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CONTENTS

A Systematic Literature Review of Big Data Analytics in Healthcare Digital Transformation

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Abstract. This paper aims to analyse the current literature on big data analytics in healthcare digital transformation and to provide a research agenda for scholars and guidance for practitioners on related research themes. In doing so, it will offer support on further development for researchers and accelerate adoption for practitioners. A systematic literature review was performed based on Brocke et al. A data analysis of 64 articles based on Webster & Watson, which met the SLR review published between 2011 and 2021, was conducted. Five themes were identified in big data analytics in healthcare transformation, namely governance, healthcare, enablement, digital health initiatives and applications, based on previous research publications by various scholars between 2011 and 2021. To the best knowledge of the authors, this is the first research study to review the literature on big data analytics in digital healthcare transformation. The future research agenda sheds light on plenty of topics that can be investigated further through multiple methodologies; however, the availability of datasets for researchers may be a limitation to driving the research forward. A summary of the current literature under the five themes of BDA analytics in healthcare digital transformation is provided.

Keywords: Big data analytics; Healthcare; Digital transformation; Digital health; Healthcare management; Application of big data analytics.

1. Introduction

Big data analytics involves applying advanced analytics techniques to datasets to provide insights and support the decision-making process for managers seeking to drive better outcomes. Furthermore, the larger the dataset, the more difficult it becomes to manage [1]. Big data analytics (BDA) can be conceptualised as the analysis of comprehensive, lively, affordable, enormous and diverse datasets to deliver complex solutions [2-4]. Furthermore, BDA has often been recognised for its capacity to support decision-making as a result of the richness of the data collected and its ability to provide informed simulations for challenges in numerous fields [1, 5]. The healthcare sector has experienced multiple applications of big data analytics, and in order to understand its scope and applications therein, and to understand its potential, it is necessary to elaborate a clear definition of what constitutes "healthcare": in essence, it is the efforts made to maintain or restore physical, mental or emotional wellbeing, especially by trained and licensed professionals [6]. Another significant construct is the healthcare ecosystem [7, 8], which includes hospitals, healthcare providers, payers, industry, patients, regulators and government. This ecosystem demonstrates how different parties play a critical role in driving healthcare and well-being in society. Many studies have investigated the potential application of BDA in healthcare; for instance, Iyamu, Mgudlwa [9] developed a framework to guide healthcare practitioners on the benefits of employing analytics. Wang, Hajli [10], for their part, proposed a business value model for BDA in healthcare to explore its business value, whilst Wilson, Bazzoli [11] focused on predictive analytics applications to improve patient care and optimise costs in a US province's health system. Nordin

et al. [12] used a BDA tool to analyse type 2 diabetes mellitus patients in private hospitals which assessed organisational knowledge through action-based learning to drive value-based healthcare solutions. Riikkinen et al. [13] explored the value of BDA for insurance by applying artificial intelligence chatbots to assess customers' value creation. Singh et al. [14] provided practical guidance for healthcare sector professionals on managing by improving and benchmarking strategies through BDA, and Spanò, Ginesti [15] offered insights into the use of big data in performance management systems in cancer – specifically head and neck cancer treatment, prevention and benefits – from their analysis of archival sources and 19 interviews with physicians in the field. The study used the middle range theory (MRT) framework to determine whether BDA in the case of head and neck cancer favours the authorisation of performance management system discourses in healthcare.

Visualisation techniques in data mining are used for the early and correct diagnosis of different diseases, patient satisfaction measures and identifying a hospital's best leaders. In addition, they provide insights into the usefulness of business intelligence (BI) on two levels, namely the doctor and the hospital level. BI can be utilised to make better strategic decisions in terms of running the hospital and its determining its growth. At the doctor level, on the basis of various symptoms of a disease, a doctor can provide suitable treatment for patients. Doughty, Livingstone [16] described the infrastructure required to implement technology-enabled health and support services successfully.

The many different applications of big data in healthcare vary in their scope. Companies are currently investing heavily in order to adopt new technologies, with big data and associated analytics revenue forecasted to have reached $274.3 billion by the end of 2022 [17]. In the last decade, digital analytics has led the field in terms of total funding in digital health applications [18], reaching $6.2 billion. In 2020, a survey was published by Mercom, citing that capital and data analytics spending in digital health funding totalled $1.838 billion [18].

This figure represents 0.0088% of US GDP in 2020 [19]. Investments made in digital health and new technologies by healthcare organisations are rising; however, much more clarity is needed to unleash the full potential of BDA in healthcare. When looking deeper at the global healthcare big data market in 2016, it was divided into three sections: analytics services had a 40.9% market share, hardware had 26.4% and software had a 32.7% market share. The growth of analytics services has led to a positive upward trend in their use, and it is due to reach 42.1% by 2025 [20]. With the massive investment from healthcare organisations in BDA, and a significantly large body of research literature on the subject, there are fragmented efforts to understand its comprehensive value and effect on digital healthcare transformation.

As discussed earlier, applications for BDA in clinical practice are on the rise, and authors like Nordin et al. [12], Spanò, Ginesti [15] and Riikkinen et al. [13] have researched a number of cases on this topic. What will the future of clinical analytics look like by 2025, and how will companies continue to invest in BDA for better healthcare? In 2016, in the healthcare market, clinical analytics was estimated at $1.65 billion, financial analytics $2.38 billion and operational analytics $0.65 billion. However, it is predicted that by 2025, these figures will have risen exponentially to $11.35 billion, $13.14 billion and $4.45 billion, respectively [20], thereby equating to a 23.9% average yearly increase over a nine-year period.

With the massive investment made by organisations in BDA, how can these investments digitally transform healthcare? Integrating BDA may provide various contextual outcomes from current data and practice in healthcare. To understand what is meant by digital transformation, Gong, Ribiere [21] describe it as 'A fundamental change process, enabled by the innovative use of digital technologies

accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve an entity[1] and redefine its value proposition for its stakeholders'.

So, are senior management teams and CEOs enabling the digital transformation of healthcare? In a survey [22] on big data technology adoption plans in organisations worldwide, as of 2019, 44% of those surveyed in the healthcare sector said that they were using big data, 37.5% said that they may use it in the future and 18.5% said that they had no plans to do so in the future. The research shows that 66% of healthcare organisations are still assessing the use of big data technologies, thus demonstrating that there is still a significant amount of potential and a long road ahead to reach the potential of BDA in the sector.

From this perspective, the main entities of focus are the healthcare organisations that play a role in the healthcare ecosystem.

Examples of BDA in healthcare transformation include disease diagnosis and symptom identification [23] in breast cancer, which are achieved through social media platforms. Utilising genetic blogs online enables a public health tool to enhance the credibility of the digital health application of genetics [24]. Lee et al. [25] investigated the effectiveness of machine learning through emergency department data in terms of transforming emergency departments and helping them deal with critical health issues and avoid readmissions.

Transformational leadership was behind all these examples. A recent survey by NewVantage Partners [26] interviewed 72 C-level executives, mainly from the financial services and healthcare industries, on the principle drivers of artificial intelligence and big data investment in 2020. The outcome concluded that one of the main principal drivers of investment is transformation, with an agreement of 53.7%. The endorsement of the C-level executives for the transformation of healthcare is one of the keys to enablement.

These investments in big data generally – and specifically in BDA – are driven by several objectives and the ways in which they transform of healthcare services and clinical outcomes or drive and optimise innovation, costs, efficiencies, regulatory perspectives and competitive advantage [26].

Research on BDA in healthcare digital transformation is on the rise, albeit with fragmented themes across the years.

The first objective of this study is to classify the literature on this topic into themes that can guide future scholars and practitioners and help them understand the evolution of BDA in healthcare transformation. The second objective is to provide a future research agenda for researchers on BDA in healthcare transformation, using a systematic literature review (SLR) [27].

The research in this paper is based on an SLR of the current literature from 2011 to 2021, in line with two research questions:

RQ1 *What are the current themes of BDA research in healthcare transformation?*

RQ2 *What is the future agenda for BDA in healthcare transformation?*

2. Methodology

A systematic literature review, based on the guidelines suggested by Brocke et al. [27], and Watson, Webster [28], will be used to help understand the use of BDA in healthcare transformation. The choice of the SLR method is due to its rigour, its systematic approach to grouping the literature, which involves systematic data

[1] An "entity" can be classed as an organisation, a business network, an industry or society.

collection procedures, and several descriptive and qualitative data analysis techniques.

2.1. Database Selection

The databases chosen for this study included Business Source Complete, Emerald Insight, Jstor and Clarivate Web of Science.

A Boolean search used the following advanced search terms: "(BDA) AND (Healthcare) AND (Transformation)"

Other Synonyms also covered were: "(BDA) AND (Healthcare) AND (Digital Transformation)", "(Big analytics) AND (Healthcare) AND (Transformation)", "(Big analytics) AND (Healthcare) AND (Digital Transformation)" "(Data Science) AND (Healthcare) AND (Transformation)", "(Data Science) AND (Healthcare) AND (Digital Transformation)".

Of the 3,810 articles in the results, seven were selected from Business Source Complete. After reading the titles, to assess their relevance to the topic, six articles were further selected to read the abstract, after which five were selected for the final review. For Emerald Insights, 3,684 articles were sorted in terms of relevance to the keywords. The titles were scanned, and relevant titles that fitted the research question were manually selected, with 41 articles chosen. Of these, abstracts were read and 22 articles fitted the research question. Jstor provided 75 articles. After using the matching keywords and filtering based on "Business, economics, health policy, health sciences, public health," 26 articles were selected after reading the titles for relevancy, following which 10 were selected for the final review. From Clarivate Web of Science, the initial search resulted in 40 articles, 35 of which were further investigated by reading the abstracts, and 27 articles were finally selected.

The final results of 64 articles selected for review after checking their relevancy to the research question as shown in Fig. 1.

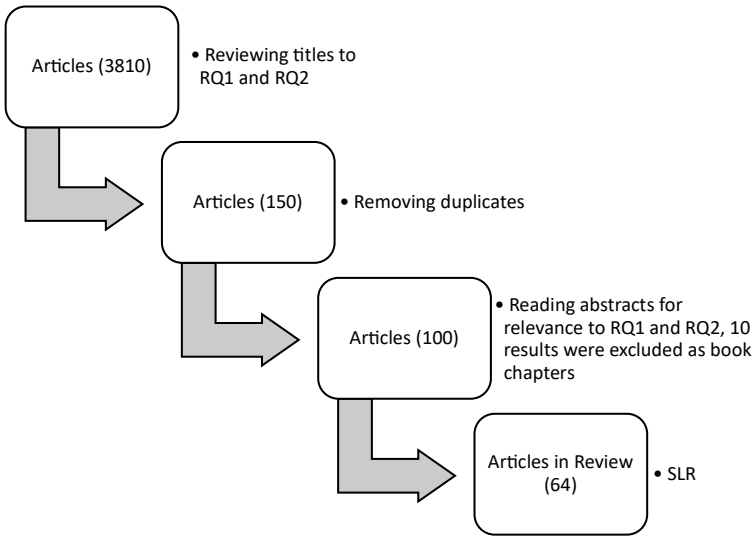


Fig. 1. Illustration of the SLR review process

SLR included only published journal articles and conference proceedings for this paper; book chapters were excluded.

2.2 Theme Classification

The SLR review classified the 64 papers based on a number of themes, in order to help build a structure for the review and provide a comprehensive outcome for researchers on these different topics for future research.

After reviewing previous work on classifying BDA in healthcare, Khanra et al. [3] provided an initial roadmap for BDA themes in the sector. The authors categorised themes in two ways. The first was based on the following five themes: health awareness, healthcare ecosystem, hospital management, specific medical condition and technological aspects. They also developed the secondary themes conceptual evolution, data governance, decision support, disease prediction and strategy formulation.

Kalaiselvi, Thirumurthi Raja [29] also offered a perspective on classifying applications of BDA in healthcare, and these included staffing, outcomes, electronic medical records, efficiency and productivity, patient engagement and predictive analytics, thereby making a massive contribution to BDA applications in healthcare and to potential guidance for further research in this area.

These themes helped develop the SLR review in this research paper, as they provided a roadmap for BDA in healthcare. Extending further on Khanra et al. [3] and Kalaiselvi and Thirumurthi Raja's [29] work, theme classification evolved in further work with the addition of digital transformation as part of the theme development.

In this theme grouping, in answer to research question 1 (RQ1), the themes identified herein were based on a perspective combining BDA with healthcare digital transformation to provide clarity for future researchers. The first theme was Governance, which relates to the control of data, privacy and the ethical management of big data. Winter, Davidson [30] contended that the characteristics of machine learning will devastate existing data governance methods such as privacy regulation and informed consent. Enhanced governance techniques and tools will therefore be necessary to help safeguard the independence and constitutional rights of individuals, in order to control their personal health information. Agrawal, Madaan [31] presented a structured model of BDA implementation barriers in healthcare within the supply chain sector, which included data quality, security of health data and other vital elements that are beneficial to starting the transformation journey. Examples of digital health initiatives found in the literature include the utilisation of artificial intelligence, the Internet of Things, m-health or e-health initiatives via which generated data are further analysed to provide certain outcomes. Safavi et al. [32] cited the top-funded companies in digital health and emphasised that organisations with biosensors had the most outstanding funding. Furthermore, they argued that digital healthcare corporations have not yet had a proven substantial impact on disease burden or cost efficiencies in the United States healthcare system, and they also highlighted the importance of the governance of digital health and policies issued by government to archive patient data and consumer rights, to develop solutions or products with a high impact on society. Applications include examples of the implementation of BDA in healthcare to improve outcomes in disease management. Wang, Hajli [10] provided new insights for healthcare practitioners on how to establish BDA capabilities for business transformation, as well as a pragmatic basis on which to stimulate a more detailed investigation of BDA implementation. Dhagarra et al. [33] proposed a big data-backed coupled blockchain-based solution that could be obtained voluntarily by citizens of India [34] for healthcare delivery. The conceptual framework was contextualised in the Indian context but had comprehensive appropriateness, as it could serve as a comprehensive solution to the problem of dispersed, poorly maintained and disorganised patient medical records. This would in turn could enhance the interoperability and accessibility of medical records. The model would also give an answer to the unsatisfactory medical service and inept utilisation of available limited resources. The healthcare management theme grouped the literature

based on improving the sector in terms of several elements, ranging from staffing to patient flow management. Mithas et al. [35] addressed a variety of strategy-related service management questions that service providers and consumers face in the context of emerging healthcare and technology trends. They also derived implications for governance choices and questions related to this point. The argument that Mithas et al. [35] developed focused on transformation in healthcare across a broader theme, i.e., information technology that is inclusive of BDA, in order to further develop these findings' validity. Gravili et al. [36] showed that BDA generates a meaningful shift that has made it possible to extend the research to health systems. Through both predictive and prescriptive analysis, BDA represents an efficient choice and a new method that can be employed to solve, manage, assess and report intangible resources – made up of human, relational and structural capital – thus assisting policymakers in identifying policies and practices via intellectual capital. The enablement theme classified the literature based on models utilised to enable BDA adoption. Ram, Zhang [37] devised a model for B2B organisations, such as healthcare ecosystem parties, to adopt BDA, whilst Singh et al. [14] highlighted key strategic issues in managing the healthcare sector, which can serve as guidelines for adopting BDA in this area. In addition, Wang et al. [38] provided a comprehensive BDA transformation model for healthcare organisations based on case studies of BDA implementation in countries such as the United States, Canada, Australia, United Kingdom, China and India, in which massive investment took place to build BDA capabilities in these institutions.

3. Results

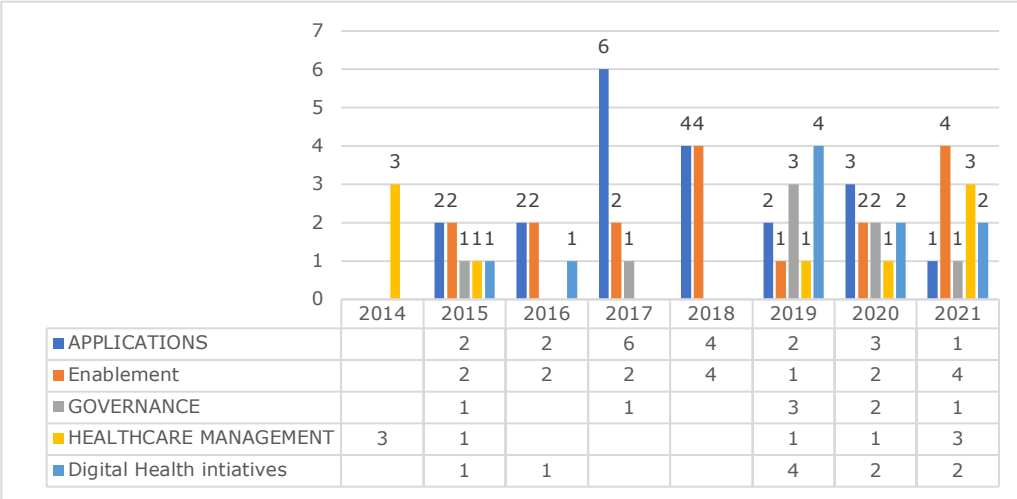
As summarised in Table 1, the analysis determined that out of the 64 journal articles, eight addressed the governance of BDA and 11 examined different initiatives on digital health. The highest contribution of the research was in terms of applications of BDA in healthcare, with 19 articles, followed by BDA enablement with 17 articles. Additionally, research on BDA in healthcare management was found in 12 research articles.

Table 1. Themes from the SLR analysis

Themes	**Papers**	**Years**	**No of Articles**
Governance	[30, 31, 39-44]	2015-2021	8
Digital health initiatives	[32, 45-54]	2015-2021	11
Applications	[10-13, 15, 16, 23, 25, 32, 33, 55-64]	2015-2020	19
Healthcare management	[14, 35, 36, 65-72]	2014-2021	10
Enablement	[3, 9, 37, 38, 44, 45, 73-84]	2015-2021	17

An exciting finding (illustrated in Fig. 2) was revealed when the research articles were analysed over time, inclusive of different themes. Generally, in the past three years, there has been a rising research interest in BDA in healthcare transformation; for instance, in 2019, 2020 and 2021, there were 11, 10 and 11 articles, respectively. From 2011 to 2013, there were no research articles captured in the SLR review. Research grew in 2014, with a focus on healthcare management. Kolker, Kolker [70] started the era of healthcare analytics, Harper [68] questioned the role of BDA in transforming electronic medical records and You et al. [72] applied BDA through sparse matrix clustering to provide a new perspective on patients' specialist utilisation records, combined with a statistical learning methodology that could quantify the tightness of links between different specialties and highlight significant specialist clusters. In 2015, contributions were made in line with each of the five themes. In 2017, the focus was more on applications of BDA in healthcare, with six research

articles, and this trend continued in 2018, decreased in 2019, started to rise again in 2020, but was limited in 2021. Applications in BDA made the highest contribution with 19 research articles, written from 2015 to 2021.



	2014	2015	2016	2017	2018	2019	2020	2021
APPLICATIONS		2	2	6	4	2	3	1
Enablement		2	2	2	4	1	2	4
GOVERNANCE		1		1		3	2	1
HEALTHCARE MANAGEMENT	3	1				1	1	3
Digital Health intiatives		1	1			4	2	2

Fig. 2. SLR analysis of BDA themes in the last decade.

For governance, limited research was done between 2011 and 2018, with only two articles published; however, for 2019-2021, six were published on that theme. Enablement research started in 2016 and continued every year until 2021, with a total of 17 research articles from 2015 to 2021. The digital health initiative theme was limited between 2015 and 2018 to two research articles, while interest increased from 2019 to 2021 with eight articles in these three years.

4. Discussion

The results provide clarity on the latest research themes in BDA in digital healthcare transformation, thereby offering direction for future researchers on the topic. A focus on the "applications" theme was dominant among researchers, which is valid evidence that there is an unmet need in enabling BDA for healthcare transformation, albeit the trend in applications has declined since 2017. On the other hand, "governance" made a limited contribution until 2018, with most of the research appearing in the last three years, from 2019-2021. Is this a coincidence or possibly a mandate to accelerate BDA research in digital healthcare transformation? The governance of data, privacy and ethical views of patient data information needs further investigation until a standard procedure is reached. The BDA governance framework is a critical success factor for digital transformation in healthcare.

Likewise, there may be a correlation between the rise in research on governance and enablement. Between 2019 and 2021, there was a rising trend in the enablement of BDA in healthcare. As the focus is to drive the adoption of BDA in this sector, it is dependent on the governance of data. Priorities for future research on the agenda should focus on enablement and borrow from other industries to accelerate this revolution. Governance should also be considered in this regard, as healthcare is a highly regulated industry, and data governance should be established and systems put in place to ensure continuity and replicability.

The future contribution of enablement and governance topics is a key element in accelerating the practical implications of BDA in healthcare. While the research agenda provided various examples of key topics to cover the five identified themes, it was limited to the current scope of research and focused more on enablement and

governance as key enabling factors for transformation.

Digital initiatives and applications are interconnected, as the former focuses on digital initiatives and the latter on broader patient outcomes. Applications within the agenda propose few research topics to be researched, but the scope is broad. Furthermore, to ensure the potential of digital initiatives and BDA applications in healthcare transformation is unleashed, enablement and governance are the key areas that need further development, in order to add value for practitioners and society.

The limitation of this research paper might be that it is missing some papers or conference proceedings that were not accessible on the selected databases, although efforts were made to use different synonyms for words used in research, to be as thorough as possible. The research accessed four database libraries, which should have captured most of the literature published on the topic.

5. Research Agenda

After analysing the literature, a research agenda on BDA in healthcare transformation was drafted for future research (see Table 3). It is the result of discussions on the findings and corresponding potential opportunities for further research.

Table 3. Proposed Research Agenda

Theme	Selected Research Question	Proposed Research Methods
Enablement	• What are the enabling factors and derailing factors for transforming healthcare through BDA? • What is the role of middle management and senior leadership teams in transforming healthcare through BDA within the healthcare ecosystem? (Learn about each organisation separately) • What is the correlation between governance and enablement in digital transformation in healthcare? • What can the healthcare sector learn from other industries that have successfully implemented big data analytics?	• Qualitative study • Qualitative study • Hypothesis, quantitative study • Literature review
Healthcare management	• How can big data visualisation help healthcare organisations in providing better care to patients? • What are the best analytical tools for big data analytics in healthcare management?	• Qualitative study • Qualitative study/literature review
Governance	• What are the quality factors that impact big data analytics in healthcare? • What is the effect of big data analytics management in healthcare governance? • Define big health data analytics management • What are the actions required to ensure big data privacy in healthcare?	• Qualitative study • Hypothesis, quantitative study • Construct development • Qualitative study
Digital Health initiatives	• How can digital consumerisation in healthcare enhance the value of BDA in its management? • How can an integrated model of IoT, medical E-commerce and BDA transform healthcare?	• Qualitative study • Qualitative/quantitative study (case-based with datasets)
Applications	• What are the current applications of BDA analytics in healthcare? • What are the diseases that primarily benefit from BDA in healthcare? • How has BDA influenced value-based pricing in healthcare? • What is the relationship between BDA implementation and hospital readmission? Assess healthcare institutions that implement BDA to manage in-patient care • What is the role of life sciences organisations in healthcare digital transformation? A big data and AI-focused study	• Literature review • Literature review • Literature review and theory development • A quantitative study, datasets to develop a hypothesis • Qualitative study, to develop a theoretical model for life sciences organisations

The research on enablement is a key element in driving the acceleration of BDA in healthcare digital transformation, with a focus on factors enabling and derailing this transformation, understanding the role of senior leaders in empowering middle management to adopt BDA and also understanding the role of governance in enabling BDA in healthcare, since it is a highly regulated industry and scrutiny from authorities and society places a high emphasis on privacy. Finally, it would be beneficial to uncover learning from other industries, especially the technology industry, in terms of enabling BDA in the transformation journey.

For healthcare management, one of the most vital areas, regardless of applications, is big data visualisation, i.e., for healthcare administrators, managers and practitioners, what impact can BDA visualisation have on healthcare outcomes, and how can it provide better healthcare? Additionally, what tools should be chosen what are the best practices that should be adopted?

Governance is a barrier to the adoption of BDA in healthcare transformation. Understanding the quality of the data and sources of information for accuracy, and building a standard procedure framework for precise governance, is one of the key success factors for transforming healthcare. Research should be conducted through interviews with health authorities, industries, insurance companies and patients to define a broad scope of pinch points to be considered while developing a standard procedure for data governance.

Digital initiatives focus on two main topics that can help practitioners and researchers alike. The impact of digital consumerisation in healthcare can be further investigated in line with the rise of internet hospitals in China, as a tele-health model for healthcare management [85] has driven the digital consumerisation and the establishment of a new business model. Consequently, BDA can play a critical role in estimating patient adherence, quality of care, hospital customer experience and medication errors – the applications and outcomes of which are unlimited.

Furthermore, when we look at the amount of data generated from various IoT healthcare devices and link that to the e-commerce model of internet hospitals or e-pharmacies, or patients' electronic medical records, a thorough case can be researched to measure its impact on healthcare management quality and patient care.

The last theme identified is "applications", which focuses on BDA case studies that enhance patient care outcomes. Studies into what disease areas BDA has added value to could contribute to further research developments and help practitioners provide better healthcare management solutions. Additionally, a focus on value-based costing in healthcare, aligned with an understanding of how BDA can drive better decision-making in terms of the cost evaluation of biosimilars, generics and new medicines, will help us assess re-admissions into hospitals. This could be achieved via a study comparing a group of hospitals that have implemented BDA and others which do not do so, thereby providing plenty of insights into its impact and how it influences healthcare outcomes.

The use of both BDA and artificial intelligence can create synergy in automated healthcare decision-making, albeit this an area in which limited research has been done to review the integration of both technologies on healthcare outcomes.

Finally, the role of life sciences companies, pharmaceuticals, medical devices and diagnostics is focused on providing multiple solutions to drive and improve healthcare outcomes. However, in relation to their role in accelerating technologies, especially BDA, artificial intelligence can help in supporting the evolution of digital healthcare transformation.

BDA in healthcare offers a vast research opportunity across a broad range of themes. The healthcare industry is lagging behind when it comes to adopting new technologies [86], mainly when it comes to big data and AI technologies. Consequently, a proposed theme-based question to drive the research into BDA in

healthcare should be developed alongside relevant methodologies to aid future scholars.

6. Conclusion

This systematic literature review has comprehensively explored the landscape of Big Data Analytics (BDA) within the realm of healthcare digital transformation, identifying critical themes and providing a structured overview of the current academic discourse. Our analysis of 64 pertinent articles published between 2011 and 2021 has revealed five major themes: *governance, digital health initiatives, applications, healthcare management,* and *enablement*. These themes highlight the diverse applications of BDA in healthcare, ranging from operational enhancements to governance and policy-making, underlining the pivotal role of BDA in advancing healthcare services and management practices.

The findings indicate a robust growth in research focused on the applications of BDA in healthcare, suggesting a strong recognition of its potential to transform healthcare outcomes. However, the themes of governance and enablement have emerged as critical areas needing further exploration, especially considering the rapid evolution of digital technologies and their integration into healthcare frameworks.

Our study is not without limitations. The review was restricted to articles available in selected databases, potentially omitting relevant studies published in other venues or in non-English languages. Additionally, the rapid pace of technological advancements may have led to the emergence of new trends not captured in this review. Future research should address these gaps.

Furthermore, empirical research is needed to evaluate the practical impacts of BDA implementations in healthcare settings. Investigating the interplay between governance, enablement, and technology adoption will also be crucial in understanding how best to leverage BDA for healthcare transformation. This approach will not only enrich the academic literature but also provide actionable insights for practitioners aiming to harness the power of big data in healthcare.

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Aims and Objectives

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This current Issue divided on two equal parts: 1. Scientific view on digital technology implementations (the first three articles) and 2. Economics scientific view (the last two articles) with multidisciplinary approach on adoption of Digital technology/knowledge in modern reality.

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