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SYSTEMATIC LITERATURE REVIEW OF THE DEVELOPMENT OF DATA SCIENCE APPLICATIONS IN HEALTHCARE

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ABSTRACT

Aim/Purpose	This study aims to identify the influential factors in the application of Applied Data Science in healthcare.
Background	The research examines the historical adoption and use of Applied Data Science in the healthcare industry, addressing the specific question: What are the factors that influence the use of Applied Data Science in healthcare throughout the history of information technology?
Methodology	The study was conducted using a systematic literature review methodology following Kitchenham and Charters' (2007) protocol, which includes planning, conducting, and reporting the review.
Contribution	The study contributes to understanding key factors that shape the adoption and application of data science technologies in healthcare.
Findings	The study used thematic analysis and identified six factors that influenced the application of Applied Data Science in healthcare: deep learning, data organization, medical or healthcare applications, techniques used, data and computing infrastructure, and language systems.

Recommendation for Practitioners	The study recommends that the application of data science should adapt in response to advancements in technologies and computing infrastructure. It further suggests that recent developments in these areas may drive a significant transformation in the field.
Recommendation for Researchers	The study recommends further examination of the evolution of applied data science in healthcare, especially from 1975 to 1990, when limited primary studies were available.
Impact on Society	The results highlight the importance of technological infrastructure, advanced learning models, organized datasets, and ethical considerations for effective data science integration in healthcare.
Future Research	Future studies should explore the timeline more, particularly in the time frame of 1975 to 1990, when a gap in the literature was found. Studies could also investigate regional differences, especially focusing on how differences in incomes and GDP affect healthcare data. Additionally, further research should expand beyond the ACM Digital Library to create a more comprehensive view of the field.
Keywords	applied computing, life and medical sciences, health informatics

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Dr Hazem Said is a Professor of Information Technology and the Director of the School of Information Technology (SoIT) at the University of Cincinnati (UC). He is a certified Project Management Professional (PMP). Dr Said founded the UC Information Technology Solutions Center (ITSC) in 2012, where he consults with government, public, and private organizations and leads teams of professionals, as well as graduate, undergraduate, and high school students, to investigate, develop, and support a variety of information technology solutions. In addition, Dr Said is a co-founder and co-director of the Ohio Cyber Range Institute and the Justice, Law, and Information Technology Institute. Dr Said is the recipient of over 200 grants and contracts totaling over $30 million and has authored over 30 articles on topics related to information technology education.