CONCLUSION AND RECOMMENDATION

➢ BIM adoption is low in the Nigerian construction Industry.

➢Challenges and approaches to overcoming BIM in this study will assist the Nigerian construction industry to plan for the effective utilization of BIM in their prospective projects.

➢Collaborative procurement systems to support BIM should be provided.

➢ BIM education should be encouraged.

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Approaches to Overcoming the Challenges of BIM Implementation	No. of Respondents in Ordinance Scale					Total	Efx	Mean	Relative Index (RI)	Rank
	1	2	3	4	5					
Increase research for BIM technology in Institutions of Higher learning	2	20	14	56	52	144	568	3.94	0.78	1
Conduct BIM skills development programmes	4	20	22	52	46	144	548	3.81	0.76	2
Conduct workshops on BIM benefits to create awareness amongst stakeholders	16	12	24	46	46	144	526	3.65	0.73	3
Introduce Collaborative Procurement Systems to support BIM technology	8	16	30	56	34	144	524	3.64	0.73	3
Develop forms of contracts for stakeholders for intellectual property of BIM technology	8	20	26	54	36	144	522	3.63	0.73	3
Develop adequate infrastructure to support BIM technology	6	20	30	60	28	144	516	3.58	0.72	6
Have Government enforce the usage of BIM as a primary requirement for procurement in the construction industry	8	22	28	52	34	144	514	3.57	0.71	7
Develop forms of contracts for stakeholders for insurance of BIM technology	8	24	36	34	42	144	510	3.54	0.71	7
Communicate lessons learned from the pilot projects to all stakeholders	10	24	26	48	36	144	508	3.53	0.70	9
Increase Client demand for BIM in non-public sector projects	12	18	36	56	22	144	490	3.40	0.68	10
Improve on the Standardization of the BIM process	10	24	40	48	22	144	480	3.33	0.67	11
Undertake pilot projects to validate and demonstrate the BIM outcomes	16	22	30	50	26	144	480	3.33	0.67	11
Improve Interoperability of BIM software within existing applications	18	34	26	28	38	144	466	3.24	0.65	13
Integrate BIM into education courses across all built environment disciplines	12	24	40	60	8	144	460	3.19	0.64	14
Establish feasible ways of moving from traditional practice into BIM	12	36	40	30	26	144	454	3.15	0.63	15
Increase the availability of BIM technology	14	44	38	28	20	144	428	2.97	0.59	16
Establish BIM project execution guides to aid BIM implementation	20	32	44	38	10	144	418	2.90	0.58	17
Educate Government departments on 'model-based' deliverables and its benefits	14	44	46	28	12	144	411	2.86	0.57	18

Challenges to BIM Implementation	No. of Respondents in Ordinance Scale					Ef	Efx	Mean	Relative Index (RI)	Rank
	1	2	3	4	5					
Lack of BIM education.	2	20	14	56	52	144	568	3.94	0.79	1
Lack of Information on BIM	4	20	22	52	46	144	548	3.81	0.76	2
Lack of Investment in BIM Technology	10	12	24	60	38	144	536	3.72	0.74	3
Lack of Government Support through legislation	16	12	24	46	46	144	526	3.65	0.73	4
Lack of Standards to Guide Implementation	8	16	30	56	34	144	524	3.64	0.73	4
Lack of sufficient ICT Infrastructure	8	20	26	54	36	144	522	3.63	0.73	4
Lack of Collaborative Procurement Systems to support BIM	6	20	30	60	28	144	516	3.58	0.72	7
Lack of Trained Professionals to handle the tools	8	22	28	52	34	144	514	3.57	0.71	8
Inadequate Power Supply	8	24	36	34	42	144	510	3.54	0.71	8
Lack of Demand from Clients	10	24	26	48	36	144	508	3.53	0.71	8
Lack of Management Support	6	18	50	50	20	144	492	3.42	0.68	11
Social and Habitual Resistance to Change	12	18	36	56	22	144	490	3.40	0.68	11
Challenges arising from licensing procedures	10	22	36	58	18	144	484	3.36	0.67	13
High Cost of Training	10	24	40	48	22	144	480	3.33	0.67	13
Lack of Support from the Industry	16	22	30	50	26	142	480	3.33	0.67	13
Unwillingness to change from traditional paper-based practices	18	34	26	28	38	144	466	3.24	0.65	16
High Cost of Implementation of BIM	12	24	40	60	8	144	460	3.19	0.64	17
Challenges arising from copyright procedures	10	28	46	48	12	144	456	3.17	0.63	18
Hesitation to Learn new technology	12	36	40	30	26	144	454	3.15	0.63	18
Constraints in Interoperability amongst project teams	14	18	58	42	12	144	452	3.14	0.63	18
Culture Shock (Contrary to common practice)	14	22	38	28	20	144	494	3.43	0.69	21
No proof of financial benefits	20	32	44	38	10	144	418	2.90	0.58	22
Challenges arising from insurance issues	12	44	44	38	6	144	414	2.88	0.58	23
Legal and Contractual Constraints	14	44	46	28	12	144	412	2.86	0.57	24
Complicated Modelling process	18	40	44	32	10	144	408	2.83	0.56	25

Building Information Modeling (BIM) Software	No. of Respondents in Ordinance Scale					Total	Efx	Mean	Relative Index (RI)	Rank
	1	2	3	4	5					
AutoCAD Architecture	20	12	24	44	44	144	512	3.56	0.71	1
Revit Architecture	40	24	24	28	28	144	412	2.86	0.57	2
ArchiCAD	34	32	26	36	16	144	400	2.78	0.56	3
Sketch up	46	24	24	30	20	144	386	2.68	0.54	4
AutoCAD Civil 3D	66	36	20	16	6	144	292	2.03	0.41	5
Revit Structure	66	28	30	12	8	144	300	2.08	0.42	6
AutoCAD MEP	70	34	20	18	2	144	280	1.94	0.39	7
Arc GIS	74	34	22	10	4	144	268	1.86	0.37	8
Revit MEP	80	28	22	10	4	144	262	1.82	0.36	8
Land Desktop Development	98	12	16	12	6	144	248	1.72	0.34	9
Vector Works	92	24	12	12	4	144	244	1.69	0.34	10
Staad Pro	106	12	8	10	8	144	234	1.63	0.33	11
Orion	102	18	10	10	4	144	228	1.58	0.32	12
Navisworks	104	18	10	8	4	144	222	1.54	0.30	13
Tekla	116	8	12	2	6	144	206	1.43	0.29	14
Bentley Systems	112	16	8	4	4	144	204	1.42	0.28	15
FM Desktop	114	18	6	2	4	144	196	1.36	0.27	16
InfraWorks	116	16	6	2	4	144	194	1.35	0.27	17
Catia	118	14	6	2	4	144	192	1.33	0.27	18
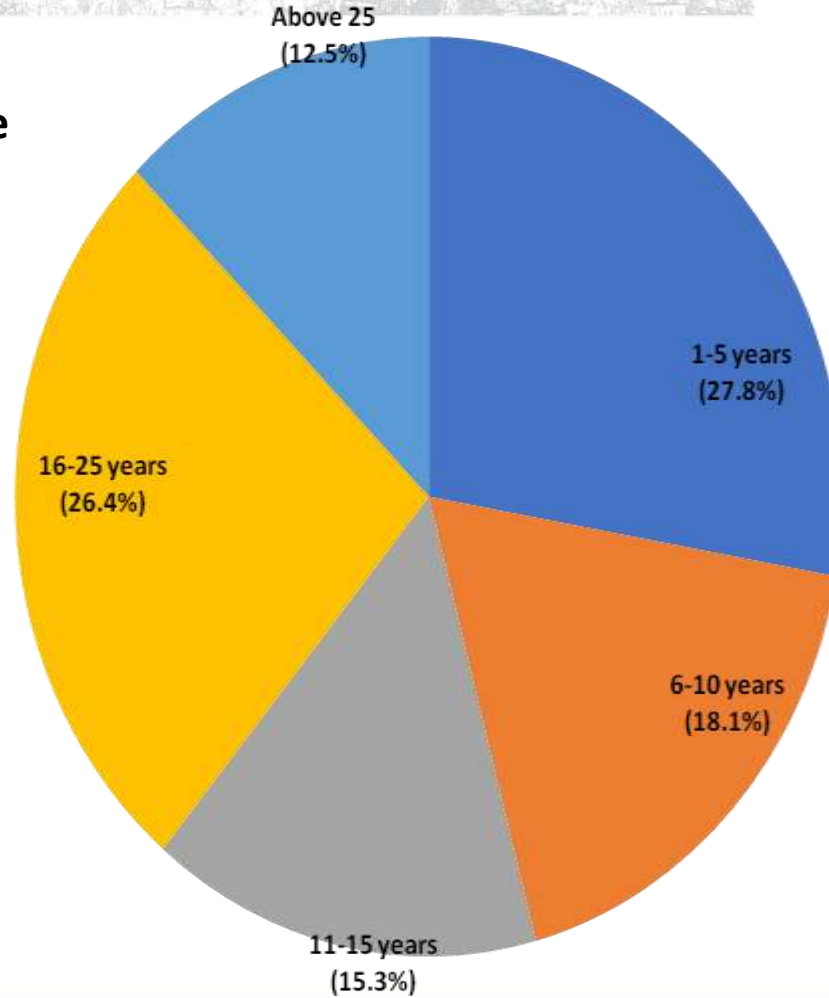
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Area of practical experience
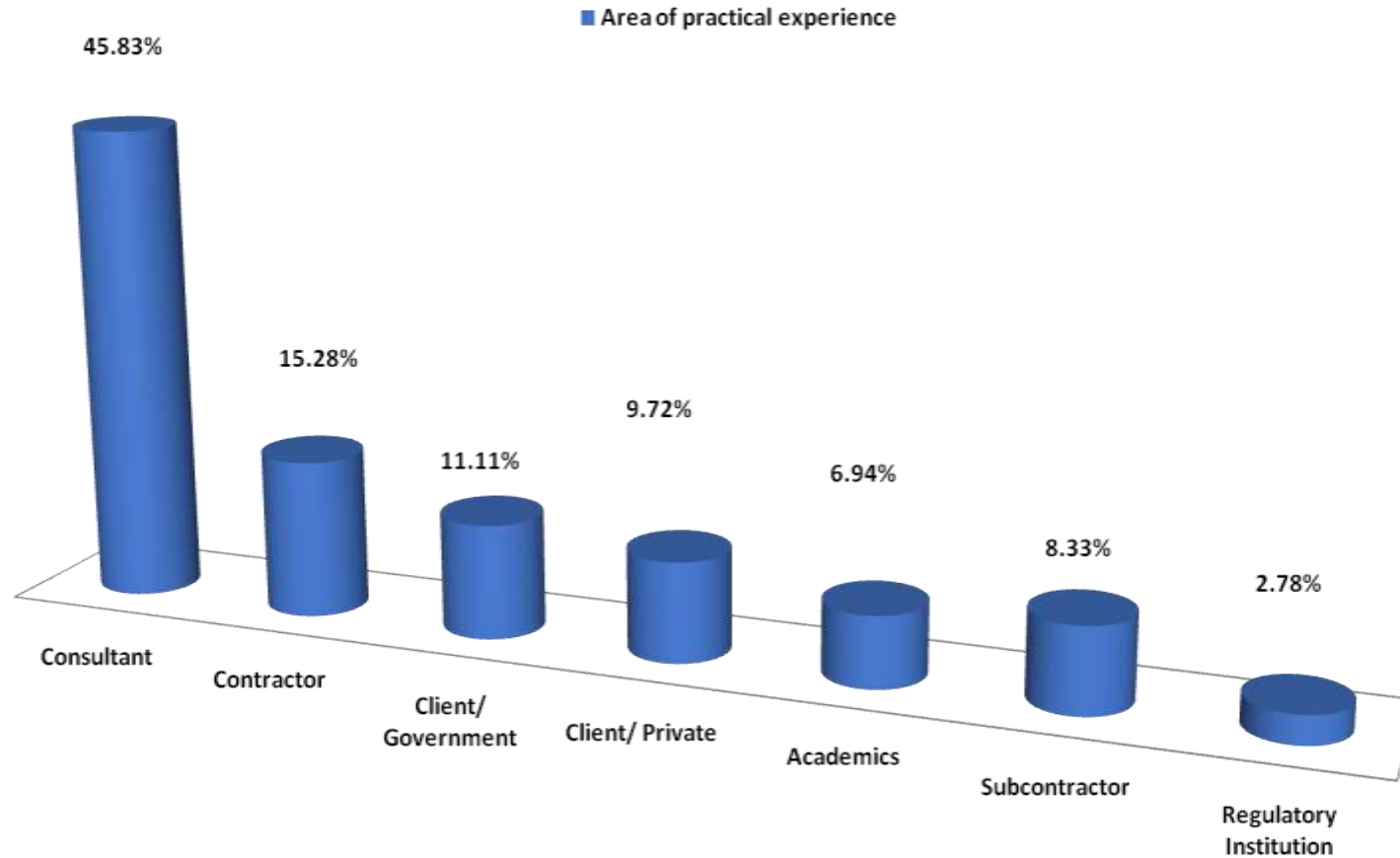
Academic Qualification
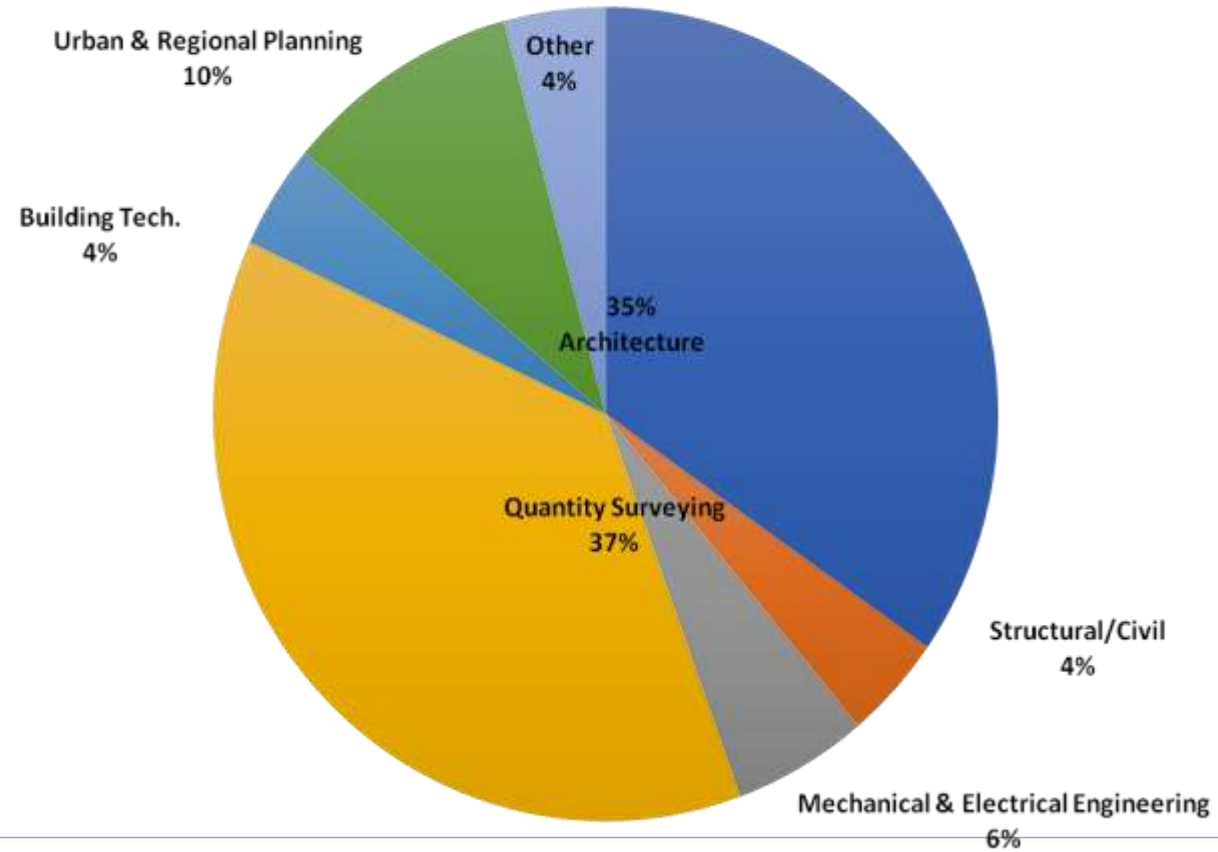
Sample Size

The target population is 8200 firms. The sample size of the research was calculated using Yamanes' formula in Singh and Masuku (2014) for calculating sample size as indicated below.

n= N/ {1+N (e) 2}

Where n represents Sample Size, N represents population= 8200, e = 0.050

n=8200/1+8200(0.050)2

Therefore, the sample size equals 321 (Three hundred and twenty one)

QUESTIONNAIRE	NUMBER	PERCENTAGE
1. Distributed	321	100
2. Retrieved Questionnaire	144	44.86
3. Not Returned	177	55.14

METHODOLOGY

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- ✓ The Target population of study was 8200 Nigerian Building Design Firms.
- ✓ The sampling method used for this study is Simple Random sampling with a sample size of 321 .
- ✓ The research instrument used for this study is the structured questionnaire.
- ✓ The data obtained was tabulated and analyzed using tables, means, pie charts, bar charts and Relative Important Index.

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BIM, IMPLEMENTATION AND IT CHALLENGES IN NIGERIA

➢BIM is a cutting edge technology that has addressed prominent challenges in the Architecture, Engineering and Construction (AEC) industries in most of the developed countries.

➢Construction industries in developing countries due to identified challenges and unavailability of the clear understanding of best practices, are dithering whether to adopt this technology.

➢lack of awareness among stakeholders, lack of standard to guide implementation, lack of information technology (IT) infrastructure, lack of education and training, lack of government direction as major challenges faced in the adoption of BIM technologies.

Thank you for listening

RUYA Tambaya Fadason