, BERT sentiment analysis, Electric vehicle, Public opinion, Twitter (X)

PARTICIPANT-INDEPENDENT MODEL-BASED CLASSIFICATION OF THE BIG FIVE PERSONALITY DIMENSIONS USING HANDWRITING IMAGES USING DEEP VISUAL REPRESENTATIONS

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Abstract

Background / Aims : This study addresses participant leakage in handwriting-based personality assessment by classifying the Big Five personality dimensions through participant-independent nested cross-validation. A total of 867 Turkish handwriting images collected from 45 participants were analyzed, with personality traits measured using the BFI-10.

Materials / Method : Deep visual representations were extracted using ResNet50 and a TrOCR visual encoder pre-trained on handwriting data. TrOCR embeddings were aggregated at the participant level using mean and standard deviation pooling. Logistic Regression and Shrinkage Linear Discriminant Analysis were evaluated as classifiers, while PCA with 5 and 10 components was used for dimensionality reduction. A late-fusion strategy combining prediction probabilities from ResNet50 and TrOCR was also examined. To reduce optimism bias and prevent participant leakage, all analyses were conducted at the participant level using 5-fold, 10-repeat nested cross-validation. Performance was evaluated using Balanced Accuracy, ROC-AUC, Matthews Correlation Coefficient (MCC), F1-score, precision, and recall, and compared with a DummyClassifier baseline.

Result : The strongest and most consistent performance was observed for Openness to Experience. ResNet50 achieved a Balanced Accuracy of 0.633 ± 0.091, ROC-AUC of 0.666, MCC of 0.276, and F1-score of 0.699, compared with a most-frequent DummyClassifier Balanced Accuracy of 0.496. TrOCR achieved a Balanced Accuracy of 0.630 and ROC-AUC of 0.645. For Conscientiousness, ResNet50 achieved a Balanced Accuracy of 0.588 and ROC-AUC of 0.626. For Emotional Stability, late fusion produced the highest Balanced Accuracy of 0.575. Extraversion remained close to chance, while Agreeableness did not show consistent performance above baseline. The findings indicate that handwriting-based visual patterns are not equally discriminative across personality dimensions. Predictive signals were most evident for Openness to Experience and, to a lesser extent, Conscientiousness.

Conclusion / Implications : The study contributes a transparent evaluation framework based on participant-independent validation, nested model selection, training-derived class thresholds, and explicit baseline comparison.

Keywords: Handwriting Analysis, Big Five Personality Traits, Deep Visual Representations, ResNet50 and TrOCR, Machine Learning, Nested Cross-Validation

ASYNCHRONOUS PEER LEARNING THROUGH OPEN ACCESS INSTITUTIONAL REPOSITORIES: HOW GRADUATION PROJECTS SUPPORT STUDENT LEARNING

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Abstract

At universities, graduation projects are classified as “second-tier gray literature” and are treated as exam documents. At universities in Turkey, they are not shared via open access and are destroyed after the statutory retention period expires. This situation leads to a loss of institutional memory and hinders asynchronous peer learning. This study was conducted as a qualitative single-case study with the aim of preventing the loss of institutional memory by storing graduation projects at Haliç University in an open-access institutional repository (OAIR). This project was developed in response to the university’s lack of an existing OAIR and the fact that projects are treated as exam documents. In the context of Haliç University, the goal is to share the metadata of projects at the undergraduate, associate’s, and graduate levels with the public. The works included in this graduation archive project serve as role models for future project developers, helping them overcome the “blank page syndrome” and address gaps in methodological knowledge. Project developers can identify topics and resolve issues related to writing guidelines by reviewing past projects. This contributes to asynchronous peer learning. The ability to cite projects displayed in the graduation archive as metadata facilitates their inclusion in the academic literature. Being indexed by Google Scholar as metadata allows all students who develop projects to view their projects as open access. As a reflection of Wilhelm von Humboldt’s vision that “every student is a researcher” and that “university work should be disseminated to the wider community,” this initiative is significant in that it confers the status of scientific work on both undergraduate and associate degree projects.

Keywords: Open Access Publishing, Gray Literature, Bibliometrics, Mentoring, Knowledge Management, Problem-Based Learning

TRANSFORMING ARTIFICIAL INTELLIGENCE RISKS INTO ACTIONABLE MANAGEMENT INFORMATION: A DESIGN SCIENCE APPROACH

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Abstract

The growing adoption of artificial intelligence (AI) in organizations creates new challenges associated with privacy, bias, inaccurate outputs, transparency, accountability, and regulatory compliance. Moreover, AI risk information is often dispersed across different systems, processes, and business functions, making it hard to transform risk-related data into actionable information for managerial decision-making. This study addresses the following research question: How can an AI-enabled management information system transform organizational AI risks into structured and actionable management information? The study focuses on developing a system prototype that operationalizes the risk-based management principles of ISO/IEC 42001:2023 and supports organizational AI governance. A Design Science Research (DSR) approach was utilized for this purpose using Notion AI. The prototype integrates an AI system inventory, AI risk register, control register, and management-oriented decision-support outputs. Synthetic organizational AI use cases from different business functions were developed to avoid the use of personal or confidential organizational data. Within the scope of the study, six synthetic AI use-case scenarios were selected based on four predefined criteria. Scenario-based analysis was employed to examine the system's ability to identify, structure, classify, prioritize, and associate AI risks with relevant control measures. The proposed prototype demonstrates a structured process for transforming dispersed AI risk data into management-oriented information. The system design enables AI use cases to be linked with identified risks, risk levels, proposed controls, and management priorities within an integrated information environment. It also offers a basis for creating consolidated risk summaries and decision-support information via Notion AI. The study conceptualizes AI risk management as both a governance issue and a management information systems problem. As a concrete output, the prototype generates an integrated AI risk register that links each synthetic AI use case to identified risks, risk levels, corresponding control measures, management priorities, and decision-support summaries.

Keywords: Artificial Intelligence, Risk Management, Management Information Systems, Artificial Intelligence Governance

CONTROL TOWER: AN ENGINEERING INTELLIGENCE AND GOVERNANCE PLATFORM FOR HETEROGENEOUS IT ECOSYSTEMS

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Abstract

Background/Aims: As enterprises manage hundreds of heterogeneous software projects across on-premise and cloud infrastructures, maintaining holistic visibility over technology stacks and security vulnerabilities becomes exceedingly complex. Concurrently, the uncontrolled adoption of artificial intelligence (AI) tools introduces novel challenges in cost management and resource optimization. Furthermore, assessing software product teams' maturity levels in adopting AI-native and agentic workflows is a critical necessity. This study introduces "Control Tower," an engineering intelligence platform designed to centralize IT governance, automate dependency analysis, and provide granular oversight over AI resource utilization across decentralized teams.

Materials/Method: Built on a high-performance architecture, the platform integrates with ecosystem tools to automate continuous technology stack analysis and monitor operational deployment statistics across cloud and on-premises environments. To address AI governance, it incorporates a dedicated sub-console utilizing LiteLLM and Cursor APIs to monitor AI key allocations, model-based usage analytics, and active user metrics. This systematically measures teams' AI-native maturity. Additionally, the system employs dynamic service mapping and embeds real-time pre-deployment security checkpoints (Takeoff Clearance) directly into CI/CD pipelines.

Results: Implementation projections demonstrate significant operational improvements. Centralized AI tool governance is expected to yield a 29% reduction in AI licensing costs. Model usage costs have decreased by 38% through model optimization, preventing budget overruns while providing actionable visibility into agentic workflow maturity. Furthermore, the platform centralizes deployment metrics and has decreased critical pre-deployment vulnerabilities by 54%. Additionally, by automating previously unmanageable tracking processes across massive ecosystems, the platform saves an estimated 4 Full-Time Equivalents (FTEs), redirecting these engineering efforts toward innovation.

Conclusion/Implications: The Control Tower platform successfully transforms fragmented technical and deployment data into context-aware, actionable intelligence. By unifying DevSecOps auditing, hybrid infrastructure monitoring, and proactive AI governance, it optimizes enterprise investments and

fosters the structured advancement of AI-native maturity, providing a scalable and extendable platform for modern IT management.

Keywords: AI Governance, AI-Native Maturity, IT Governance, Engineering Intelligence, DevSecOps, Agentic Workflows.

Declaration of AI Usage

During the preparation of this work, the authors used Google Gemini to assist with improving the abstract's academic English and supporting translation tasks. The authors critically reviewed, verified, and edited all AI-assisted outputs and retained full control over the intellectual content of the work. The authors accept full responsibility for the accuracy, integrity, and final content of this abstract.

USE OF INFORMATION TECHNOLOGIES AND APPLICATIONS FOR PERSONS WITH DISABILITIES AND THEIR ROLE IN SOCIAL POLICY: A QUALITATIVE STUDY

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Abstract

Background/Aims: This study investigates the current information technologies available for persons with disabilities and evaluates the extent to which these technologies are recognized, utilized, and adopted by disabled individuals. Additionally, it aims to examine the overall attitudes and approaches of local public institutions toward accessibility in information technologies.

Materials/Method: This qualitative case study investigates the awareness, usage, and adoption of information technologies among persons with disabilities, alongside public institutions' attitudes toward digital accessibility. Primary data were gathered through semi-structured interviews with individuals across various disability groups, their families, a public institution administrator, and disability NGO leaders. Data collection was guided by sub-dimensions of the SAITAPSD, PTPI, and MARSAD scales, with qualitative analysis conducted via MAXQDA 2024 software.

Results: The primary findings obtained from the study are summarized as follows:

• While the participating public institution actively carries out satisfactory activities for persons with disabilities, there is a clear need for enhanced support regarding up-to-date information technology (IT) applications tailored to disabled individuals.

• Local governments tend to relegate disability-focused IT implementations behind traditional municipal services, heavily influenced by habitual administrative paradigms and service approaches.

• The severity and specific nature of an individual's disability directly influence their orientation toward IT solutions..

• Disability non-governmental organizations (NGOs) and associations were found to express expectations and needs primarily at a foundational level.

• Persons with disabilities place higher value on interactive and engaging applications—such as live music streaming—whereas their family members prioritize applications that bring joy to their children and offer practical assistance during critical moments.

Conclusion/Implications: Ultimately, the findings reveal significant potential for collaborative inter-institutional projects (such as TUBİTAK 4008 initiatives) involving public agencies, local governments, non-governmental organizations, and Management Information Systems (MIS) departments to enhance disability informatics applications. Furthermore, concrete suggestions for future research regarding the specific content and development of assistive technology applications are provided.

Keywords: Assistive Technologies, Digital Accessibility, Persons with Disabilities, Disability Informatics, Management Information Systems, Qualitative Research.

FROM PAPER TO PROCESS: LCNC-BASED BPM DIGITALIZATION AND USER ADOPTION IN THE DEFENSE INDUSTRY

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Abstract

Background: In compliance-sensitive defense organizations, workflow execution traditionally relies on manual approval chains, scattered e-mails, and paper archives, while ancillary processes frequently lack formal digital records. This creates documentation obsolescence and operational bottlenecks. This study aims to eliminate these manual constraints by redesigning training and meeting workflows within a Business Process Management (BPM) framework, deploying them on a Low-Code/No-Code (LCNC) platform (Paperwork), and evaluating end-user usability and adoption dynamics.

Method: A sequential explanatory mixed-methods single-site case study was conducted at a defense company with over 300 employees. Following an As-Is bottleneck analysis, target-state (To-Be) workflows were modeled in BPMN 2.0 and deployed on Paperwork, incorporating hierarchical digital approvals, centralized cabinet storage, and background algorithmic double-booking prevention (Poka-Yoke). Usability was evaluated with eleven active users using the Turkish-validated System Usability Scale (SUS-TR) complemented by qualitative feedback analyzed thematically.

Results: The overall mean SUS-TR score was 70.45 (SD = 26.8), denoting acceptable usability. High satisfaction was recorded for data-entry ease (100% positive), interface design (81.8%), and processing speed compared to legacy routines (90.9% better). However, individual scores exhibited bimodal polarization: seven participants scored between 65 and 100, while four clustered between 35 and 45. Thematic analysis confirmed that low scores reflected attitudinal resistance and habituation to legacy manual routines rather than technical interface failure or digital literacy deficits.

Conclusıon: LCNC platforms provide viable, agile environments for BPM transformation in compliance-driven industries, establishing auditable digital workflows. Because adoption barriers are predominantly cultural rather than technological, technical rollouts must be coupled with structured organizational change management, value framing, and role-based onboarding to ensure sustained institutional adoption.

Keywords: Business Process Management; Digital Transformation; Low-Code/No-Code; System Usability Scale; Citizen Developer; Change Management.

ENVIRONMENTAL, SOCIAL, AND GOVERNANCE DIMENSIONS OF AI MANAGEMENT: A CONTENT ANALYSIS OF ISO/IEC 42001:2023

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Abstract

The popularity of adoption of artificial intelligence (AI) in organizations has increased the need to consider sustainability alongside risk, accountability, and responsible technology governance. ISO/IEC 42001:2023 provides a management system framework for governing AI; nonetheless, its relationship with the environmental, social, and governance (ESG) dimensions of sustainable AI management requires further investigation. The purpose of this study is to evaluate how ESG dimensions are represented within ISO/IEC 42001:2023 and to identify areas that may require complementary sustainability considerations. The study employs qualitative content and gap analyses. The requirements and sub-requirements of ISO/IEC 42001:2023 are treated as units of analysis. A coding framework is developed around these three dimensions: environmental, social, and governance. Environmental codes includes energy efficiency, computational resources, environmental impact, resource efficiency, AI lifecycle, and environmental monitoring. Social codes addresses human oversight, fairness, stakeholder impact, accessibility, human well-being, and workforce impact. Governance codes entail accountability, transparency, risk management, data governance, documentation, performance monitoring, and continuous improvement. Each unit is coded as 0 (not addressed), 1 (indirectly addressed), or 2 (explicitly addressed). The results of analysis demonstrate a structured mapping of ISO/IEC 42001:2023 requirements across ESG dimensions and enable the identification of areas of direct, indirect, and limited representation. The resulting matrix highlights potential gaps between AI management system requirements and broader sustainable AI considerations. The study contributes to the sustainable AI and Green Information Systems literature by expanding the interpretation of AI management systems beyond governance and compliance. Based on the gaps identified, a complementary framework is suggested to assist organizations in integrating environmental, social, and governance considerations into their AI management practices.

Keywords: Artificial Intelligence, ESG Dimensions, Green IS, Sustainability, AI Governance

DIGITAL SHADOW: THE INVISIBILIZATION OF EMPLOYEE COMPETENCIES AND THE PERFORMANCE EVALUATION PARADOX IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract

Background/Aims: The growing integration of artificial intelligence (AI) into organizational workflows is reshaping how employee performance is assessed. As AI systems increasingly mediate task execution and output quality, the human competencies underlying observable performance may become less visible. This study conceptualizes this phenomenon as the "digital shadow" and examines a central performance evaluation paradox: while AI-assisted work may make outputs increasingly measurable, the individual competencies underlying those outputs may become more difficult to observe and accurately assess.

Materials/Method: This conceptual study draws on secondary literature and integrates Signaling Theory and Attribution Theory to examine competency assessment in AI-mediated work. No primary data were collected from human participants; therefore, ethics committee approval was not required. Through theory-driven conceptual synthesis, the study examines how AI mediation may alter competency signals and influence the attribution of performance outcomes to either the employee or the technological system.

Results: The conceptual analysis identifies two complementary mechanisms. "Competency illusion" occurs when AI-enhanced outputs lead evaluators to infer a level of individual competence that may not correspond to the employee's underlying capabilities. Conversely, "competency shadowing" occurs when genuine employee expertise becomes obscured because part of the observed performance is attributed to AI. These mechanisms are integrated into a conceptual model in which signal distortion and attribution bias jointly shape competency visibility in AI-mediated performance evaluation.

Conclusion/Implications: The proposed model provides a theoretical foundation for examining how organizations assess human competence when work outcomes are increasingly co-produced by employees and AI systems. It also establishes a basis for future empirical research, including the development of measures of competency visibility and organizational studies of digital shadow effects in performance evaluation. By identifying and structuring this paradox, the study offers a novel conceptual lens for understanding the changing relationship between human competence, AI-assisted performance, and organizational evaluation.

Keywords: Digital shadow; Artificial intelligence; Performance evaluation; Signal theory; Attribution theory; Competency visibility

INTERGENERATIONAL DIFFERENCES IN SOCIAL MEDIA USE AND THEIR DETERMINANTS

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Abstract

This study aims to identify intergenerational differences in digital behavior by examining the demographic, socioeconomic, and technological factors that determine social media use in today's rapidly digitalizing social structure, using a relational survey model—one of the quantitative research designs. The study utilizes the micro-data set of the 2024 Household Information and Communication Technologies Usage Survey conducted by the Turkish Statistical Institute. A nationwide sample of 22,300 participants, representing the general population of Türkiye, was divided into four main groups— Baby Boomers, Generations X, Y, and Z—based on their birth years. Analysis results revealed that the tendency to use social media is not homogeneous across generations; as age decreases, the likelihood of use increases significantly. Generation Z stands out as the group with the highest motivation and likelihood of use compared to the reference group, the Baby Boomers. Contrary to the common trend in the literature, it was found that in the Turkish sample, men are statistically more likely to use social media than women, and this difference reaches its most prominent level within Generation Z. The most striking finding of the study is that participation in e-commerce increases the probability of social media use by 31.1% among Baby Boomers, making it the most decisive digital factor for this generation. Additionally, it was observed that economic indicators such as household income and employment status have significant effects on intergenerational social media preferences. Furthermore, low education levels were identified as a key factor triggering digital exclusion. The findings indicate that the digital divide in Türkiye is no longer limited to access to technology but has acquired a structural character shaped by the quality of use and socioeconomic dynamics. This clearly demonstrates that technology policies should be developed in a more inclusive and layered structure that considers the unique needs of each generation.

Keywords: Management Information Systems, Social Media, Intergenerational Differences, E-Commerce, Digital Divide

EXPLAINABLE, TIERED WEB-BASED CLINICAL DECISION SUPPORT SYSTEM FOR SURGICAL TRIAGE IN LOW BACK PAIN

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Abstract

Background/Aims: Treating low back pain often means weighing many patient-reported symptoms together with clinical findings. Existing prediction models often rely on advanced imaging and give little insight into how they reach a decision. This study aimed to build a tiered, explainable machine-learning clinical decision support system (CDSS) estimating the likelihood of surgical treatment from patient-reported data and simple bedside neurological tests, without imaging.

Materials/Method: In this prospective, single-centre, cross-sectional study, data from 312 patients with low back and leg pain were analysed. Ten machine-learning algorithms were compared across three tiers: patient-reported symptoms alone (Tier 1); symptoms plus the straight-leg-raise (Lasègue) test and motor-strength testing (Tier 2, primary model); and all clinical variables (Tier 3). Discrimination was measured with repeated 10×5-fold stratified cross-validation (CV-AUC). Calibration was checked with the Brier score, and clinical usefulness with decision-curve analysis. SHAP explained predictions, and the selected model was built into an experimental Python/Flask web-based CDSS.

Results: Tier 1 showed only moderate discrimination (CV-AUC=0.749). Adding two bedside tests raised the primary Tier 2 model to CV-AUC=0.970, close to the full Tier 3 model (0.976). On the independent test set, Tier 2 reached 87.3% accuracy, 0.96 sensitivity, and 0.82 specificity, with good calibration (Brier=0.093) and positive net benefit across relevant thresholds. SHAP showed that Lasègue positivity, motor weakness, and age most strongly influenced predictions.

Conclusion/Implications: Patient-reported information alone provided limited prediction, while two simple bedside examinations markedly improved performance. The findings demonstrate the feasibility of imaging-free, explainable decision support. However, the model predicts the treating specialist's decision rather than an independently verified surgical outcome. Therefore, it should be considered a decision-support and standardisation tool, not an independent diagnostic system. Findings are single-centre and external multicentre validation is needed before routine use.

Keywords: Clinical decision support systems; explainable artificial intelligence; machine learning; low back pain; surgical triage; health informatics

USER ATTITUDES TOWARD AI-SUPPORTED DIGITAL SELVES: A COMPARISON OF STATIC AND EVOLVING DIGITAL SELVES

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Abstract

Background/Aims: Increasing digitalization enables individuals to leave extensive digital traces, including texts, images, audio recordings, videos, preferences, and behavioral data. Advances in machine learning and generative artificial intelligence make it possible to construct AI-supported digital selves based on these traces. This study examines user attitudes toward such systems and proposes a distinction between a "static digital self," which remains limited to information accumulated during an individual's lifetime, and an "evolving digital self," which can generate new content, learn new information, and develop after the individual's lifetime.

Materials/Method: A quantitative, scenario-based survey design was employed. Participants evaluated progressively autonomous scenarios in which an AI-supported digital self presented an individual's existing information, generated new responses by imitating their communication style, produced new ideas or works based on previous creations, and continued learning after the individual's lifetime. Perceived identity representation, trust, ethical acceptability, and consent were assessed.

Results: Preliminary findings indicate decreasing acceptance as system autonomy increases. While 71.4% considered a static system representing existing information to reflect the individual's digital identity, this proportion decreased to 38.1% when the system generated previously unexpressed responses. Only 19.0% reported trust in content produced by an evolving digital self, and 14.3% considered such a system ethically acceptable. Explicit consent emerged as a central concern: 90.5% stated that consent during the individual's lifetime should be required. Nevertheless, 66.7% considered the development of new views after the individual's lifetime inappropriate even when explicit consent existed.

Conclusion/Implications: The findings suggest a perceived boundary between preserving an individual's digital traces and creating an autonomous AI entity acting on their behalf. Explicit consent appears necessary but insufficient to legitimize continued autonomous development, highlighting important implications for digital identity, representation, and posthumous AI governance.

Keywords: Artificial Intelligence; Digital Identity; Digital Self; Generative Artificial Intelligence; Machine Learning; Informed Consent

EVALUATION OF THE ARTIFICIAL INTELLIGENCE PERFORMANCE OF G20 COUNTRIES ACROSS SCIENTIFIC, TECHNOLOGICAL, HUMAN CAPITAL, AND COMMERCIAL DIMENSIONS: AN ENTROPY-COCOSO APPROACH

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Abstract

Background/Aims: Artificial intelligence (AI) has become an increasingly strategic field with a significant influence on economic growth, technological innovation, scientific research, and international competitiveness. The level of AI development across countries can be assessed by considering multiple factors collectively, including scientific research capacity, patents, the commercial ecosystem, and a skilled human capital base. This study aims to analyze the AI performance of G20 countries, which represent a substantial share of the global economy and technological production, using an integrated multi-criteria decision-making (MCDM) approach.

Materials/Method: Rather than relying on a single index, this study constructed an original decision matrix using data obtained from different official data sources. The weights of the criteria were determined using the Entropy method, while the final performance ranking of the countries was computed utilizing the CoCoSo method.

Results: Given the findings obtained using the Entropy method, the criteria were ranked from most to least important as follows: number of AI-related patents per capita, AI talent score, AI commercial ecosystem score, and number of AI-related scientific publications per capita. Given the findings obtained using the CoCoSo method, the three countries with the highest AI performance were the USA, South Korea, and China, whereas the three countries with the lowest AI performance were Mexico, South Africa, and Argentina.

Conclusion/Implications: The results indicate that countries' AI performance is not determined only by their overall economic size; rather, the competitive structure among countries is shaped by the relative importance of strategic criteria such as patent activity and AI-related talent. This study is expected to contribute to the literature by identifying differences in AI performances of G20 countries through the integration of data from different institutional sources and by providing a comparable ranking based on the Entropy-CoCoSo methods.

Keywords: Artificial Intelligence Performance, CoCoSo, Entropy, G20 Countries, MCDM.

TAKASLA: AN ARTIFICIAL INTELLIGENCE-SUPPORTED SUSTAINABLE E-COMMERCE PLATFORM WITH AUTOMATED CONTENT MODERATION

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Abstract

Background/Aims: Rapid consumption, the depletion of natural resources, and increasing waste have intensified the need for alternative platforms that support sustainable consumption and product reuse. This study aims to develop **TAKASLA**, a platform that enables the exchange of usable products, integrates sustainable consumption with artificial intelligence (AI), and creates a safer and more reliable exchange environment through the moderation of user-generated content.

Materials and Method: TAKASLA is an AI-supported product exchange platform designed for web and mobile environments. The system integrates product exchange among users, personalized recommendations based on user preferences and behaviors, and AI-based automated content moderation for identifying inappropriate or potentially harmful content in product listings and user-generated content.

Results:The developed TAKASLA model provides a sustainable digital exchange approach that supports the recirculation of usable products. The platform integrates product exchange, personalized recommendations, and automated content moderation within a single system. While existing AI-supported barter applications primarily use AI for functions such as product recognition, product valuation, and user or exchange matching, TAKASLA positions automated content moderation as a trust and safety component of the exchange ecosystem. This approach contributes to reducing potential risks arising from user-generated content and promoting a more reliable user experience.

Conclusion:TAKASLA integrates sustainable consumption, product reuse, AI-supported personalization, and automated content moderation within a unified e-commerce model. The distinctive aspect of the study is that AI is used not only for functions such as product matching and valuation but also as a proactive safety layer for moderating user-generated content in a barter-based digital marketplace. In this respect, TAKASLA offers a sustainable e-commerce model that supports safer digital interaction, encourages product reuse, and may contribute to reducing resource consumption and waste generation.

Keywords: E-commerce platform, Exchange, Inappropriate content moderation, Artificial intelligence

SBOM-BASED SOFTWARE SUPPLY CHAIN RISK MANAGEMENT: EVALUATION OF OPEN SOURCE, SAAS, AND AI COMPONENTS

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Abstract

Software Bills of Materials (SBOMs) are increasingly promoted as a mechanism for making software supply chains observable. However, the existence of an SBOM does not necessarily make its records operationally usable for vulnerability management. This study examines how completely package records from public open-source repositories can be mapped to a vulnerability intelligence service and how observable exposure varies across software ecosystems.

A reproducible descriptive analysis was conducted on SPDX 2.3 SBOMs obtained via the GitHub Dependency Graph for eight public repositories: Kubernetes, Visual Studio Code, Flask, FastAPI, pandas, TensorFlow, Node.js, and Apache Airflow. Package names, versions, and ecosystems were normalized from package URLs and submitted to the Open Source Vulnerability (OSV) batch query service. The analysis calculated OSV query ability, known-vulnerability exposure among query able packages, and vulnerability-record concentration. The sample contained 18,739 package records, of which 17,040 (90.93%) were query able through the implemented mapping method. OSV returned at least one vulnerability record for186 package records and 506 vulnerability records in total. Query ability ranged from 3.70% for pandas to 99.95% for Kubernetes. The observed share of query able packages with a known OSV record ranged from 0.28% for Node.js to 25.00% for pandas; the latter estimate was based on only four query able records and should not be generalized.

SBOM-based risk management should therefore assess not only whether an SBOM exists but also whether its records are identifiable, query able, and linked to actionable vulnerability intelligence. The findings support a governance workflow that combines SBOM integrity checks, ecosystem aware normalization, vulnerability-database enrichment, and supplier-level review.

This workflow provides a practical decision-support basis for software procurement and patch prioritization, while the non-random sample and database coverage require cautious interpretation.

Keywords: software supply chain; software bill of materials; cybersecurity; open-source software; vulnerability management; risk assessment

CYBERSECURITY AND PRIVACY GOVERNANCE IN ORGANIZATIONS USING GENERATIVE AI: A MATURITY MODEL BASED ON THE NIST AI RMF

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Abstract

Organizations are rapidly integrating public generative artificial intelligence (GenAI) services,Self-hosted foundation models, retrieval augmented generation applications, and tool using agents into business processes. This expansion introduces cybersecurity, privacy, ethical, and accountability risks that cannot be addressed solely through model performance metrics. This study proposes an organizational maturity model based on the NIST Artificial Intelligence Risk Management Framework (AI RMF) for governing GenAI use.

A design science approach was used to synthesize NIST AI RMF 1.0, the NIST Generative AI Profile, and DOI indexed research published between 2021 and 2026. The instrument operationalizes the AI RMF functions Govern, Map, Measure, and Manage across sevendi mensions: governance and accountability; use case and risk mapping; data and privacylifecycle; security engineering and access control; evaluation, monitoring, and assurance; human oversight, ethics, and workforce; and third party and lifecycle resilience. Twenty-one evidence items are scored on a 0–4 scale and converted into a normalized maturity index.

The model defines five levels Initial, Developing, Defined, Managed, and Optimized and includes a critical floor rule that prevents high aggregate scores from masking weaknesses in

privacy, security, assurance, or third-party controls. The literature synthesis indicates that GenAI governance must integrate technical testing with organizational accountability, data lifecycle controls, meaningful human oversight, continuous monitoring, and supplier governance. The model treats governance as a lifecycle capability rather than merely a policy document.

The proposed model enables organizations to move from asking whether they use GenAI to asking under which cybersecurity, privacy, and ethical controls they use it. It is intended as a decision support and self-assessment instrument, not as a certification scheme or a predictor of breach probability. Future research should establish content validity through expert evaluation and test reliability, construct validity, and practical feasibility with information security, privacy, IT, risk, and internal audit professionals.

Keywords: Generative AI; cybersecurity governance; privacy governance; NIST AI RMF; organizational maturity;responsible AI; large language models

THE MIS CAPABILITY PARADOX: A DYNAMIC APPROACH TO EFFECTIVE USE UNDER ORGANIZATIONAL INFORMATION-PROCESSING CONSTRAINTS

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Abstract

Expanding management information systems (MIS) capability can strengthen decision support and increase access to decision-relevant information. Yet greater technological capability does not necessarily translate into more effective MIS use in managerial decision making. Existing research addresses different aspects of this problem, including technological capability, effective use, information load, managerial attention, system complexity, and integration. Less clear is how these mechanisms interact as MIS capability develops and why their relative influence may change over time. This study conceptualizes this problem as the MIS Capability Paradox and develops a dynamic theoretical framework to explain the conditions under which it may emerge.

The theory is developed conceptually and formalized using system dynamics to represent accumulation, history dependence, and unequal rates of change. The model treats MIS Capability, Unprocessed Information Backlog, System Complexity, and System Integration as four accumulated states. Its starting point is Dual Generation: expanding MIS capability can simultaneously strengthen decision-support potential and increase the supply of decision-relevant information requiring organizational processing. Processing pressure, however, is not determined by information quantity alone. The Processing-Burden Architecture explains how unprocessed information, system complexity, and system integration shape the effort required to process information under finite managerial attention. Because these conditions need not develop at the same rate as MIS capability, their relative influence can shift over time—a process conceptualized here as Dynamic Mechanism Rebalancing.

Rather than assuming a predetermined linear or inverted-U relationship between MIS capability and effective use, the framework explains effective use as dependent on the evolving relationship between technological value potential and the organizational information-processing conditions required to realize that potential. Sustainable MIS effectiveness therefore requires not only expanding technological capability but also developing the organizational conditions needed to convert that capability into effectively usable value.

Keywords: MIS capability; effective MIS use; organizational information processing; managerial attention; system complexity; system dynamics.

SMARTCARE: A ROLE-BASED SMART NOTIFICATION SYSTEM DESIGN FOR MANAGING CLINICAL DATA IN HOSPITAL INFORMATION SYSTEMS

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Abstract

Background/Aims: Hospitals generate large volumes of clinical data, including vital signs, laboratory results, treatment information, and clinical observations. However, timely identification and communication of clinically significant changes remain challenging. Excessive and non-prioritized alarms may also contribute to alarm fatigue and workflow interruptions. This study proposes SmartCare, a role-based clinical notification and decision support system that evaluates clinical data, prioritizes significant changes, and delivers appropriate notifications to the relevant healthcare professional.

Materials/Method: SmartCare was designed as a multi-stage clinical information management system. Its architecture includes clinical data integration, data quality control, temporal trend evaluation, configurable clinical rule processing, notification prioritization, role-based user matching, wearable notification, acknowledgement tracking, and escalation. The proposed data model includes oxygen saturation, heart rate, respiratory rate, blood pressure, body temperature, consciousness status, critical laboratory results, and treatment-related information. Notifications are matched with the responsible healthcare professional according to patient assignment, professional role, and priority. Smartwatch-based notifications serve as a rapid interaction interface, while detailed clinical information remains available through secure clinical information systems. A scenario-based simulation framework is proposed for evaluation.

Results: SmartCare establishes an integrated workflow connecting hospital information systems with role-based clinical notifications and wearable technologies. The system separates data acquisition, clinical evaluation, prioritization, user matching, acknowledgement, and escalation rather than generating undifferentiated alerts. The evaluation framework assesses recipient matching, notification delivery time, acknowledgement and response times, unnecessary notification rates, and escalation success.

Conclusion/Implications: SmartCare provides a system-level approach to clinical information management by integrating data evaluation, role-based notification, priority management, acknowledgement tracking, and escalation. Its contribution is the integration of these functions rather than smartwatch use alone. The system is designed to support healthcare professionals without replacing clinical judgment.

Keywords: Health Informatics; Hospital Information Systems; Clinical Decision Support Systems; Wearable Technology; Alarm Management; Clinical Notification

ARTIFICIAL INTELLIGENCE INTEGRATION IN ORGANIZATIONAL INFORMATION PROCESSING: A TASK-BASED COMPARATIVE ANALYSIS

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Abstract

Artificial intelligence (AI) is increasingly integrated into digital applications used for organizational information processing. However, assessing this integration only by what AI can do overlooks two questions: how tasks are divided between users and AI, and how users retain control. Research on human–AI collaboration has addressed task delegation and human oversight, but few studies have compared how these dimensions are reflected in organizational applications at the task level. Drawing on task delegation and human oversight, this study investigates how AI functions, user control, and support for evaluating AI-generated outputs are combined across information-processing tasks.

A document-based comparative analysis covers five areas: business communication, document production, data analysis, document analysis, and meeting/collaboration. The study draws on provider documentation for Gmail/Gemini, Microsoft 365 Copilot in Word, Excel, and Teams, and Adobe Acrobat AI Assistant. From these sources, 28 AI-enabled tasks were selected and analyzed along three dimensions: AI functions, user involvement and control, and features supporting the evaluation of AI-generated outputs.

The results reveal a distinction between AI capabilities and the conditions under which users remain involved. AI primarily supports information retrieval, generation, summarization, and analysis, while direct system action is limited to a few tasks. More importantly, comparable AI capabilities are accompanied by different forms of user control and mechanisms for evaluating AI-generated outputs. These mechanisms range from access to underlying context and sources to source traceability and explicit verification guidance. Thus, what AI can do does not fully indicate how much control users retain or what support is available for evaluating its outputs.

The study extends discussions of task delegation and human oversight through a task-level comparison across organizational applications. For managers, the findings highlight the importance of assessing AI-enabled systems beyond their capabilities, considering both user control and the support available for evaluating AI-generated outputs.

Keywords: Artificial Intelligence, Management Information Systems, Human–AI Collaboration, Information Processing, Human Oversight

TRIPLE TRANSFORMATION - URBAN, GREEN, AND DIGITAL: A SOCIO-TECHNICAL ANALYSIS OF TÜRKİYE'S SMART CITY POLICIES WITHIN THE FRAMEWORK OF THE 12TH DEVELOPMENT PLAN

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Abstract

Urbanization challenges require twin transitions (green & digital) to achieve sustainable development goals. Specifically, the twin transition is a key tool for SDG 11, transforming cities into smart cities that use digital technologies to be inclusive, safe, resilient, and sustainable. While developing smart cities, slum areas and informal settlements are major challenges to urbanization and to achieving sustainable goals in developing nations like Türkiye. Therefore, Türkiye has established various regulations and laws for urban transformation. This suggests that twin transitions alone are inadequate for Türkiye and other developing nations to address urbanization challenges. Thus, "Triple Transformation (Urban, Green and Digital)," which takes the "Twin Transition" approach one step further by placing the spatial dimension, is necessary. This necessity supports a socio-technical approach, which is the fundamental philosophy of management information systems. In this context, this study examines smart city strategies in Türkiye's 12th Development Plan and the complementary Urban Quality of Life Report from a Management Information Systems (MIS) perspective for triple transformation. In this context, the study used a qualitative document analysis design and systematically coded policy texts. For coding, the study followed a mixed content analysis strategy, blending main codes derived from global smart city indices (IMD/IESE) with sub-codes from policy texts. Within this strategy, the study cross-examined urban-green objectives (vertical axis) with digital objectives (horizontal axis) on a two-dimensional matrix. This approach identified mismatches between strategic objectives in policy texts and the technical infrastructure. Based on these findings, the study presents a strategic framework to help decision-makers achieve sustainable development goals and contribute to the targets of Sustainable Development Goal 11 (SDG 11).

Keywords: Triple Transformation, Smart Cities, Digital Transformation, SDG 11, Sustainable Development, Management Information Systems, Socio-Technical Analysis

FROM DIGITAL PASSENGER FEEDBACK TO MANAGEMENT DECISIONS: GENERATING MULTILINGUAL AND EXPLAINABLE PASSENGER EXPERIENCE INTELLIGENCE FROM GOOGLE MAPS REVIEWS AT ANTALYA AIRPORT

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Abstract

Background / Aims : Online user-generated reviews provide a rich data source that complements traditional survey-based service quality assessments. However, airport service quality studies often rely on overall sentiment classification or frequency analyses of predefined categories, limiting their ability to distinguish simultaneous and divergent evaluations of multiple service attributes within a single review. This study develops and validates an end-to-end artificial intelligence framework that transforms multilingual, unstructured Google Maps reviews of Antalya Airport into aspect-level, explainable, and managerially actionable service quality intelligence.

Materials / Method : A total of 50,166 Google Maps reviews posted between 2013 and 2026 were analyzed, including 21,897 reviews containing free-text content. An 18-dimensional hybrid service ontology was constructed by integrating ASQ dimensions with data-driven themes identified through TF-IDF/SVD-based clustering. Aspect-level multi-label sentiment extraction was evaluated using classical machine learning, a fine-tuned multilingual Transformer (XLM-RoBERTa), and a few-shot large language model under identical train/validation/test splits. Twenty-four machine-learning algorithms were compared using Macro-F1 and class-level precision, recall, and F1. The best-performing model was applied to the full corpus. Aspect-level sentiment variables were subsequently modeled using ordinal logistic regression and gradient boosting with SHAP to explain star ratings and derive a managerial decision-support matrix.

Result : XGBoost achieved the highest Macro-F1 score (0.801), outperforming LightGBM (0.790), logistic regression (0.782), XLM-RoBERTa (0.692). SHAP analysis identified comfort and seating, check-in/baggage processes, food and beverage services, waiting time/queue management, and price perceptions as the strongest drivers of overall satisfaction. The decision matrix prioritized check-in/baggage, waiting time, price perception, and staff attitude as high-impact improvement areas.

Conclusion / Implications : The framework advances airport review analytics from generic sentiment classification toward explainable, aspect-based passenger experience intelligence and offers a reproducible decision-support approach for converting unstructured digital trace data into prioritized managerial actions

Keywords: Airport Service Quality; User-Generated Content; Aspect-Based Sentiment Analysis; Explainable Artificial Intelligence; Large Language Models; Decision Support Systems

DIGITAL LITERACY AND AWARENESS OF DIGITAL TECHNOLOGIES AMONG MERCHANTS: A STUDY ON THE CASE OF NIGDE

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Abstract

Background/Aims: The rapid diffusion of digital technologies has transformed the way businesses communicate, conduct transactions, access information, and manage their daily operations. In this process, digital literacy has become an important competency for individuals and organizations to adapt effectively to technological change. For merchants, who constitute an important part of local economic activity, the ability to understand and use digital technologies may influence their adaptation to digital transformation. However, the level of digital literacy and awareness of digital technologies among local merchants remains insufficiently explored. Therefore, this study aims to examine the digital literacy levels and awareness of digital technologies among merchants operating in Niğde. It also investigates whether digital literacy is associated with awareness of digital technologies.

Materials/Method: A quantitative research design will be employed using a survey method. The target population consists of merchants operating in Niğde. Data will be collected through a structured questionnaire comprising demographic and business-related questions and measurement items addressing digital literacy and awareness of digital technologies. Descriptive statistics will be used to determine participants' digital literacy and technology awareness levels. Reliability analysis and appropriate inferential statistical methods will be applied to examine relationships between the variables and differences across selected demographic and business characteristics.

Results: Data collection and statistical analysis are ongoing. The study is expected to identify the current level of digital literacy and awareness of digital technologies among merchants and to reveal whether digital literacy is significantly associated with technology awareness.

Conclusion/Implications: The study is expected to contribute to the information systems literature by providing empirical evidence on digital competencies and technology awareness at the local business level. Its findings may also provide practical implications for digital literacy initiatives and policies supporting merchants' adaptation to digital transformation.

Keywords: Digital Literacy; Digital Technologies; Technology Awareness; Digital Transformation; Merchants; Information Systems**.**

WHEN HELP HURTS: DESIGNING SKILL-PRESERVING GENERATIVE AI FOR INFORMATION SYSTEMS EDUCATION

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Abstract

Background/Aims: Generative AI (GenAI) assistants now sit inside the everyday workflow of students and knowledge workers, yet recent experimental evidence suggests that unrestricted assistance can improve immediate performance while, in some settings, weakening subsequent unaided performance and critical engagement. The information systems (IS) discipline has met this problem before: Zuboff's distinction between technology that automates work and technology that informates it, and the decision support literature on automation bias, anticipated this tension between assistance and capability preservation. This study asks how GenAI tools can be designed so that they informate rather than automate learning, preserving the skills learners are meant to acquire.

Materials/Method: We conduct a conceptual analysis that integrates three streams: classic IS theory on deskilling and automation, cognitive science on desirable difficulties and retrieval practice, and recent empirical work on GenAI in education and work. From this synthesis we derive a design framework and a set of testable propositions.

Results: The framework, which we call Form, Not Volume, argues that learning outcomes depend less on how much assistance is available than on the form in which it is delivered. It specifies three friction mechanisms, namely delayed disclosure of solutions, mandatory learner commitment before assistance, and explanation-first rather than answer-first responses, and maps each to the cognitive process it protects. It further distinguishes productive friction, which sustains skill formation, from mere obstruction, which only reduces adoption.

Conclusion/Implications: The framework gives IS educators and system designers an actionable vocabulary for building GenAI tools that keep humans in the learning loop, and it repositions deskilling as a design problem for responsible IS practice rather than an inevitable cost of adoption.

Keywords: generative AI; deskilling; automation bias; desirable difficulties; human-AI interaction; information systems education

AI-POWERED FOOTBALL SCOUTING DATA PIPELINE AND AUTOMATED DECISION SUPPORT ASSISTANT

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Abstract

Background/Aims: Talent identification in modern football increasingly relies on quantitative analytics; however, smaller and mid-tier clubs face an analytical accessibility gap due to costly enterprise scouting software, fragmented unstructured web data, and technical illiteracy among domain experts. This study aims to develop an end-to-end, automated Decision Support System (DSS) that bridges this divide by integrating an autonomous sports data pipeline with a natural language conversational interface.

Materials/Method: The methodology incorporates a three-tier architecture. First, an automated Extract, Transform, Load (ETL) pipeline was developed in Python using cloudscraper and BeautifulSoup to harvest demographic, financial, and multi-season performance metrics from Transfermarkt across Europe's top 10 football leagues. Second, a relational database normalized to the Third Normal Form (3NF) was established on Microsoft SQL Server to ensure ACID-compliant Master Data Management. Third, a dual-agent Generative AI architecture powered by Google Gemini was constructed: an AI Data Engineer translates natural language requests into deterministic Transact-SQL (T-SQL) scripts, and an AI Head Scout synthesizes tabular outputs into tactical reports. The system was deployed as an interactive bilingual web application using Streamlit.

Results: The pipeline successfully extracted and standardized records for over 6,000 professional players across 10 leagues, reconstructing historical valuations for over 99% of player profiles. Operational benchmarking revealed that local T-SQL query execution completed almost instantaneously, while end-to-end conversational report generation was achieved in just a few seconds. Crucially, decoupling SQL generation from conversational interpretation eliminated generative hallucinations across empirical scouting scenarios, reliably identifying undervalued talent and contract arbitrage opportunities.

Conclusion/Implications: This research demonstrates that enterprise-grade decision support can be achieved using accessible tools without proprietary third-party subscriptions. By democratizing quantitative scouting analytics, the proposed architecture provides sports organizations with an economically viable, hallucination-free decision-making framework.

Keywords: Football Scouting, Text-to-SQL, Decision Support Systems, Data Engineering, Large Language Models, Sports Analytics

THE IMPACT OF ANTHROPOMORPHIC NPC ASSISTANTS ON PLAYER EXPERIENCE: A SYSTEMATIC LITERATURE REVIEW IN THE CONTEXT OF SOCIAL PRESENCE, COGNITIVE LOAD, AND FLOW

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Abstract

Recent advancements in Generative Artificial Intelligence (GenAI) technologies have transformed Non-Player Characters (NPCs) in video games from static text-based entities to dynamic social agents. The integration of GenAI and Large Language Models (LLMs) into NPC behavior is reshaping player interactions, creating a shift from mechanical tasks to social simulations. Despite this rapid adoption, academic literature regarding the psychological impacts of these autonomous agents on players remains fragmented. The aim of this study is to systematically analyze the existing literature on the psychological effects of GenAI-based NPCs on player experience, bridging the gap between technical AI autonomy and psychological states. Following the PRISMA 2020 guidelines, this systematic review examined 39 academic studies published between 2010 and 2026. Data was extracted from Web of Science and Scopus databases. The selected studies were analyzed to identify bibliometric characteristics, methodological approaches, and findings related to Flow, Social Presence, Trust, and Cognitive Load. The findings reveal exponential growth in the field from 2023 onwards, with 87.2% of the studies employing quantitative research methods. Content analysis shows that while most research focuses on constructs such as "Flow" and "Social Presence," variables like "Cognitive Load" and "Trust" are significantly under-researched. The synthesized results indicate that GenAI-based agents enhance player loyalty and Flow states through deep "social interaction" and strong anthropomorphism. However, the uncertainty and unpredictability caused by AI hallucinations severely damage Trust, which consequently increases the players' cognitive costs and disrupts the immersive experience. This study identifies a critical research gap in the measurement of cognitive load regarding GenAI NPCs. To mitigate the risks of uncertainty while maintaining high social immersion, the implementation of hybrid architectures—combining rule-based systems for narrative consistency and GenAI for social dialogue—is highly recommended for future game design.

Keywords: Generative AI, NPC, Flow Theory, Cognitive Load, Systematic Review, Player Experience.

THE THEMATIC EVOLUTION OF DECISION SUPPORT SYSTEMS RESEARCH IN THE CONTEXT OF HUMAN–ARTIFICIAL INTELLIGENCE COLLABORATION: A BIBLIOMETRIC ANALYSIS

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Abstract

Artificial intelligence (AI) technologies are transforming the use of decision support systems (DSS) and the relationship between humans and technology in decision-making processes. This study aims to examine the thematic evolution of research on decision support systems in the context of human-AI collaboration over time through bibliometric analysis. For this purpose, records obtained from the Scopus and Web of Science databases were merged, and duplicate records were removed, resulting in a comprehensive dataset of 560 publications in total. The analyses were conducted using Bibliometrix/Biblioshiny in the R programming environment. Annual scientific production, scientific production by country, the development of research topics over time, and the most frequently used key concepts were examined in detail. The findings indicate that research in this field has expanded rapidly and significantly in recent years and has diversified considerably. Thematic analysis shows that early studies mainly focused on decision support systems in specific application areas, particularly health and rehabilitation. Over time, research shifted toward decision-making and AI-supported decision processes, while human-AI interaction and collaboration became increasingly prominent and visible in recent years. In addition, the emergence of concepts such as trust, explainable AI, and large language models indicates that the research agenda has expanded beyond purely technical decision support toward the interaction between humans and AI. The findings also show that clinical decision support systems remain an important application area, while research increasingly addresses the complementary roles of humans and AI together in decision-making. Overall, the results suggest that human-AI collaboration has become an increasingly prominent thematic direction in decision support systems research, reflecting a broader shift in research focus toward human-AI interaction and collaboration.

Keywords: Human-AI Collaboration, Decision Support Systems, Artificial Intelligence, Decision Making, Bibliometric Analysis

BEHAVIORAL USER PROFILING FROM USER REVIEWS ON GAMING PLATFORMS

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Abstract

User reviews on digital gaming platforms are an important feedback source that reflects players' experiences while also influencing purchasing decisions and games' visibility on the platform. Determining whether a game should be recommended based solely on review text can lead to neglecting complementary information from users' behavior on the platform, which may limit the accuracy of recommendation predictions. This study aims to predict users' game recommendation decisions by jointly using textual and behavioral data, and to identify exploratory player profiles based on user behavior. Of the 21,747,371 records in the Steam Reviews 2021 dataset, 200,000 reviews written in English and consisting of at least five words were selected while preserving the class distribution. Natural language processing algorithms were applied to user feedback, and the resulting textual features were classified using Logistic Regression and LinearSVC. To improve model performance, numerical and categorical indicators representing playtime, game ownership, review activity, and user interactions were combined with the textual features to build hybrid models. To prevent data leakage from records of the same user appearing in both training and test sets, a five-fold stratified group cross-validation based on user identities was applied. In addition, the behavioral patterns of 192,936 unique users were explored using the unsupervised MiniBatch K-Means method. The findings show that the Logistic Regression model based solely on review text achieved a weighted F1 score of 88.9% and a ROC-AUC of 93.6%, and that adding behavioral indicators increased these values to 90.2% and 94.9%, respectively, demonstrating that behavioral data makes a meaningful contribution to text-based models. Although clustering yielded six user profiles, a silhouette score of 0.229 indicated limited separation between profiles. Multi-source models combining user feedback with platform behavior were developed to improve recommendation prediction, and future research will focus on user-centered decision support applications.

Keywords: Digital games, user feedback, behavior analytics, user profiling, artificial intelligence.

STREAM SIMULATION AND WINDOWING ANALYSIS OF HISTORICAL TRAFFIC ACCIDENT DATA USING APACHE KAFKA IN SMART CITIES: THE CASE OF FRANCE

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Abstract

Background/Aims: Traditional batch data processing methods fall short in performing real-time analysis and enabling timely risk intervention for traffic data generated in dynamic urban environments. The objective of this study is to apply stream processing approaches to traffic safety, analyze accident densities across time windows, and provide an applicable decision-support framework for streaming data.

Materials/Method: Historical traffic accident data from France covering the years 2005–2016 were utilized. While data from 2005–2015 were used for model training, data from 2016 were fed into the Apache Kafka architecture in chronological order to execute a stream simulation representing real-time data ingestion. Analysis was performed using Tumbling Window (non-overlapping hourly intervals) and Sliding Window (overlapping hourly intervals) techniques. Additionally, a Random Forest algorithm was integrated into the streaming architecture to classify the environmental lighting conditions of accidents.

Results: The raw dataset consists of 839,875 records and 16 variables, with 74,837 records evaluated following preprocessing (70,030 for training and 4,807 processed sequentially in the stream layer). The 1-hour Tumbling Window analysis identified the most intensive time window as 2016-10-11 07:00 (6 accidents, 1.40/hour mean). In the Sliding Window analysis (3-hour window with a 1-hour slide), the highest moving average was 3.67 accidents/hour on 2016-12-16 18:00, and 481 high-risk intervals exceeding the threshold of 1.81 accidents/hour were detected. To address class imbalance, SMOTE was applied. The post-SMOTE model achieved 74.82% overall accuracy, 84% weighted precision, 75% weighted recall, and 78% weighted F1-score. Notably, minority class ("nighttime without lighting") recall improved from 1% to 32%, and its F1-score rose from 2% to 9%.

Conclusion/Implications: This study quantitatively demonstrates that real-time traffic risk monitoring can be effectively achieved by proposing an adaptable architecture ready for direct integration with live data streams in smart cities.

Keywords: Apache Kafka, Real-Time Stream Processing, Tumbling Window, Sliding Window, Traffic Accident Analysis.

SUSTAINABILITY AND ESG PERFORMANCE IN ENTERPRISE RESOURCE PLANNING SYSTEMS A SYSTEMATIC LITERATURE REVIEW FROM A DIGITAL TRANSFORMATION PERSPECTIVE

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Abstract

Background/Aims: Sustainability regulation and stakeholder demand require reliable and auditable environmental, social, and governance (ESG) information. Enterprise resource planning (ERP) systems may provide the integrated data infrastructure needed for this purpose, yet the mechanisms linking ERP capabilities to ESG performance remain fragmented. This study examines the ERP-sustainability relationship, identifies research gaps, and develops an integrated conceptual framework.

Materials/Method: A systematic literature review was conducted in accordance with PRISMA 2020. Searches were performed between January and February 2026 in Web of Science Core Collection, Scopus, ScienceDirect, SpringerLink, Emerald Insight, Wiley Online Library, IEEE Xplore, and MDPI, supplemented by Google Scholar. Peer-reviewed English-language full-text studies directly addressing ERP and sustainability or ESG were included. Records were screened after duplicate removal, and eligible studies were synthesized through qualitative thematic content analysis.

Results: ERP systems supported environmental performance through energy and carbon management, resource efficiency, waste reduction, and sustainable supply chains. They also enabled workforce safety monitoring, employee development, supplier social compliance, internal controls, risk management, transparency, auditability, and regulatory compliance. Their effects were primarily indirect, operating through data governance, process integration, analytical capacity, and organizational learning. Artificial intelligence, the Internet of Things, big data analytics, blockchain, and cloud computing strengthened real-time monitoring, prediction, traceability, and decision support. However, benefits depended on organizational readiness, data quality, leadership commitment, user expertise, and sustainability-oriented culture. Social and governance outcomes, emerging economies, and longitudinal causal evidence remained underexamined.

Conclusion/Implications: ERP should be viewed as a strategic digital capability rather than stand-alone operational software. The proposed ERP-ESG Digital Transformation Model integrates resource-based, dynamic capability, stakeholder, natural resource-based, institutional, and legitimacy perspectives. Organizations should embed ESG indicators, ownership, quality controls, and audit trails within ERP processes while governing algorithmic bias, privacy, cybersecurity, and explainability. Future research should empirically test the model across industries and countries using longitudinal designs.

Keywords: Enterprise Resource Planning; ESG; Corporate Sustainability; Digital Transformation; Artificial Intelligence; Systematic Literature Review

A COMPARATIVE ANALYSIS OF CLASSICAL AND DEEP LEARNING-BASED OBJECT DETECTION APPROACHES IN TERMS OF ACCURACY AND COMPUTATIONAL EFFICIENCY

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Abstract

Background/Aims: Object detection is an important computer vision application used in fields such as security surveillance, autonomous monitoring, and decision support systems. Although deep learning-based models have improved object detection accuracy, their computational requirements and energy consumption must also be taken into account. This study aims to compare classical and deep learning-based object detection methods in terms of accuracy, inference speed, and energy consumption.

Materials/Method: In this study, two classical methods (HOG-SVM and LBP-SVM) and four deep learning models (YOLOv8s, YOLOv10s, YOLO26s, and RT-DETR-R18) were evaluated on the same test dataset consisting of 56,340 images. To examine the consistency of the results, each deep learning model was run using three different random seeds. Model performance was evaluated using mAP50, mAP50-95, frames per second (FPS), and inference latency. Energy consumption was measured in kWh for each model. The results were evaluated using 95% confidence intervals, and measurements obtained from various hardware monitoring tools were compared.

Results: Among deep learning models, YOLOv8s achieved the highest accuracy with an mAP50-95 value of 0.572 while also demonstrating low energy consumption. Among classical methods, HOG-SVM outperformed LBP-SVM in terms of both accuracy and computational efficiency. RT-DETR-R18, however, lagged behind the YOLO models under the training budget and dataset conditions used in this study.

Conclusion/Implications: The findings indicate that object detection models should not be compared based solely on their accuracy scores. Inference speed and energy consumption provide additional insights into model efficiency and should be evaluated alongside accuracy. The use of three different random seeds and 95% confidence intervals provided a more reliable evaluation for comparing model results. These results highlight the importance of considering energy consumption and computational efficiency alongside accuracy when evaluating object detection methods within the framework of the Green AI approach.

Keywords: Object Detection; Deep Learning; Machine Learning; Computer Vision; Algorithms; Efficiency

ZERO-SHOT KEY INFORMATION EXTRACTION FROM TURKISH E-ARCHIVE INVOICES USING GEMINI MODELS

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Abstract

The rapid expansion of Türkiye's e-transformation ecosystem has increased the need for automated processing and integration of electronic financial documents into enterprise resource planning systems. However, the lack of direct data integration for e-Archive invoices remains a significant challenge when invoices are transmitted or stored as PDFs, images, or printed documents. In such cases, organizations frequently rely on manual data entry. Traditional OCR and rule-based approaches are limited by the diversity of invoice templates, optical noise, variations in document layouts, and the difficulty of constructing large-scale datasets due to commercial confidentiality. This study evaluates the zero-shot capability of modern large language models for directly extracting structured JSON data from e-Archive invoice images without task-specific model training. A total of 999 invoice images collected from different sectors and invoice formats were comprehensively analyzed across 17 target fields using five models from the Gemini family. Model performance was evaluated using document-level exact match, field-level exact match, corpus-level character error rate, and null-field accuracy. The results demonstrate that zero-shot multimodal LLMs can achieve high accuracy in structured invoice information extraction. All evaluated models achieved an average field-level exact match of 98% or higher. At the document level, Gemini 3 Flash achieved the best overall performance, with an exact-match accuracy of 86.59% and a character error rate of 0.41%. The lower-parameter Lite models exhibited more noticeable character errors in critical fields such as supplier tax identification numbers, whereas Gemini 3.6 Flash demonstrated the strongest resistance to hallucinating values for fields that were absent from the invoice. Furthermore, the Lite models provided a favorable price-performance trade-off, with processing times below three seconds and low processing costs per 1,000 invoices. Overall, the findings indicate that zero-shot LLM-based extraction is a promising alternative to conventional OCR and rule-based approaches for scalable and automated e-Archive invoice processing.

Keywords: Large Language Models, Information Storage and Retrieval, Pattern Recognition, Automated, Natural Language Processing

A MULTIMODAL DECISION SUPPORT SYSTEM FOR MASTITIS TRIAGE IN DAIRY CATTLE WITHOUT THERMAL IMAGING

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Abstract

Mastitis is among the most economically damaging diseases in dairy farming. Existing automated detection approaches require thermal imaging or milking-parlour sensors, creating a cost barrier for small and medium-scale enterprises. This study proposes a decision support system operating with standard mobile cameras and routine herd records. The system does not diagnose, but prioritises animals for California Mastitis Test or veterinary examination. Two publicly available datasets were used. Udder images were obtained from the Roboflow Universe "cow-and-mastitis-detection" dataset (CC BY 4.0); among 4,897 annotated images, 1,264 containing udder labels were isolated, comprising 798 healthy and 597 mastitic udder annotations. Labels were provided with the dataset and were not re-annotated by the authors. Herd data were obtained from a Mendeley Data IoT-based clinical mastitis dataset (6,600 records from 1,100 animals; 915 healthy, 185 mastitic), including lactation month, previous mastitis status, udder measurements and body temperature. For external validation, the authors collected 72 healthy udder images under field conditions in Sivas and Malatya, labelled by absence of clinical signs. To prevent data leakage, perceptual-hash grouping enabled animal-level splitting of images and Cow_ID-based splitting of herd data. The pipeline integrates YOLOv8 detection, EfficientNet-B0 classification and LightGBM risk scoring in a layered architecture. Udder detection achieved mAP@0.5 of 0.832 and 0.806 for healthy and mastitic classes. Internal testing yielded F1 = 0.992 ± 0.003 across three random seeds. Grad-CAM analysis revealed the model attended to background rather than diagnostic regions; region cropping corrected this source bias. External evaluation on the field images yielded a specificity of 0.746, with false positives attributable to surface soiling. The discrepancy between internal and external performance demonstrates that high test metrics alone are insufficient evidence of clinical utility. Source bias in public datasets and domain shift between clinical and field conditions require explicit validation in livestock informatics.

Keywords: Mastitis detection, YOLOv8, EfficientNet-B0, LightGBM, Decision support System

A STUDY ON STUDENT INTERACTION PATTERNS IN ARTIFICIAL INTELLIGENCE ASSISTANTS INTEGRATED INTO LEARNING MANAGEMENT SYSTEMS

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Abstract

The integration of artificial intelligence (AI) assistants into Learning Management Systems (LMS) transforms not only how students access information but also how they interact with academic and institutional support processes. This study examines real usage data between students and AI-based course and support assistants integrated into an LMS to reveal student interaction patterns, conversational continuity, and time-dependent usage behaviors.

A retrospective observational design was adopted. Computational text analysis, automatic topic and intent classification, and sequential interaction analysis were employed in combination. Following data cleaning and anonymization, 11,635 student chats were converted into 12,031 analytic sessions, and 20,980 student conversation turns were analyzed. Student messages were represented using word- and character-based TF-IDF features, and topic and intent categories were constructed through data-driven clustering and rule-based automatic classification.

Student interactions concentrated predominantly on exams and assessment, assignments and academic production, and course content and learning support. Topic continuity was approximately 61% across 8,949 consecutive student-turn transitions; it was higher in the course assistant (65.2%) than in the support assistant (58.4%), and the same pattern held for intent continuity (39.4% vs. 27.1%). Of the 12,031 sessions, 39.3% were multi-turn (course assistant: 44.5%; support assistant: 37.3%). The topic, and particularly the intent, of the first message was statistically significantly associated with the conversation developing a multi-turn structure. Temporal analyses further showed that usage intensity and purposes varied across the academic calendar.

The findings demonstrate that LMS-integrated AI assistants involve more than question-answer interactions: a dynamic, sequential interaction structure emerges in line with students' academic and administrative needs. These results offer meaningful implications for the design of AI assistants within LMS and for the planning of academic support processes.

Keywords: sequential pattern analysis, computational text analysis, learning analytics, learning management system, student interactions, AI assistants

ASSESSING COUNTRIES' ARTIFICIAL INTELLIGENCE DEVELOPMENT PERFORMANCE USING AN INTEGRATED MAD-CODAS APPROACH

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Abstract

The purpose of this study is to assess countries' levels of artificial intelligence (AI) development using a Multi-Criteria Decision-Making (MCDM) approach and the multidimensional indicators included in the GAID (Global AI Development Index), and to highlight differences in relative performance among countries. The study is based on six core pillars of the GAID that measure AI development: Research and Innovation, Talent and Skills, Governance and Regulation, AI Economy and Investment, Infrastructure and Computing Power, and Responsible AI and Society. These pillars collectively assess countries' scientific and industrial production capacity, qualified human resources, regulatory and institutional structures, economic and financial capacity, computing infrastructure, and the ethical and social dimensions of AI. The analysis utilized data from 65 countries. The weights of the indicators were determined using the Mean Absolute Deviation (MAD) method, an objective weighting approach, while the CODAS (Combinative Distance-Based Assessment) method was employed to rank the countries.

The MAD results showed that the indicator with the highest discriminatory power in terms of AI development was "AI Economy and Investment" (0.2289), followed by "Infrastructure and Computing Power" (0.1852) and "Governance and Regulation" (0.1611). The weights of the "Talent and Skills," "Research and Innovation," and "Responsible AI and Society" indicators were calculated as 0.1443, 0.1440, and 0.1365, respectively. According to the CODAS results, the United States ranked first, followed by China, the United Kingdom, Singapore, and India, while Türkiye ranked 58th among the 65 countries. These findings indicate that AI development cannot be explained solely by scientific and technological capacity; economic investment, computing infrastructure, and governance capacity also play significant roles in determining countries' relative performance. Rather than directly adopting GAID's pre-calculated composite ranking, this study provides a data-driven alternative country ranking by objectively weighting the indicators and re-evaluating countries using the CODAS method.

Keywords: Artificial Intelligence Development, Multi-Criteria Decision-Making (MCDM), MAD–CODAS

DEEP LEARNING-BASED DETECTION OF AI-GENERATED VOICES: A LAYER-WISE ANALYSIS OF OUT-OF-DOMAIN GENERALIZATION

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Abstract

Advances in text-to-speech (TTS) and voice conversion technologies have made it possible to generate highly realistic synthetic speech, posing a significant threat to voice-based authentication and organizational communication security. Although spoofed-speech detection models reported in the literature achieve high performance on controlled datasets, their out-of-domain generalization under real-world conditions remains poorly understood. This study investigates the out-of-domain generalization of a self-supervised spoofed-speech detector and identifies the most suitable wav2vec 2.0 layer for robust detection. Representations from all thirteen layers of a frozen, pre-trained wav2vec 2.0 model were each used to train a lightweight classifier. Training and in-domain evaluation used 121,461 recordings from the ASVspoof 2019 Logical Access dataset; out-of-domain evaluation used the In-the-Wild dataset, with half of its speakers reserved as an independent hold-out set. All experiments were repeated across five random initializations, and results were compared using paired statistical tests. The findings reveal a pronounced generalization gap: the Equal Error Rate (EER) rose from 1.23% in-domain to 21.31% out-of-domain. Contrary to common practice, the final layer of wav2vec 2.0 was not optimal; intermediate layers provided a statistically significant advantage out-of-domain ($p<0.002$), reducing error by 21.7% in relative terms. However, differences among the top-performing layers fell within random-initialization variation, limiting the reliability of single-run layer selection. Neighborhood analysis showed that genuine speech occupies a narrow acoustic region of the training distribution while spoofed speech surrounds it, explaining the systematic misclassification of unseen genuine recordings as spoofed. These results indicate that benchmark performance can overstate real-world reliability, as the generalization problem stems primarily from limited acoustic diversity. Future work should therefore prioritize increasing the acoustic diversity of genuine speech over further architectural refinement.

Keywords: Spoofed speech detection; synthetic speech; out-of-domain generalization; self-supervised learning; wav2vec 2.0

THE EVOLUTION OF GENERATIVE ARTIFICIAL INTELLIGENCE ETHICS IN BUSINESS AND MANAGEMENT RESEARCH: A BIBLIOMETRIC ANALYSIS

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Abstract

The rapid adoption of generative artificial intelligence (GenAI) technologies in business and management has increased scholarly attention to their ethical dimensions. However, studies examining the development of GenAI ethics research specifically within business and management, including key research trends and scientific collaboration patterns, remain limited. This study aims to examine the evolution of GenAI ethics research in business and management and identify prominent conceptual trends and collaboration patterns. Publications were retrieved from the Web of Science Core Collection for 2023–2026 to capture the recent development of GenAI research. The search combined terms related to GenAI (e.g., generative artificial intelligence, ChatGPT, large language models), ethics (e.g., ethics, responsible AI, fairness, transparency, accountability, trust), and business and management (e.g., business, management, organization, firm, workplace). Following preliminary screening and eligibility assessment, 324 publications were included in the bibliometric analysis. Data were analyzed using VOSviewer, focusing on annual publication distribution, author keyword co-occurrence, and collaboration networks among authors, institutions, and countries. Findings indicate a marked acceleration in GenAI ethics research. Of the publications examined, 3 were published in 2023, 36 in 2024, 112 in 2025, and 173 in 2026. Keyword analysis identified 1,224 distinct terms, of which 31 meeting a minimum occurrence threshold of five were included. Artificial intelligence, generative artificial intelligence, ChatGPT, large language models, and ethics emerged as prominent concepts. Türkiye ranked 23rd with 6 publications and collaborated with 9 countries. Overall, GenAI ethics is developing as a multidimensional field at the intersection of artificial intelligence, ethics, large language models, and business and management applications. The study maps the field's scientific structure and provides a basis for future research on ethical governance, responsible artificial intelligence, and organizational GenAI use.

Keywords: Generative artificial intelligence, artificial intelligence ethics, responsible artificial intelligence, large language models, bibliometric analysis

A COMPARATIVE ANALYSIS OF TEXT NORMALIZATION METHODS FOR FINANCIAL NLP

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Abstract

Text normalization, encompassing both stemming and lemmatization, constitutes a foundational preprocessing step in natural language processing pipelines, yet its impact on domain-specific tasks such as financial text analysis has received limited systematic attention in the era of large language models. This study presents a comprehensive comparative analysis of classical normalization algorithms, including Porter, Snowball, and Lancaster stemmers alongside WordNet and spaCy lemmatizers, against LLM-based normalization using GPT-4o and Claude. We evaluate these methods on a corpus of English-language financial disclosures drawn from SEC filings and the Financial PhraseBank dataset, with particular attention to domain-specific terminology, including compound financial terms, abbreviations, and numeric entities that are known to challenge rule-based approaches. Rather than relying solely on intrinsic metrics, we assess normalization quality through three downstream tasks: financial named entity recognition, sentiment classification, and information retrieval accuracy within a retrieval-augmented generation pipeline. Our results indicate that classical stemmers exhibit substantially higher over-stemming and under-stemming error rates on financial-specific vocabulary compared to general-domain text, while LLM-based normalization demonstrates superior handling of domain terminology at the cost of increased computational overhead and reduced determinism. We further analyze how normalization choice propagates through the pipeline, revealing measurable effects on downstream task performance, particularly in retrieval accuracy. These findings offer practical guidance for selecting text normalization strategies in financial NLP applications and underscore the trade-offs between classical efficiency and LLM-based contextual accuracy. The analysis also demonstrates that normalization effectiveness varies across downstream tasks, highlighting the importance of task-aware preprocessing decisions in financial NLP. We conclude with recommendations for hybrid normalization pipelines tailored to financial text processing.

Keywords: Text Normalization, Stemming, Lemmatization, Financial NLP, Large Language Models, Information Retrieval, Named Entity Recognition

PERCEPTIONS OF BLOCKCHAIN-BASED APPLICATIONS IN THE DIGITAL ECONOMY: THE ROLE OF KNOWLEDGE AND PROFESSIONAL POSITION

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Abstract

Blockchain technology has become an important component of the digital economy, with potential implications for information management, transparency, reliability, intermediation, and digital marketing processes. Beyond their technical capabilities, the implementation of blockchain-based applications also requires an understanding of how users perceive and evaluate the technology. This study examines whether perceptions of blockchain-based marketing applications differ according to individuals' demographic characteristics, professional position, and level of blockchain knowledge.

The study is based on survey data collected from 109 white-collar participants. Perceptions were measured using a five-point Likert-type questionnaire and analyzed in IBM SPSS 25. Exploratory factor analysis identified four dimensions: uncertainty removal; solution capability and reliability; mediation, creativity and innovation; and data management, ecology and the digital economy. The four-factor structure explained 62.43% of total variance, with a KMO value of .940. Descriptive statistics, independent-samples t-tests, and one-way ANOVA were used to examine group differences.

The findings indicate that perceptions across the four dimensions did not differ significantly by gender, age, education level, or seniority ($p > .05$). In contrast, statistically significant differences were observed according to professional position and level of blockchain knowledge across all four dimensions ($p < .05$). These findings indicate that professional position and technology-related knowledge differentiate perceptions of blockchain-based marketing applications, whereas the demographic characteristics examined in the study do not.

Overall, the results show that perceptions of blockchain applications vary more clearly across levels of technology knowledge and professional positions than across the demographic characteristics examined. For organizations considering blockchain-based solutions, the findings also point to the relevance of technology awareness, user readiness, and professional context when planning implementation and communication strategies.

Keywords: Blockchain Technology, Digital Economy, Management Information Systems, Digital Transformation, Blockchain Knowledge, Blockchain Applications

EVALUATING DECISION QUALITY IN DECISION SUPPORT ENVIRONMENTS: THE IMPACT OF OCCUPATIONAL STRAIN AND SOCIO-CONTEXTUAL DYNAMICS

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Abstract

Background/Aims: Decision Support Systems (DSS) are fundamentally designed to enhance organizational performance by providing analytical data and structured models to decision-makers. However, in highly dynamic business environments, the ultimate quality of DSS-assisted decisions is heavily shaped by unobserved behavioral and structural pressures. This study aims to empirically evaluate the underlying latent relationships between occupational strain, socio-contextual dynamics, and decision-making quality, emphasizing the human element within decision support frameworks.

Materials/Method: A cross-sectional survey methodology was employed to gather perceptual data from professionals regarding their critical business decisions. The research utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) to robustly estimate and validate the multidimensional latent constructs. The measurement model specifically assessed key variables, including psycho-social competence, occupational strain, external guidance impact, and socio-contextual constraints. Subsequently, a detailed structural model was evaluated to identify the direct and indirect effects of these organizational stressors on the final decision experience.

Results: The structural equation modeling analysis revealed highly significant relationships among the examined latent constructs. The empirical results indicated that occupational strain exerts a prominent, direct influence on decision quality, functioning as a primary operational driver within complex organizational contexts. Conversely, socio-contextual dynamics encompassing spatial, temporal, and critical resource limitations demonstrated a consistent, statistically significant negative impact on effective decision outcomes. The variance-based modeling confirmed that systemic organizational pressures frequently overshadow pure analytical capabilities, even when decision-makers are supported by data-driven DSS tools.

Conclusion/Implications: The quality of enterprise decision-making is fundamentally restricted by systemic structural and contextual stressors rather than isolated cognitive limitations. For Decision Support Systems to be genuinely effective, organizational architectures must be purposefully designed to mitigate occupational strain and proactively account for socio-contextual barriers.

Keywords: Decision Support Systems, Decision Quality, Occupational Stress, Structural Equation Modeling, Behavioral Decision Theory, Workplace Dynamics.

WHY DO EMPLOYEES LEAVE? AN EXPLAINABLE ARTIFICIAL INTELLIGENCE APPROACH TO EMPLOYEE ATTRITION RISK

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Abstract

Employee attrition is a critical human resource problem that directly affects organizational productivity, institutional memory, and recruitment costs; employee turnover has been a central topic in organizational behavior research for over a century. Although conventional machine learning models can predict employee attrition with high accuracy, their "black box" nature makes it difficult for human resource managers to understand the reasoning behind these predictions. This study builds Logistic Regression, Random Forest, and XGBoost classification models on the IBM HR Analytics dataset (1,470 employees, 30 explanatory variables) to predict employee attrition, applying stratified sampling and class weighting to address class imbalance. The three models achieved 75.2%, 83.3%, and 84.0% accuracy and 0.798, 0.786, and 0.783 ROC-AUC, respectively. SHAP (SHapley Additive exPlanations) was applied to the XGBoost model, which showed the most balanced F1-score (0.447), to generate both global and individual explanations. The results show that overtime, monthly income, stock option level, job role, and age are the variables that contribute most to the model's attrition predictions. The observed attrition rate among employees who work overtime (30.5%) is approximately three times higher than among those who do not (10.4%). An individual SHAP explanation for a young, low-income, low-tenure employee who works overtime shows a predicted attrition probability of 99.7%; this employee's actual outcome was indeed attrition. The study suggests that explainable AI methods can provide transparency in HR analytics and offer an analytical framework usable in decision-support processes, while emphasizing that these outputs reflect association rather than causation and should be used alongside human oversight.

Keywords: Personnel Turnover, Artificial Intelligence, Machine Learning, Decision Making, Explainable Artificial Intelligence

ESTIMATING OF A CANDIDATE'S EMPLOYMENT POTENTIAL IN JOB APPLICATION PROCESSES WITH ARTIFICIAL INTELLIGENCE

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Abstract

Background/Aims: Unemployment is a major social, psychological, and economic problem affecting both individuals and society. Employment potential may be associated with individual characteristics such as age, gender, education level, and marital status, as well as labor-market conditions. Estimating candidates' employment potential before job application may help them assess their suitability, reduce time loss, and make more informed career decisions. This study aims to estimate candidates' employment potential through artificial intelligence and machine learning algorithms and thereby provide data-driven decision support for employment and human resource processes.

Materials and Method: Real-world data from 10,000 candidates who applied to the Turkish Employment Agency (İŞKUR) were analyzed. The dataset was trained according to candidates' employment outcomes following their applications, and the employment potential of new applicants was estimated. C4.5, Random Forest, K-Nearest Neighbors (KNN), Support Vector Machine (SVM), and Naive Bayes algorithms were employed. The models were compared using R^2, MAE, RMSE, Accuracy, Precision, Recall, F1 Score, and MCC evaluation metrics.

Results: C4.5 achieved the highest predictive performance, with an R^2 value of 0.806. Furthermore, C4.5 outperformed the other algorithms across all evaluated metrics, including MAE, RMSE, Accuracy, Precision, Recall, F1 Score, and MCC.

Conclusion: The findings demonstrate that artificial intelligence-based machine learning approaches can serve as effective decision-support tools for estimating employment potential. From a Management Information Systems (MIS) perspective, the study's distinctive contribution lies in integrating artificial intelligence and data analytics with human resource and employment decision-making processes using real-world data. This approach can support faster, more objective, and data-driven decisions while contributing to candidates' career planning and improving the effectiveness of organizational recruitment processes.

Keywords: Unemployment, Employment Acceptance, Turkish Employment Agency, Machine Learning, Artificial Intelligence

INFORMATION NEEDS IN CHOOSING MANAGEMENT INFORMATION SYSTEMS: EVIDENCE FROM YOUTUBE COMMENTS

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Abstract

University choice increasingly involves digital environments in which individuals seek information beyond official institutional sources. This study examines the information needs expressed in YouTube comments about Management Information Systems (MIS) in Türkiye, focusing on university-choice context, uncertainty, temporal change, and interaction through replies. In September 2026, twenty Turkish-language videos were selected using a predefined six-query search protocol and eligibility criteria. YouTube Data API v3 was used to collect 12,362 comment records, including 2,780 top-level comments and 9,582 replies. A hybrid inductive-deductive, codebook-based thematic content analysis was applied to top-level comments. A 300-comment pilot sample was used to develop and refine a final 23-theme codebook, and comments could receive multiple theme codes. The primary analytical sample comprised 1,657 comments in which the university-choice context was explicit or probable. Temporal patterns were examined using video-clustered Generalized Estimating Equations with Benjamini-Hochberg false discovery rate correction.

University/program choice was the most frequent information need (38.0%), followed by personal fit (21.7%), field comparison (15.9%), ranking and preference (13.6%), and coding/technical skills (11.5%). Concern or uncertainty was identified in 276 comments (16.7%); within this subset, field comparison (38.0%) and personal fit (37.3%) were especially prominent. Although yearly theme shares fluctuated, city/location was the only theme showing a statistically significant positive temporal trend in the main model (OR=1.156, 95% CI: 1.070–1.249, FDR p=0.005). In addition, 82.9% of preference-related comments received at least one reply, while 44.1% received a reply from the video owner.

The findings show that MIS-related information needs on YouTube are shaped primarily by practical choice questions rather than basic definitional needs. They also indicate that YouTube comment sections provide an interactive setting in which university-choice-related information needs frequently receive responses, although the quality of those responses was not assessed.

Keywords: Management Information Systems; university choice; information needs; YouTube; thematic analysis; information-seeking behavior

SEMI-INTELLIGENT AUTOMATIC QUESTION GENERATION: THE CASE OF DISTANCE EDUCATION

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Abstract

In today's distance education environments, obtaining support from artificial intelligence applications is becoming increasingly important for the effectiveness and sustainability of educational processes. This need arises from various technological and educational challenges, as well as the difficulties instructors encounter in assessment and evaluation processes. In particular, preparing high-quality test items requires considerable time, knowledge, and expertise. Automatic Question Generation (AQG) systems have the potential to reduce instructors' workload while supporting the generation of questions targeting different cognitive levels. In particular, automatically generating knowledge-level questions, which constitute a significant portion of examinations, may allow instructors to devote more time to developing questions that assess higher-order cognitive skills.

Although numerous studies have investigated automatic question generation for different languages, research focusing specifically on Turkish educational content within the context of distance education remains limited. Therefore, this study developed a semi-intelligent Automatic Question Generation (AQG) system for Turkish, focusing on distance education. The system was developed using the content of oral courses offered at Atatürk University Open and Distance Education Faculty and the questions provided at the end of course sections. The questions generated by the system are not intended to be used directly in examinations. Instead, they can first be reviewed by the test preparation unit and subsequently evaluated and approved by academics who are experts in the relevant fields.

The developed system is expected to reduce the time and workload of instructors during question preparation, minimize problems in the question generation process, and contribute to a more systematic assessment and evaluation process. Furthermore, the system may provide support for improving important characteristics of assessment instruments, including content coverage, validity, reliability, and question diversity, while enabling the generation of questions targeting different cognitive levels.

Keywords: Artificial intelligence, automatic question generation, distance education, Turkish natural language processing, assessment and evaluation, question generation, educational technologies.

THE RELATIONSHIP BETWEEN SMART CITY PERCEPTION AND TRUST IN SMART CITIES: AN EMPIRICAL STUDY

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Abstract

Background/Aims: As cities worldwide increasingly adopt smart technologies, citizens' trust has become an important factor in the successful implementation of smart city initiatives. However, the relationship between citizens' perceptions of smart cities and their trust in these initiatives remains insufficiently understood. This study examines whether perceptions of individual and societal benefits, as well as environmental sustainability, are positively associated with trust in smart cities. Three hypotheses were tested: (H1a) perceptions of individual benefits are positively associated with trust in smart cities; (H1b) perceptions of societal benefits are positively associated with trust in smart cities; and (H2) perceptions of environmental sustainability are positively associated with trust in smart cities.

Materials/Method: This study employed a quantitative research design. Data were collected through a structured online questionnaire using convenience sampling. The questionnaire, developed based on the relevant literature, included items measuring perceptions of individual benefits, societal benefits, environmental sustainability, and trust in smart cities. Exploratory factor analysis (KMO = 0.936) revealed a four-factor structure explaining 67.14% of the total variance: individual benefits, societal benefits, environmental sustainability, and trust. Cronbach's alpha coefficients for the four factors ranged from .771 to .915. The proposed model was tested using structural equation modeling (SEM).

Findings: The structural equation model demonstrated acceptable fit (CMIN/DF = 3.546; CFI = .925; RMSEA = .074; IFI = .925). Perceptions of societal benefits (β = .525, $p < .001$) and environmental sustainability (β = .200, p = .002) were significantly and positively associated with trust in smart cities. In contrast, perceived individual benefits were not significantly associated with trust (β = .105, p = .430). Accordingly, H1b and H2 were supported, whereas H1a was not supported.

Conclusion/Implications: The findings suggest that citizens' trust in smart cities is more strongly associated with broader societal and environmental benefits than with the personal advantages they expect to receive. Theoretically, the study highlights the multidimensional nature of perceived benefits by distinguishing between individual and societal benefits and demonstrating that these dimensions relate differently to trust. Practically, the findings suggest that local governments and policymakers seeking to strengthen public trust should emphasize the collective and environmental value of smart city initiatives rather than focusing predominantly on individual convenience and personal gains.

Keywords: Smart Cities; Trust; Perception; Environmental Sustainability; Perceived Benefits; Structural Equation Modeling

AN EMPIRICAL STUDY ON THE RELATIONSHIP BETWEEN PERCEPTIONS OF AUTONOMOUS VEHICLES AND INTENTION TO USE THEM

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Abstract

Aim/Background: With the rapid development of autonomous vehicles, understanding how individual perceptions shape usage intentions has become crucial. This study examines the relationship between the dimensions of autonomous vehicle perception and intention to use. It was hypothesized that perceived individual benefits and advantages (H1), perceived environmental sustainability (H3), and perceived traffic and transport efficiency (H4) positively affect usage intention, whereas perceived risks and barriers to use (H2) negatively affect it.

Materials/Method: Using a quantitative research design, data were collected from 544 participants via convenience sampling with a structured online questionnaire. The instrument consisted of 7-point Likert-type autonomous vehicle perception and usage intention scales. Exploratory factor analysis (principal components, varimax rotation) was conducted; item 8 was removed due to a lack of discriminant validity, yielding a 29-item, five-factor structure (KMO = .943; Bartlett's $p < .001$; 66.8% of total variance explained). Cronbach's alpha values ranged from .839 to .939. The hypotheses were tested using structural equation modelling.

Results: The structural model showed acceptable fit (CMIN/DF = 3.690; CFI = .905; IFI = .905; RMSEA = .070). Perceived individual benefits and advantages positively and significantly predicted usage intention ($\beta = .678$; $p < .001$), while perceived risks and barriers to use had a significant negative effect ($\beta = -.176$; $p = .003$). The effects of perceived environmental sustainability ($\beta = .096$; $p = .153$) and perceived traffic and transport efficiency ($\beta = .043$; $p = .410$) were not significant. Thus, H1 and H2 were supported, whereas H3 and H4 were not.

Conclusion/Implications: The findings indicate that perceived individual benefits and advantages are the main determinant of usage intention, while perceived risks and barriers to use negatively affect usage intention. Perceived environmental sustainability and traffic and transport efficiency alone do not explain usage intention. These results can guide automotive manufacturers and policymakers in framing communication around individual benefits such as safety, comfort, and time savings, and in addressing technical, legal, and trust-related concerns.

Keywords: Autonomous Vehicles, Technology Perception, Intention to Use, Structural Equation Modelling, Technology Acceptance.

GLOBAL TRENDS IN TRAFFIC AND TRAFFIC ACCIDENT MANAGEMENT: RECOMMENDATIONS IN LIGHT OF GLOBAL LITERATURE

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Abstract

Globally, road traffic accidents claim the lives of approximately 1.19 million people each year. Furthermore, between 20 and 50 million individuals suffer non-fatal injuries, with many experiencing permanent disabilities. Overall, traffic accidents inflict substantial economic losses on individuals, their families, and nations. Motivated by this reality, our study focuses on exploring the discourse within the global literature regarding the resolution of this critical issue. To this end, the research examines all traffic management studies published after the year 2000, utilizing data extracted from the Web of Science (WoS) database. The acquired dataset was analyzed using bibliometric methods, while text mining was employed to conduct topic analysis on research concerning traffic and traffic management. For the purposes of scientometric and bibliometric mapping, analyses of author collaborations, citation networks, and institutional or country affiliations were performed on the cleaned dataset using scientific mapping software such as VOSviewer and Bibliometrix (R-Studio). Additionally, Natural Language Processing (NLP) techniques were applied to article abstracts and titles using the Python programming language, specifically utilizing the NLTK and SpaCy libraries. Topic modeling algorithms, including Latent Dirichlet Allocation and BERTopic, were employed to cluster research trends and sub-themes. The findings confirm the existence of a massive scientific literature on traffic safety and accident management in international databases like WoS; specifically, a search for the exact term "traffic accident" yielded 8,910 documents across all years. However, a major persisting problem is that this extensive data remains unstructured for traffic enforcement officers and their affiliated organizations, failing to provide actionable inputs for their decision-making processes. Consequently, this study systematically examines developments in the literature and classifies the scientific data in alignment with the specific operational requirements of these organizations.

Keywords: Traffic accident, traffic management, traffic problems, trend analysis, scientometrics.

FROM PRODUCT ATTRIBUTES TO CONSUMER EXPERIENCE: EVIDENCE FROM ONLINE REVIEWS OF SLEEP SUPPLEMENTS

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Abstract

Background/Aims: E-commerce has reshaped retail management, and online reviews have become a strategic data source for observing customer experience at scale, for credence goods such as sleep supplements. This study builds on a conceptual framework integrating customer experience management and signaling theory to examine how product attributes translate into consumer experience and its expression in online reviews. It characterizes sentiment and thematic patterns in sleep supplement reviews and tests how price segment, form factor, and ingredient composition relate to sentiment, review helpfulness, and topic distribution.

Materials/Method: The study analyzed 83,096 consumer reviews of 520 sleep supplement products sold on Amazon (McAuley Lab Amazon Reviews 2023 dataset). Sentiment was measured with VADER and review themes were identified through Latent Dirichlet Allocation. Kruskal-Wallis tests assessed differences across price segments, form factors, and ingredient categories; OLS regression modeled form-factor effects and helpfulness; a chi-square test with Cramer's V assessed topic distribution by price segment.

Results: 74.8% of reviews were positive (mean VADER = 0.452), correlating strongly with star rating ($r = 0.72$). Price segment had a statistically significant but managerially negligible relationship with sentiment (rho = 0.019). Form factor and ingredient composition were both significantly associated with sentiment ($p < 0.001$): Gummy and Powder scored higher than Capsule or Tablet, and Chamomile and Magnesium scored highest among single-ingredient products. Review length, verified purchase, and rating extremity positively predicted helpfulness, while sentiment was negatively associated ($R^2 = 0.206$). Topic distribution differed significantly by price segment (Cramer's V = 0.082): Budget reviewers discussed falling/staying asleep and taste more, Premium reviewers emphasized wellness and herbal alternatives.

Conclusion/Implications: The findings support the proposed product-attributes-to-consumer-experience path: price is a weak driver of sentiment, whereas form factor, ingredient simplicity, and segment-specific concerns shape how consumers experience and discuss sleep supplements, offering guidance for assortment design and segment-specific communication.

Keywords: Sentiment Analysis; Topic Modeling; Text Mining; Online Consumer Reviews; E-commerce Analytics; Consumer Behavior

MOBİL GÖRÜNTÜLERDEN YENİDOĞAN SARILIĞI TARAMASI İÇİN DERİN ÖĞRENME VE RENKMETRİK ÖZELLİK FÜZYONUNA DAYALI KALİBRE EDİLMİŞ KARAR DESTEK SİSTEMİ

A CALIBRATED DECISION SUPPORT SYSTEM BASED ON DEEP LEARNING AND COLORIMETRIC FEATURE FUSION FOR NEONATAL JAUNDICE SCREENING FROM MOBILE IMAGES

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Özet

Yenidoğan sarılığı, yaşamın ilk günlerinde sık karşılaşılan ve zamanında değerlendirilmediğinde ciddi nörolojik komplikasyonlara yol açabilen önemli bir sağlık problemidir. Toplam serum bilirubin ölçümünün invaziv olması ve laboratuvar altyapısı gerektirmesi, erişilebilir ön tarama yöntemlerine duyulan ihtiyacı artırmaktadır. Bu çalışmanın amacı, standart mobil cihaz kameralarıyla elde edilen yenidoğan görüntülerinden hiperbilirubinemi riskini değerlendirebilen, ek donanım gerektirmeyen ve klinik karar sürecini destekleyen yapay zekâ tabanlı bir sistem geliştirmektir.

Çalışmada, toplam serum bilirubin değerleri ve demografik bilgilerle ilişkilendirilmiş 2.235 yenidoğan görüntüsü içeren NeoJaundice veri seti kullanılacaktır. Görüntülerden yüz, sklera ve cilt bölgeleri çıkarılacak; renk düzeltme matrisi aracılığıyla cihaz ve aydınlatma farklılıklarının azaltılması sağlanacaktır. Veri sızıntısını önlemek amacıyla eğitim, doğrulama ve test kümeleri hasta düzeyinde ayrılacak; eğitim verilerine uygun görüntü artırma işlemleri uygulanacaktır. Derin özelliklerin elde edilmesinde EfficientNet ve ReXNet tabanlı çok görevli evrişimli sinir ağı mimarileri değerlendirilecektir. Model, toplam serum bilirubin düzeyinin regresyon yoluyla kestirilmesi ve klinik riskin ikili olarak sınıflandırılması görevlerini birlikte gerçekleştirecek şekilde tasarlanmıştır. RGB, LAB ve HSV renk uzaylarından çıkarılan istatistiksel renk özellikleri XGBoost algoritmasıyla modellenecek ve derin öğrenme çıktılarıyla birleştirilecektir.

Model performansı duyarlılık, özgüllük, doğruluk, F1 skoru ve ROC-AUC ölçütleriyle değerlendirilecek; tahmin güvenilirliği Platt ölçekleme veya izotonik regresyonla kalibre edilecektir. Klinik karar eşiği, en az %99 duyarlılık korunurken mümkün olan en yüksek özgüllüğü sağlayacak şekilde belirlenecektir. Nihai modelin TFLite biçimine dönüştürülmesi ve 8-bit kuantizasyon uygulanarak mobil cihazlarda çevrim dışı çalıştırılması hedeflenmektedir. Önerilen yaklaşımın özgün değeri; derin görsel özellikleri, renkmetrik göstergeleri ve olasılık kalibrasyonunu mobil kullanıma uygun tek bir karar destek mimarisinde birleştirmesidir. Sistem, kesin tanı aracı olarak değil, sağlık profesyonellerinin karar sürecini destekleyen erişilebilir bir ön tarama çözümü olarak tasarlanmaktadır.

Anahtar Kelimeler: Yenidoğan sarılığı, hiperbilirubinemi, derin öğrenme, renkmetrik analiz, mobil sağlık, karar destek sistemi

Abstract

Neonatal jaundice is common during the first days of life and may cause severe neurological complications when not evaluated promptly. Because total serum bilirubin measurement is invasive and requires laboratory infrastructure, accessible screening methods are needed. This study aims to develop an artificial intelligence-based system that assesses hyperbilirubinemia risk from images captured with standard mobile device cameras, requires no additional hardware, and supports clinical decisions.

The study will use the NeoJaundice dataset, which contains 2,235 neonatal images associated with total serum bilirubin values and demographic information. Facial, scleral, and skin regions will be extracted, and a color correction matrix will reduce device- and lighting-related variations. To prevent data leakage, the training, validation, and test sets will be separated at the patient level, and appropriate image augmentation techniques will be applied to the training data. EfficientNet- and ReXNet-based multitask convolutional neural network architectures will be evaluated for deep feature extraction. The model will simultaneously perform total serum bilirubin regression and binary clinical risk classification. Statistical color features extracted from the RGB, LAB, and HSV color spaces will be modeled using XGBoost and fused with the deep learning outputs.

Model performance will be evaluated using sensitivity, specificity, accuracy, F1 score, and ROC-AUC. Prediction reliability will be calibrated using Platt scaling or isotonic regression. The clinical threshold will maximize specificity while maintaining at least 99% sensitivity. The final model will be converted to TFLite and quantized to 8-bit format for offline execution on mobile devices. The approach integrates deep visual features, colorimetric indicators, and probability calibration within a mobile decision-support architecture. The system is intended as an accessible screening tool to support healthcare professionals rather than as a definitive diagnostic instrument.

Keywords: Neonatal jaundice, hyperbilirubinemia, deep learning, colorimetric analysis, mobile health, decision support system

CLINICIAN-SCORED EVALUATION OF RETRIEVAL- AND CACHE-AUGMENTED LARGE LANGUAGE MODELS FOR TURKISH BLOOD COUNT REPORTING[1]

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Abstract

Background/Aims: Large language models (LLMs) are increasingly proposed for automated clinical reporting, and retrieval-augmented generation (RAG) is widely assumed to improve factual grounding. Evidence is limited for non-English clinical text and for the newer cache-augmented generation (CAG) alternative. This study asks whether retrieval augmentation improves the quality of Turkish interpretive reports generated from complete blood count (CBC) results, as judged by physicians, and whether automatic text-overlap metrics can substitute for expert judgement.

Materials/Method: Reports were generated for 40 test cases drawn from a hospital laboratory dataset of 88,798 patients covering 21 CBC parameters. Four models (GPT-4o, GPT-3.5 Turbo, Llama 3 and Mistral) were run in two configurations, direct prompting and RAG over a curated hematology knowledge base. Each report was independently scored by two physician raters on four dimensions (five-point scale). A second analysis compared CAG against RAG for GPT-5 under the same protocol. Paired conditions were compared with Wilcoxon signed-rank tests, and ROUGE-L was computed against reference reports.

Results: Retrieval augmentation did not improve report quality. Overall clinician scores were lower under RAG for all four models (GPT-4o 4.67 to 4.53; GPT-3.5 Turbo 3.94 to 3.71; Llama 3 3.04 to 2.82; Mistral 2.17 to 2.11), with the largest losses in clinical accuracy and appropriateness and almost none in language quality. For GPT-5, CAG and RAG did not differ significantly (all $p>0.20$), both near the scale ceiling. ROUGE-L did not track expert judgement: its correlation with clinician scores was negative (rho=-0.350).

Conclusion/Implications: In this Turkish clinical reporting setting, retrieval augmentation added no measurable value and reduced expert-rated quality, while the simpler cache-augmented design performed equally well at lower cost. Retrieval components should therefore be validated empirically rather than assumed beneficial, and automatic overlap metrics should not replace clinician evaluation when health information systems are assessed.

Keywords: Artificial Intelligence; Natural Language Processing; Blood Cell Count; Medical Informatics; Clinical Decision Support Systems; Hematology

This study is derived from the doctoral dissertation of the first author, completed at atatürk university, ınstitute of social sciences.

LIGHTWEIGHT INTERPRETABLE DEMAND FORECASTING AND INVENTORY REPLENISHMENT FROM REAL-WORLD ERP DATA: A CASE STUDY

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Abstract

Background/Aims: Resource-constrained enterprises may struggle to adopt advanced artificial intelligence due to limited computing capacity and opaque decision models. This study examines whether a lightweight, intrinsically explainable machine learning framework can improve demand forecasting and support inventory replenishment using real-world enterprise resource planning (ERP) data.

Materials/Method: A real ERP-derived product sales report covering 2 January 2024 to 11 July 2026 was analyzed. After excluding return invoices and non-kilogram transactions, 13,726 sales records covering 56 stock-keeping units were retained. A daily panel for the ten most frequently transacted SKUs yielded 8,940 observations. Predictors included lagged demand, rolling demand statistics, lagged transaction and customer counts, lagged weighted prices, price change, and calendar variables. A Random Forest Regressor constrained to 50 trees and a maximum depth of five was evaluated using a chronological 80/20 train-test split. Ridge regression and a seven-day seasonal naive forecast were benchmarks.

Results: The lightweight Random Forest achieved an MAE of 76.22 kg, an RMSE of 253.77 kg, and an R^2 of 0.610. It outperformed the seasonal naive benchmark (MAE 94.26 kg; RMSE 347.51 kg; R^2 0.269) and the Ridge baseline (MAE 91.94 kg; RMSE 259.63 kg; R^2 0.592). The seven-day lagged customer count was the dominant predictor (47.36%), followed by seven-day demand (15.20%), fourteen-day demand (15.09%), and twenty-eight-day demand (13.84%). A forecast-driven reorder-point rule achieved 95.5% demand coverage for the highest-volume SKU.

Conclusion/Implications: Real-world ERP data can enable lightweight, interpretable demand forecasting without deep learning infrastructure. Combining constrained Random Forest predictions, intrinsic feature importance, and forecast-driven reorder-point calibration provides a practical decision-support pathway for resource-constrained enterprises.

Keywords: Explainable Artificial Intelligence; Demand Forecasting; Random Forest; ERP Data; Inventory Management; Decision Support Systems

A BIBLIOMETRIC ANALYSIS OF DIGITAL MATURITY

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Abstract

The digital maturity literature is gaining increasing importance within digital transformation research. Thematic diversification of this literature in recent years has prompted a need for an up-to-date assessment of the field. This study examines prominent publications, research areas, emerging topics, and the geographical distribution of contributions to the field. The dataset comprises 768 English-language articles obtained from a search of WoS Core Collection on August 25, 2026, using the term "digital maturity." No restrictions were applied regarding publication year or subject category. Citation and co-word analyses were conducted using VOSviewer. Keyword variations were standardized via a thesaurus. Emerging themes were evaluated based on frequency of occurrence and average publication year. The findings reveal a marked increase in publication activity from 2020 onwards. The digital transformation and digital maturity concepts form the conceptual core of the field. Other prominent themes include healthcare, digital transformation, SMEs, and education. Highly cited studies link digital maturity to organizational resilience, leadership, resource management, and agility. Emerging themes include business model innovation, circular economy, and twin transition. The literature includes contributions from authors across 92 countries, with China providing the largest share. In terms of research domains, the most frequently studied areas are general organizational studies, healthcare, and manufacturing/industry. Regarding research objectives, relationship-impact analysis, conceptual framework development, case studies, and measurement studies stand out. An analysis of contributions to digital maturity research by field reveals that the UK and Australia stand out in the healthcare sector, while China, France, and Spain are prominent in general organizational studies. Research originating from Türkiye focuses heavily on production-oriented studies, a category in which Italy also stands out. Regarding research objectives, China makes the most significant contribution to

the literature on impact-relationship analysis. The study offers an up-to-date and comprehensive overview that reflects the field's evolution and characteristics over time.

Keywords: Digital maturity, digital transformation, bibliometric analysis

COMPARING MARKETING CLAIMS AND USER EXPERIENCE IN CHATGPT AND GEMINI: AN ANALYSIS OF GOOGLE PLAY REVIEWS

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Abstract

Background/Aims: Generative artificial intelligence applications are widely used for information seeking, learning, content creation, and everyday problem solving. App-store descriptions create expectations about response quality, speed, multimodal functions, usability, personalization, and pricing. This study compared the marketing claims of ChatGPT and Google Gemini with user experiences reported in Google Play reviews.

Materials/Method: Reviews were collected for ChatGPT and Gemini for the common period from 15 September 2025 to 9 September 2026. After content-level language screening, 5,000 English-language reviews were sampled from each application using proportional stratification by star rating. Marketing claims were organized into predefined experience constructs, and reviews were mapped using a development-informed frozen rule-based lexicon. Sentiment was assessed with RoBERTa. Construct prevalence was compared with chi-square or Fisher's exact tests, while sentiment differences were assessed with Mann-Whitney U tests. Effect sizes and Holm-adjusted p values were reported. BERTopic was used for exploratory thematic analysis.

Results: Of 10,000 reviews, 1,308 (13.08%) mapped to at least one predefined construct. Response quality was more frequent in ChatGPT reviews than Gemini reviews (6.62% vs 4.98%), whereas multimodal features (0.86% vs 1.80%) and usability (1.14% vs 2.16%) were more frequent in Gemini reviews. Pricing was more frequent for ChatGPT (2.68% vs 1.74%). These differences remained significant after Holm correction, with small effect sizes. Construct-specific sentiment favored ChatGPT for response quality and usability. At review level, 78.1% of ChatGPT reviews and 66.9% of Gemini reviews were classified as positive.

Conclusion/Implications: ChatGPT and Gemini differed in the experience dimensions discussed by users and in sentiment for selected dimensions. App-store claims may be more informative when interpreted together with construct-specific user feedback. Independent human validation of the frozen construct-mapping framework is planned for the full manuscript.

Keywords: Artificial Intelligence; ChatGPT; Gemini; Google Play; User Experience; Sentiment Analysis

COMPARISON OF DEEP LEARNING MODELS FOR DEFECT DETECTİON IN PRINTED CIRCUIT BOARDS

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Abstract

The detection of printed circuit board (PCB) defect in the electronic industry is a crucial stage that significantly affects product quality. The inadequacy of manuel inspections in terms of speed and accuracy is driving the sector towards AI-assisted automation systems. In this study, the performance of various deep learning models in detecting PCB surface defects was evaluated and compared. A dataset comprising 230 high-resolution PCB images with 1,704 annotated instances across six different defect types was utilized in this study. Data augmentation techniques were applied to overcome data limitations during the training phase. To compare model performances, medium-scale convolutional neural networks (YOLOv5m, YOLOv8m, YOLOv10m, YOLO11m) and the transformer-based RT-DETR-l model were employed. To ensure the statistical reliability of the experimental results, the models were trained on an NVDIA A100 GPU using 5 different seed values, and the results were reported as mean ± standard deviation. The experimental results revealed that the accuracy rates of the models were very close to each other, stabilizing at a certain level. YOLO11m achieved the highest mean accuracy (mAP50: 89.65 ±0.6%; mAP50-95: 47.58 ±0.4%). Since the differences between the architectures remained within the standard deviation range, it demonstrated that computational cost and parameter count were the primary determining factors in model selection. In this context, YOLOv10m (16.5M parameters) stood out with an inference speed of 8.61 ms, a precision of 94.88%, and a recall of 83.68%. Meanwhile, the RT-DETR-l model yielded an mAP50 of 88.75±0.9%. This saturation in accuracy rates emphasizes the importance of low computational cost for industrial integration. With its optimal balance of speed, parameter efficiency, and localization, YOLOv10m was determined to be the ideal model for real-time production lines. Furthermore, it was observed that Transformer models trail behind CNNs on limited datasets.

Keywords: Defect Detection, Deep Learning, Printed Circuit Board, YOLO, RT-DETR

ANALYSIS OF PATIENT FLOW IN AN OPHTHALMOLOGY OUTPATIENT CLINIC USING PROCESS MINING AND DISCRETE EVENT SIMULATION

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Abstract

Background/Aims: This study aimed to analyze patient flow in an ophthalmology outpatient clinic using process mining and to evaluate alternative capacity and appointment-planning scenarios using discrete event simulation (DES).

Materials/Method: Retrospective hospital information system records of 14,883 visits between January and June 2026 were analyzed, comprising 63.1% scheduled visits and 36.9% non-scheduled visits. The data were transformed into an event log conforming to IEEE Std 1849-2023 (XES) and analyzed using PM4Py to identify process variants and bottlenecks. During variant analysis, activities sharing the same recorded timestamp were grouped into a single step because the available data did not reliably establish their chronological order. A DES model was developed in SimPy, and five scenarios were evaluated over 30 replications of 119 simulation days each.

Results: The analysis identified 284 distinct process variants, with the five most frequent accounting for 78.8% of visits. Mean examination duration differed significantly between scheduled and non-scheduled visits (4.03 vs. 27.70 minutes; Mann–Whitney $U = 6{,}263{,}856$, $p < 0.0001$, $r = 0.757$). The longest mean interval between recorded activities was associated with laboratory-related processes (321.96 minutes). The baseline mean waiting time was 186.5 minutes. Increasing the number of concurrently available physicians from two to three reduced mean waiting time to 108.6 minutes (41.8%). Assigning dedicated physicians to patient groups reduced waiting time by 12.3%, whereas a 20% increase in patient volume increased it by 14.6%. Intelligent patient routing reduced mean waiting time by 4.2%.

Conclusion/Implications: Increasing physician availability yielded the greatest waiting-time reduction among the evaluated scenarios. The findings demonstrate how process mining and DES can be used together to identify workflow bottlenecks and evaluate alternative staffing and appointment-planning strategies.

Keywords: Appointment scheduling, Capacity planning, Discrete event simulation, Ophthalmology outpatient clinic, Patient flow, Process mining

THE PROBLEM OF "ARTIFICIAL AUTHENTICITY" IN E-COMMERCE: FAKE REVIEWS AND THE REDEFINITION OF CONSUMER TRUST IN THE AGE OF GENERATIVE AI

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Abstract

Online reviews (eWOM) on e-commerce and accommodation platforms rely on the premise that they provide consumers with indirect access to another user's actual experience during the decision-making process. With the proliferation of large language models (LLMs), linguistically fluent but synthetic interpretations are emerging that are not based on any real-world experience. This study examines this transformation through the lens of "authenticity," a central concept in tourism and consumer research. It argues that the issue requires reframing: the question is no longer merely "Is this review accurate?" but rather "Is there an actual lived experience behind this review?"

Taking existing detection methods for human-generated deception (such as linguistic or emotional pattern analysis) as a starting point, the study discusses why these methods may prove conceptually inadequate when faced with synthetic content that is experience-free yet linguistically flawless. It re-evaluates the "digital skepticism" and decision-making difficulties consumers experience due to this loss of authenticity within this new context. The study's core argument is that preserving consumer trust in the age of artificial intelligence necessitates a shift from mere deception detection to the verification of actual experiences.

Accordingly, the study proposes a concrete direction for platform managers and researchers. It advocates moving beyond current approaches that merely assess the linguistic accuracy of reviews toward mechanisms that verify their grounding in real experiences such as matching reviews with verified purchase or accommodation records, analyzing behavioral consistency in a reviewer's past patterns, and employing location or date-based cross-verification. The study aims to provide a conceptual foundation for future empirical research.

Keywords: Artificial Authenticity, Generative AI, Deceptive Reviews, Consumer Trust, eWOM, Deception Detection

FROM TRADITIONAL TEXT MINING TO GENERATIVE ARTIFICIAL INTELLIGENCE: A COMPARATIVE ANALYSIS OF TOPIC DISCOVERY METHODS USING DEEPFAKE RESEARCH AS A CASE STUDY

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Abstract

Background/Aims: Advances in natural language processing and generative artificial intelligence are reshaping large-scale text analysis. Traditional topic modeling methods such as Latent Dirichlet Allocation (LDA) remain widely used, while transformer-based BERTopic and Large Language Models (LLMs) offer richer semantic representations and more interpretable thematic outputs. Recent studies have begun comparing these approaches. Deiner et al. (2024) showed that LLMs can support inductive thematic analysis and produce themes that align substantially with human judgments, while Kim et al. (2026) directly compared LDA, BERTopic, and GPT using a two-stage human evaluation framework and reported important differences in interpretability, stability, and human alignment. However, their systematic comparison in scientific corpora, particularly regarding reproducibility and stability, remains limited. Building on this emerging literature, the present study compares them within a scientific corpus.

Materials/Method: Deepfake research is used as a case study representing online misinformation and synthetic media. Titles and abstracts of scientific publications will be retrieved from bibliographic databases and processed using a standardized text-cleaning pipeline. LDA, BERTopic, and prompt-based LLM topic extraction will then be applied to the same corpus. Their outputs will be evaluated using topic coherence, topic diversity, stability across repeated runs, interpretability, and expert assessment. Agreement between LLM-generated thematic classifications and human expert judgments will also be examined.

Results: The analysis is expected to identify the comparative strengths and limitations of probabilistic, embedding-based, and generative approaches. Particular attention will be given to whether LLMs generate more interpretable topic labels without sacrificing stability and reproducibility, and whether human validation increases the reliability of AI-generated thematic structures.

Conclusion/Implications: By benchmarking LDA, BERTopic, and LLM-based topic discovery under a common analytical design, this study aims to clarify when generative AI can serve as an independent analytical component and when human oversight remains necessary, contributing to more transparent, valid, and reproducible AI-augmented text mining.

Keywords: Deepfake; Text Mining; Generative Artificial Intelligence; Large Language Models; BERTopic; LDA; Topic Modeling

ARTIFICIAL INTELLIGENCE-POWERED CYBERSECURITY APPROACHES: AN ANALYSIS BASED ON WEB OF SCIENCE DATA

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Abstract

The increasing diversity, complexity, and prevalence of cyber threats have made it necessary to reconsider approaches based solely on traditional security measures. As organizations accelerate their digital transformation processes and integrate information systems more extensively into their business operations, their attack surfaces continue to expand, leading to increased cybersecurity risks. The growing frequency of these risks has also made their adverse effects on organizations' operational activities and economic structures increasingly evident. In this context, artificial intelligence (AI) technologies have gained increasing importance in cybersecurity research due to their potential to facilitate the early detection and analysis of cyber threats and the prevention of potential attacks. With the integration of AI-based applications into security processes, the number of academic studies examining the role of these technologies in identifying, assessing, and preventing cyber threats has also increased. Nevertheless, studies that address this rapidly expanding body of literature from a holistic perspective and systematically reveal current research trends remain limited. This situation causes the existing body of knowledge to remain fragmented and makes it difficult to identify common trends and research gaps across studies.

The main purpose of this study is to systematically examine the academic literature on AI-supported cybersecurity approaches. In this context, a literature search will be conducted using the Web of Science database and the keywords "cybersecurity" and "artificial intelligence." The search is planned to be limited according to criteria such as publications from the last five years and articles published in English. The study is expected to identify current trends in the literature, research methods employed, and prominent conceptual approaches, as well as to reveal existing research gaps. In addition to providing a framework to guide future research, the study aims to contribute to the evaluation of AI-based cybersecurity solutions by researchers and practitioners in the field of Management Information Systems.

Keywords: Cyber Security, Artificial Intelligence, Systematic Literature Review, Management Information Systems.

REPRODUCIBLE SIMULATION-BASED EVALUATION OF AN IOT ARCHITECTURE FOR ANOMALY MONITORING OF A SIX-AXIS INDUSTRIAL ROBOT

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Abstract

This study aims to develop a transparent and reproducible pre-laboratory method for evaluating anomaly-monitoring strategies for a six-axis industrial robot before measurements from physical equipment are available. A deterministic Python simulation generates multichannel robot-like telemetry consisting of normalized axis current, joint temperature, and position error. Independent runs are assigned to training, validation, and test sets to prevent data leakage. Four labelled anomaly types are introduced: current spikes, gradual current drift, thermal rise, and tracking error. Three detection strategies are compared: deterministic engineering rules, an Isolation Forest model using window-based current features, and an OR fusion that reports an anomaly when either detector is activated. A separate stochastic communication model represents QoS 1-like message delivery under baseline and impaired network profiles, including latency, packet loss, retries, and duplicate delivery. Performance is evaluated at event level using precision, recall, F1 score, detection delay, delivery completeness, latency percentiles, and run-level bootstrap confidence intervals.

The principal result is that the rule detector identified 18 of 24 labelled events without a false-positive episode and achieved the highest F1 score of 0.857, whereas OR fusion identified 23 events and increased recall to 0.958 but produced 16 false-positive episodes, reducing precision to 0.590 and F1 to 0.730. Under impaired communication conditions, the 95th-percentile message-delivery latency increased from 39.7 to 342.8 ms and duplicate deliveries occurred.

The findings show that detecting more events does not automatically produce the most useful monitoring system. Rule-based detection is preferable when missed events and false alerts are balanced through F1, while fusion may be justified when missing an anomaly is considerably more costly and false alerts can be reviewed. The study provides reproducible code, parameters, labels, tables, and figures for later laboratory validation; it does not claim measured KUKA performance or certified robot safety.

Keywords: Anomaly detection, industrial robot, Internet of Things, Isolation Forest, reproducible simulation

A PRE-REGISTERED ABLATION OF SPECIFICATION COMPONENTS IN LLM-GENERATED UNIT TESTS FOR EMBEDDED C

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Abstract

Background/Aims: Detailed design documents are mandatory in automotive software development (ASPICE SWE.4). Large language models are increasingly used to generate unit tests from them. Which parts a model needs has not been measured. Taxonomy-driven test design implicitly assumes every specification component contributes independently. This study measures how generated test quality degrades as structured specification components are removed individually and in combination.

Materials/Method: A pre-registered ablation covered seven embedded C modules from production automotive projects. Thirteen specification conditions comprised the full document, six single-component removals (boundary values, mock contracts, internal state, error paths, type definitions, decision tables), four pairwise combinations, one contradiction injection and a signatures-only document. Each cell received at least eight independent generations at temperature 0.7, each with its own seed. Every suite was compiled, linked and run under Ceedling and CMock. The declared primary outcome was a suite that compiled, linked and passed. Module was a blocking factor. This gave twelve Holm-corrected contrasts per model. Three models were run to completion.

Results: Removing components individually produced no measurable effect. On a code-specialised 14B model, eleven of twelve contrasts stayed between p=0.44 and p=1.00. Only emptying the document entirely moved the outcome, by -0.232 (p=0.0012). A second model gave -0.482 (p=0.0012). A third did not replicate this, at -0.214 (p=0.176). Capability on the full document followed lineage rather than size. Four Qwen2.5 variants between 14B and 32B stayed below the pre-registered 0.30 pass-rate floor. Two reasoning models cleared it.

Conclusion/Implications: These models need specification content to exist in structured form, not to be finely decomposed. The effect appears as a threshold rather than a gradient. The assumption that each design component contributes independently is not supported by these results. Effort is therefore better spent selecting a model by lineage than further decomposing the design document.

Keywords: Unit test generation, large language models, embedded C, specification ablation, pre-registration, software testin.

ARTIFICIAL INTELLIGENCE APPLICATIONS IN CARBON MANAGEMENT

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Abstract

Background/Aims: In carbon management, new applications are being implemented in parallel with technological advancement. Artificial intelligence (AI) technologies are used across a wide range of applications. Studies in the literature suggest that this technological transformation gives rise to an inherent contradiction. Indeed, AI systems generate significant carbon footprints of their own, due to the substantial energy consumed during training and inference processes. In other words, the tool used to solve the carbon problem is becoming part of the problem itself. This study aims to jointly examine, based on the existing literature, the contributions of AI to carbon management and the limitations arising from its own energy consumption.

Materials/Method: This study reviews 56 publications retrieved from the Web of Science database using the keywords "carbon management" and "artificial intelligence," published between 2019 and 2026. The studies were classified into two themes using content analysis. The first theme was defined as "AI's contributions to carbon management," encompassing carbon capture and storage, energy systems, the building and construction sector, agriculture and ecosystem monitoring, and corporate carbon performance. The second theme was defined as "AI's own energy consumption and limitations," addressing data center energy demand, model training and inference costs, and hardware life-cycle emissions.

Results: The findings indicate that most of the literature positions AI as a solution tool. However, this optimistic framing has recently been questioned, with a shift toward balancing practices such as green AI, carbon-aware computing, and standardized carbon accounting protocols.

Conclusion/Implications: The study is expected to contribute to the field by synthesizing these two research trends, which have so far been addressed separately in the literature. In conclusion, it is considered that for the use of AI in carbon management to progress within a sustainable and responsible framework, technical optimization, institutional transparency, and policy regulations need to be developed simultaneously.

Keywords: Artificial Intelligence, Carbon Management, Sustainability Paradox.

THE EFFECT OF ORGANIZATIONAL INFORMATION SECURITY CLIMATE ON COMPLIANCE INTENTION AND SECURITY AVOIDANCE BEHAVIORS: A MIXED-METHODS STUDY

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Abstract

Background/Aims: The purpose of this study is to examine how organizational determinants such as top management support, security auditing, awareness programs, and security policy shape the corporate information security climate, and to investigate the effect of this climate on employees' compliance intentions and security avoidance behaviors.

Materials/Method: A mixed-methods design combining quantitative and qualitative data was adopted in this study. Quantitative data were collected from 163 participants through a survey, while qualitative data were gathered through semi-structured interviews with 10 white-collar employees and 5 managers. Quantitative data were analyzed using t-tests, ANOVA, correlation, and multiple linear regression analyses in SPSS, while qualitative data were analyzed using the thematic analysis method.

Results: According to the analysis results, security auditing was found to be the strongest factor shaping the information security climate, followed by security policy and awareness programs. A stronger information security climate was found to positively affect employees' compliance intention while significantly reducing security avoidance behavior. Demographic variables (gender, age, sector, position) were found to create no statistically significant difference in the perception of security climate. The qualitative findings supported the quantitative data.

Conclusion/Implications: It was concluded that "time and workload pressure" underlies employees' rule violations, and that managerial oversight (the effect of authority and performance) is the most critical source of motivation for increasing compliance. Organizations seeking to strengthen employee compliance should incorporate security auditing into performance evaluation systems and design user-friendly security procedures that take workload into account. The study is considered to contribute to the information security literature by presenting a model that integrates organizational determinants, security climate, avoidance behavior, and compliance intention.

Keywords: Information Security, Information Security Climate, Compliance Intention, Security Avoidance.

DIGITAL TRACES OF EMOTIONS: AN INTEGRATED SENTIMENT ANALYSIS OF THE 2026 FIFA WORLD CUP FINAL

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Abstract

Background/Aims: FIFA World Cup finals are global social media events in which millions of viewers interact simultaneously on digital platforms, generating large volumes of user-generated content. This study aims to analyze viewer comments on the 2026 FIFA World Cup final in an integrated manner, in terms of overall sentiment orientation, basic emotion categories, and salient themes.

Materials/Method: The data source consists of the comments on the highlights video of the Spain-Argentina final, published on FIFA's official YouTube channel on 20 July 2026. A total of 9,509 comments collected via Python on 26 July 2026, were analyzed using Orange programme, an open-source, visual data mining platform. Following text pre-processing, the positive, negative, and neutral distribution was determined with VADER, while basic emotion categories were identified based on the Ekman model. Prominent themes were further examined through topic modelling and word cloud analyses.

Results: According to VADER, 40.5% of the comments were positive, 41.5% neutral, and 18.0% negative, with a mean compound score of +0.147 indicating a slightly positive overall tendency. In the Ekman model, Joy (41.4%) and Surprise (35.3%) were the dominant emotions, followed by Sadness (12.4%), Fear (7.9%), Anger (1.9%), and Disgust (1.1%). Thematic analyses revealed that positive discourse clustered around Spain's success and congratulatory messages, whereas critical expressions were comparatively more visible in comments concerning Argentina and Messi.

Conclusion/Implications: By integrating overall sentiment, basic emotion categories, and thematic content, the study offers a holistic view of sport-related social media reactions, revealing not only what users feel but also which actors and themes these emotions target. It shows that unstructured comments can be turned into meaningful information for decision-making, helping brands and sponsors identify actors linked to positive or negative perceptions and steer campaigns; clubs and federations monitor digital reputation; and media organizations detect highly engaging themes for content strategy.

Keywords: Social Media, Sentiment Analysis, Data Mining, Natural Language Processing, FIFA World Cup

PERSPECTIVES OF GENERATIONS X, Y, AND Z ON FAMILY STRUCTURE IN TÜRKİYE IN THE DIGITAL AGE: A COMPARATIVE ANALYSIS OF HUMAN AND CHATGPT RESPONSES

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Abstract

Background/Aims: The digital age has transformed individuals' social relationships, modes of communication, and perspectives on family structure. There are differences between Generations X, Y, and Z, particularly regarding adaptation to technology, communication preferences, and family values. In Türkiye, digital transformation has accelerated changes in the traditional family structure, redefining the interpersonal communication patterns, intergenerational value conflicts, and roles within the family. This study aims to compare the perspectives on family structure of individuals from different generations and genders living in Türkiye with the perspective generated by ChatGPT.

Materials/Method: To identify the views of individuals representing Generations X, Y, and Z in Türkiye regarding family structure, a questionnaire was developed considering the characteristics of each generation. It included questions concerning demographic characteristics, digitalization and family communication, family values and roles, intergenerational differences, and perceptions of family in the digital age. Random sampling was used during data collection. The questionnaire was administered to participants and ChatGPT. Statistical analyses were conducted to determine whether the relationships among the variables were significant.

Results: The findings revealed significant intergenerational differences in terms of time spent using technology, communication methods, traditional family values, and roles within the family. However, ChatGPT was found to give more optimistic results. By comparing survey data collected from individuals with the responses generated by ChatGPT to the same survey questions, this study seeks to

analyze generational differences and to make an innovative contribution to literature by focusing on human-AI comparisons, an area that has received relatively limited scholarly attention.

Conclusion/Implications: This study highlights how digitalization is transforming family dynamics and patterns of intergenerational communication and emphasizes the need to develop strategies promoting mindful technology use and meaningful shared family time. It also demonstrates that AI-generated responses alone are insufficient for field-based research and underscores the importance of empirical, primary field data.

Keywords: Artificial Intelligence, Differences Among Generations X, Y, and Z, Digitalization, Family Structure.

AI-ASSISTED CYBER RISK ANALYTICS AND DIGITAL SUPPLY-CHAIN RESILIENCE: THE ROLE OF TRUST AND RISK PROPENSITY

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Abstract

Background/Aims: The use of digital technologies can increase the visibility, coordination, and resiliency of supply chain management while simultaneously increasing reliance on third-party technology and exposure to cybersecurity threats. Based on literature on digital supply chain resiliency, technology trust, and risk-driven technology adoption, this paper examines the influence of AI-generated vulnerability information on decision-making in remediation. The focus is on how trust in AI and risk propensity affect the exploitation of exploit prediction technologies for digital supply chain resiliency.

Materials/Method: Scenario-based experiments will be carried out through the use of real-life vulnerability properties through the Common Vulnerability Scoring System (CVSS) and Exploit Prediction Scoring System (EPSS). Subjects will evaluate several scenarios with regards to third party software vulnerabilities where the variables that change include the likelihood of exploit, supplier's criticality, and the remediation action proposed by the AI. These variables include importance of remediation, willingness to remediate based on AI suggestion, cyber risk perception, operational impact perception, confidence, trust in AI, and risk taking behavior.

Results: As data collection is in process, the study aims to find out if an increased likelihood of exploitation and criticality of the supplier make the need for mitigation higher; if trust in AI has effect on reliance on AI-driven suggestions; and if risk tolerance plays a role in the balance between cyber risks and operational disruptions. Furthermore, this study aims to explore whether the combination of traditional severity information and AI-driven exploit prediction leads to better prioritization.

Conclusion/Implications: The research on vulnerability management has been reframed using the behavioral risk-analytics approach to the digital supply chain boundary. The research introduces the ideas of cyber risk analytics in the current body of literature on technology trust, risk propensity, and supply chain resilience.

Acknowledgment: This study is supported by the Commonwealth Cyber Initiative (CCI) – Virginia.

ANALYSIS OF EMPLOYMENT DETERMINANTS FOR MANAGEMENT INFORMATION SYSTEMS GRADUATES: A DECISION TREE AND SHAP ANALYSIS BASED ON THE ATATÜRK UNIVERSITY SAMPLE

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Abstract

Background/Aims: The transition of Management Information Systems (MIS) graduates into the professional workforce is shaped by interactions among demographic, individual, structural, and educational factors. This study aims to examine the determinants and patterns influencing the employment status of MIS graduates. Identifying these factors is important for bridging the gap between academic preparation and industry expectations and for supporting targeted career counseling strategies.

Materials/Methods: The study utilized survey data collected from 263 graduates of the Department of Management Information Systems at Atatürk University who graduated between 2016 and 2025. Machine learning techniques were employed for data analysis. Specifically, a Decision Tree algorithm based on the Gini index was used to identify graduate profiles and structural patterns associated with employment. In addition, SHAP analysis was conducted to interpret the global predictive mechanism and determine the magnitude and direction of each variable's effect on employment probability.

Results: SHAP analysis identified male gender, older age, and earlier graduation year as the strongest positive predictors of employment. Geographical constraints and perceived lack of preparation negatively affected employment probability, whereas a higher perception of competition had a positive effect. Decision tree profiling showed that young female graduates (age < 28.5) faced barriers primarily due to perceived unpreparedness. In contrast, older male graduates with a moderate Cumulative Grade Point Average (CGPA ≤ 3.265) demonstrated a high employment rate, while older graduates with a higher CGPA (CGPA > 3.265) showed a relatively lower employment rate.

Conclusion/Implications: The employability of MIS graduates is influenced by demographic characteristics, time elapsed since graduation, and professional preparedness, with a notable gender difference. These findings emphasize the need for university programs to provide targeted career support, particularly for female students. By leveraging explainable artificial intelligence, this study provides a data-driven framework for higher education planning.

Keywords: Employment, Management Information Systems, Machine Learning, Decision Trees, SHAP

THE IMPACT OF CONTRACTED INFORMATION TECHNOLOGY PERSONNEL EMPLOYMENT ON INFORMATION SYSTEMS MANAGEMENT IN THE PUBLIC SECTOR: A QUALITATIVE STUDY FROM MANAGERIAL AND EMPLOYEE PERSPECTIVES

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Abstract

Background/Aims: Public institutions require qualified IT professionals to develop and sustain increasingly complex information systems. To compete with private-sector salaries and attract experienced IT professionals, Türkiye introduced the Contracted Information Technology Personnel (CITP) model, which allows differentiated salary ceilings based on positions and qualifications. This model serves as an important mechanism for providing the technical human resources required for public-sector information systems management. This study examines the CITP model from employee and managerial perspectives, focusing on institutional contributions, performance factors, advantages and limitations, and changing IT workforce needs.

Materials/Method: A qualitative case study design was employed. Semi-structured interviews were conducted with 43 participants, including 30 contracted IT personnel and 13 managers. Additionally, 48 CITP recruitment announcements published between 2008 and 2024 were examined. Interview data were analyzed using thematic analysis and recruitment announcements through document analysis.

Results: The findings indicate that the CITP model contributes to public institutions through technical expertise, adoption of new technologies, and software development. However, salary and employment rights, staff turnover, inadequate documentation, task allocation, limited career opportunities, organizational commitment, and managerial factors constrain its effectiveness and sustainability. Recruitment analysis showed that system- and network-oriented positions predominated between 2010 and 2017, while software-related positions became more prominent after 2018. Positions related to emerging technologies, including artificial intelligence, data, and DevOps, also became increasingly visible.

Conclusion/Implications: Although the CITP model strengthens public-sector IT capacity, its sustainable effectiveness depends on both technical competence and organizational conditions.

Improving employment rights, career development, role clarity, and institutional standardization is therefore important. The study contributes to Management Information Systems by demonstrating the relationship between IT workforce management, evolving technological competency requirements, and the management and sustainability of public-sector information systems.

Keywords: Contracted Information Technology Personnel, Information Systems Management, Public Sector, Digital Transformation, IT Workforce

HUMAN-LIKE STRATEGIC REASONING IN LARGE LANGUAGE MODELS: A COMPARATIVE STUDY USING A FOUR-DIGIT NUMBER PUZZLE

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Abstract

The rapid development of large language models (LLMs), extending beyond generating correct answers to integrating feedback, eliminating alternatives, and making strategic decisions, has increased interest in their human-like reasoning capabilities. This study aims to comparatively examine the strategic reasoning performance of different ChatGPT models in a feedback-driven, multi-step problem-solving task. The study addresses the following research question: To what extent do different ChatGPT models exhibit observable characteristics of human-like strategic reasoning?

A comparative case study design with a behavioral evaluation approach was employed. A four-digit number puzzle game was used as the experimental task. The researcher selected a four-digit number with unique digits, while the AI model attempted to identify the target through successive guesses. After each guess, feedback was provided regarding correct digits in correct positions and correct digits in incorrect positions. Model behaviors were evaluated in terms of information consistency, transfer of prior information, hypothesis elimination, strategic guessing, retrospective inference, avoidance of redundant guesses, and solution efficiency. Game sessions involving GPT-3.5, ChatGPT Pro, GPT-4o, GPT-5 Thinking, and GPT-5.6 Sol were comparatively analyzed.

The findings indicate that earlier models had difficulties transferring previous feedback to subsequent guesses, retaining eliminated alternatives, and generating information-rich guesses. GPT-4o showed improvement in local inference but still exhibited information loss and repetitive guessing. In contrast, GPT-5 Thinking identified the target numbers within 4–6 guesses across five scenarios. GPT-5.6 Sol successfully solved all three examined scenarios within 6–8 guesses. These findings suggest that recent LLMs exhibit observable characteristics of human strategic reasoning, particularly in feedback integration, hypothesis elimination, and sequential decision-making.

Keywords: Large language models, human-like reasoning, strategic reasoning, ChatGPT, problem-solving, artificial intelligence**.**

CAREER MOBILITY AND SECTORAL TRANSITION PATTERNS OF MANAGEMENT INFORMATION SYSTEMS GRADUATES: AN ATATÜRK UNIVERSITY EXAMPLE

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Abstract

Background/Aims: Management Information Systems (MIS) is an interdisciplinary field that combines information technologies with business and organizational knowledge. This structure enables graduates to pursue careers across diverse sectors. Understanding how MIS graduates move between sectors can provide insights into their employment trajectories and skill transferability. This study aims to identify the main employment sectors of MIS graduates and examine recurring patterns of horizontal sector transitions.

Materials/Method: The study was conducted with 291 graduates of the Management Information Systems Department at Atatürk University who graduated between 2016 and 2025. Data were collected through a survey in which respondents reported multiple sectors in which they had worked. Frequency analysis was used to identify major employment sectors. Association rule mining based on the Apriori algorithm was employed to examine sectoral transition patterns using support, confidence, and lift measures. A directed network representation was also used to visualize sectoral mobility.

Results: Software Development was the most frequently reported employment sector (82), followed by Public Institutions and Government Departments (56), Web Design and Development (50), and E-Commerce (41). Association analysis revealed strong transition patterns between specific sectors. For example, 75% of graduates with experience in Food Processing and Production subsequently appeared in Software Development or E-Commerce, while 63% of those in Artificial Intelligence and Machine Learning and 64% of those in Web Design transitioned to Software Development. In transportation, transitions between Air Transportation and Land and Rail Transportation reached 100% confidence in both directions. Network analysis identified Software Development and Public Institutions and Government Departments as prominent receiving hubs.

Conclusion/Implications: The findings indicate that MIS graduates follow diverse and interconnected career trajectories rather than a single sector-specific pathway. These patterns highlight the cross-sector applicability of MIS-related competencies and provide an empirical basis for understanding graduate career mobility and skill transfer.

Keywords: Management Information Systems, Career Mobility, Sectoral Employment, Association Rule Mining, Apriori Algorithm

ARTIFICIAL INTELLIGENCE, DIGITAL TRANSFORMATION, AND CYBER SECURITY IN THE GLOBAL NEWS AGENDA: A GDELT-BASED ANALYSIS

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Abstract

In the field of Management Information Systems (MIS) , artificial intelligence, digital transformation, and cybersecurity have been among the key issues influencing businesses' technology investments, governance priorities, and risk management approaches in recent years. The purpose of this study is to conduct a comparative analysis of the visibility of these three topics in the global online news agenda and the positive-negative language trends (news tone) emerging in news texts. The study utilized the GDELT DOC 2.0 API and created a pilot dataset covering the period from June 19, 2026, to September 17, 2026. Each topic (artificial intelligence, digital transformation, and cybersecurity) was queried using specific keyword groups. The dataset consists of a total of 39 observations (3 topics × 13 weeks). Visibility, average news tone, and news volume—normalized by GDELT—were calculated on a weekly basis (for a total of 13 weeks). This study analyzed a total of 304,300 news texts on artificial intelligence; 62,642 on cybersecurity; and 59,593 on digital transformation. The average news tone values were calculated as 0.282, -0.708, and 2.284, respectively. The term 'news tone' was treated not as a direct measure of public sentiment but as a descriptive media indicator representing the general positive-negative language trend in news texts. The findings show that artificial intelligence stands out significantly in terms of news volume, while cybersecurity has a lower average tone value and digital transformation has a higher one. Since this is a pilot study, the findings should not be interpreted as reflecting long-term trends, public opinion, or causal relationships. Future studies should examine how media visibility and tone influence organizational technology adoption, digital transformation strategies and cybersecurity investment decisions. From an MIS perspective, integrating media analytics with organizational and operational data may help to explain how technological issues move from public discourse to managerial decision-making.

Keywords: Artificial Intelligence, Digital Transformation, Cybersecurity, Information Systems, Data Analysis

THE RELATIONSHIP BETWEEN PM2.5, TEMPERATURE, AND RELATIVE HUMIDITY AND DEATHS DUE TO RESPIRATORY SYSTEM DISEASES: A COMPARATIVE ANALYSIS OF ISTANBUL, ANTALYA, AND ERZURUM (2018–2024)

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Abstract

Although the relationships between climate variables, air quality, and respiratory health have been widely investigated, studies comparing provinces representing different climate zones in Turkey are limited. This study aims to examine the relationships between PM2.5, average temperature, and relative humidity and the share of deaths caused by respiratory system diseases within total deaths in Istanbul, Antalya, and Erzurum during the 2018–2024 period, and to evaluate the differing patterns across these provinces. A total of 21 province-year observations were used in the study. PM2.5 data were obtained from the air quality monitoring network of the Ministry of Environment, Urbanization and Climate Change; temperature and relative humidity data from NASA POWER; and mortality data from TurkStat. A general multiple linear regression model, province-specific models, and diagnostic-sensitivity analyses were applied. Although the F-test for the general model was not significant, a positive and significant relationship was identified between relative humidity and the share of deaths due to respiratory system diseases (β=0.001283; p=0.038), whereas PM2.5 and temperature were not found to be significant. However, the significance regarding relative humidity was not maintained in some sensitivity analyses, indicating that the finding was sensitive to model specification. In province-specific analyses, while the Antalya model was not significant, significant coefficients were obtained for PM2.5 and relative humidity in Erzurum, and for relative humidity in Istanbul. Given the availability of only seven years of observations for each province, these results are considered exploratory. The findings demonstrate that the relationships between environmental indicators and the share of deaths caused by respiratory system diseases vary across provinces and should be evaluated by taking local conditions into account. Although the limited number of observations constrains generalizability, the study demonstrates that integrating diverse institutional data sources can contribute to monitoring regional environment-health relationships and supporting local decision-making processes with data.

Keywords: PM2.5, Air Pollution, Climate Variables, Respiratory System Diseases

***This paper presents part of the research conducted within the scope of the project entitled “İklim Değişikliği ve Hava Kirliliğinin Solunum Sağlığı Üzerindeki Bölgesel Etkileri: Türkiye’de Uzun Dönem Panel Veri ve Senaryo Analizi,” supported by the TÜBİTAK under the 2209-A University Students Research Projects Support Program (Project Application No.: 1919B012531655).

CAN HEALTH TECHNOLOGIES REPLACE THE HEALTHCARE WORKFORCE FOR PREGNANT AND NON-PREGNANT WOMEN?

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Abstract

While digital monitoring tools are rapidly expanding in maternal and child health, the success of these technologies is shaped by women's acceptance levels and their trust-based relationships with healthcare personnel. In this regard, evaluating user beliefs within the framework of the existing healthcare workforce is critically important for strengthening public health systems. The primary aim of this study is to comparatively evaluate the attitudes of pregnant and non-pregnant women toward health technologies and the healthcare workforce, and to identify the sociodemographic factors influencing these attitudes. The sample comprised 180 women (90 pregnant and 90 non-pregnant) who presented to Giresun Maternity and Children's Diseases Training and Research Hospital, selected via purposive sampling. Data were collected using a personal information form and a 34-item Likert-type scale adapted from the literature, and analyzed using t-tests, analysis of variance, and multiple linear regression. The findings revealed that pregnant and non-pregnant women exhibited similar overall attitudes and subscale levels. However, item-level evaluations demonstrated that pregnant women had a higher perceived ease of learning technology, whereas non-pregnant women expressed significantly greater concerns regarding data privacy and difficulty in technology use. Multiple regression analysis showed that active employment was the sole significant variable positively predicting technology perception. Furthermore, trust and satisfaction toward healthcare professionals were markedly higher than technology perception in both groups and were maintained independently of demographic characteristics. In conclusion, while women's trust in healthcare personnel continues to serve as the fundamental cornerstone, pregnancy motivation and active working life play a facilitating role in adopting digital health tools. Therefore, addressing data privacy concerns and maintaining simple interfaces in digital health applications will significantly enhance system adoption.

Keywords: Management Information Systems, Health Informatics, Health Technologies, Healthcare Workforce, Pregnant Women

GROWTH AND THE LIMITS OF PRODUCER CONTROL IN TÜRKİYE'S MOBILE GAME INDUSTRY: A PLATFORM GOVERNANCE PERSPECTIVE

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Abstract

Mobile game development is a major, globally oriented Turkish production sector, yet its studios depend on app stores, engines and ad networks governed elsewhere. First, which production conditions did Türkiye's leading mobile studios change between 2016 and 2025, and who held the decision right over those they did not change? Second, where a platform owner and a court governed one platform, did improved commercial terms alter the court-ordered access restriction? This descriptive documentary case study draws on 38 convenience-sampled transactions, 60 public statements, 10 industry reports and 17 firm and policy documents. Nine structured comparisons (four firm trajectories, two platform-rule changes, one boundary case, one contextual, one post-period) separate changes in activity, ownership and infrastructural rules by who decided each. Gram Games, Peak, Rollic and Dream Games changed products, monetization, publisher coordination or financing; every sampled studio exit with an identifiable acquirer transferred ultimate control abroad. Authority over app-store, engine and access rules stayed with platform owners or public authorities. Apple's 2021 App Tracking Transparency (ATT) rule and Unity's 2023 per-install fee, never implemented, show exposure to external rules whose effects this design cannot isolate. Zynga's 2021 report of record Rollic results contradicts an immediate, uniform post-ATT downturn. For Roblox, the boundary case, its reported 8.5% rise in the cash rate paid for earned Robux (September 2025) coexisted with the August 2024 access restriction. We term this configuration double platform dependency: where participation requires corporate permission and territorial access to one platform, improved terms need not remove an access restriction. Linking game production research with information systems work on complementors and boundary resources, we distinguish producer growth, ownership change and infrastructural access by who can alter each. For studios and policymakers, subsidies, ownership choices and negotiated terms should match the authority able to change the binding constraint.

Keywords: platform governance, complementors, boundary resources, game production, mobile games, Türkiye

AN AUTONOMOUS SEO ANALYSIS, LEAD SCORING AND REPORTING SYSTEM DRIVEN BY GENERATIVE AI AND WORKFLOW AUTOMATION: THE ROKETSEO MODEL

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Abstract

Background/Aims: In contemporary digital marketing, performing lead scoring and preliminary analysis manually generates high operational costs and considerable time loss, while intuition-based qualification yields inconsistent, error-prone decisions. This study aims to design and introduce to the literature an autonomous architecture, named RoketSEO, that couples generative artificial intelligence with workflow automation in order to make lead qualification and technical SEO reporting fully autonomous.

Materials/Method:An event-driven microservice pipeline was built on the open-source n8n automation platform, orchestrating Google Gemini (a large language model), the Google PageSpeed Insights API, and an email service. Each incoming website lead first passes an algorithmic data-privacy (GDPR/KVKK) consent node; a language model then assigns the lead a dynamic score between 1 and 100 according to its sectoral potential. For high-value leads scoring 80 and above, live Core Web Vitals metrics are retrieved through the Google API and interpreted by a second generative model, which drafts a personalized technical SEO strategy. The HTML output is rendered into a branded PDF and delivered to the prospect through autonomous email.

Results: The implemented workflow executed the full path — consent verification, scoring, live technical measurement, report generation, and delivery — without human intervention, reducing a formerly manual, minutes-long procedure to a matter of seconds and removing the subjectivity of heuristic scoring through zero-shot prompt engineering.

Conclusion/Implications:RoketSEO illustrates a shift from rule-based automation toward autonomous, agentic artificial intelligence in B2B marketing, where competitive advantage is increasingly shaped by speed and hyper-personalization. The model offers researchers and practitioners a replicable, privacy-compliant, and scalable blueprint for data-driven lead management.

Keywords: Generative AI, Lead scoring, Marketing automation, Workflow automation, Technical SEO.

A COST-SENSITIVE PREDICTIVE MAINTENANCE FRAMEWORK: MULTI-LABEL FAILURE DIAGNOSIS AND OPERATIONAL THRESHOLD OPTIMIZATION

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Abstract

Background/Aims: In smart manufacturing, predictive maintenance is critical to mitigate unplanned downtime and enhance operational decision-making. However, conventional machine learning models often neglect the asymmetric economic consequences of misclassifications and fail to provide granular insights into specific machine failure mechanisms. This study proposes a cost-sensitive predictive maintenance framework designed to accurately predict failures, optimize economic maintenance thresholds, and classify distinct failure modes across industrial quality grades.

Materials/Method: Using the AI4I 2020 Predictive Maintenance Dataset (n=10,000, 3.39% failure prevalence), domain-engineered features (including mechanical power, speed-to-torque ratio, and strain index) were derived from raw sensor data. Stratified training and testing splits (75:25) were applied to benchmark Logistic Regression, Random Forest, Support Vector Machines (SVM), and Gradient Boosting. In addition to discrimination metrics (ROC-AUC, PR-AUC), an asymmetric cost matrix was implemented (C_{FN}=5000, C_{FP}=300; establishing a 16.7:1 penalty ratio balancing catastrophic missed failures against unnecessary inspection costs) to optimize the operational decision threshold. Multi-label classification was employed to model discrete failure modes across product quality variants (H/M/L).

Results: Gradient Boosting demonstrated superior predictive capability, attaining 98.1% ROC-AUC and 91.2% PR-AUC. Beyond diagnostic accuracy, tuning the operational decision threshold from the default 0.50 cutoff down to the cost-optimal 0.03 threshold yielded a 26.1% reduction in total operational maintenance expenditures (reducing expenditures from 80,900 to 59,800 cost units). Furthermore, multi-label failure modeling effectively isolated discrete root causes (specifically tool wear, heat dissipation, power failure, and overstrain) demonstrating differentiated risk distributions across high, medium, and low product quality classes.

Conclusion/Implications: Coupling domain feature engineering with cost-sensitive threshold optimization successfully bridges predictive modeling with strategic industrial maintenance. The proposed architecture provides industrial decision-makers with an actionable, economically grounded framework that substantially decreases operational downtime expenses while enabling targeted, failure-specific intervention protocols.

Keywords: Predictive Maintenance, Cost-Sensitive Learning, Gradient Boosting, Decision Support Techniques, Machine Learning, Equipment Failure Analysis.

THE INSTAGRAM ACCESS BLOCK IN TÜRKIYE AS A NATURAL EXPERIMENT: MULTI-SOURCE EVIDENCE ON PLATFORM SUBSTITUTION, SENTIMENT, AND TOURISM DEMAND

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Abstract

Background/Aims: Government-imposed restrictions on social media platforms are an increasingly common governance tool, yet their psychosocial and economic consequences are rarely measured empirically. Instagram was blocked nationwide in Türkiye for nine days, from 2 to 10 August 2024. Because the interruption was externally imposed, abrupt and simultaneous for all users, it is treated as a natural experiment. The study asks whether the overall emotional tone of X (Twitter) shifted during the block, and whether tourism demand was measurably affected at peak season.

Materials/Method: A symmetric design compared nine days before, during and after the block. To avoid selection bias, topic-based search was rejected in favour of topic-neutral stopword queries stratified into eight daily time slices, yielding 12,581 Turkish tweets from 10,974 accounts; no account-level criterion was applied. Off-the-shelf sentiment tools failed validation, so 1,485 tweets were manually annotated for polarity and dominant emotion. Window comparisons were combined with regression models controlling for the time trend. The same design was applied to Google Trends, Interbank Card Centre spending and Ministry border statistics.

Results: Negative tweets rose from 45.3% to 47.7%, a non-significant 2.4-point difference (95% CI -3.8 to +8.6; $p = 0.445$; $d = 0.05$) that remained non-significant across five specifications and across both full distributions (polarity $p = 0.510$; emotion $p = 0.601$). Tweets mentioning the block rose twelvefold, confirming that the dataset captured the event. Tourism indicators showed no effect either: accommodation card transactions grew 11.5% year-on-year, matching neighbouring months.

Conclusion/Implications: No evidence was found that the block altered emotional tone or tourism demand; any effect is smaller than 8.9 percentage points. In all three datasets an uncontrolled before-and-after comparison produced significant “effects” that vanished once a time trend and a control group were included - a quantified caution against event-window designs that lack a control layer.

Keywords: natural experiment; platform blocking; sentiment analysis; tourism demand; Instagram

WHAT ARE MIS RESEARCHERS CURIOUS ABOUT? A TOPIC MAP READ FROM THESES

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ABSTRACT

This study aims to identify the topics around which graduate theses on Management Information Systems (MIS) in ProQuest are grouped, and to interpret them from an information systems perspective. It is an exploratory text analysis based on thesis titles and abstracts. The search returned 4,982 records from 2011–2025. After 17 records were removed as duplicates or for language mismatch, the remaining 4,965 were analyzed with BERTopic, which represents texts numerically by semantic similarity, clusters similar ones, and labels each cluster with its most distinctive words. Long texts were split into segments. Model selection balanced topical detail against the share of theses assigned to a topic.

The analysis produced 45 topic clusters, of which health informatics and information security are the most prominent. Digital service use, governance, and data analytics stand out as research lines that address the user–organization relationship from different angles. Clusters on geographic information systems, environmental applications, and cultural heritage show that the collection spans several sectors and disciplines. A comparison of selected periods suggests that process mining and analytics-oriented studies have become more visible recently, but this does not indicate a change of direction for the field as a whole. In repeated runs with different random starting values, theses that clustered together formed a consistent structure, although some were assigned to different topics. The findings are therefore read as connected research themes, not sharply bounded classes.

The study shows that topic modeling can help organize thesis collections and select samples for later qualitative reviews. Three limitations apply: the analysis relies only on thesis abstracts, the data are limited to English-language theses in ProQuest, and the topic labels were not evaluated by independent experts. Findings should not be generalized to the whole field but used as a research map with a defined scope.

Keywords: Management Information Systems; Information Systems; Topic Modeling; BERTopic; Natural Language Processing; Data Mining; Machine Learning

ICT TRADE, LABOR PRODUCTIVITY, AND ECONOMIC GROWTH: ROBUST PAM CLUSTERING AND QUANTILE REGRESSION ANALYSIS OF ICT TRADE IN OECD COUNTRIES

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Abstract

Digitalization, driven by the widespread adoption of information and communication technologies (ICT) and the development of knowledge-based production capacity, has become increasingly important in determining countries' productivity and economic performance. This study aims to examine the relationships between ICT trade, R&D activities, human capital, and foreign trade indicators and labor productivity and economic growth across OECD countries. The study employs cross-sectional data for 2020 and 2023 and applies Quantile Regression and Robust PAM Clustering methods to account for the heterogeneous economic and technological structures of countries and to move beyond average effects.

For the 28 OECD countries with available data in 2023, the Robust PAM clustering analysis identified six distinct clusters. The differentiation among clusters was particularly associated with exports, R&D, ICT services and goods trade, human capital, and productivity indicators. Ireland, Israel, and Korea were placed in separate clusters, reflecting their distinctive profiles across these indicators.

The Quantile Regression results for both periods indicate that the relationship between ICT trade, productivity, and economic growth is not homogeneous across the distribution. In the productivity models, no statistically strong relationship was identified for ICT services exports or ICT goods exports at the quantiles, whereas ICT goods imports exhibited a negative and statistically significant association in 2020, particularly at the median quantile ($\tau = .50$; $\beta = -0.057$) and the upper productivity quantile ($\tau = .75$; $\beta = -0.069$). In 2023, the negative coefficients persisted, although their statistical significance weakened. Overall, the findings indicate that the contribution of digitalization to economic performance depends not only on the volume of ICT trade but also on the quality and composition of such trade and the productivity level of the economy.

Keywords: ICT Trade, Labor Productivity, Economic Growth, Human Capital, Robust PAM Clustering, Quantile Regression.

PROFILING JOB INTERVIEW DIFFICULTIES AMONG MANAGEMENT INFORMATION SYSTEMS GRADUATES USING K-MEANS CLUSTERING

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Abstract

Background/Aims: Management Information Systems (MIS) graduates may experience job interview difficulties arising from both individual/professional and contextual conditions. This study identifies the dimensions of these difficulties, derives profiles, and examines their relationships with demographic, academic, and employment characteristics.

Materials/Method: Survey data from 364 graduates of the MIS Department at Atatürk University included ten Likert-type items measuring job interview difficulties. Internal consistency was assessed using Cronbach's alpha, and the factor structure was examined through principal axis factoring with Direct Oblimin rotation. After screening, 304 participants who answered at least six of the seven retained items were included; six missing responses were median-imputed. Individual/professional and contextual difficulty scores were calculated and standardized. K-means solutions with two to six clusters were compared using the Silhouette, Calinski-Harabasz, and Davies-Bouldin indices. Stability was evaluated through 1,000 bootstrap replications. Associations with gender, work experience, postgraduate education, age, graduation year, and grade point average were tested using chi-square and Kruskal-Wallis tests with Holm correction.

Results: Internal consistency was satisfactory (Cronbach's α = 0.854). The Kaiser-Meyer-Olkin value was 0.834, Bartlett's test of sphericity was significant ($p < 0.001$), and the two-factor structure explained 53.261% of the variance. Considering validation indices, parsimony, and interpretability, a three-cluster solution was selected (Silhouette = 0.412; Calinski-Harabasz = 265.752; Davies-Bouldin = 0.863). The profiles were Low Difficulty (n = 154; 50.66%), Individual/Professional Difficulty-Dominant (n = 96; 31.58%), and Multidimensional High Difficulty (n = 54; 17.76%). The mean bootstrap Adjusted Rand Index was 0.843, and profile-specific Jaccard coefficients ranged from 0.863 to 0.931. No significant associations with external variables remained after Holm correction.

Conclusion/Implications: The findings provide an exploratory basis for understanding heterogeneity in graduates' job interview difficulties and may inform the future development of profile-sensitive career support. Further research should validate these profiles and assess their practical relevance before profile-based interventions are implemented.

Keywords: Management Information Systems, Job Interview Difficulties, Graduate Employability, K-Means Clustering, Career Support

MITIGATING BIAS IN CLINICAL DECISION SUPPORT SYSTEMS: A FAIRNESS-BY-DESIGN APPROACH

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Abstract

Background/Aims: Clinical Decision Support Systems (CDSS) optimize diagnosis, patient prioritization, and resource allocation. However, they risk reproducing existing inequalities due to systematic algorithmic bias arising in the processes of data collection, labeling, model design, and physician interaction. Algorithmic fairness in healthcare must extend beyond simple mathematical equality of output to aim for equity in clinical outcomes. The most prominent gap in the literature is the lack of post-deployment audits and comprehensive lifecycle governance in routine maintenance processes. Accordingly, this study aims to conceptualize the principles of algorithmic fairness in CDSS development processes and to present a comprehensive "Fairness-by-Design" framework that encompasses the entire system lifecycle.

Materials/Method: This study adopts a qualitative literature synthesis and conceptual modeling methodology. The principles of algorithmic fairness and governance criteria have been methodologically aligned with the stages of the AI Lifecycle. The proposed system architecture is structured around four main stages: data acquisition and preprocessing, model training, clinician-in-the-loop integration, and periodical monitoring of algorithmic drift.

Results: The findings indicate that algorithmic fairness in the CDSS cannot be achieved with a single algorithm and that technical interventions and managerial audits must be carried out in combination. The proposed model establishes actionable process steps and governance criteria, ranging from identifying representation gaps in datasets and balancing fairness-accuracy trade-offs to conduct continuous fairness auditing in live systems.

Conclusion/Implications**:** This study focuses on algorithmic fairness in medical AI applications from a Management Information Systems perspective, positioning it at the center of system design and governance. The proposed framework provides a continuous fairness control mechanism to assist software developers, data scientists, and healthcare administrators both before and after the integration of AI systems into clinical processes.

Keywords: Clinical Decision Support Systems, Artificial Intelligence, Algorithmic Fairness Health Equity

BİREYSEL SİBER GÜVENLİK ALGISI, GİZLİLİK BİLİNCİ VE KORUYUCU DAVRANIŞLAR ÜZERİNE AMPİRİK BİR ARAŞTIRMA

AN EMPIRICAL INVESTIGATION INTO CYBERSECURITY PERCEPTION, PRIVACY AWARENESS, AND PROTECTIVE BEHAVIORS

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Özet

Dijitalleşmenin gündelik yaşamın ve iş süreçlerinin merkezine yerleşmesiyle birlikte siber güvenlik, salt donanımsal ve yazılımsal bir BT uzmanlığı alanı olmaktan çıkarak bireylerin farkındalık, tutum ve günlük alışkanlıklarıyla şekillenen davranışsal bir savunma zincirine dönüşmüştür. Korunma Motivasyonu Teorisi (Rogers, 1975; Johnston & Warkentin, 2010) ve Planlanmış Davranış Teorisi (Ajzen, 1991; Bulgurcu vd., 2010) kuramsal çerçevesinde kurgulanan bu çalışma; bireylerin veri gizliliği hassasiyetleri ile parola yönetim disiplinlerinin, nihai teknik cihaz koruma tedbirlerine nasıl dönüştüğünü ampirik olarak incelemeyi ve bu koruyucu davranışların demografik özelliklere göre nasıl farklılaştığını ortaya koymayı amaçlamaktadır. Araştırmanın verileri, farklı meslek ve yaş gruplarından 415 aktif dijital teknoloji kullanıcısından anket yöntemiyle toplanmıştır. Hipotez testleri öncesinde veri dağılımının çarpıklık, basıklık ve normallik testleri üzerinden incelenmesiyle parametrik analiz varsayımlarının tam olarak sağlandığı doğrulanmıştır. Yapılan faktör analizleri ise bireysel siber güvenlik algısının birbirini besleyen ve tamamlayan üç temel boyutta yapılandığını kanıtlamıştır: Teknik cihaz savunması (antivirüs, güvenlik duvarı ve sistem güncellemeleri), çevrim içi gizlilik ve veri paylaşım bilinci ile parola ve kimlik doğrulama yönetimi (iki faktörlü doğrulama, güçlü ve periyodik şifre kullanımı). Kurulan yapısal model; bireylerin bilgisayar ve akıllı telefonlarında teknik savunma araçlarını devreye sokmalarını sağlayan en temel itici gücün parola yönetimi disiplini olduğunu, bunu veri gizliliği hassasiyetinin desteklediğini ve bu iki temel alışkanlığın teknik güvenlik davranışlarının yarısından fazlasını tek başına açıkladığını göstermiştir. Bu bulgu, parola disiplininin bireysel güvenlikte pasif bir önlem değil, tüm koruyucu mekanizmaları tetikleyen bir kaldıraç işlevi gördüğünü ortaya koymaktadır. Demografik farklılık analizleri ise dikkat çekici ve ezber bozan sonuçlar üretmiştir: Literatürdeki yaygın ön kabullerin (Branley-Bell vd., 2022) aksine cinsiyet değişkeni güvenlik davranışlarında anlamlı bir farklılaşma yaratmamış; kadın ve erkek kullanıcıların benzer düzeyde temel siber okuryazarlığa ulaştığı görülmüştür. Buna karşılık aile sorumluluğu artan evli bireylerin, lisansüstü eğitim düzeyine sahip kullanıcıların, on yılı aşkın internet tecrübesi bulunan kıdemli kullanıcıların (Almalı & Kızıldere, 2025) ve birden fazla akıllı cihazdan oluşan geniş bir teknoloji ekosistemini eş zamanlı yönetenlerin parola disiplininde ve teknik koruma reflekslerinde belirgin biçimde daha tedbirli ve proaktif davrandıkları tespit edilmiştir. Elde edilen sonuçlar; kurumların ve politika yapıcıların yalnızca güvenlik yazılımları temin ederek siber tehditleri önleyemeyeceğini, insan odaklı güvenlik kültürünün inşasında öncelikle günlük parola alışkanlıklarının ve veri mahremiyeti bilincinin geliştirilmesine odaklanılması gerektiğini kanıtlamaktadır.

Anahtar Kelimeler: Siber güvenlik algısı, korunma motivasyonu teorisi, gizlilik bilinci, parola yönetimi, teknik cihaz savunması, normallik analizi, koruyucu siber davranış, demografik farklılıklar.

Abstract

As digitalization becomes deeply embedded in daily life and organizational operations, cybersecurity has evolved from a purely hardware- and software-centric IT concern into a human-centered behavioral defense chain shaped by individual attitudes, perceptions, and daily habits. Theoretically grounded in Protection Motivation Theory (Rogers, 1975; Johnston & Warkentin, 2010) and the Theory of Planned Behavior (Ajzen, 1991; Bulgurcu et al., 2010), this study aims to empirically examine the structural mechanisms through which privacy awareness and password management discipline translate into technical device protection behaviors, while exploring how these protective actions diverge across demographic profiles and technological backgrounds. Empirical data were gathered from 415 active technology users across diverse occupations and age groups using a structured survey instrument. Prior to hypothesis testing, the distributional properties of the data were rigorously examined via skewness, kurtosis, and normality assessments, confirming that parametric test assumptions were fully satisfied. Subsequent factor analyses confirmed that individual cybersecurity perception is organized around three robust, mutually reinforcing dimensions: technical device defense (antivirus deployment, firewalls, and timely operating system updates), online privacy and personal data caution, and password and authentication management (two-factor authentication, complex credentials, and regular renewal). The structural equation model reveals that proactive credential discipline serves as the primary catalyst driving individuals to deploy technical protective tools on their devices, reinforced by personal privacy awareness. Together, these two behavioral antecedents explain more than half of the variation in technical security actions, demonstrating that credential hygiene acts as an essential gateway to broader defensive behaviors. Furthermore, demographic difference analyses challenge conventional assumptions in the literature (Branley-Bell et al., 2022): gender does not yield any significant divergence across security dimensions, indicating that baseline cybersecurity awareness has attained universal parity between men and women. Conversely, married individuals, postgraduate degree holders, users with over a decade of online experience (Almalı & Kızıldere, 2025), and individuals managing an ecosystem of multiple smart devices exhibit significantly higher vigilance, demonstrating more disciplined password hygiene and robust system protection routines. These findings signify that organizational and national cybersecurity strategies cannot succeed solely through technical software solutions; sustainable resilience fundamentally requires cultivating daily password discipline and personal privacy mindfulness as foundational behavioral pillars.

Keywords: Cybersecurity perception, protection motivation theory, privacy awareness, password management, technical device defense, normality assessment, protective security behavior, demographic differences.

THE RELATIONSHIP BETWEEN ENTERPRISE SIZE AND ARTIFICIAL INTELLIGENCE ADOPTION INDICATORS: A PANEL DATA ANALYSIS OF THE EUROPEAN UNION AND TÜRKİYE

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Abstract

The study examines the relationship between enterprise size and four artificial intelligence (AI) adoption indicators in European Union (EU) member states and Türkiye. Enterprise size is classified by the number of persons employed as small (10-49), medium-sized (50-249), and large (250 or more). The indicators cover enterprises using at least one AI technology, enterprises whose AI technologies were developed by their own employees, enterprises that have considered using at least one AI technology, and enterprises using AI technologies for at least one purpose.

The significance of the study lies in examining four distinct dimensions of AI adoption rather than relying on a single indicator. The inclusion of Türkiye alongside EU member states also enables a descriptive comparison within a broader European context.

Using Eurostat's Artificial intelligence by size class of enterprise dataset, the study covers 27 EU member states and Türkiye for 2021, 2023, 2024, and 2025. Four separate regression models examine differences between medium-sized and large enterprises and small enterprises for each indicator, controlling for country-year fixed effects.

The results reveal positive and statistically significant relationships between enterprise size and all four indicators. After accounting for country-year fixed effects, medium-sized and large enterprises exhibit higher values across all indicators than small enterprises. These findings indicate that AI adoption varies by enterprise size across multiple dimensions. However, the results establish statistical associations and should not be interpreted as evidence that an increase in the number of people employed directly causes greater AI adoption.

Departing from the extant literature, which predominantly confines the analysis of AI adoption to a single indicator, this study examines four distinct dimensions of adoption concomitantly and situates Türkiye within the same panel data framework as the 27 EU member states, thereby furnishing an original contribution with respect to both conceptual breadth and geographical scope.

Keywords: Enterprise Size; Artificial Intelligence; European Union; Türkiye; Panel Data Analysis.

DIGITAL TWINS IN EDUCATION: DESIGN AND USABILITY EVALUATION OF A WEB-BASED HYBRID LEARNING PLATFORM

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Abstract

Digital twin technologies are increasingly applied beyond traditional domains such as industrial monitoring, predictive maintenance, and simulation, extending into the development of immersive and interactive educational environments. This study investigates the use of visual digital twins in educational processes, focusing on their opportunities, potential risks, and international implementation examples. As part of this study, an educational platform was developed to facilitate the participation of both students and educators in a shared educational process via the visual digital twin of a physical classroom. The platform's real-time 3D visualization infrastructure utilizes the PlayCanvas game engine, and photorealistic representations of physical spaces are generated using Gaussian Splatting methods. For the pilot application, several physical spaces at Iskenderun Technical University were scanned and converted into visual digital twins. A multi-user system was established, enabling users to be present simultaneously in the same virtual environment through avatars, engage in live voice communication and screen sharing, and use seating and in-class interaction mechanisms. The platform further incorporates collaborative and individual web frameworks, media and live streaming components, persistent 3D objects, remote presentation control, and role-based classroom tools. In a pilot study involving approximately 40 students, the platform's usability and user experience were evaluated. Participants used the developed platform during a 2-hour class session; afterwards, the SUS-TR and UEQ-S scales were administered to assess perceived usability and the pragmatic and hedonic aspects of the user experience. In addition, through follow-up questions, students' experiences with course participation, their levels of interaction with other users, their perceptions of how closely the digital twin resembled a physical classroom, their sense of being present in the classroom, and their intentions to use the system again in the future were assessed. Quantitative data were analyzed descriptively, and open-ended student feedback was examined to identify strengths and areas for improvement.

Keywords: Digital Twin, Hybrid Education, Immersive Learning, 3D Gaussian Splatting

THE DIGITAL VISIBILITY PARADOX IN SUPPLY CHAIN INFORMATION SYSTEMS: PRELIMINARY EVIDENCE ON INFORMATION LAYERS AND FORECAST ACCURACY. A PILOT STUDY

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Abstract

Background**:** Supply chain visibility investments, including Internet of Things sensors, real time tracking, control towers, and predictive analytics, assume that more information improves operational decisions. Since Jacoby, Speller, and Kohn (1974), the information overload literature has reported an inverted U relationship between information load and decision quality. This pilot study examines whether forecast accuracy in a real supply chain demand series improves at every step as visibility layers are added, and which explanations fit any departure. Forecast accuracy is a proxy for one decision input, not managerial decision quality. Method**:** A quantitative pilot fitted a staged ordinary least squares regression to daily sales for one store product series from FreshRetailNet-50K, a stockout-annotated fresh retail demand dataset (69 days; 54 training, 14 test observations); industry surveys were reviewed as context only. Results were checked against naive baselines, rolling origin validation, regularised models, and diagnostic models. Results: Test RMSE fell 67.6 percent (1.061 to 0.344) as discount and calendar event data were added across three information levels, then rose 57.2 percent relative to Level 3 (to 0.540) when a fourth, weather based layer was added, though Level 4 remained 49.1 percent below Level 1. Under rolling origin validation the increase was about 19 percent and the pooled Diebold-Mariano test was not significant ($p = 0.154$). Temperature was almost collinear with calendar time ($r = 0.98$); a linear time trend alone reproduced the deterioration, whereas random covariates did not. Conclusion**:** The data provide preliminary evidence of a non-monotonic relationship between visibility layers and forecast accuracy in one series. They do not establish a threshold, a confirmed visibility paradox, or information overload as the cause; a trending covariate is the best-supported explanation. Industry reports (2023 and 2026 Gartner surveys, as reported by Rana, 2026) are contextual only.

Keywords: Supply chain visibility; Information overload; Forecast accuracy; Demand forecasting; Regression analysis; Pilot study

THE TRANSFORMATION OF ONLINE KNOWLEDGE SHARING IN THE AGE OF GENERATIVE ARTIFICIAL INTELLIGENCE: A CASE OF INFORMATION SECURITY STACK EXCHANGE

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Abstract

Online Q&A communities are information systems that support users in searching for information, accessing expertise, and solving problems collectively. With the widespread adoption of generative artificial intelligence (GenAI) tools, the role of these communities in knowledge sharing and the question-asking behaviors of their users may have changed. The purpose of this study is to examine whether observable indicators of question complexity and the response rate have changed on the Information Security Stack Exchange (https://security.stackexchange.com/) platform. As part of this research, 15149 questions were extracted from the platform using the Stack Exchange API. An interrupted time series (ITS) analysis was performed on the data grouped monthly, which covered the period from January 1, 2020, to September 17, 2026. January 2023 was identified as the intervention point. Binomial logistic regression was used to observe changes in the response rate, while a linear ITS model was used to observe changes in question complexity indicators. The findings showed that the response rate decreased significantly before the intervention. However, no significant change (e.g., trend break) was detected in the response rate after the intervention. A significant trend toward an increase in the average and median number of words in the question body, that was observed following the intervention. In contrast, no significant change was detected in the average number of tags following the intervention, in terms of the presence of code content in the question or the use of multiple tags. These findings do not prove a direct causal effect of the widespread adoption of GenAI tools on these variables. The study presents a MIS research framework to examine the transformation of online technical communities in information sharing and collective knowledge production in the era of GenAI.

Keywords: Digital Transformation, Online Technical Communities, Interrupted Time Series Analysis, Information Systems, Information Security Stack Exchange.

AN EMPIRICAL STUDY ON THE RELATIONSHIP BETWEEN PERCEPTION OF 5G TECHNOLOGY AND INTENTION TO USE 5G TECHNOLOGY

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Abstract
Background/Aims: As fifth-generation (5G) mobile technology becomes increasingly widespread, understanding how individuals perceive its benefits and risks is important for explaining their intention to use it. This study examines the relationships between three dimensions of 5G perception and usage intention. Three hypotheses were tested: (H1) perceived societal and future-oriented benefits are positively associated with intention to use 5G; (H2) perceived technological benefits are positively associated with intention to use 5G; and (H3) perceived risks are negatively associated with intention to use 5G.

Materials/Method: A quantitative research design was employed, and data were collected from 400 participants using a structured questionnaire with seven-point Likert-scale items. Principal component analysis with oblique rotation identified four components explaining 62.72 % of the total variance: perceived societal and future-oriented benefits, perceived risks, perceived technological benefits, and usage intention. Following the exclusion of one item, 34 items were retained. Cronbach's alpha coefficients ranged from .901 to .950. The hypothesized relationships were examined using covariance-based structural equation modeling (SEM).

Findings: The structural equation model demonstrated acceptable fit according to selected indices (CMIN/DF = 2.871; CFI = .905; RMSEA = .068; IFI = .906). Perceived societal and future-oriented benefits ($\beta = .335$, $p < .001$) and perceived technological benefits ($\beta = .352$, $p < .001$) were positively and significantly associated with intention to use 5G technology. However, perceived risks were not significantly associated with usage intention ($\beta = -.015$, $p = .733$). Thus, H1 and H2 were supported, whereas H3 was not supported.

Conclusion/Implications: The findings indicate that perceived technological benefits and societal and future-oriented benefits are positively associated with 5G usage intention, whereas perceived risks do not exhibit a statistically significant relationship. The study contributes to technology acceptance research by distinguishing multiple dimensions of 5G perception and examining their relationships with usage intention within a single structural model. From a practical perspective, the results suggest that telecommunications operators and policymakers may encourage 5G adoption by communicating its technological advantages and potential societal and future-oriented benefits.

Keywords: 5G Technology; Usage Intention; Societal Benefits; Technological Benefits; Perceived Risks; Structural Equation Modeling

DESIGN AND DEVELOPMENT OF A MULTICHANNEL AND AUDITABLE ELECTRONIC ATTENDANCE SYSTEM IN HIGHER EDUCATION

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Abstract

Higher education attendance management requires consistent recording across participation channels, transparent application of absence rules, and traceable corrections. Differences in device availability and teaching practices motivate an integrated approach beyond attendance capture alone. This study presents the design, development, and scenario-based technical evaluation of a multichannel, auditable electronic attendance system. The research question concerns how attendance collection, absence decisions, and semester records can be integrated within a common institutional workflow. To address these needs, the web-based system organizes workflows around student, instructor, and administrator roles. The system supports four attendance methods, including dynamic QR codes, NFC student cards, individual manual marking, and bulk marking. QR tokens use cryptographic signatures and periodic renewal to limit reuse. The design incorporates institutional single sign-on, optional campus-network restrictions, spreadsheet-based course and enrollment import, and timetable-based session creation. Absence calculations use teaching hours, with separate rules for theoretical and practical or laboratory components. Reasoned corrections, recorded session cancellations, semester closure, audit logs, and SHA-256 archive integrity checks support retrospective examination of attendance decisions. To assess the implementation, technical evaluation used synthetic data in an isolated local MySQL environment. An initial automated run passed 38 of 45 tests. Following targeted corrections and additional regression checks, all 62 automated cases in the final run passed. These results concern selected business rules and do not establish complete coverage of the 48 high-level scenarios identified for evaluation. Taken together, the design and evaluation offer an integrated information-system design connecting flexible attendance collection with explainable absence calculations and auditable semester management. Institutional authentication, physical NFC operation, usability, and effectiveness in classroom practice remain to be evaluated in field studies. The implementation and technical findings provide a basis for a subsequent institutional pilot.

Keywords: Electronic attendance; Management information systems; Dynamic QR codes; Audit trails; Absence management.

INVESTIGATION OF DIGITAL FATIGUE LEVELS AMONG UNIVERSITY YOUTH: THE CASE OF ATATÜRK UNIVERSITY

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Abstract

Background/Aims: The increasing integration of digital technologies into everyday life has given rise to digital fatigue, a contemporary phenomenon characterized by physical, mental, and emotional exhaustion stemming from prolonged exposure to digital devices. University students, who conduct a significant portion of both their academic and social lives through digital platforms, represent a particularly vulnerable group. This study aims to examine the digital fatigue levels of undergraduate students and to identify the dimensions that shape this experience.

Materials/Method: The research was conducted with 463 undergraduate students (55.72% female, 44.28% male) enrolled at Atatürk University in Erzurum. Data were collected through a structured questionnaire encompassing five dimensions: psychological, sociological, physical, academic, and recovery. Internal consistency was verified using Cronbach's alpha coefficients. Ordered logistic regression analysis was employed to identify predictors of perceived digital fatigue, and average marginal effects were calculated to interpret each dimension's contribution.

Results: More than half of the participants (50.32%) reported perceiving digital technology as highly fatiguing. The academic, psychological, physical, and recovery dimensions significantly predicted digital fatigue levels. The academic dimension emerged as the strongest predictor, with reduced interest in coursework, declining academic performance, and online examination stress playing central roles. Constant pressure to remain active on social media, attention difficulties, and digital social comparison were prominent psychological contributors. Eye strain, sleep disturbances, and headaches were the most frequently reported physical complaints. The sociological dimension did not yield a statistically significant effect.

Conclusion/Implications: Digital fatigue is a prevalent and multidimensional concern among university students, with academic pressures constituting the most significant driver. These findings highlight the need for digital awareness programs, regulation of academic digital workload, and structured promotion of recovery strategies within higher education institutions.

Keywords: Digital fatigue, university students, ordered logistic regression, academic performance, digital awareness.

DIGITAL PRIVACY PERCEPTION AMONG UNIVERSITY STUDENTS: AN ANALYSIS WITH PARTIAL PROPORTIONAL ODDS MODEL

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Abstract

Background/Aims: The rapid integration of digital technologies into everyday life has made privacy perception an increasingly critical concern. University students, who conduct much of their academic and social lives through digital platforms, represent an important group for understanding how trust in privacy protection is formed. This study aims to identify the determinants of digital privacy perception among undergraduate students at Atatürk University.

Materials/Method: Data were collected from 888 undergraduate students through a structured questionnaire comprising 58 Likert-type items: internet usage purposes, digital privacy knowledge, social media privacy, device fingerprint awareness, psychological effects, sociological effects, web trustworthiness assessment, security measures, password management, and breach response behaviors. Chi-square independence tests were applied to all items, and the 47 significant items were entered into an ordered logistic regression model. A stepwise elimination procedure over 35 iterations yielded a final model of 15 variables. Since the proportional odds assumption was violated across five tests, a partial proportional odds model (gologit2) was applied. Multicollinearity was not detected (mean VIF=1.87).

Results: Awareness of data retention rights and regularly checking website privacy policies were the strongest positive predictors of platform trust. Active responses to data breaches and social internet use also increased trust perception. Conversely, two-factor authentication use and sociological awareness of secure digital interaction were associated with lower trust, suggesting that heightened awareness fosters a more skeptical stance toward platforms.

Conclusion/Implications: Digital privacy perception is shaped by behavioral and sociological factors alongside technical knowledge. These findings highlight the need for privacy education programs that foster active digital behaviors, and contribute to the literature through the application of a partial proportional odds approach rarely used in digital privacy research.

Keywords: Digital privacy, platform trust, university students, partial proportional odds model, ordered logistic regression

THE RISE OF MANAGEMENT INFORMATION SYSTEMS UNDERGRADUATE PROGRAMS IN TÜRKİYE: EVIDENCE FROM ADMISSION CUTOFF RANKS, 2016–2026

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Abstract

Management information systems (MIS) programs have expanded rapidly in Türkiye. Research has focused on curricula, graduate research and competencies. Long-term admission outcomes have received little attention. This study examines how the supply and selectivity of MIS undergraduate programs changed between 2016 and 2026 and whether the rise differs from trends in neighboring fields that admit with the equal-weight score. A program-level longitudinal database was compiled from Council of Higher Education (YÖK Atlas) records and Student Selection and Placement Center (ÖSYM) publications. It contains 1,579 program-year observations for 287 program lines at 105 universities represented in the central placement system. The analysis combines supply indicators, median admission cutoff ranks, a balanced panel, improvements over three, five and eight years, program fixed-effects models with a quota control, within-faculty comparisons and breakdowns by university type, fee tier, language, region and city. Universities offering MIS increased from 36 in 2016 to 103 in 2026 and quotas outside open education rose from 2,422 to 6,704. The median cutoff rank of state daytime programs improved from 368,914 in 2018 to 134,162 in 2026. All 21 state programs observed in every year improved by 64 to 89%. Among state daytime programs every region improved and Marmara had the best median (32,522). Across core-segment city groups Ankara ranked first (39,561). MIS moved from fourth to first place among nine equal-weight fields. It closed at a better rank than business administration in 28 of 29 matched faculties in 2026. The relative gain persists when quotas are controlled. Fee-paying lines at foundation universities showed much weaker fill and selectivity outcomes. MIS has become markedly more selective within the equal-weight admission market of Türkiye despite substantial capacity growth. Future expansion should attend to capacity, program quality and the weaker performance of fee-paying segments.

Keywords: Management Information Systems; Universities; School Admission Criteria; Admission Cutoff Rank; Higher Education; Türkiye

THE RESEARCH MISSION IN UNIVERSITY GOVERNANCE: FINDINGS FROM THE 2025 INSTITUTIONAL SELF-EVALUATION REPORTS

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Abstract

This study examines how the research mission is reflected in the governance of research universities in Türkiye. Research universities are often evaluated through research performance, rankings, publications, and similar output indicators. However, less attention has been given to how the research mission is reflected in governance structures, decision-making processes, resource use, and institutional improvement. The study analyzed the "Leadership, Governance and Quality" sections of the 2025 Institutional Self-Evaluation Reports (ISERs) of all 23 research universities in Türkiye. Document analysis and thematic analysis were used. Meaningful text segments were coded and then regrouped according to similarities and relationships among the reported practices. Three researchers participated in the coding process, and the coding framework was refined through a second review and joint discussion. The analysis resulted in two main themes. The first, "Data and feedback in decision-making and improvement," included the combined use of different indicators, the use of feedback in decision-making and improvement, and changes in institutional structures or processes based on evaluation results. The second, "Reflection of the research university mission in governance," focused on how the research mission was reflected in strategic priorities, research-specific management structures, the use of research performance in management, resource allocation, benchmarking, and incentive mechanisms. Research performance was explicitly used in management processes in 19 universities, research-specific governance structures were reported in 17, and incentive mechanisms in 12. In contrast, strategic allocation of research resources was clearly reported in 7 universities and systematic benchmarking in 6. The findings suggest that research universities share several governance practices, but differ in how the research mission is connected to strategy, performance,

resources, benchmarking, and incentives. The study offers a governance-based perspective for understanding these differences among research universities.

Keywords: Research universities, university governance, research mission, institutional governance, thematic analysis, research management

TEMPORAL AND DIRECTIONAL PERFORMANCE OF TECHNICAL ANALYSIS PATTERNS IN CRYPTOCURRENCY MARKETS: AN ALGORITHMIC ANALYSIS OF THE 2019–2024 PERIOD

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Abstract

This study examines the periodic performance of classic technical analysis patterns in cryptocurrency markets and whether this performance varies based on the pattern's direction. Daily and four-hour price data for BTC, ETH, LINK, XRP, and SOL from the 2019–2024 period were utilized; ascending/descending triangles and wedges, as well as head-and-shoulders patterns, were identified algorithmically. The analysis was conducted on a total of 1,192 trades concluded during the 2019–2021 and 2022–2024 periods. Fisher's exact test was applied for rate comparisons, logistic regression for evaluating the period-by-direction interaction, and the Benjamini–Hochberg false discovery rate correction for multiple comparisons. The overall success rate rose from 39.1% to 43.4%, though this difference was not statistically significant (p=0.141). In contrast, while the success rate for bearish patterns increased from 32.8% to 42.4% (p=0.012), no significant change was observed for bullish patterns (48.5% vs. 44.7%; p=0.419). Consequently, the performance gap between directions narrowed from 15.6 percentage points to 2.3 points, and the period-by-direction interaction was found to be significant (p=0.019). The increase observed in the four-hour ascending wedge pattern remained significant even after the multiple comparison correction (q=0.0093). The persistence of the increase in bearish pattern success—even when comparing only years of strong bullish trends—supported the finding of directional convergence. The findings indicate that, in the second period examined, the performance asymmetry between upward and downward patterns narrowed significantly, rather than there being a deterioration in the overall performance of technical patterns. However, the current study design does not allow for disentangling the extent to which the observed period-to-period difference stems from technological transformation, the market regime, or concurrent market developments. The results should be regarded as preliminary findings of ongoing research that do not support causal inferences.

Keywords: Cryptocurrency Markets, Technical Analysis, Technical Patterns, Algorithmic Analysis, Pattern Performance

***This paper presents part of the research conducted within the scope of the project entitled "Yapay Zekânın Kripto Piyasasında Teknik Analiz Formasyonları Üzerindeki Etkisi: 2019–2024 Dönemi Karşılaştırmalı Nicel Analizi" supported by the TÜBİTAK under the 2209-A University Students Research Projects Support Program (Project Application No.: 1919B012554144).

BEYOND FACT-CHECKING: A PUBLIC-SECTOR DISINFORMATION RESILIENCE CAPABILITY MODEL

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Abstract

Public-sector responses to disinformation are frequently organized around reactive fact-checking: identifying a false claim, establishing the relevant facts, and issuing a correction. Although essential, this claim-by-claim approach does not fully capture the institutional capabilities required to maintain information integrity under conditions of high velocity, ambiguity, and coordinated manipulation. This conceptual study introduces public-sector disinformation resilience capability, defined as the collective ability of public institutions to anticipate, detect, prioritize, verify, respond to, and learn from information threats while sustaining credible, transparent, and rights-sensitive public communication. Drawing on dynamic capabilities, organizational resilience, information-processing, and strategic communication research, the study develops a multidimensional capability model comprising anticipatory sensing, evidentiary verification, risk prioritization, coordinated response, and adaptive learning. These capabilities operate as an interconnected and recursive system: monitoring generates threat signals; verification transforms signals into evidence; prioritization directs scarce institutional attention; coordination enables timely and consistent responses; and organizational learning converts completed cases into improved detection rules, response protocols, and preventive communication. The effectiveness of this system is expected to depend on threat velocity, information ambiguity, multimodality, interorganizational fragmentation, data accessibility, platform dependence, and pre-existing levels of public trust. The framework shifts the unit of analysis from individual fact-checks to the wider institutional system that produces and sustains information integrity. It therefore conceptualizes resilience not as the number of false claims corrected, but as the capacity to preserve reliable public information functions before, during, and after information disruption. The model provides a foundation for assessing institutional readiness, identifying capability gaps, and designing more anticipatory and coordinated public-sector responses to disinformation.

Keywords: public-sector disinformation resilience; dynamic capabilities; information integrity; strategic communication; institutional capacity; public-sector governance

THE VERIFICATION BOTTLENECK: A RISK-BASED TRIAGE MODEL FOR AI-ACCELERATED DISINFORMATION IN PUBLIC INSTITUTIONS

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Abstract

Generative artificial intelligence has sharply reduced the cost of producing persuasive falsehoods across text, image, audio, and video formats. Institutional verification, however, continues to require time, expertise, reliable evidence, and coordination across organizational boundaries. This asymmetry creates a verification bottleneck, defined as the systemic gap between the volume and velocity of potentially harmful claims entering the information environment and the capacity of public institutions to verify and address them before consequential harm occurs. Drawing on organizational information-processing theory, bounded rationality, risk governance, and crisis decision-making research, this conceptual study develops a risk-based triage model for allocating limited verification resources. The model evaluates incoming claims according to their potential societal harm, diffusion velocity, target criticality, evidentiary uncertainty, reversibility of consequences, verification cost, and availability of authoritative counterevidence. These dimensions route claims into four response pathways: immediate intervention for high-impact and rapidly spreading threats; accelerated expert verification accompanied by an interim warning when uncertainty remains high; standardized correction or prebunking for recurring and well-understood narratives; and continued monitoring for low-impact or weakly diffused claims. Institutional data access, cross-agency coordination, provenance technologies, platform cooperation, legal constraints, and public trust are identified as conditions shaping triage effectiveness. The framework moves beyond detection accuracy by treating disinformation response as an institutional resource-allocation problem. It also explains why expanding monitoring capacity without corresponding verification and response capacity may increase backlogs rather than improve resilience. By providing transparent and auditable prioritization criteria, the model supports faster, proportionate, and evidence-based decision-making while reducing the risk that institutional attention is captured by highly visible but comparatively low-impact content.

Keywords: AI-accelerated disinformation; verification bottleneck; risk-based triage; generative artificial intelligence; public institutions; decision support

MODELING USER INTEREST ON DIGITAL GAME PLATFORMS: AN ANALYSIS BASED ON STEAM DATA

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Abstract

The proliferation of digital platforms has turned the systematic analysis of user-generated data, the understanding of user behaviors, and the development of data-driven decision-support mechanisms into a significant area of research. This study aims to model user interest using quantitative methods based on game data from Steam, a digital game distribution platform.

Within the scope of the study, the relationship between various game attributes and user interest is examined using the multiple linear regression method. Two distinct dependent variables were defined to represent different dimensions of user interest: the number of concurrent players at the time of data collection represents instantaneous user interest, while the total number of user reviews represents cumulative user interaction. Separate regression models were constructed for both dependent variables, and model performances were comparatively evaluated using appropriate metrics (R^2, RMSE).

To enhance the interpretability of the constructed models, SHAP (SHapley Additive exPlanations) analysis—an explainable AI method—was applied. Through this analysis, the variables determining model predictions were identified, and the direction (positive/negative) and magnitude of their contributions to the prediction outcomes were assessed.

The findings reveal the effects of game attributes on both instantaneous and cumulative user interest. The SHAP analysis enables model outputs to be supported not only by statistical performance metrics but also by variable-level explainability. In this regard, the study presents an interdisciplinary approach at the intersection of digital platform analytics, business analytics, data science, and explainable AI; it is expected to contribute to the data-analytics-based examination of user interest on digital game platforms and to the enhancement of transparency in predictive models.

Keywords: User interest, steam, multiple linear regression, explainable AI, SHAP

ESTABLISHMENT OF AN INVENTORY REGISTRATION AND MANAGEMENT SYSTEM FOR THE FETHIYE CULTURE HOUSE AND ITS PROMOTION VIA DIGITAL MEDIA TOOLS

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Abstract

Our study was conducted to establish a comprehensive inventory infrastructure aimed at directly improving the preservation, display, and accessibility of the book and document collections at the Fethiye Culture House,and to share our innovative museum approach. This project was supported under the TÜBİTAK 2209 scheme. Inventory inconsistencies—which lead to practical issues frequently encountered in small-scale local archives, such as the misplacement of materials, unsuitable storage conditions, and difficulties regarding public access—are addressed through our project's field-oriented solutions. Inventory systems for cultural assets are of critical importance for the effective management and preservation of cultural heritage,as well as for the sound establishment of investment programs and decision-support mechanisms. Furthermore, access via 360VR technology plays a significant role in the future vision of modern museology; in this context, it is believed that the innovative resource access service—developed using the INSTA360 Titan VR and designed for presentation on the museum's website—will introduce a significant innovation to the sector. Current studies in the relevant literature also provide robust evidence regarding the novelty, utility, and advantages of this technology. During the project, museum resources were coordinated with administrators to digitize key artifacts and make them accessible to the public. Field visits with Fethiye Municipality officials secured full support for the project's implementation, and a detailed metadata dictionary covering sixteen local categories was developed. Technical outputs included Excel templates, field validation rules, and sample datasets; the collected data was organized to fit the database model, enabling the creation of business intelligence-driven management dashboards.A dedicated webpage provided users with access to digitized documents and inventory management tools, while a QR code generation module facilitated the presentation of digital media content. This initiative successfully managed the cultural center's inventory and provided us—as future researchers—with unique, hands-on experience in programming and digital media tools through the resolution of real-world challenges.

Keywords: Culture House, Museology, Business Intelligence, Inventory Management System, Digital Media, Digital Transformation.

DIGITALIZATION IN AGRICULTURAL DEVELOPMENT: STRENGTHENING FARMER-CENTER INTERACTION THROUGH SOCIAL MEDIA, WEB-BASED COMMUNICATION INFRASTRUCTURE, AND NEEDS ANALYSES

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Abstract

Social media has emerged as a critical component in agricultural communication. Although farmers frequently search for agricultural information online, they exhibit a moderate level of trust in the information accessed via the internet. To address this, the current project was carried out under the coordination of the Beşkaza Genetic Resources and Innovative Technologies Application and Research Center (BEYTEK) to ensure that regional farmers can access the most reliable information. This study targets the digital transformation of BEYTEK, aiming to increase the visibility of scientific studies, projects, and field activities conducted within the center. The research was supported by the TUBITAK 2209 program. The website developed within the scope of the project serves as the primary platform where the center's activities are systematically showcased, research results are published, event announcements are made, and the digital archive is managed. The website is intended to function not merely as a promotional tool, but also as an institutional information management system. In this context, the center's fields of study, research laboratories, field applications, academic publications, project partnerships, and educational activities are comprehensively presented. Furthermore, the social media strategy is built upon a participatory communication model that extends beyond mere promotion. Communication efficiency has been enhanced through the regular monitoring of reach, engagement, and viewership metrics using digital analytics tools. This study has also contributed to strengthening BEYTEK's corporate identity. Initiatives such as the revision of corporate design elements, digital presentations, promotional videos, and the modernization of the logo have established a professional brand identity that accurately reflects the center's research profile. Ultimately, these efforts are expected to increase the center's credibility in national and international project collaborations, enhance its visibility in funding applications, and build prestige among stakeholders.

Keywords: Farmer Registration System, Digitalization, Regional Development, Web Design, Social Media.

BÜTÇE GELİRLERİNİ ARTIRMAK İÇİN VERİ ODAKLI BİR MODEL: SEKTÖREL ORAN ANALİZİNİN ULUSAL / KAMUSAL KAYNAK PLANLAMASINA ENTEGRASYONU*

A DATA DRIVEN MODEL TO IMPROVE BUDGET REVENUE: INTEGRATING SECTORAL RATIO ANALYSIS INTO NATIONAL / PUBLIC RESOURCE PLANNING*

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Abstract

For years, traditional budgetary logic in public financial management has primarily relied on controlling expenditures, managing appropriations, and enforcing legal limits. Conversely, there is a distinct lack of a dynamic, real-time, and explicit monitoring mechanism to accurately measure efficiency and revenue potential on the income side of the budget. This structural deficiency frequently leads to substantial deviations in revenue forecasts, ultimately necessitating the coverage of persistent budget deficits through public borrowing. The primary objective of this study is to establish a measurable, practical, and highly comprehensible Key Performance Indicator (KPI) model that systematically boosts government revenues by adapting private-sector financial analysis methodologies to the domain of public finance.

To rigorously test the model's overall validity, reliability, and practical applicability, the non-life insurance sector was specifically selected as the pilot area due to its high level of financial transparency and strict adherence to the Uniform Chart of Accounts standards. Ten years of comprehensive financial data (2015–2024) from active companies within the sector were analyzed, leading to the development of a novel and practical rating method known as Sectoral Ratio Analysis (SORAN). Empirical findings indicate that the SORAN method can be readily applied not only in the insurance sector but across all major real-economy sectors, including manufacturing, energy, tires, plastics, food, agriculture, and healthcare.

The high-quality, actionable data generated by this model will initially serve as a critical performance indicator for monitoring budget revenues. Subsequently, it will be shared by the Ministry of Treasury and Finance to enable private enterprises to benchmark their financial performance effectively. Ultimately, it will function as the primary data foundation for the National/Public Resource Planning (NRPP / PRPP) system.

Keywords: Budget Revenue Performance, Sectoral Ratio Analysis (SORAN), Sectoral Benchmarking, National / Public Resource Planning Platform (NRPP /PRPP), Management Information Systems (MIS).

* This study was written by adapting the doctoral thesis, titled “An Analysis Aimed at Improving Budget Revenue Performance: The Non-Life Insurance Sector,” to the discipline of Management Information Systems (MIS) and the Society 5.0 perspective.

CIVIL SOCIETY ORGANIZATIONS AS STRATEGIC ACTORS IN THE DEVELOPMENT OF THE SOFTWARE SECTOR AND RECOMMENDATIONS FOR TÜRKIYE

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Abstract

A strong software sector within a country depends on the development of a qualified workforce, the pursuit of research and development (R&D) policies, the establishment of R&D institutions, the advancement of human resources, and the presence of strong educational infrastructure. It also relies on the creation of legal and regulatory frameworks to foster and protect the sector, the safeguarding of industry representatives, the establishment of national software quality standards aligned with global benchmarks, and the protection of intellectual property rights. Through these elements, the software sector can effectively compete with global rivals and achieve sustainability. Non-Governmental Organizations (NGOs) play a critical role in this dynamic, multi-layered, and highly interactive ecosystem. Operating as independent, non-profit entities for the public good, NGOs serve as a vital bridge between government policies and the private sector, actively shaping industry standards and fostering a collective vision. A review of the existing literature reveals a significant scarcity of studies addressing the intersection of the software industry and non-governmental organizations. Therefore, the primary objective of this study is to discuss the importance of NGOs for the software sector through global examples, evaluate the initiatives of prominent organizations, and present a comprehensive assessment. Furthermore, the study outlines actionable strategies and future perspectives for the enhancement of the software sector in Turkey. As demonstrated by global counterparts such as NASSCOM in India or the Irish Software Association, civil initiatives that unite industry stakeholders have proven to be the driving force in formulating and executing national strategies. Despite possessing a strong, youthful demographic potential and well-established associations, Turkey has yet to develop a unified umbrella organization capable of consolidating the sector, akin to India's NASSCOM or Brazil's Softex. By comparing Turkish NGOs with global benchmarks, this study identifies existing structural gaps and provides strategic recommendations to policymakers for fostering a more integrated and competitive national software ecosystem.

Keywords: Software, software sector, civil society organizations, association, global competition, Türkiye.

AI-POWERED, DATA-DRIVEN COLORECTAL CANCER PATIENT COUNSELING AND EARLY WARNING SYSTEM

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Abstract

Colorectal cancer poses a severe burden on public health worldwide in terms of mortality and morbidity rates. When the disease is diagnosed at a localized early stage, the five-year relative survival rate is 91.5%; however, this rate drops to 16.2% in the late stages. Literature reviews have demonstrated that in addition to the significant role of lifestyle and habits in the development of colorectal cancer, the early recognition of pre-diagnostic symptoms by individuals is of paramount importance. Therefore, an evaluation based on patients' self-reported current symptoms is crucial for the diagnostic process. This study aims to generate personalized early warning and preventive outputs by analyzing epidemiological and symptom-based data obtained from patients. The research was supported within the scope of the TUBITAK 2209 program. A review of recent literature reveals an increasing focus on natural language processing and machine learning-based models for medical diagnosis, symptom analysis, and patient triage processes. Particularly in fields such as healthcare, where accuracy rates are of critical importance, the combined use of large language models (LLMs) and machine learning is highly recommended. However, most existing studies have primarily focused on English datasets and clinical endpoints, revealing a notable lack of research dedicated to community-level early diagnosis. This creates a significant gap in the development of community-based early warning systems. This study is scientifically original in its integration of LLM-based semantic analysis with classical machine learning risk prediction algorithms within a multi-layered hybrid architecture. This integrated approach comprehensively evaluates both linguistic semantic structures and numerical risk variables under a single model framework. The high rates of late diagnosis in colorectal cancer significantly increase the burden on national cancer screening programs. In this regard, our study is expected to enhance symptom awareness among individuals, alleviate the workload of cancer screening centers such as Cancer Early Diagnosis, Screening and Training Centers, and empower at-risk individuals to take necessary preventive measures proactively.

Keywords: Colorectal Cancer, Early Diagnosis, Risk Prediction, Machine Learning, Natural Language Processing.

PREDICTING JUDICIAL DECISIONS OF CONCORDAT APPLICATIONS: AN EXPLAINABLE MACHINE LEARNING APPROACH USING EVENT LOG DATA

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Abstract

Background: The concordat processes, which can be monitored through both historical accounting data and the status of its current legal stages, are significant for ensuring the business continuity and allowing commercial activities to proceed without interruption. For this reason, the data obtained at every stage of the process is regarded as significant evidence concerning the analysis of businesses' credit risks and the efficiency of independent audit processes. This research seeks to model judicial decisions of concordat applications based on event log data collected during the concordat proceedings and to interpret the predictions with explainable artificial intelligence.

Method: As predictors, instead of historical accounting-related data, this work applies event data of process-related activities such as temporary respite, definitive respite, extension of respite, creditors' meetings, court hearing, change of commissioner along with province, sector, court, and commissioner. The data used in this study was obtained from www.konkordatotakip.com, a platform that systematically tracks and publishes official concordat announcements. The evaluation is performed on 6,510 records with final decisions categorized into approval, rejection, and bankruptcy. Logistic Regression, Decision Tree, Random Forest, Extra Trees, Support Vector Machine, K-Nearest Neighbors, AdaBoost, and XGBoost algorithms are evaluated with group-aware five-fold cross-validation.

Results: The results revealed that the most influential predictors in the model output are the sector, the number of creditors' meetings, the province, the court, and the commissioner. Among the classes, the number of creditors' meetings was the most influential variable in predicting the approval class. In turn, the sector was the first influential variable for the rejection and bankruptcy classes.

Conclusion: The research reveals the potential of event log data to convey meaningful predictive information for final concordat decisions and the ability of explainable machine learning model outputs to provide complementary decision support to the independent audit and banks' credit risk assessment processes.

Keywords: Concordat, machine learning, event log, credit risk, explainable artificial intelligence, SHAP, decision support system.

DIGITAL ADOPTION DISPERSION, LOGISTICS PERFORMANCE, AND SUPPLY CHAIN RESILIENCE: A CROSS-COUNTRY ANALYSIS

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Abstract

Background/Aims: Digital transformation is widely assumed to strengthen supply chain performance, yet cross-country research typically measures only the average level of digital adoption, overlooking how unevenly adoption is distributed across firms of different sizes. This asymmetry, large firms digitizing rapidly while SMEs lag behind, could undermine logistics performance and resilience independently of a country's overall adoption level. This study tests whether digital adoption dispersion across firm sizes predicts logistics performance and resilience once level and income are held constant.

Materials/Method: Using Eurostat's Digital Intensity Index by enterprise size class and ICT security policy indicators for 31 European countries, alongside the World Bank Logistics Performance Index and GNI per capita, this study builds a dispersion measure orthogonal to the average adoption level, avoiding the collinearity that conflates unevenness with level in raw gap measures. Pearson correlations and multiple regressions, including a two-wave panel with clustered standard errors, test whether dispersion predicts each outcome independently of level and income. Analysis is at the country level, so associations here reflect country-level patterns rather than direct evidence of firm-level behavior.

Results: Dispersion shows no significant bivariate or multivariate association with either logistics performance ($p = .83$; $p = .52$ with controls) or resilience ($p = .37$; $p = .41$ with controls; $p = .31$ in the clustered panel). Average adoption level significantly predicts resilience ($p = .003$), and national income significantly predicts logistics performance ($p < .001$); dispersion adds no explanatory power beyond either.

Conclusion/Implications: Contrary to the asymmetry hypothesis, unevenness in digital adoption across firm sizes does not independently affect logistics performance or resilience once level and income are accounted for. Policies narrowing the digital divide between large firms and SMEs may not yield the gains often assumed; raising the average adoption level appears more consequential than closing gaps between firms.

Keywords: Digital Adoption; Digital Divide; Logistics Performance; Supply Chain Resilience; Small and Medium Enterprises; Cross-Country Analysis

INTEGRATED MOBILE APPLICATION DESIGN FOR CULTURAL TRIP PLANNING

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Abstract

Background/Aims: Mobile applications developed for cultural trips provide users with information about cultural sites. However, needs such as site exploration, route planning, budget management, personalization, and group trip planning are often not addressed within an integrated framework. This study aims to design a mobile application that integrates different stages of the cultural trip process within a single platform and can be personalized according to user needs. The proposed application is intended to facilitate the exploration of cultural sites, enable users to develop trip plans based on their interests and budgets, support effective trip planning, and facilitate the organization of group trips.

Materials/Method: An Agile project approach was adopted for the design and development process. Existing cultural travel applications were reviewed to identify their functional features and limitations. Based on this review, user requirements and core functions were defined. The application was designed to integrate cultural site exploration, route planning, budget management, AI-supported personalized recommendations, group trip planning, and multilingual support. User flows and interface designs were developed, and an interactive prototype was created. Following the completion of the design phase, the development phase was initiated.

Results: The design process resulted in an integrated application structure combining cultural site exploration, route planning, budget management, personalization, group trip planning, and multilingual support. The interactive prototype was designed to enable these functions to operate as interconnected components rather than as independent features, supporting an integrated user experience.

Conclusion/Implications: This study presents an integrated mobile application design that combines cultural site exploration, trip planning, personalization, budget management, and group travel functions. The completed prototype provides a foundation for further application development and is expected to facilitate users' cultural trip planning and management processes.

Keywords: Cultural Travel, Mobile Applications, Route Planning, Artificial Intelligence, Trip Planning

ACTING IN THE AGE OF ARTIFICIAL INTELLIGENCE: ACTORS' PERSPECTIVES ON AI, DIGITAL CLONING, AUTHENTICITY, AND OCCUPATIONAL TRANSFORMATION

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Abstract

Artificial intelligence (AI), generative AI, computer-generated imagery, voice synthesis, and digital cloning technologies are increasingly entering creative production processes, raising important questions about artistic authenticity, consent, performance rights, occupational security, and the future organization of creative labour. These developments are particularly significant for acting, where the performer's face, voice, body, gestures, and expressive characteristics constitute both elements of artistic performance and potentially reusable digital resources. This study examines how actors and acting professionals perceive the transformation of acting in the context of AI-assisted production and digital cloning. Eight semi-structured interviews with participants representing different career stages and performance-related professional backgrounds were anonymized and analysed using a researcher-controlled hybrid thematic analysis. The qualitative analysis was supplemented by descriptive computational procedures examining theme density, participant coverage, participant-level thematic distributions, thematic-profile similarity, lexical concept matching, and concept co-occurrence. These procedures were used solely to support qualitative interpretation and cross-case comparison rather than for statistical inference or independent validation. The findings identified six interconnected themes concerning production support and artistic threat, human and embodied authenticity, digital cloning and performance rights, occupational insecurity, audience authenticity, and the future of acting. Digital cloning, consent, and performance rights emerged as the most densely represented theme, while production support versus artistic threat, occupational insecurity, and future acting appeared across all eight interviews. Cross-case comparisons did not reveal a consistent relationship between career stage and perceptions of AI, although several early- and intermediate-career participants displayed similar thematic profiles regarding digital cloning and occupational risk. Overall, participants perceived AI neither solely as a threat nor simply as a production-support tool. Instead, AI was understood as a technology that may facilitate creative production while simultaneously creating new concerns regarding human authenticity, control over digital identity, consent, employment vulnerability, and the changing boundaries of professional acting.

Keywords: Generative Artificial Intelligence; Digital Cloning; Actors; Creative Labour; Performance Rights; Synthetic Media.

SAME AI UNEQUAL ADVANTAGE THE ARTICULATION DIVIDE IN GENERATIVE AI USE

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Abstract

Generative artificial intelligence is often presented as a democratizing technology because natural-language interfaces make advanced computational capabilities accessible to broad populations. However, equal access does not necessarily translate into equal benefit. This conceptual paper develops the articulation divide as a specific mechanism within the broader AI outcome divide. The articulation divide refers to systematic differences in users' ability to transform partially formed goals, tacit knowledge, contextual constraints, and evaluative criteria into representations that generative AI systems can act on, and to assess and refine the outputs that follow. Drawing on research on digital inequality, prompt and generative AI literacy, knowledge articulation, absorptive capacity, metacognition, and human–AI interaction, the paper identifies four interdependent articulation capabilities: problem formulation, contextualization, iterative refinement, and evaluative calibration. These capabilities are supported by domain knowledge, linguistic resources, metacognitive skill, and generative AI literacy, but their effects are conditioned by task ambiguity, task stakes, language–system fit, and system-provided scaffolding. Five propositions specify how these resources and conditions may shape output quality, efficiency, learning, agency, and appropriate reliance. The framework does not assume that generative AI inevitably widens inequality. Evidence that AI assistance can disproportionately benefit less experienced users suggests that structured tasks, clarification support, and embedded guidance may reduce articulation demands and compress performance gaps. The paper therefore positions the articulation divide as a process-level explanation of why nominally similar access to the same AI system can generate unequal realized outcomes, while also identifying conditions under which system design, training, and organizational support may mitigate those differences. The framework is intended to support empirical testing across educational, professional, and everyday generative AI use contexts.

Keywords: articulation divide; generative artificial intelligence; digital inequality; AI literacy; prompt literacy; human–AI interaction; metacognition; absorptive capacity

DATA MINING APPLICATIONS IN MACROECONOMICS: A SYSTEMATIC LITERATURE REVIEW

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Abstract

The aim of this study is to systematically examine the problems, purposes, and approaches for which data mining techniques are utilized in the field of macroeconomics. Accordingly, a systematic literature review was conducted in the Web of Science and Scopus databases using keywords targeting the intersection of macroeconomics and data mining. The identified studies were evaluated against predefined inclusion and exclusion criteria to determine their eligibility for the analysis. The selected studies were classified and examined within the framework of fundamental macroeconomic areas such as economic growth, employment and unemployment, foreign exchange and commodity prices, inflation, and interest rates. Alongside their application areas, the specific data mining techniques and their intended purposes were considered to identify major patterns in the literature. Particular attention was given to how these approaches are used for analyzing macroeconomic indicators, interpreting economic dynamics, and forecasting future developments.

The review indicates that data mining techniques have been applied to a range of macroeconomic problems beyond descriptive analysis. In particular, they provide analytical opportunities for identifying patterns in economic data, examining relationships among macroeconomic variables, and supporting forecasting-oriented analyses. The review also considers the distribution of these approaches across different macroeconomic topics and objectives. Furthermore, by identifying areas that remain insufficiently addressed in the existing literature, the study aims to highlight potential research gaps. Overall, this study seeks to provide a structured overview of the current use of data mining in macroeconomics and to offer a conceptual basis for researchers interested in developing future studies at the intersection of data mining and macroeconomics.

Keywords: Data Mining, Macroeconomics, Economic Forecasting, Machine Learning, Systematic Literature Review

WHEN EVERYONE CAN WRITE, WHO WILL READ? GENERATIVE AI AND ORGANIZATIONAL COMMUNICATION INFLATION

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Abstract

Generative artificial intelligence has sharply reduced the time and effort required to produce emails, reports, summaries, proposals, and meeting notes, while the human capacity to attend to, interpret, prioritize, and verify such messages has not expanded correspondingly. This conceptual paper develops organizational communication inflation: a system-level condition in which the attention required per unit of decision-relevant information rises because message production grows faster than the collective capacity to process it. Drawing on the attention-based view of the firm, information overload research, the economics of communication, and signaling theory, the paper specifies a five-part process. Falling production costs permit proliferation in volume, frequency, and elaboration; linguistic polish and length become weaker signals of sender effort; part of the cost saved by senders is transferred to recipients as prioritization and verification work; recipients adopt AI to filter, summarize, and answer; and cheaper response production feeds back into supply. Two claims are deliberately withheld. Proliferation is not assumed: a precision effect, in which AI yields fewer and shorter messages, is stated as the rival hypothesis. Recursion is not assumed to be pathological: machine mediation compresses attention demand when the summarization layer preserves decision-relevant content, and inflates it otherwise. The paper further argues that signal dilution is partial rather than terminal, because signaling equilibria re-form on dimensions that generative AI cannot cheaply imitate. The contribution is to move the unit of analysis for AI communication productivity from the individual producer to organization-wide attention allocation, and to treat recipient attention as an externality of low-cost message production.

Keywords: generative artificial intelligence; organizational communication; organizational attention; information overload; signaling theory; AI-mediated communication

MANIPULATIVE INTERFACE DESIGN IN THE DIGITAL ERA: ASSESSING THE INFLUENCE OF DARK PATTERNS ON USER BEHAVIOR IN E-COMMERCE PLATFORMS

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Abstract

Dark patterns, intentionally embedded in interface design to influence, steer, or manipulate user behavior, have become increasingly prevalent in digital commerce platforms. These design practices influence users' decision-making by exerting psychological pressure, restricting perceived options, or encouraging actions users would not normally choose. Therefore, in this study, the effects of dark patterns frequently encountered in online shopping environments on user behaviors were examined using an experimental method in order to determine the boundaries of the risks faced by consumers. As part of the study, product pages featuring seven different dark patterns (false urgency, false scarcity, social proof manipulation, hidden costs, preselected defaults, distracting questions, and shame or approval-seeking) were designed, and an experimental e-commerce site was created by adding a control page that did not contain any dark patterns. The effect of each dark pattern on purchasing decisions was evaluated among 240 college students, with approximately 30 participants per product page. Before interacting with the product page, participants were classified according to their personality traits using a standardized 10-item personality inventory. Purchasing preferences, as exhibited on the product page under each assigned condition, were then analyzed in relation to personality profiles. The results indicate that the likelihood of detecting and being influenced by dark patterns varies by age, gender, educational attainment, and digital or IT literacy. However, these findings are insufficient to fully explain the cognitive and behavioral effects of dark patterns, pointing to the necessity for more comprehensive research. Future studies should validate these results using larger, more representative samples and advanced methods such as EEG and eye-tracking, which would provide valuable contributions to the field.

Keywords: Dark Patterns, Sludge, e-Commerce, User Experience, Consumer Behavior

SCIENCE DIPLOMACY: AN ASSESSMENT OF SCIENTIFIC COOPERATION BETWEEN Türkiye AND MOROCCO AND PROPOSALS FOR ENHANCED COOPERATION

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Abstract

As key actors in the Mediterranean basin and their respective regions, Turkey and Morocco hold strategic importance due to their geopolitical positions and deep-rooted histories. Although a substantial growth has been observed in the higher education and research and development (R&D) capacities of both countries in recent years, the current state, potential, and evolution of their bilateral scientific collaboration have not been adequately investigated. Addressing this gap, this study provides a multidimensional evaluation of the academic collaboration between Turkey and Morocco by employing text mining, topic modeling, bibliometric methods, and business intelligence tools. A multi-layered, hybrid methodological approach was adopted for data collection and analysis. The dataset was extracted from the Web of Science (WoS) database by systematically scanning all document types that simultaneously include "Turkey", "Türkiye", and "Morocco" within the author affiliations. The analytical process comprises three primary phases: bibliometric network analysis and visualization, topic modeling, and business intelligence integration. The findings reveal the focal disciplines of researchers from both countries, the structural formation of co-authorship networks, the leading institutions and pioneering researchers, and the temporal evolution of research trends. An examination of joint scientific productivity indicates that 3,930 collaborative documents have been published over the years. Turkey ranks as Morocco's ninth most frequent collaborative partner, contributing to 2.94% of its total scientific output across all years. Conversely, Morocco is Turkey's fifty-sixth most frequent collaborative partner, accounting for 0.329% of its scientific productivity. The most intensive fields of collaboration between the two nations encompass physics, astronomy and astrophysics, chemistry, other topics in science and technology, and environmental sciences and ecology. Ultimately, this research contributes to the data-driven restructuring of national science policies and proposes an adaptable methodological framework for analyzing similar international collaboration ecosystems.

Keywords: Higher Education Policies, Scientific Productivity, Scientific Collaboration, Topic Modeling, Business Intelligence, Türkiye, Morocco.

DESIGN OF A TURKISH DIGITAL KIOSK SYSTEM IN A THREE-TIER HYBRID ARCHITECTURE FOR HOSPITAL INFORMATION SERVICES

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Abstract

Information desks, typically located on the ground floors of hospitals, serve as one of the most critical units for welcoming patients, providing support, and addressing their informational needs. These units often encounter substantial workloads. Recognizing this reality, this study developed a Turkish-language digital patient consultation system implemented on a kiosk, explicitly focusing on the needs of patients and their relatives. The developed system features a flexible architecture that can be seamlessly integrated into various types of healthcare facilities. A review of the literature indicates a notable scarcity of digital consultation systems specifically designed for hospital services in the Turkish language. The proposed prototype operates on a synthetic hospital database encompassing records of facilities, departments, physicians, and frequently asked questions (FAQs). Each record is converted into an accessible text chunk, thereby generating a corpus comprised of 24 chunks and 254 tokens. Prior to lexical scoring, a Turkish text normalization layer maps accented characters to their ASCII equivalents, removes punctuation, and filters out common stop words. The system is built upon a three-layered architecture. The first layer, a rule-based triage component, scans each user request against 16 predefined risk expressions; in the event of a match, it immediately redirects the user to the emergency department. The deterministic layer generates a template-based response corresponding to the highest-scoring record. An optional hybrid layer integrates lexical and semantic scores using embedding vectors to feed the context into a local large language model (LLM). If the model becomes inaccessible, the system safely falls back to the deterministic response. This generative layer is strictly constrained to utilize only the retrieved context and is expressly prohibited from providing medical advice. Consequently, this study demonstrates scientific novelty by integrating a deterministic safety baseline with an optional generative layer within a single, unified Turkish-language kiosk architecture.

Keywords: Hospital Information Kiosk, Turkish Natural Language Processing, Retrieval-Augmented Generation, Large Language Models, Triage Screening, Digital Transformation.

SHORT-TERM TRAFFIC CONGESTION PREDICTION IN SYNTHETIC IOT-BASED SMART CITY DATA: A COMPARISON OF MACHINE LEARNING, LSTM, AND MAMBA-BASED SELECTIVE SSM APPROACHES

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Abstract

Background/Aims: Short-term traffic congestion prediction supports traffic management and urban mobility planning in smart cities. This study aimed to predict the next-hour congestion level using synthetic IoT-based traffic data and compare conventional machine-learning methods with sequential deep-learning approaches.

Materials/Method: The dataset included 204,000 hourly observations from 100 intersections. For each intersection, traffic and environmental variables from the previous six hours were used to predict the next-hour congestion class. To prevent target leakage, congestion_score and the current congestion_level were excluded from model inputs. Training and test sets were split chronologically at an 80%-20% ratio. Random Forest, XGBoost, Long Short-Term Memory (LSTM), and a Mamba-based Selective State Space Model (SSM) were compared. A persistence model assuming that the current class remains unchanged in the next hour served as the baseline. Accuracy, Macro-F1, and balanced accuracy were used for evaluation.

Results: Random Forest achieved the highest performance with 0.946 accuracy and 0.901 Macro-F1, while XGBoost produced similar results with 0.945 accuracy and 0.901 Macro-F1. The Mamba-based SSM reached 0.933 accuracy and 0.880 Macro-F1, outperforming LSTM at 0.921 accuracy and 0.862 Macro-F1. The persistence baseline remained lower at 0.776 accuracy and 0.519 Macro-F1. Feature importance analysis identified cyclical hour features, weekend status, peak-hour indicators, and traffic intensity as key predictors.

Conclusion/Implications: More complex sequential models did not outperform tree-based methods for this data structure. In synthetic traffic data with strong temporal and periodic patterns, Random Forest and XGBoost remained highly competitive. The findings indicate that data structure and temporal regularities may be more influential than model complexity in short-term congestion forecasting. Because the data are synthetic, validation on real-world urban traffic data is needed before broader generalization.

Keywords: Smart cities; traffic congestion prediction; machine learning; LSTM; Mamba

SECURING THE EMPOWERED AI FACTORY: ADAPTIVE CYBERSECURITY GUARDRAILSFORCITIZENDEVELOPERSBUILDINGAGENTICAISYSTEMS

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Abstract

Background/Aims: Citizen developers now build a growing share of enterprise applications using low-code and no-code platforms increasingly augmented by generative and agentic artificial intelligence, while organizations simultaneously industrialize AI production through AI factory style platforms. This convergence expands the attack surface through AI-generated code vulnerabilities, prompt injection, over-privileged connectors, shadow deployments, and unmanaged agent behavior, risks traditional application security and identity frameworks were not designed to govern. Following a design-science research approach, this study designs and demonstrates an adaptive cybersecurity guardrail artifact for AI factory platforms that secures citizen developers by default, without requiring security expertise of the developer.

Materials/Method: This study follows the design-science research cycle of problem identification, artifact design, and demonstration. The problem is grounded in literature on low-code/no-code security risk and agentic AI governance. The artifact, an adaptive guardrail framework of four components, is demonstrated against a representative scenario: an employee connecting an AI agent to a customer database to automate report generation, tracing which component intercepts which risk at each step of that workflow.

Results: In the demonstrated scenario, policy-as-code enforcement restricts the agent's database connector to read-only, least-privilege access at creation; context-aware control adjustment escalates access sensitivity to require review once personally identifiable fields are detected in the query; discovery and inventory logging registers the agent centrally so it is not a shadow deployment; and governance pathways route the flagged request to a reviewer while surfacing a plain-language explanation to the developer.

Conclusion/Implications: The demonstration shows the four components function together across a realistic workflow rather than in isolation, offering platform teams and CISOs an early reference pattern for embedding security into AI factory platforms. Structured expert evaluation of the artifact against security effectiveness, developer velocity, usability, and organizational feasibility is planned as the next phase of this research.

Keywords: Citizen Development;Agentic AI;Cybersecurity Governance;Low-Code/No-Code Security; Adaptive Guardrails; AI Factories

FROM CLICKS TO STREAMS: EXPLAINING SVOD CONSUMPTION THROUGH NETFLIX ENGAGEMENT AND GOOGLE TRENDS DATA

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Abstract

Subscription video-on-demand (SVOD) services have become a regular part of online media consumption. Many studies still analyze audience behavior primarily using questionnaires and self-reported choices. This analysis takes a different approach by focusing on publicly available data in addition to reflecting on earlier research about the SVOD usage and consumption motivations. Its main objective is to investigate whether viewing routines on Netflix can be better comprehended when platform engagement data are considered alongside external search interest.

The study is organized through the secondary data from Netflix's `What We Watched` reports and Google Trends. The streaming platform Netflix provides title-level criteria such as views, hours viewed, runtime, global availability period, and release date, while Google Trends offers an indication of public search interest over time. These data are anticipated to be increased with publicly available information on content type, language, release timing, etc. The analysis will use descriptive statistics, correlation analysis, and multivariate regression. Separate comparisons are also organized for movies and TV series, as well as for recently released titles.

The research is expected to identify patterns that clarify how originality of the content, and broader online attention levels relate to streaming consumption. In addition, the study aims to investigate diverse behavioral indicators from publicly available data sources. These indicators might show actual audience attention, instead of relying only on what users articulate about they intend to watch.

The project is designed to contribute to the analysis of digital consumer behavior through a practical, repeatable way to study SVOD consumption by harnessing publicly available data from Netflix and Google. The research would also provide valuable insights for academic researchers and professionals alike who are interested in audience engagement, and the relationship between search activity and platform usage.

Keywords: SVOD, Netflix, digital consumer behavior, streaming platforms, Google Trends, business intelligence

WEB OF SCIENCE AND SCOPUS PUBLICATION PROFILES OF PROFESSORS IN THE FIELD OF MANAGEMENT INFORMATION SYSTEMS

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Abstract

The aim of this study is to examine the publication profiles of professors listed in YÖK Academic under the field of Management Information Systems using two bibliometric databases and to reveal the distribution of publications across universities and academic units. Cross-sectional data for 103 professors actively employed at higher education institutions were matched at the individual level; publication counts, citation counts, and h-indices from Web of Science (WoS) and Scopus were compared. WoS indexing categories, journal quartiles, and institutional publication totals were also analyzed descriptively. Results are reported without disclosing professors' names or personal identifiers. The median publication counts for WoS and Scopus are 11 and 15, respectively, while the median citation counts are 111 and 157. The Scopus publication count is higher than the WoS count for 69 individuals, and the citation count is higher for 82 individuals. The sample is distributed across 60 universities and 32 different faculties or academic units. While 37 universities are represented by only one individual, a total of 38 individuals are affiliated with the nine universities that have at least three representatives. The study contributes by evaluating indicators from the two databases for the same researchers alongside their distribution across institutions. The findings show that publication profiles vary depending on the data source used and that institutional publication totals must be interpreted in light of the number of individuals included from each institution. Therefore, the results should not be viewed as a ranking of institutions' total academic output or the quality of individuals' research.

Keywords: Management Information Systems, bibliometrics, Web of Science, Scopus, institutional distribution

FROM CRYPTOCURRENCY AWARENESS TO BLOCKCHAIN UNDERSTANDING: EXPLORING INNOVATION BARRIERS IN MOROCCO

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Abstract

Blockchain technology has attracted growing attention in recent years, not only because of its connection with cryptocurrencies but also because of its possible uses in secure transactions, smart contracts, data management, and decentralized services. Yet, the development of blockchain does not depend on technology alone. People's awareness of the technology and the environment in which it is introduced also play an important role. Against this background, this study examines awareness of blockchain in Morocco and identifies the main barriers that may slow its wider development. An exploratory quantitative study was conducted using a questionnaire completed by 113 respondents. The analysis focuses on respondents' knowledge of cryptocurrencies, their familiarity with blockchain technology, their perception of its innovative potential, and the main obstacles to its development in Morocco. The results show a clear difference between awareness of cryptocurrencies and familiarity with blockchain itself. Although 79.6% of respondents report having some knowledge of cryptocurrencies, only 56.6% say they are familiar with blockchain technology. Bitcoin is by far the best-known cryptocurrency, recognized by 94.7% of respondents in the relevant survey item. At the same time, 77% consider blockchain to be a revolutionary technology. When asked about the main barriers to its development in Morocco, respondents most often mention the lack of regulation (56.6%) and limited knowledge and mastery of the technology (54.9%). Inadequate technological equipment is also identified by 27.9% of respondents. Overall, the results suggest that familiarity with cryptocurrencies does not necessarily mean a similar understanding of the technology behind them. Improving blockchain literacy, strengthening digital skills and infrastructure, and providing a clearer regulatory framework may therefore help create more favorable conditions for blockchain-based innovation in Morocco.

Keywords: Blockchain; Morocco; Technological Awareness; Digital Innovation; Cryptocurrency Knowledge; Innovation Barriers.

ARTIFICIAL INTELLIGENCE AS A TOOL FOR PREVENTING FINANCIAL INSTABILITY: OPPORTUNITIES AND CHALLENGES FOR REBUILDING LEBANON'S FINANCIAL SYSTEM

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Abstract

The rapid development of artificial intelligence (AI) is transforming the financial sector by offering new tools for risk detection, forecasting, decision-making, and financial supervision. In the context of Lebanon's prolonged financial crisis, AI may represent an important opportunity to support the reconstruction of a more resilient, efficient, and stable financial system. This study examines the potential contribution of AI to preventing financial instability in Lebanon, with particular attention to risk management, early risk detection and anticipation, and financial stability. It also investigates the challenges that may limit the effective implementation of AI, including data quality, technological infrastructure, cyber-security, regulatory constraints, and the availability of specialized human skills.

The study adopts a quantitative approach based on a structured questionnaire targeting professionals in the Lebanese financial sector. The proposed empirical framework examines the relationships between AI adoption, financial risk management, risk detection and anticipation, and financial stability, while considering the moderating role of implementation challenges. The findings highlight the potential of AI to strengthen risk management practices, improve early warning capabilities, and enhance the resilience of the Lebanese financial system. However, the effective contribution of AI depends on the development of appropriate technological, institutional, regulatory, and human capacities.

This research contributes to the literature on AI and financial stability by focusing on the specific context of a crisis-affected emerging economy. It provides insights for financial institutions and policymakers seeking to integrate AI into strategies aimed at rebuilding a more resilient and sustainable financial system in Lebanon.

Keywords: Artificial Intelligence; Financial Instability; Financial Risk Management; Financial Stability; Early Warning Systems; Lebanese Financial System; Financial Resilience.

SMART INTERSECTION TECHNOLOGIES FOR SUSTAINABLE CITIES: A CONCEPTUAL SYNTHESIS BASED ON THE SUSTAINABLE DEVELOPMENT GOALS

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Abstract

Rapid urbanisation and rapid growth of urban population have put a great deal of pressure on transport infrastructures, leading to multifaceted challenges such as traffic congestion, economic inefficiencies and environmental degradation. As conventional transport planning is increasingly insufficient to meet these crises, technological and sustainability-oriented infrastructure solutions have become critical alternatives. The main purpose of this research is to analyse smart intersection systems, which hold an important role in the constantly changing management of urban mobility, within a conceptual framework integrated with the United Nations Sustainable Development Goal 11 (SDG 11: Sustainable Cities and Communities). This research analyses the evolution of intersection management paradigms, from geometric design to artificial intelligence-based intelligent systems, and maps the core components of smart intersections against the specific targets of SDG 11. The resulting integration matrix shows that image processing and LiDAR technologies directly improve road safety (SDG 11.2), while AI-assisted adaptive signalling and green wave systems contribute to reduce emissions by reducing idling times (SDG 11.6). Furthermore, vehicle-to-infrastructure (V2I) communication and IoT-based panels are identified as key enablers for disaster resilience and evidence-based urban planning (SDG 11.3 and SDG 11.5). Hence, this paper contends that smart intersection architectures are not merely a means of traffic optimisation but strategic imperatives in the building of inclusive, resilient and sustainable cities. Finally, the paper ends with policy recommendations for decision makers and a theoretical basis for future research.

Keywords: Smart Intersections, Sustainable Development Goals, Intelligent Transportation Systems, Adaptive Signaling, Urban Sustainability.