How Creative Frameworks Solve Data and Information Challenges in Healthcare

The healthcare sector has experienced rapid digitisation, significantly improving how data is collected, processed, and provided. However, healthcare professionals still face various data and information management challenges. These challenges, commonly categorised as "data problems" or "information problems," hinder the optimal use of healthcare data in clinical and operational decision-making. In response to these challenges, creative frameworks, such as user-centred design (UCD), design thinking, and human-centred design (HCD), have emerged as potential solutions. These frameworks provide a structured and human-centric approach to problem-solving, but their use in addressing healthcare data issues remains limited. This article explores the use of creative frameworks to solve data and information problems in healthcare, discusses their strengths and limitations, and highlights the need for a new, more focused approach.

The Intersection of Data, Information, and Healthcare

Data is foundational to effective decision-making and patient care in the healthcare sector. When processed and structured, data turns into valuable information that healthcare professionals rely on for diagnosis, treatment planning, and operational management. Structured data, such as electronic health records (EHRs), demographic information, and diagnosis codes, is relatively easy to manage and analyse. However, unstructured data, including patient histories and medical images, poses more complex challenges regarding integration and analysis. Moreover, data-related problems can occur due to gaps in data collection, inaccuracies, or difficulties in processing and integrating data into usable formats.

Information problems arise when healthcare professionals cannot efficiently access, synthesise, or utilise data. Issues such as information overload, poor data visualisation, and ineffective communication of insights further exacerbate the problem. As healthcare professionals need to make quick and accurate decisions, addressing these challenges is essential to improving the quality of patient care and ensuring effective operational management. Creative frameworks offer an opportunity to reimagine how these data and information challenges can be tackled.

Creative Frameworks: An Overview

Creative frameworks, widely used in various industries to foster innovation and problem-solving, have proven effective in healthcare settings for software development and user experience design. UCD, HCD, and design thinking are some of the most prominent frameworks for creating user-friendly solutions prioritising human needs and behaviours. These frameworks emphasise the importance of involving end-users, such as healthcare professionals and patients, throughout the development process, ensuring that the final product meets their specific needs.

Creative frameworks have been applied with varying degrees of success to healthcare data and information problems. For instance, UCD has been widely used to address data collection and visualisation problems. By focusing on the user's interaction with data systems, UCD helps to streamline the design of data interfaces, making it easier for healthcare professionals to access and interpret relevant information. Similarly, design thinking promotes a collaborative approach to problem-solving, encouraging interdisciplinary teams to work together to identify challenges and develop creative solutions.

Despite these successes, the use of creative frameworks in addressing more abstract data problems—such as data integration and processing—remains limited. One reason could be that these frameworks are often applied after a specific problem has already been identified, rather than being used as a tool to discover and define the problem itself. This reactive approach may limit the potential of creative frameworks to solve more complex and underlying data challenges in healthcare.

Current Applications and Challenges

Research indicates that creative frameworks predominantly address information problems, particularly in data visualisation. This is evident from most studies reviewed, which focused on improving how healthcare data is presented and made accessible to users. For instance, visualisation tools that help doctors and nurses easily interpret patient data can significantly reduce the cognitive load on healthcare professionals, allowing them to make quicker and more informed decisions. Additionally, these frameworks have been applied to streamline the design of electronic health record systems, improving how healthcare professionals navigate and interact with patient data.

However, applying creative frameworks to more technical and abstract data problems, such as data collection and processing, is less common. Data processing involves transforming raw data into usable information, often requiring advanced algorithms and sophisticated technologies. While UCD and HCD focus on user interaction and experience, they may not provide the necessary tools to address the technical complexities of data processing and integration. As a result, there is a growing recognition that new or adapted creative frameworks are needed to address these more abstract challenges in healthcare data management.

Another challenge in applying creative frameworks in healthcare is the lack of standardisation in terminology and methodology. Different researchers and practitioners may use varying terms to describe similar concepts, making it difficult to establish a common understanding of how these frameworks should be applied. Furthermore, there is often insufficient documentation on how creative frameworks were implemented in practice, which hinders the ability to replicate successful approaches across different healthcare settings.

Towards a Human-Centred Data Approach

While creative frameworks have shown potential in solving healthcare information problems, their application to data problems remains underexplored. Existing frameworks, such as UCD and design thinking, excel in addressing data visualisation and user interaction issues but fall short in tackling more complex data processing challenges. This gap suggests the need for a new approach that integrates the strengths of creative frameworks with a more technical focus on data management.

One possible solution is the development of a Human-Centred Data Approach, which would combine the principles of UCD with a deeper understanding of healthcare data processing and integration. This approach would involve healthcare professionals and data scientists working together from the earliest stages of development to identify and address data-related challenges. By involving end-users in the design process, the Human-Centred Data Approach would ensure that the resulting data systems are both user-friendly and technically robust.

In conclusion, while creative frameworks offer valuable tools for addressing healthcare data and information challenges, much work remains in adapting these frameworks to the healthcare sector's unique needs. A more focused, interdisciplinary approach that incorporates user-centred design principles and advanced data management techniques could help bridge the gap and improve healthcare outcomes. The development and implementation of such an approach could pave the way for more efficient, accurate, and user-friendly healthcare data systems in the future.

Source: JMIR Human Factors

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