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Blood Donation Coordination platform

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Abstract: The lack of blood donors is a global problem that prevents the demand for blood prompted by an ageing population and increased life expectancy from being met. The aim of this study was to conduct an initial exploration of the reasons for using digital platforms in blood donation. Using a Theory of Planned Behaviour (TPB) framework, microdata for 389 participants from Latin American countries and Spain, and Partial Least Square-Structural Equation Modelling (PLS-SEM), the study obtained three main prediction paths. The first two started from feelings of trust in the digital community and a positive mood state associated with a modern lifestyle, and they were linked to attitudes and behavioural control in the explanation of the intention to donate and actual blood donation. The third path started from modern lifestyles, and was linked to the subjective norm in the prediction of intention and actual donation. These paths represent one of the very first attempts to predict intentions of donation and collaborative donation by taking a PLS-SEM approach. By determining the paths underpinning collaborative blood donors' motives, the results of this study provide strong support for the usefulness of the TPB model within the context of digital platform use and blood donation.

Keywords: blood donation, digital platforms, collaborative exchanges, consumer behaviour, Theory of Planned Behaviours.

I. INTRODUCTION

The ageing population and the rise in life expectancy are together increasing the demand for blood supplies. Having enough blood and blood components available to meet the demand depends on the blood donation rate and frequency [1]. The aim of this work is to study, for the very first time, the motives for blood donation via digital platforms and, with this knowledge, to develop strategies to promote the use of this new digital tool. In today's interconnected world, the need for efficient and effective blood donation coordination has become increasingly paramount. Blood donation remains a critical lifeline for countless individuals facing medical emergencies, surgeries, and chronic conditions.

However, the traditional methods of organizing and managing blood donation drives often face challenges such as logistical complexities, inefficient resource allocation, and difficulty in matching donors with recipients in a timely manner. Blood donation is a critical aspect of healthcare systems worldwide, playing a fundamental role in saving lives during emergencies, surgeries, and treatments for various medical conditions.

The efficiency and effectiveness of blood donation programs heavily rely on robust coordination between donors, recipients, and healthcare facilities. In recent years, technological advancements have presented opportunities to streamline and enhance these coordination efforts through dedicated platforms designed to connect stakeholders and optimize resource management.

1.2 OBJECTIVES OF THE STUDY

The online blood donation system aims to enhance both the blood donation procedure and the healthcare system through a holistic approach.

The technology intends to expedite blood transfusions for patients in need by streamlining the donation procedure and decreasing delays by offering an accessible platform for donors to register and participate. The system also aims to improve donor management through centralised record-keeping and efficient communication channels, and to boost donor participation by providing a practical and user-friendly interface.

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II. THEORETICAL BACKGROUND

2.1 MOTIVATIONS FOR BLOOD DONATION

Various studies have analysed the factors that motivate donors to give blood. Research has put their motives into three main groups: altruism, self-interest, and response to direct or social appeal. Altruism is considered to be the main motive in the majority of the studies, and it is based on the desire to help others by donating without receiving anything in return. Self-interest motives are based on the pursuit of some kind of individual interest, such as getting satisfaction from helping others or being rewarded for donations. Lastly, response to direct or social appeal motives are extrinsic ones originating from marketing campaigns run by blood collection institutions, or from the influence exerted by reference groups.

Blood shortages are a persistent issue in healthcare systems globally, often resulting in delayed or compromised medical treatments. A coordination platform can help alleviate these shortages by improving donor engagement, optimizing inventory management, and facilitating timely communication during emergencies.

The development and implementation of a blood donation coordination platform represent an innovative approach to leveraging technology for healthcare improvement. By studying the motivations behind such platforms, this research aims to contribute to the advancement of healthcare technology and inspire further innovations in blood donation practices.

2.2 PARTICIPATION IN COLLABORATIVE DIGITAL PLATFORMS

The use of collaborative digital platforms for blood donation coordination is a promising strategy to address the global shortage of blood donors. These platforms can help promote blood donation by increasing awareness, facilitating donor scheduling and recruitment, and improving the overall donor experience.

1. **Donor Engagement:** Collaborative digital platforms can significantly enhance donor engagement by providing user-friendly interfaces for donor registration, appointment scheduling, and donation tracking. Studying participation levels helps gauge the effectiveness of these platforms in attracting and retaining donors over time.

2. **Facilitating Real-Time Communication:** Participation in digital platforms enables real- time communication between blood donors, recipients, and healthcare facilities. This communication is vital for notifying donors of urgent needs, coordinating donation drives, and sharing updates on blood supply status. Analysing participation patterns sheds light on the effectiveness of communication features within these platforms.

3. **Optimizing Blood Supply Management**: Active participation in collaborative platforms contributes to better blood supply management. Donors who participate regularly through these platforms can help maintain sufficient inventory levels and respond promptly to critical shortages. Understanding participation dynamics aids in optimizing inventory forecasting and resource allocation.

4. **Improving User Experience:** Participation metrics provide insights into the user experience of the platform. By studying participation levels and user feedback, researchers can identify areas for improvement in platform design, functionality, and overall usability.

5. **Measuring Impact and Effectiveness:** Participation data serves as a key indicator of the platform's impact and effectiveness in achieving its objectives. High participation rates correlate with successful outcomes such as increased blood donations, reduced shortages, and improved response times during emergencies.

III. METHODOLOGY

The methodology for a blood donation coordination platform can involve various strategies and techniques to facilitate blood donation processes, enhance donor engagement, and improve blood service quality.

One approach is to develop a web-based system that interconnects donors, patients, and blood banks, managing information of registered donors and providing features for electronic medical records and blood information. This approach can be enhanced by incorporating cloud hosting features, system performance improvements, and providing users with various statistics to optimize blood donation services.

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3.1 DATA COLLECTION

The data collection process for studying a blood donation coordination platform involves gathering various types of information to assess its effectiveness, impact, and user engagement. This comprehensive data collection effort is essential for conducting rigorous research and generating valuable insights. Data collection begins by defining specific metrics and indicators aligned with the objectives of the study, such as donor participation rates, frequency of donations, user demographics, and communication effectiveness. The platform's backend system can automatically capture quantitative data related to donor registrations, donation transactions, and inventory management. Additionally, surveys, interviews, and focus groups can be conducted to collect qualitative data on user experiences, satisfaction levels, and perceived benefits of the platform. These qualitative insights provide context and depth to complement quantitative findings. Data on communication activities, including the usage of alerts, notifications, and response rates during emergencies, are also crucial for assessing the platform's role in facilitating timely responses to blood supply needs. Ethical considerations must guide data collection efforts, ensuring participant confidentiality and informed consent. By employing a mix of quantitative and qualitative methods, researchers can gather comprehensive data to evaluate the impact and effectiveness of the blood donation coordination platform, informing evidence-based conclusions and recommendations for improving blood donation practices and healthcare technology.

3.2 DEVELOPMENT METHODOLOGY

The development methodology of a blood donation coordination platform can involve various strategies and techniques. A case study on improving the digital experience of blood donation highlights the importance of understanding the problem space with regards to a decrease in repeat donors. The development of an online blood donation system can also involve the use of HTML, CSS, JavaScript, PHP, and MySQL to design and develop the system. The system aims to enhance both the blood donation procedure and the healthcare system through a holistic approach, including streamlining the donation procedure, improving donor management, boosting donor participation, and ensuring donor information security.

3.3 SYSTEM DEVELOPMENT

The PHP System Development Lifecycle Model for a blood donation coordination platform involves utilizing PHP programming language to develop and implement the platform. PHP is a popular server-side scripting language that is commonly used for web development. In the context of a blood donation coordination platform, the PHP System Development Lifecycle Model would entail following the phases of the System Development Life Cycle (SDLC) while leveraging PHP for system analysis, design, implementation, testing, and deployment.

- Planning
- Analysis
- Designing
- Software Development
- Software Testing
- Implementation
- Maintenance

Planning Stage
This initial phase involves defining the problem, scope, and objectives of the project.
It sets the project schedule and secures funding and resources.

Analysis Stage
In this phase, specific details required for the new system are gathered, and the needs of end-users are determined. Developers create a software requirement specification document. **Designing Stage**

This stage involves designing the architecture of the system, creating database schemas, and developing the user interface.

Software Development Stage
During this phase, the actual coding and development of the system take place based on the design specifications.

Software Testing Stage
The system is thoroughly tested to ensure it meets requirements and functions correctly.

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Implementation Stage
This phase involves deploying the system into a production environment and making it available to end-users.

Maintenance Stage
After deployment, ongoing support, bug fixes, and updates are carried out to ensure the system's continued functionality and efficiency.

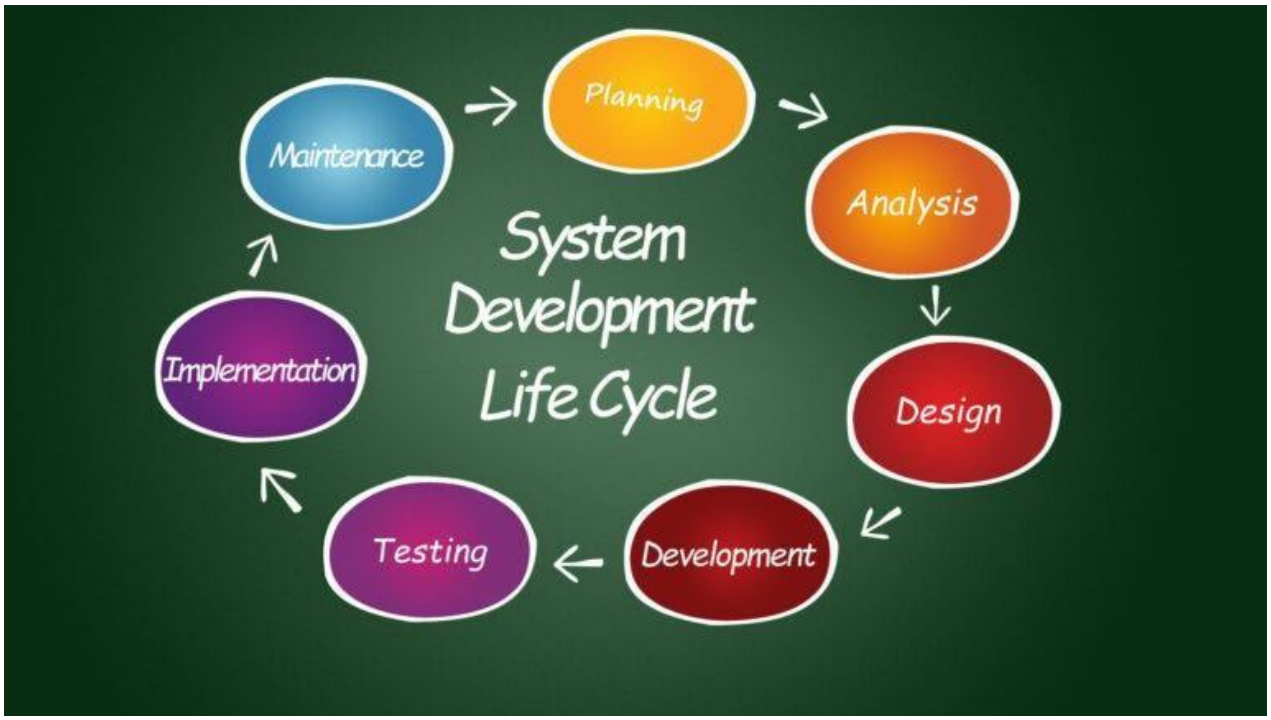

Fig.1 System Development Life Cycle

IV. USER ENGAGEMENT

The focusing on user engagement in a blood donation coordination platform, you would aim to explore and analyse how users interact with the platform, their levels of participation, and the factors influencing their engagement. Below are suggested topics and content areas that you can cover under the theme of user engagement.

Furthermore, continuous efforts to sustain and improve donor engagement through various initiatives, including social media campaigns, community events, and partnerships, are essential for the long-term success of blood donation coordination platforms.

PERSONALIZED DONOR ENGAGEMENT
Personalizing donor engagement through tailored messaging, convenient donation avenues, and addressing common misconceptions can enhance user engagement.

IMPROVING DIGITAL EXPERIENCE
Improving the digital experience of blood donation by understanding the problem space with regards to a decrease in repeat donors can help enhance and improve donors' blood donation digital experience.

MATCHING ALGORITHMS
Utilizing matching algorithms for blood donation can help create and coordinate blood supply via automated social prompts, subject to the expressed preferences of the donors.

ONLINE PLATFORM FOR BLOOD DONATION
Developing an online platform for blood donation and reception can help coordinate donations effectively by providing an intuitive and user-friendly interface.

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CHARACTERIZATION OF BLOOD DONORS

Characterizing blood donors and non-blood donors using online surveys can help identify factors that influence blood donation behavior and develop strategies to increase user engagement.

BLOOD DONATION PRACTICE

Understanding the factors associated with blood donation practice can help develop strategies to increase user engagement in blood donation coordination platforms.

V. SCOPE OF PROJECT

Blood donation coordination platforms aim to streamline the process of blood donation by providing a centralized database of registered donors, inventory management of nearby blood banks, and real-time updates on blood availability. These platforms also facilitate the collection of blood from low-risk, regular, voluntary unpaid donors, ensuring the quality and safety of donated blood. By automating administrative tasks, enhancing efficiency, and improving donor engagement, these platforms aim to address the limitations of previous systems, such as the lack of a centralized database and the difficulty in searching for donors in a given area.

Matching algorithms can also be integrated into these platforms to create and coordinate blood supply based on donor availability and blood type. This can help ensure timely supplies of blood and reduce shortages during emergency situations. Furthermore, blood donation coordination platforms can provide educational resources and raise awareness about the importance of blood donation, encouraging more people to become regular donors.

VI. CONCLUSION

The conclusion of blood donation coordination platforms is that they play a vital role in enhancing the efficiency, safety, and accessibility of blood donation processes. These platforms leverage technology to automate administrative tasks, engage donors, manage inventory, and provide real-time updates on blood availability. By digitizing the blood donation process and implementing safety measures, these platforms ensure a secure and reliable blood supply for patients in need, especially during emergencies.

Moreover, blood donation coordination platforms focus on user engagement by offering personalized profiles, tracking donation history, and providing incentives to encourage regular donations. They also contribute to public awareness and education about the importance of blood donation, fostering a sense of community among donors and recipients.

REFERENCES

[1]. Sanchez A.M., Ameti I.D., Schreiber G.B., Thomson R.A., Lo A., Bethel J., Williams A.E. The potential impact of incentives on future blood donation behaviour. Transfusion. 2001;41:172–178. doi: 10.1046/j.1537-2995.2001.41020172.x.
[2]. Abdul-Gafaru et al.; Asian J. Res. Com. Sci., vol. 17, no. 4, pp. 44-61, 2024; Article no.AJRCOS.112749
[3]. France J.L., France C.R., Himawan L.K. A path analysis of intention to redonate among experienced blood donors: An extension of the theory of planned behavior. Transfusion. 2007;47:1006–1013. doi: 10.1111/j.1537-2995.2007.01236.x.
[4]. Premkumar Balaraman., Kalpana Kosalram.: E-Hospital Management and Hospital Infor- mation systems – Changing Tends, I.J. Information Engineering and Electronic Business, 1,50-58(2013).
[5]. Sibinga CT. Existing and recommended legislative framework for a national blood transfusion policy. Global Journal of Transfusion Medicine. 2017 Jul 1;2(2):89.
[6]. "Blood donation", 2016. Available: https://www.your.md/condition/blood- donation/#chapterintroduction.
[7]. S. A. Chaudhari, S. S. Walekar, K. A. Ruparel, and V. M. Pandagale, "A Secure Cloud Computing Based Framework for the Blood bank," IEEE Xplore, 2018. https://ieeexplore.ieee.org/abstract/document/8537 351
[8]. Blood donor selection Guidelines on assessing donor suitability for blood donation. Annex 3. Geneva: World Health Organization:2012[17 August 2012]
[9]. Michael Chau, Eddie Cheng and Chi Wai Chan. Data Analysis for Healthcare: A Case Study in Blood Donation Center Analysis. Proceedings of Sixteenth Americas Conference on Information Systems (AMICS), 2010.
[10]. Self Study: Concepts of ASP.Net. Retrieved February 20, 2013, from http://www.asp.net.com

