Diffusion of BIBFRAME Among Cataloguers in Nigerian Libraries

An Examination of Cataloguers' Adopter Categories

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Abstract

- *BIBFRAME is a popular subject among librarianship catalogers. As BIBFRAME is improved, its practical applications in libraries to improve information resource discovery and launch cataloguing data onto the World Wide Web are being researched, developed, and embraced. Because it is still in its early stages, BIBFRAME provides a chance to study increasing cataloguers' views of it, and even the connection it has with cataloguers' behaviours, as predicted in Roger's Diffusion of Innovation model. This study reports on the findings of a survey of Nigerian cataloguers with regards to their adopter subcategories (innovator, early adopter, and early majority) with which they identify. The research also looked at the connection between cataloguer adopter categories and BIBFRAME knowledge and perceptions among Nigerian catalogers. The study's results have theoretical implications for the Diffusion of Innovation model within librarianship cataloguing narratives, and practical implications for facilitating the process of diffusion of up coming technologies among Nigerian catalogers.*

Introduction

- The Library of Congress developed the BIBFRAME (Bibliographic Framework) to make bibliographic data more accessible inside and beyond the library community. BIBFRAME will make catalogue data available online
- BIBFRAME is slated to replace MARC standards.
- It uses linked data principles to make bibliographic data more useful .
- BIBFRAME is the next step in catalogue development that has expanded resource finding possibilities to the web environment.
- BIBFRAME serves as a solution to cataloguers concerns about MARC-based systems. MARC contains flaws. One of which is that, library bibliographic data is incompatible with the Web.
- According to Coyle (2000) using linked data eliminates the need for human interpretation at the record level to establish appropriate connections between data components.
- BIBFRAME has additional uses. It could soon solve the problem of libraries being isolated from the semantic web by creating a new communication protocol.
- It may reduce traditional cataloguing costs by reducing the time required to maintain authority data (Frank, 2014).
- It will eventually semantically integrate library data into the Web, allowing users to discover previously unavailable library data (Schreur, 2018).
- It is vital to monitor the BIBFRAME technology as it evolves. Understanding Nigerian cataloguers' adoption categories is a critical first step towards spreading BIBFRAME in Nigerian cataloguing narratives.

Statement of the Problem

- BIBFRAME is an invention that is gaining popularity among librarians worldwide, particularly cataloguers. Given the early stage of development and acceptance of this technology, there is a unique opportunity to study cataloguers in Nigeria in terms of the Diffusion of Innovations model and cataloguer adopter types. In Nigeria, no research of this scope has yet been published in the academic literature of library and information science (LIS). Such an investigation may be helpful to both the knowledge of diffusion of innovations theory and cataloguers' views of BIBFRAME and its adopter categories in Nigeria. The results may be useful to cataloguing managers and tech-savvy librarians in Nigeria who want to increase receptivity among colleagues to implementing BIBFRAME technology in their libraries.

Assumptions

- The perceptions of cataloguers in Nigeria toward the prospect of BIBFRAME in Nigerian libraries has influence on cataloguers' adopter categories
- The adopter categories of cataloguers on BIBFRAME vary from the adopter category, as described in Roger's model of Diffusion of Innovations

Theoretical Framework

- The Diffusion of Innovations (DOI) theory is one of the most frequently cited social theories of the twentieth and twenty-first centuries. Despite its origins more than a half-century ago, the DOI is now recognised as a chronological and disciplinary transcending theory. The adoption of an invention by individuals and groups is referred to as diffusion (some new technology, idea, or another innovation). People use knowledge about an invention to determine whether to adopt (use) it (Rogers, 2003)

- Many social scientists research and apply two key components of Roger's diffusion theory. The first investigates the rate and range of dispersion. This has been addressed by Minishi-Majanja & Kiplang'at (2005). According to Lund, Omame, Tijani & Agbaji (2020) these authors investigated how libraries adopted various information and communication technologies at varying rates. However, because this technology is so new, adoption will most likely be slow.

- The second component is connected to Rogers' concept of adopter categories. Rogers identified five types of adopters: innovators, the very first people to adopt an innovation; early adopters, the trendsetters of sorts, who do not rush to adopt an innovation but evaluate and adopt the innovation only after determining its value; early majority, those who follow the leadership of the early adopters; and late majority, those who follow the leadership of the late adopters and laggards, who are traditionalists who actively oppose change (Zhai, YDing, & Wang, 2018). It may be possible to investigate how different categories of adopters view emerging topics differently by using these adopter categories as a demographic variable for a population. This is the aspect with which the current study is concerned. There has been little research into how adopter categories influence perceptions of innovations among librarianship cataloguers, and none on BIBFRAME.

Method

- An electronic copy of the survey using Google forms was distributed via email to the Nigerian Library Association Cataloguing And Classification (NLA: Cat & Class group) on WhatsApp. Hard copies were also distributed amongst respondents. The population for the survey consists of the paid-up members of the Nigerian Library Association's Cataloguing, Classification and Indexing Section. They are six hundred and fifty (650). The study used a simple random sampling method to pick one-quarter of the population, one hundred and sixty-five (165) subjects. Cataloguers were classified in this study as librarians who work in the cataloguing unit of any library in Nigeria or teach cataloguing, classification, or indexing in any library school in Nigeria. One hundred and forty-one (141) respondents participated in the study

- The survey considered: demographics, adopter category , following of BIBFRAME trend by cataloguers, and knowledge and outlook/optimism about Bibframe. The purpose of asking these variety of questions is to cover the scope of the two assumption made in the study. The researchers assumed that perceptions of cataloguers in Nigeria toward the prospect of Bibframe in their libraries has influence on cataloguers' adopter categories. They also hypothesised that the adopter categories of Nigerian cataloguers on BIBFRAME vary from the adopter category, as described in Roger's model of Diffusion of Innovations

- Data was analysed using descriptive statistics (mean, percentage and standard deviation) and multiple regression. The study descriptive statistics (mean/standard deviation) are provided for each variable. The regressions are performed using the dependent variable of adopter category ("innovator, early adopter and early majority"), and responses to other questions within the survey as explanatory variables. These regressions examine whether the responses to questions pertaining to knowledge, optimism, and outlook toward Bibframe have a significant relationship with the category of adopter. According to Lund, Omame, Tijani, & Agbaji (2020 "such an analysis has theoretical value and practical value (identification of variables that may help speed up the diffusion process)."

Results

- There were 141 cataloguers that took part in the study. Participants range in age from 30 to 39 years old (32%), 40 to 49 years old (39%), 50 to 59 years old (18%), and 60 and older (11%). Ten percent of participants have a bachelor's degree in library science, fifty-seven percent have a master's degree in library and information science (LIS), and 33% have a PhD. Cataloguers (69%) outnumbered cataloguing lecturers (31%) in the survey. In terms of survey distribution, no significant differences in answers to questions were observed between respondents from the category of lecturers and cataloguers.

Results Contd...

- Table 1 shows Rogers's Diffusion of Innovation model and composition of the study participants. Adopters of a technology (innovation) are thought to fall along a normal distribution in Roger's model of diffusion, with innovators representing 2.5 percent of the population, early adopters representing 13.5 percent, early majority and late majority each representing 34 percent, and laggards representing 16 percent. Table 1 compares the percentages (totaling 100 percent of the total population) to the answers of the study's sample population on their adoption pattern of cataloguing technology. In this research, innovators account for a phenomenal 18 percent, early adopters for 52 percent, and early majority for 30 percent. This represents the distribution's right skew. The bias was foreseen, given that this research is more likely to appeal to early adopters, as well as the fact that cataloguers are more open to innovations and new technology than other librarians

Table 1: Roger's Diffusion of Innovations Model and Composition of the Study Participants

Categories of Adopters in Roger's Model	Cumulative Percentage of Individuals	
	Standard Diffusion Model	Participants of This Study
Innovators	2.5%	18%
Early Adopters	16%	52%
Early Majority	50%	100%

Result Contd…

- Table 2,shows subjects' knowledge of and outlook about BIBFRAME. The participants scored approximately 3 on a 4-point Likert scale (values 1-4), showing fairly high levels for both variables. Based on the manner in which the questionnaire was disseminated, most of the respondents of this study are tech-inclined, yet these high reported levels are nevertheless surprising, considering the still nascent status of BIBFRAME and its research.

Table 2: Cataloguers' Knowledge of and Outlook about BIBFRAME

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Adopter Category	141	1.00	3.00	2.2411	.73583
followingtrends	141	.00	6.00	3.6170	1.77144
My knowledge about bibframe as a concept is high	141	1.00	4.00	2.9007	.78654
My knowledge about trends in Bibframe is high	141	1.00	4.00	2.9858	.99273
I am optimstic about the future of Bibframe for improving resource discovery in libraries	141	3.00	4.00	3.4965	.50177
Cataloguers who do not develop competences in Bibframe are at risk of losing competitive advantage in future	141	2.00	4.00	3.4113	.50809
I have concerns about using Bibframe in my cataloguing work	141	1.00	4.00	2.2624	.76200
I believe Bibframe will make cataloguing data more visible in the web	141	3.00	4.00	3.6241	.48608
In general, i believe Bibframe will contribute to improving cataloguing function in libraries	141	2.00	4.00	3.4468	.61442
Valid N (listwise)	141				

Results Contd…

- Table 3 shows a summary of the composite effect of participants knowledge and outlook about BIBFRAME. The result of regression analysis for Adopter Category recorded a coefficient of determination which is the adjusted R^2 value of **0**.038 implies that the variables included in the model explain R is 38.0% variation included in the model that include: My knowledge about BIBFRAME as a concept is high, My knowledge about trends in BIBFRAME is high, I am optimistic about the future of BIBFRAME for improving resource discovery in libraries, Cataloguers who do not develop competences in BIBFRAME are at risk of losing competitive advantage in future, I have concerns about using BIBFRAME in my cataloguing work, I believe BIBFRAME will make cataloguing data more visible in the web, In general, I believe BIBFRAME will contribute to improving cataloguing function in libraries. The remaining 62% can be attributed to error in specification and the exclusion of other factors from the model. The five (5) variables: My knowledge about BIBFRAME as a concept is high, My knowledge about trends in BIBFRAME is high, Cataloguers who do not develop competences in BIBFRAME are at risk of losing competitive advantage in future, I believe BIBFRAME will make cataloguing data more visible in the web, In general, I believe BIBFRAME will contribute to improving cataloguing function in libraries were statistically significant determinants of Adopter Category. However, two (2) variables: I am optimistic about the future of BIBFRAME for improving resource discovery in libraries and I have concerns about using BIBFRAME in my cataloguing work were not statistically significant determinants of Adopter Category. Conclusively, five out of the seven variables taken together accounted for 38% of the variance in the adopted category.

- The F-ratio is 33.607. It is statistically significant at 0.05, which confirms that adopted category is statistically related to independent variables of My knowledge about BIBFRAME as a concept is high, My knowledge about trends in BIBFRAME is high, Cataloguers who do not develop competency in BIBFRAME are at risk of losing competitive advantage in future, I believe BIBFRAME will make cataloguing data more visible in the web, In general, I believe BIBFRAME will contribute to improving cataloguing function in libraries were statistically significant determinants of Adopter Category. It shows a significant relationship with p-value less than 0.05, except in two (2) variable, I am optimistic about the future of BIBFRAME for improving resource discovery in libraries and I have concerns about using BIBFRAME in my cataloguing work, It shows a significant relationship with p-value greater than 0.05, which were not statistically significant determinants of Adopter Category. therefore, My knowledge about BIBFRAME as a concept is high, My knowledge about trends in BIBFRAME is high, Cataloguers who do not develop competences in BIBFRAME are at risk of losing competitive advantage in future, I believe BIBFRAME will make cataloguing data more visible in the web, and In general, i believe BIBFRAME will contribute to improving cataloguing function in libraries were statistically significant determinants of Adopter Category.

Table 3: summary of composite effect of Participants Knowledge and Outlook About BIBFRAME on adopter category

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.494	1.008		1.482	.141	-.501	3.488
	followingtrends	-.009	.054	-.021	-.161	.873	-.115	.098
	My knowledge about bibframe as a concept is high	.073	.145	.078	4.504	.001	-.214	.361
	My knowledge about trends in Bibframe is high	-.142	.092	-.191	3.538	.002	-.324	.041
	I am optimstic about the future of Bibframe for improving resource discovery in libraries	.023	.127	.016	.182	.856	-.228	.274
	Cataloguers who do not develop competences in Bibframe are at the risk of losing competitive advantage in the nearest future	-.008	.129	-.006	3.065	.009	-.264	.248
	I have concerns about using Bibframe in my cataloguing work	.145	.083	.150	1.746	.083	-.019	.309
	I believe Bibframe will make cataloguing data more visible in the web	.163	.134	.108	3.217	.002	-.102	.428
	In general, i believe Bibframe will contribute to improving cataloguing functions in libraries	.133	.109	.111	3.221	.004	-.082	.347

a. Dependent Variable: Adopter Category

$R=0.315$; $R^2 = 0.038$; F-ratio=33.607

Discussion: Theoretical Implication

- The regression models reveal a strong relationship between BIBFRAME knowledge perception, and adopter category. This finding suggests that cataloguers who are more willing to adopt an emerging technology like BIBFRAME believe they have a better understanding of emerging technologies. This outcome is understandable. Early adopters commonly perceive themselves to be more knowledgeable and confident in the innovations they adopt. However, it does not provide sufficient empirical support for the relationship between adopter category and optimism about the future of BIBFRAME in improving resource discovery in libraries and concerns about using BIBFRAME in the cataloguers' work. This viewpoint is not consistent with the findings of researchers such as Ellen, Bearden, and Sharma, who linked Diffusion of Innovations research to Bandura's (1977) self-efficacy concepts.

- On average, innovators and early adopters follow BIBFRAME trends much more closely than the early majority. As a result, although there are differences in information behaviour between innovators and the early majority. However, the difference is not surprising given that previous research by Chatman (1986) has demonstrated the phenomenon.

- In general, respondents to this survey were enthusiastic about BIBFRAME and its potential use in libraries. While some respondents expressed concern about not being proficient enough to use BIBFRAME for cataloguing work, this was a minority viewpoint.

- This finding supports the notion that cataloguers generally prefer emerging technologies and their incorporation into cataloguing services. It also corresponds well with the results of the adopter categories, where the majority fell into either the early adopter or early majority categories.

- The Diffusion of Innovations framework, in general, could be used more frequently in LIS research because it is relevant to many studies published in the discipline's literature today. This study demonstrates how LIS researchers can use the framework to study library employee perspectives/attitudes successfully. Furthermore, the framework is helpful for policy and prediction studies because it can be used to identify social and technological barriers for specific populations.

Discussion: Practical Implication

- The Diffusion of Innovations framework, as mentioned in the theoretical implications section above, can be a practical framework for developing institutional policy. This application for policy development is critical because the framework guides the researcher in identifying differences between groups and investigating why those differences exist. In line with this viewpoint, this study has some policy implications.

- For example, the positive attitude toward BIBFRAME demonstrated by respondents in this study, as well as the presence of cataloguers as innovators and early adopters, suggests that BIBFRAME may be an area where libraries are ready to explore more deeply.

- Many libraries have already begun to use BIBFRAME. The University of Illinois at Urbana library, for example, capitalised on the growing interest in BIBFRAME by researching the technology and converting items from Dublin Core records to BIBFRAME 2.0. Furthermore, the Library of Congress created BIBFRAME training materials, presentations, announcements, BIBFRAME reviews, and a research agenda to investigate its applications within libraries and information organisations (The Library of Congress, 2021). With the high level of interest in BIBFRAME demonstrated in this study, Nigerian cataloguers may become interested in similar projects soon.

Conclusion

- The participating cataloguers in this study were very open to the possibility of incorporating BIBFRAME into the library's cataloguing processes. They demonstrated that they are generally early adopters and the early majority of new information and communication technologies. This finding suggests that Nigerian catalogers, like their counterparts around the world, are eager and ready to take the lead in the spread of BIBFRAME.

- The urgency for adopting an innovation like BIBFRAME falls primarily on early adopters. The other categories frequently rely on these individuals to determine the value of an innovation(Theo, 2017).

- Given that many of the early adopters in this study expressed positive attitudes toward BIBFRAME being used in the library environment, there is a good chance that this technology will play a significant role in cataloguing services in the coming years. As Rogers suggested while describing diffusion as a process of information exchange, he advocates' best tool is information about the innovation (what it is, how it works, what benefits it could provide, cost/benefit analysis, project management needs) and ensuring that it is disseminated to the primary decision makers within a system.

REFERENCES

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- Bandura, A. (1977). "Self-efficacy: Toward a Unifying Theory of Behavioral Change," Psychological Review 84 : 191–215
- Chatman, E.(1986) "Diffusion Theory: A Review and Test of a Conceptual Model in Information Diffusion," Journal of the Association for Information Science and Technology 37(6): 377–86
- Ellen, P.S., Bearden, W. O & Sharma, S. (1991). "Resistance to Technological Innovations: An Examination of the Role of Self-efficacy and Performance Satisfaction," Journal of the Academy of Marketing Science 19,(4), 297–307;
- Frank, P.(2014) "BIBFRAME: Why? What? Who?" Paper written for the Library of Congress, Washington, D.C., . http://www.loc.gov/pcc/bibframe/BIBFRAME%20paper%2020140501.docx
- Lund,, B, D., Omame, I., Tijani, S. & Agbaji, S (2020). Perceptions toward Artificial Intelligence among Academic Library Employees and Alignment with the Diffusion of Innovations' Adopter Categories. **College & Research Libraries**, [S.l.], 81(5) 865, <https://crl.acrl.org/index.php/crl/article/view/24516>..
- Minishi—Majanja, &, Kiplang'at, J. (2005) "The diffusion of innovations theory as a theoretical framework in library and information science research" South African journal of libraries and information science, 71(3): 211-224
- REFERENCES FOR BIBFRAME
- Rogers, Everett M. Diffusion of Innovations. New York: Free Press, 2003.
- Schreur, P (2018) *The Evolution of BIBFRAME: from MARC Surrogate to Web Conformant Data Model*. Paper presented at: IFLA WLIC 2018 – Kuala Lumpur, Malaysia – Transform Libraries, Transform Societies in Session 141 - Cataloguing. http://library.ifla.org/id/eprint/2202
- Theo Lynn, (2017) "Social Network Sites: Early Adopters' Personality and Influence," Journal of Product and Brand Management 26, (1): 42–51; Rogers, Diffusion of Innovations.
- Zhai, Y, Ding, Y, & , Wang, F. (2018) "Measuring the Diffusion of an Innovation: A Citation Analysis," Journal of the Association for Information Science and Technology 69(3): 368–79.

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