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ENHANCING SOFTWARE PRODUCT ADOPTION IN THE FINANCE SECTOR: THE IMPACT OF DATAANALYTICS ON USER EXPERIENCE AND ENGAGEMENT

Dr. Uma Ramachandran Iyer[1], Dr. Vijayakumar Varadarajan[2]
[1]SIFF Ventures - CTO and CBO, SSBM Geneva (DBA),
[2]Visiting Professor, La Trobe University, Melbourne, SSBM Geneva

Abstract:

Purpose: The primary goal of this study is to systematically analyze the effects of data analytics on the acceptance levels of software applications created for the financial domain. Through the examination of user actions, personalization, and involvement, the research endeavors to offer empirical validation and actionable perspectives that could assist software developers and enterprises in enhancing their design approaches and effectively fulfilling user needs.

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Methodology: Utilizing a quantitative research method, the study evaluates data gathered from 222 participants working in finance through surveys. The aim is to comprehend how data-focused advancements in software creation impact user contentment, engagement, and adoption choices. The investigation delves into various aspects of user engagement with software products, such as personalization of user interface, improvement of user engagement, and synchronization of software upgrades with user anticipations.

Findings: By conducting thorough data analysis, this article provides practical insights for software developers and companies seeking to refine their product designs to effectively address user requirements and promote adoption in the competitive finance sector.

Value: This investigation highlights the substantial significance of data analytics in enhancing user acceptance and satisfaction in the field of financial software development, offering practical advice for improving user interaction and product design.

Paper type: Research Paper

Keywords: Data Analytics, User Adoption, Finance Sector, Software Development, User Experience (UX), Personalization, Quantitative Approach, User Satisfaction, Behavioral Insights,Software Innovation

1. Introduction

General Background: Understanding the impact of data analytics on user adoption is crucialin software product development in the finance industry due to its ability to provide valuable insights for informed decision-making (Muhammad et al., 2022) (Gustavo et al, 2022), (Olga B., 2013). Data analytics can help developers assess user adoption of software projects, improve codereview processes, and enhance developers' awareness of their working context (Ranjan et al., 2021). Data analytics has revolutionized decision-making processes in the finance industry,

particularly in consumer banking and investment banking, leading to significant advancements inanalyzing consumer financial transactions and predicting financial market trends (David J. Hand.,2018). By leveraging data analytics, organizations can enhance product innovation strategies, improve process performance, and ultimately drive higher business value through improved overall performance. The role of data analytics in shaping user adoption and success insoftware product development is crucial within the finance industry.

Challenges/Constraints: Challenges facing user adoption within the realm of finance encompass time constraints, challenges in recruitment, and divergent expectations encountered inuser research (Nicki, C. et al, 2022). The utilization of data analytics has the potential to mitigate these obstacles through the facilitation of decision-making based on empirical evidence, consequently driving transformative changes within the industry (Rina R. et al., 2016). The financial sector has witnessed noteworthy advancements in the integration of data science tools, with a particular emphasis on actuarial science, insurance, consumer banking, and investment banking, illustrating the efficacy of transitioning towards data-informed decision-making practices(David J. Hand, 2018).

Statement of Problem: In the financial sector, the utilization of software solutions isfrequently impeded by obstacles such as a deficiency in user-centered design and inadequate responsiveness. The present study seeks to investigate the potential of incorporating data analytics into the process of software creation to surmount these challenges, elevate user satisfaction, and boost adoption levels. Moreover, a research endeavor concentrating on the incorporation of data analytics within organizations revealed that a conducive setting in alignment with the Technology- Organization-Environment (TOE) model exerts a positive influence on the adoption of data analytics, ultimately enhancing operational efficiency.

Objective:

This study rigorously examines and measures the impact of data analytics on the adoption rates ofsoftware products tailored for the finance sector. Its objective is to investigate how various analytics-driven improvements in software development can influence user contentment, involvement, and adoption choices. Through this investigation, the research aims to offer empirical proof and practical insights that can assist software developers and businesses in the finance industry in refining their design strategies to address user requirements and anticipations better. The value of user-centric methodologies in software development and the power of data analytics to innovate product design and user experience in the finance sector is underscored.

Scope of the study:

Enhancing user acceptance in software development through the integration of analytics is crucial for making well-informed decisions and improving the quality of software products. By harnessing data derived from various development components (Ivan et al., 2017)), software analytics can furnish valuable perspectives on user adoption rates, code review procedures, and the work environment of developers (Olga B., 2013). Tools for analysis, including those in the Android platform, enable developers to examine usage patterns, identify deficiencies in testing processes, and spur future enhancements (Raymond et al., 2010). Furthermore, software analytics can enable

managers to transform extensive project data into practical insights, thereby assisting in forecasting project outcomes and managing risks effectively (Julian H., 2020). Analytics frameworks are a mechanism for alerting project stakeholders to potential issues and facilitating project oversight tobridge the gap between process-focused management approaches and the intricate realities of software development (Vikrant et al., 2015).Literature Review:

Studies about data analytics in software product development, with a specific emphasis on user adoption, encompass a variety of insightful research endeavors. The adoption and persistence of Business Analytics (BA) in software endeavors are essential, and the role of user acceptance is also significant (Muhammad et al, 2022). A questionnaire on the acceptance of Predictive Analytics (PA) is prepared, shedding light on user apprehensions regarding transparency and privacy, affecting adoption decisions (Jingwei, & Lin, 2020). Silverio et al. (2019) amalgamated quality frameworks into software analytics tools to amplify software quality assessment and encourage acceptance, eliciting favorable reviews from industry authorities. Baysal et al. (2012) employed usage data to explore trends in software adoption, providing valuable insights into deployment patterns and user behavior across various platforms. Kenneth et al. (2012) scrutinized user data from a prosperous game to offer suggestions to game developers, illustrating the importance of data analytics in tailoring user experiences and refining development procedures.

The prior methodologies utilized in the analytics of software product development have primarily concentrated on aspects such as quantifying the electricity consumption of end users (Justin S-P, 2022), formulating frameworks for generating early alerts in development endeavors (Vikrant et al., 2015), and investigating the advantages of interactive visualization in data scrutiny (Andrea etal., 2018). Nevertheless, user acceptance needs to be examined, specifically within the realm of software product development analytics. Our study endeavors to bridge this gap by examining substantial user data derived from successful gaming platforms like Project Gotham Racing 4 (Kenneth et al., 2012) and suggesting interactive preliminary visualization guidelines to encourage acceptance among data analysts (Sutirtha et al., 2021). Through a deliberate focus on user adoption in the context of software product development analytics, we seek to provide valuable insights that can optimize decision-making procedures and enhance overall developmental results.

Research related to data analytics in software product development reveals certain deficiencies that require attention: Longitudinal studies need to focus on the enduring effects of analytics on user retention. Moreover, there exists a need for more exploration concerning sophisticated analytics, such as artificial intelligence, to augment user adoption rates. Comparative analyses spanning different sectors like finance are limited, along with investigations into how cultural and demographic variables impact the adoption of analytics (Kenneth et al., 2012). Additionally, research on measurable engagement metrics, the influence of data privacy on adoption rates, and the economic assessments of implementing analytics in terms of costs and benefits still need to beimproved. Mitigating these shortcomings can significantly improve the comprehension and efficacy of analytics in software development.

Methodology:

Here, we are utilizing a methodology encompassing quantitative and qualitative techniques to attain an all-encompassing comprehension of the influence of data analytics. The amalgamation

of statistical examination and qualitative observations offers a comprehensive perspective, uncovering numerical patterns and intricate viewpoints, thereby enriching understanding and decision-making processes.

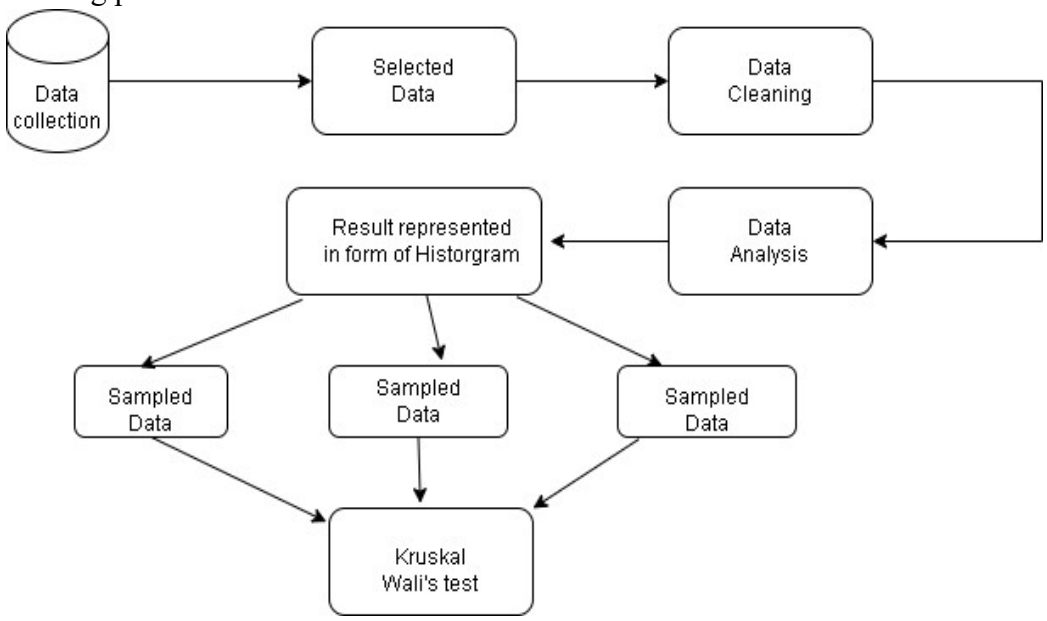

Figure 1: Process followed for identifying data patterns

2. Data Collection

Quantitative Data Collection: The data set utilized in this study comprised 222 data points obtained via a Google Form. Random sampling was employed as the designated sampling technique. The initial phase of data analysis commences with data cleansing procedures involvingeliminating redundant columns and rows and renaming columns, among other tasks.

We continued by implementing a Kruskal-Wallis analysis. TheKruskal-Wallis H test is a method used non-pairwise to compare three or more independent samplegroups. This test aims to test the Ministry of Equality on several counts. This test also serves as anon-pairwise alternative to one-way ANOVA, especially when ANOVA assumptions are not met. For our case, since the data is ordinal and fails to meet the normality presuppositions, a Kruskal-Wallis test is the best alternative.

Target Population: The target population comprises individuals in the financial sector and end-users engaging with analytics-driven software solutions.

Sampling Technique: Employing stratified random sampling ensures a balanced representation of diverse demographic factors, such as job functions, experience levels, and company scales within the finance field.

Sample Size: The determination of the sample size will be guided by the total population, a confidence level of 95%, and a margin of error of ±5%, utilizing established formulas for sample size calculation.

Analytical Method

Quantitative Analysis: Employ statistical tools for data analysis to construct histograms illustrating the distribution of user responses and conduct Kruskal-Wallis tests to compare variations among different groups.

Approach: Embrace a quantitative strategy to offer a holistic comprehension of the influence of data analytics:

Quantitative Methods: Implement surveys to assess the efficacy of particular data analytics approaches on user adoption rates—experimental Strategies: Document user attitudes and interactions using experiments and data analysis.

3. Results and Discussion:

Data Analytics impact on insights of user behavior:

The histogram illustrates a predominant number of responses clustered towards the upper end of the agreement spectrum, particularly peaking at a rating of 7. This suggests a high level of consensus among respondents regarding the efficacy of data analytics in uncovering insights into user behavior.

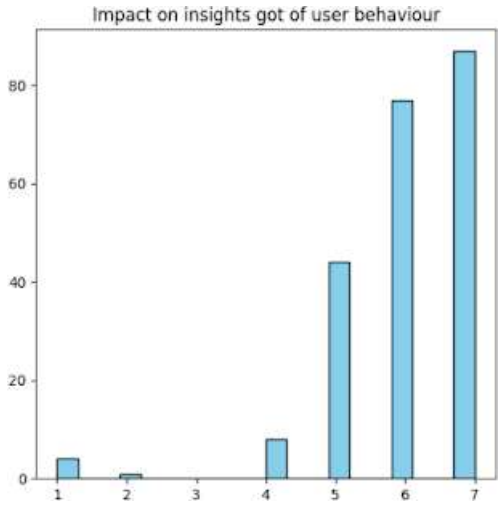

Figure 2: Data Analytics impact on insights of user behavior

1. **Big Data Analytics impact on user experience:**

This histogram also indicates high levels of agreement, with most responses falling at a rating of 6. This indicates that respondents agree that big data analytics positively impacts user experience.

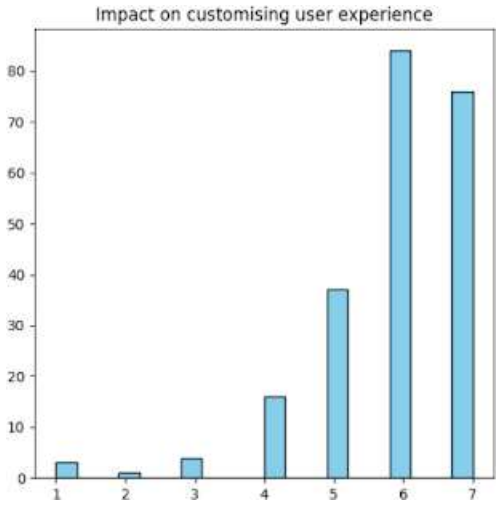

Figure 3: Big Data Analytics impact on user experience:

2. Data Analytics impact on understanding user needs:

The concentration of responses is highest at rating 7, with a secondary peak at rating 6, which shows strong agreement that data analytics aids in understanding user needs.

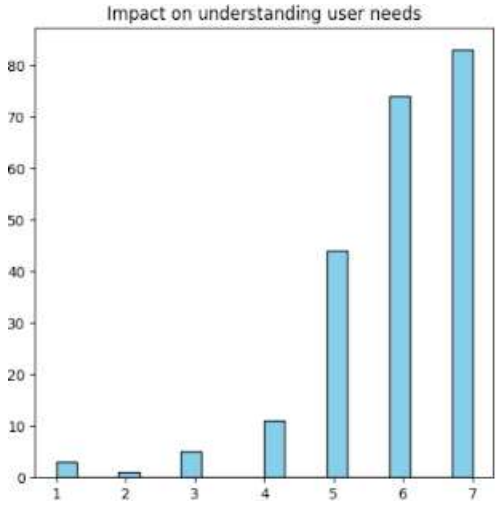

Figure 4: Data Analytics impact on understanding user needs

From all the histograms, we can infer that respondents generally perceive data analytics as having a significant and positive impact across various aspects of user engagement and experience. The responses skewed towards 'Agree' and 'Strongly Agree' (ratings 6 and 7) across all histograms suggest that the surveyed group may have had positive experiences or perceptions of applying data analytics in these areas.

Since there is nil-small difference between the different Independent groups as mentioned above, it makes sense to have a look at the correlation between. Hence, we build a correlation matrix and use a heatmap for the purpose of visualisation:

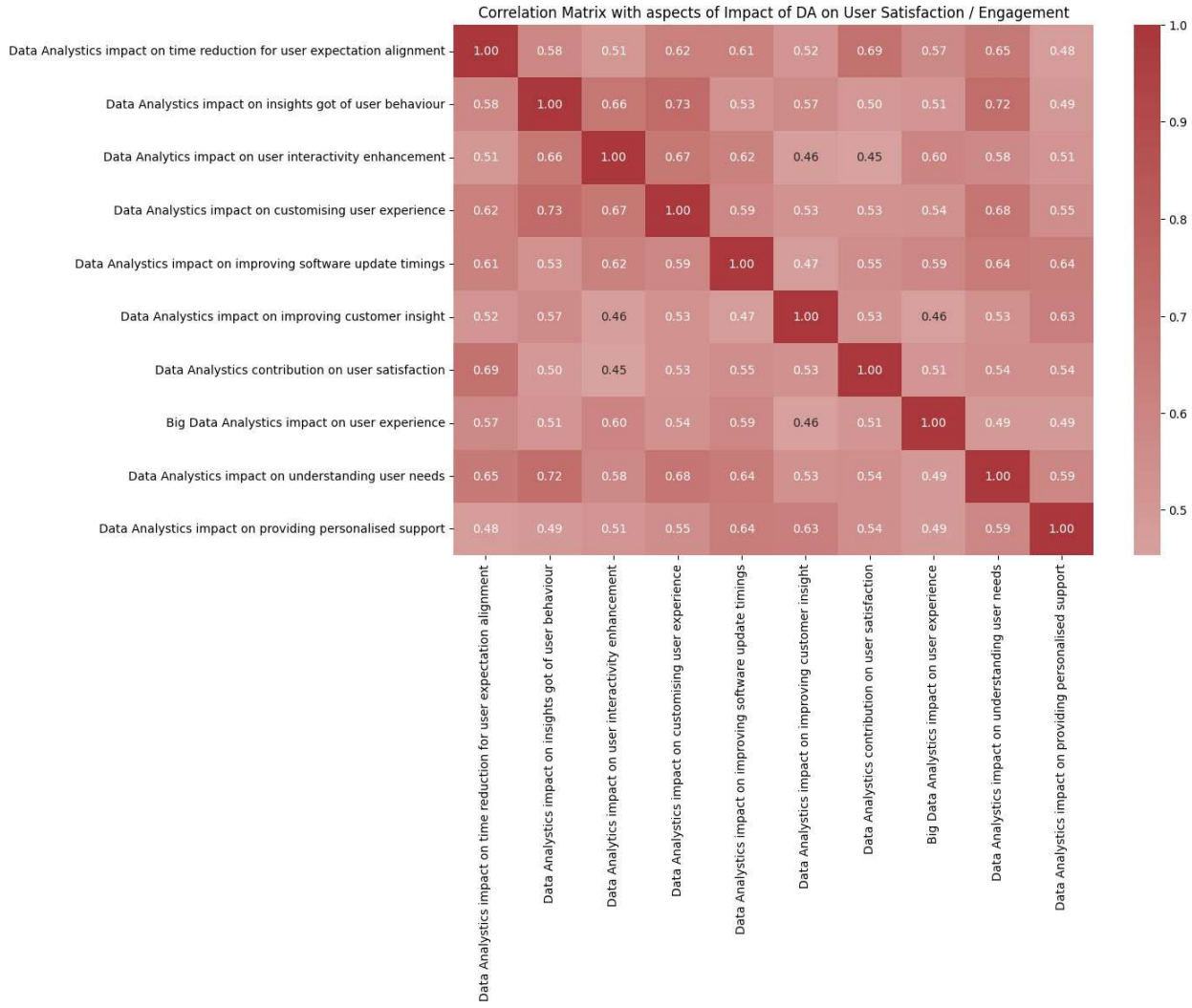

Figure 5: Correlation Matrix with aspects of impact of DA on user satisfaction/engagement

The heatmap in the image provided depicts a correlation matrix between several variables related to the impact of data analytics (DA) on user engagement aspects. Here are some key insights and observations from the heatmap:

3. Strong Positive Correlations:

The strongest correlation observed is between "Data Analytics impact on insights of user behavior" and "Data Analytics impact on customizing user experience," with a correlation coefficient of 0.73. This suggests a strong positive relationship, indicating that better insights into user behavior are strongly associated with the ability to customize the user experience effectively.

4. High Positive Correlations:

There are several pairs of variables with correlation coefficients in the range of 0.6 to 0.72, which are considered high. For example, "Data Analytics impact on understanding user needs" is highly

correlated with "Data Analytics impact on insights of user behavior" (0.72). This may imply that understanding user needs is closely linked to gaining insights into user behavior.

5. 4. Conclusion:

The outcomes of this research unequivocally illustrate the positive influence of data analytics on improving user acceptance rates of software products within the financial sector. Data analytics not only aids in achieving a more profound comprehension of user behaviors and requirements but also significantly boosts user engagement and contentment by enabling customized support and timely software enhancements. Most participants either agree or strongly agree that data analytics have resulted in noticeable enhancements in their user experience. These findings underscore the significance of integrating data analytics into software development, particularly in dynamic environments like finance. Subsequent studies should further investigate the evolving role of analytics in user acceptance, broadening the scope to encompass longitudinal research and incorporating sophisticated analytical tools such as AI to corroborate and build upon these findings. Through constant refinement of data analytics integration, software developers can more effectively fulfill the expectations of their users, promoting both increased acceptance and sustaineduser involvement.

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