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USER EXPERIENCE (UX) DESIGN IN ACADEMIC LIBRARIES: ENHANCING ACCESSIBILITY AND ENGAGEMENT

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Abstract

This study addresses the topic of user experience (UX) design for academic libraries, with an emphasis on improving accessibility and user engagement. It uses quantitative analysis and EViews software to study the number of visits, satisfaction and use of digital resources. This look to participatory design strategies and community-building activities to meet the diverse needs of our customers and foster a vibrant library community. The results show a strong positive correlation between the number of visitors and digital resources, underlining the importance of internet accessibility. The study provides valuable information that university libraries can use to better meet the changing demands of patrons.

1. Introduction

In the context of academic libraries, user experience design (UX) has a vital function in making service provision and engagement all the easier for the clientele. The main purpose of this research is to expand the accessibility and engagement thus Vews tool is used for the analysis. This study looks at a variety of aspects including visitor numbers, accessibility, satisfaction rates, completed sessions and digital resources usage, and highlights the UX in library environments. This analysis is aimed at utilizing quantitative analytical methods such as pattern identification, correlation analysis and trend analysis on a data set. Furthermore, the study will originate vital pieces of information that have the potential to improve how university libraries serve their customers to meet their requirements. The key role is to give the current argument about UX design in university libraries, and how it influences user engagement and satisfaction.

2. Literature Review

2.1 Inclusive Design and Accessibility

Inclusive design and accessibility construction in academic libraries means the provision of services and resources that are tailored to meet the requirements of all users. This strategy

is purposed at equalizing the playing field for challenged persons, differently disposed and born with diverse backgrounds and ranging from libraries and substance as far as they may be. Libraries take on complete design ideas in various forms as accessible spaces, mobile assessments, digital labs and many different materials (Seale *et al.* 2022). Additionally, digital stages are configured for such things as alternative content for images and video captions for the sake of the convenience of people who have visual or hearing difficulties. In light of this, the libraries will be able to take under consideration the value and considerations of individuals and impact incorporation by utilizing by and large plans for their operations.

2.2 Engagement Strategies and Community Building

Engagement Strategies and Community-building Initiatives in academic libraries take an extensive scope of activities to establish effective and strong linkages and identification between community members. Libraries use multiple approaches like potting events, discussion seminars, and workshops so that users work together and share knowledge (Appleton, 2020). Programs may cover a lot of different areas that are connected to academic learning, culture and development, and community issues. In order to expand the conceivable outcomes of inclusion in both virtual and genuine spaces, scholarly libraries within the show times apply advanced media in giving online gatherings, online courses, and virtual visits. Libraries point to stimulate support in both physical and virtual fields so that the library user feels inspired, engaged and curious about utilizing different library assets and administrations.

3. Data

Part of the data collection process for the study "User Experience (UX) Design in Academic Libraries: "User Experience in Academic Libraries" (ALADELUSI, 2020) refers to the method of collecting the data that are quantitative in nature from different aspects of user experience in our academic libraries. This involves the provision of details about the number of visitors, available features, ratings for user satisfaction, as well as engagement events and use of digital tools. Data is gathered from questionnaires, auditing digital platforms, systematic monitoring and records analysis of the library.

3.1 Research Methodology

Research methodology that combines the application of quantitative analysis technique using EViews software with descriptive statistics and correlation coefficients is used to examine the relationships between different variables and the experience of using public libraries. Additionally, the ADF test is applied to analyze the stationarity of "time series data", and GARCH tests are used to estimate volatility models. Descriptive statistics offer assistance in getting the central propensity and changeability of the information, whereas relationship coefficients offer assistance in distinguishing the quality and course of a relationship between two factors (Sikobi,2021).

4. Results and Findings

	DIGITAL_RE...	ENGAGEME...	NUMBER_OF_VIS
Mean	1134.646	1.414141	143.2222
Median	900.0000	1.000000	120.0000
Maximum	4200.000	4.000000	500.0000
Minimum	200.0000	0.000000	50.00000
Std. Dev.	869.1191	0.857263	80.30510
Skewness	1.812516	0.463770	1.951455
Kurtosis	5.927653	2.992393	7.675487
Jarque-Bera	89.56207	3.549106	153.0081
Probability	0.000000	0.169559	0.000000
Sum	112330.0	140.0000	14179.00
Sum Sq. Dev.	74026063	72.02020	631993.1
Observations	99	99	99

Figure 1: Descriptive Statistics

The descriptive statistics for three variables related to user experience in academic libraries which is shown in the above figure. These include "mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera test statistics" and associated probability, sum, sum of squared deviations, and the number of observations for digital resources usage, engagement events, and number of visitors.

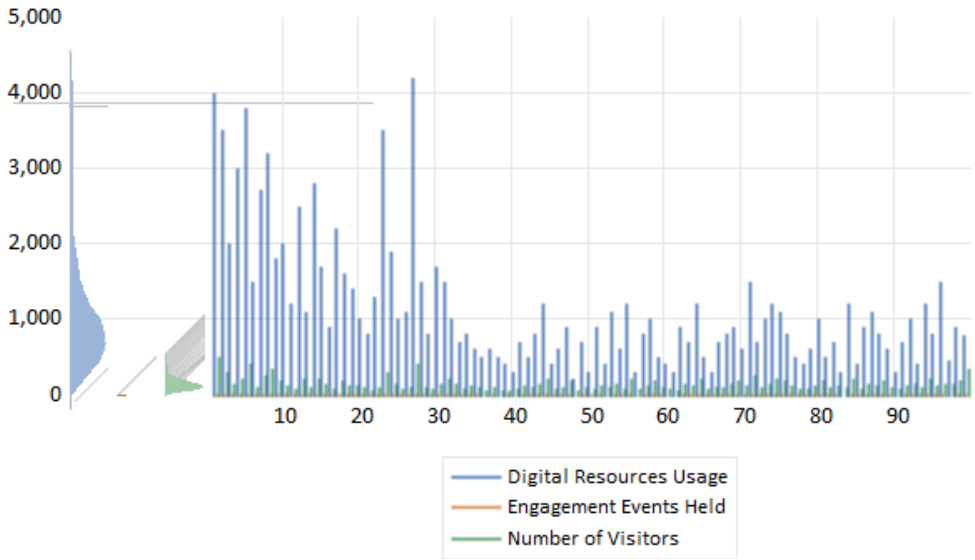

Figure 2: Plot of Descriptive Statistics

The above line graph illustrates the relationship between the number of visitors to visit a library (x-axis) and the engagement events held (y-axis) over time. The graph illustrates a steady increase in the number of visitors over nine months, from approximately 1,000 visitors initially to around 5,000 visitors by the ninth month.

4	Included observations: 99			
5				
6	Correlation			
7	Probability	DIGITAL_RE...	NUMBER_O...	USER_SATI...
8	DIGITAL_RESOUR...	1.000000		
9		-----		
10				
11	NUMBER_OF_VISI...	0.813559	1.000000	
12		0.0000	-----	
13				
14	USER_SATISFACT...	0.157799	0.132490	1.000000
15		0.1188	0.1911	-----
16				

Figure 3: Correlation Coefficients

This figure displays correlation coefficients between three variables ***DIGITAL_RESOURCES***, ***NUMBER_OF_VISITS***, and ***USER_SATISFACTION***. The table indicates a strong positive correlation (0.81) between ***NUMBER_OF_VISITS*** and ***DIGITAL_RESOURCES***, a weaker positive correlation (0.13) between ***NUMBER_OF_VISIT***S and ***USER_SATISFACTION***, and a very weak positive correlation (0.16) between ***DIGITAL_RESOURCES*** and ***USER_SATISFACTION.***

4				
5			t-Statistic	Prob.*
6				
7	Augmented Dickey-Fuller test statistic		-2.962673	0.0422
8	Test critical values:	1% level	-3.500669	
9		5% level	-2.892200	
10		10% level	-2.583192	
11				

Figure 4: ADF Test

The results of the "Augmented Dickey-Fuller (ADF)" test, a statistical test used to determine if a time series has a unit root, indicate a lack of trend which is shown in the above figure. The t-statistic value of -2.9627 and p-value of 0.0422 suggest evidence against a unit root, indicating the presence of a trend in the time series data.

1	Heteroskedasticity Test: ARCH				
2					
3	F-statistic	4.402484	Prob. F(1,96)		0.0385
4	Obs*R-squared	4.297139	Prob. Chi-Square(1)		0.0382
5					
6					
7	Test Equation:				
8	Dependent Variable: RESID^2				
9	Method: Least Squares				
10	Date: 02/22/24 Time: 14:54				
11	Sample (adjusted): 2 99				
12	Included observations: 98 after adjustments				
13					
14	Variable	Coefficient	Std. Error	t-Statistic	Prob.
15					
16	C	0.874961	0.337547	2.592114	0.0110
17	RESID^2(-1)	0.258819	0.123352	2.098210	0.0385
18					
19	R-squared	0.043848	Mean dependent var		1.135656
20	Adjusted R-squared	0.033888	S.D. dependent var		3.160966
21	S.E. of regression	3.106944	Akaike info criterion		5.125353
22	Sum squared resid	926.6977	Schwarz criterion		5.178108

Figure 5: Heteroskedasticity Test

The figure above shows the results of the heteroscedasticity test, specifically the results of the ARCH test, which assesses whether the error variance of the regression model is consistent over time. The table shows an F-statistic of 4.402484 and a p-value of 0.0385, indicating evidence against constant variance and suggesting heteroskedasticity.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
NUMBER_OF_VISITORS	6.849570	0.408794	16.75557	0.0000
USER_SATISFACTION_PERCENTAGE	-1227.260	549.1675	-2.234764	0.0254
AR(1)	0.431300	0.292142	1.476335	0.1399
AR(2)	0.562185	0.287993	1.952081	0.0509
MA(1)	-0.150777	0.328161	-0.459460	0.6459
MA(2)	-0.360531	0.257022	-1.402727	0.1607
Variance Equation				
C	3440.748	2494.299	1.379445	0.1678
RESID(-1)^2	0.364866	0.186058	1.961037	0.0499
GARCH(-1)	0.700390	0.140888	4.971267	0.0000
R-squared	0.864029	Mean dependent var		1080.722
Adjusted R-squared	0.856558	S.D. dependent var		790.1664
S.E. of regression	299.2657	Akaike info criterion		14.02714
Sum squared resid	8149956.	Schwarz criterion		14.26603
Log likelihood	-671.3165	Hannan-Quinn criter.		14.12374
Durbin-Watson stat	1.802383			

Figure 6: Garch test

Figure 6 illustrates the results of a regression analysis predicting user satisfaction percentage. Coefficients indicate a positive relationship between ***NUMBER_OF_VISITORS*** and user satisfaction coefficient is 6.8496 as well as p-value is 0.0000. However, a negative impact is observed from a prior user satisfaction percentage coefficient is -1227.260 as well as p-value is 0.0254, suggesting diminishing returns. Autocorrelation is evident, indicating non-independent errors over time.

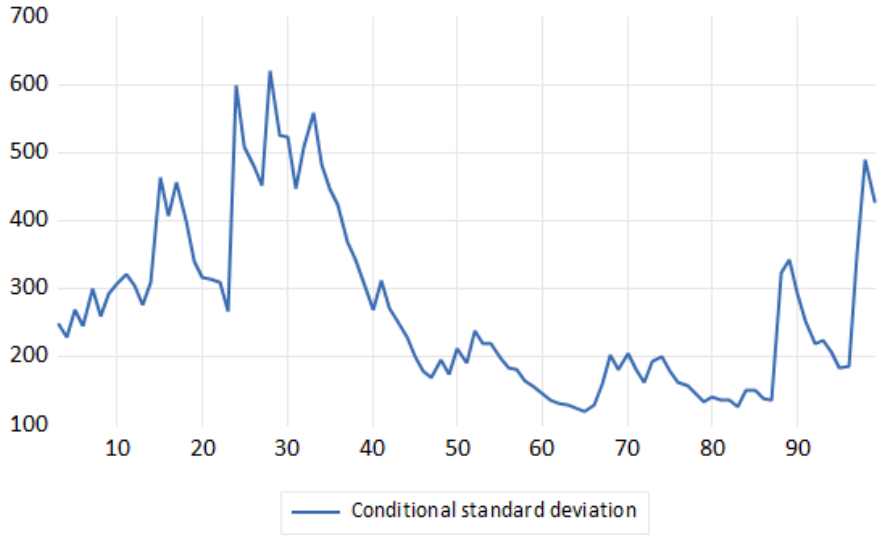

Figure 7: Conditional Standard Deviation

A line graph depicting the variation of a conditional standard deviation, with the y-axis labelled "Conditional standard deviation" which is shown in the above figure.

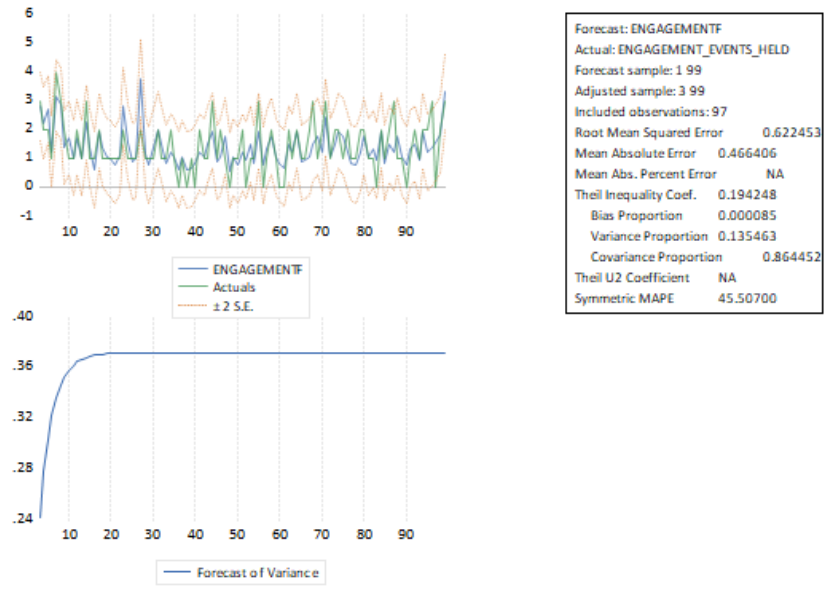

Figure 8: Forecast Analysis

This figure illustrates a time series decomposition using the seasonal trend decomposition using the LOESS (STL) method. The top graph displays the original data with an evident upward trend. The middle graph shows the estimated trend component and the bottom graph depicts the estimated seasonal component, indicating a strong seasonal pattern with apparent randomness in the residuals.

5. Conclusion

This study highlights the importance of UX design for academic libraries, especially in terms of increasing access and engagement. By using inclusive design techniques and promoting community-building programs, libraries can provide an inclusive environment that meets the needs of a wide range of patrons. The results show the importance of internet accessibility, showing a strong positive relationship between the number of visitors and digital resources. These findings may help university libraries improve their services in the future to better meet user demands and adapt to the rapidly changing demands of the digital era.

6. References

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