



# CONSTRUCTION PROFESSIONALS' PERCEPTION OF A WEB-BASED RECRUITING SYSTEM FOR SKILLED LABOUR

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## ABSTRACT

Globally, the construction industry is experiencing shortage of skilled labour to handle most of its construction projects. There is the need to develop a two-way collaborative technology that adequately connects the available skilled labour to the construction projects where they are needed and vice versa in order to reduce the shortage. By harnessing the strength of web-based technologies, this study intended to evaluate construction professionals' perception of a web-based recruiting system for skilled labour. The study developed a web-based recruiting system using CSS, HTML, Javascript and MySQL. System block design and a use case diagram was used to model the web-based systems which are presented in screen shots in this study. A total of one hundred (100) structured questionnaires were distributed to construction professionals in the attitudinal survey on the developed web-based system. The data obtained was analysed and presented using SPSS v21. Statistical tools such as stacked bars, mean score, analysis of variance (ANOVA) and Kruskal Wallis test were utilized. Based on the designed web-based platform, the study revealed that in recruiting skilled labour for construction projects, construction professional are mostly concerned with having the sufficient number of skilled labour which are readily available to the site location, properly screened and obtained through a low-cost recruiting process in order to improve their competitive advantage in the construction industry. The study identified lack of knowledge about using a web-based system, low IT training among skilled labour and inaccurate information supplied by worker as major drawbacks to using a web-based system for sourcing for skilled labour. The study revealed that there was a statistically significant difference in the drawbacks to the use of web-based recruiting system for sourcing for skilled labour among the construction professionals. The study recommended that there is need to increase ICT trainings among construction professionals and its ancillary stakeholders in order to utilize new innovative ICT tools in the construction industry. Innovative ICT tools can be used to complement traditional methods in use in the construction industry so as to enhance the delivery of construction projects.

**Keywords:** *Construction Industry, Recruitment, Skilled Labour, Social media, Web-based systems.*

## 1. INTRODUCTION

The inadequacies in the number of skilled labour available for craft works in the construction industry has become a global phenomenon. The survey by [1] emphasized that shortage of skilled labour continues to be a challenge for the construction industry. In the study by [2], about three-quarter of construction managers have experienced shortage in filling positions for artisans/skilled labour on their construction projects. [3] asserted that the demand for construction skilled labour force is far above the supply.

Researchers have identified decrease in use of traditional techniques, rise in entrepreneurship, poor image of the industry, unfriendly/harsh working conditions, inadequate training, low participation of women and globalization as contributing factors spurring the shortage in skilled labour experienced in the construction industry [4, 5, 6]. Other factors ensuring that the construction industry runs out of skilled labour includes the global explosion of human population and their housing needs [1, 7].

Consequently, construction firms have been reported to be poaching trained skilled personnel from other firms [8] while some relied on

the use of immigrant skilled workers to balance the equilibrium [7]. This study posits that the challenge may not only be about shortage but about connecting the available skilled labour to the construction sites where they are needed and vice versa. In the study by [9], construction managers mainly depended on recommendations from colleagues about artisans. This is mostly referred to as ‘word-of-mouth’ method which is most times inefficient as shortages are still reported. The study opined that the best solution would be to connect construction firms to a pool of skilled labour required and vice versa, the connection of skilled labourers to on-going construction projects in their location.

The construction industry is increasingly relying on information and communication technology to solve most of its dire challenges. This development requires that the construction industry integrates ICT in all of its processes including recruitment of its skilled labour. The notion of recruiting through web-based systems is not new to many private and public organization. [10] recorded that organizations make use of web-based technologies such as company website, online job board, social media platforms - LinkedIn, Twitter and Facebook in their recruitment processes. In the study by [11], the increase in the use of social media in order to search for jobs have become phenomenal. As such, in the United Kingdom, more than one-fifth of job seekers search Facebook for job placement while one-third of them use LinkedIn. By using social media, new and young graduates are building an online career presence for potential employers. Out of over 30,000 graduates surveyed worldwide, a study found that all the graduates in Europe would prefer an online recruitment strategy between them and their employer [12]. With this, more than forty-four (44) percent of employers in the United States are increasing their online presence in search of talented individuals by engaging their social networking sites (SNSs) as a human resource (HR) tool. More than one-third of the employers were engaging the SNSs platforms as recruitment advertising or interacting with potential employees while more than one-tenth of the employers were engaging SNSs platforms as screening tools [13].

The uniqueness of this research is the consideration of using web-based technologies in connecting potential skilled labour with their employers in the construction industry. The study would be able to contribute to the few body of knowledge available on the use of information and

communication technology (ICT) and recruitment process of skilled labour in the construction industry, especially in developing economies. The construction sector has a lot to gain from using web-based technologies in its recruitment process. Although, there is need for an attitudinal survey of construction professionals on their perception towards the concept.

Some of the common reasons companies make use of web-based technologies in their human resource processes include wider reach of potential candidates, faster route of communication between organizations and the pool of applicants, reduced cost of recruitment adverts, ease in accessing potential employees’ submitted information, reduced costs of communications, finding candidates and keeping ahead of competitors and reduced paperwork [14, 15]. In order to sort through a pool of diverse applicants and make concise selection through a faster route, large organizations in the United States have started resorting to the use of web-based technologies to achieve this goal [16]. However, there some associated drawbacks that are recorded in literature which include: large volumes of application leading to information overload, increased diversity in quality of candidates, lack of personalized response to applicants, issues related to candidate confidentiality, unavailability of computers and internet by applicant, discrimination based on candidates personal characteristics, accuracy of information and legal risks [11, 13, 17]. Nevertheless, the use of a web-based recruitment tool is considered more cost-effective on the long-run and has the potential of quickening the search for the right candidates to fill up positions than the traditional paper-based methods [18]. Therefore, the study intends to evaluate construction professionals’ perception of a web-based recruiting system for skilled labour. The following questions would guide this study:

- What are the benefits of using a web-based recruiting systems for sourcing for skilled labour in the project delivery process?
- Is there a difference in the associated drawbacks in utilizing a web-based recruiting system for sourcing for skilled labour in the project delivery process?

## 2. REVIEW OF RELATED LITERATURE

Different web-based systems have been developed to help the construction industry. Systems such as e-tendering systems [19], e-procurement systems [20] and e-material planning

and control systems [6]. Some other studies have considered the adoption and barriers to the uptake of such innovative ICT tools [21]. According to [22], the internet is a new competitive ground for organizations to thrive by helping them to rethink how they can increase effectiveness and efficiency in their business processes. As such, in the human resource sector, the internet has transformed the traditional functions of the HR manager. [23] opined that organization must not relax in their recruitment strategies, as choosing a quality employee has short-term and long-term benefits in achieving the firm's objectives. [23] argued that organizations that often adopt web-based systems in their recruitment process believe that they are more likely to discover applicants with exceptional qualities required for the position compared to using the traditional recruitment strategies. [24] asserted that as at the year 2005, 96% of all companies in the United States used the internet for their recruitment needs with an expenditure of \$ 7 billion.

In defining electronic human resource management (e-HRM), [25] defined it as a way of implementing HRM strategies, policies and practices in organizations through the conscious and direct support of and the full use of channels based on web technology. Generally, e-HRM is the planning, implementation and application of information technology for both networking and supporting at least two individual or collective actors in their shared performance of HR activities [26]. Web-based human resource management is more about automation that increases effectiveness and efficiency. Web-based human resource management eliminates the conventional human resource unit within an organization [27, 28]. Using the internet ensures that HR information is obtained easily, faster, collated, and delivered between employers and employees.

Previous web-based human resource systems that have been developed include: [15] who

utilized the Laravel Framework as a MVC (Model View Controller) design for the development of a web-based recruitment tool. The system helps to extract the needed information of eligible candidates, gives accurate output and HR can either select or reject a candidate with respect to some given query terms. [29] proposed system is a neural network web-based human resource management system model running on internet information (IIS) server with capabilities for Active Server Page (ASP) and Microsoft Access; while Hypertext Markup Language (HTML) are used for authoring web pages. [30] designed and developed a system that employed a 3-tier web architecture for recruitment of medical staff for some health institutions. There has been little or no study on the development of a web-based system for recruiting skilled labour in the construction industry.

### 3. METHODS

The study developed a web-based recruiting system for skilled labour to be utilized in the construction industry. In turn, the study measured the perception of construction professionals to the developed web-based system. The web-based system was designed using CSS, JavaScript, HTML and MySQL. Cascading Style Sheets (CSS) is designed primarily to enable the separation of document content from document presentation, with aspects such as the layout, colors, and fonts while Hyper Text Markup Language, commonly referred to as HTML. CSS is a style sheet language used for describing the presentation of a document written in a markup language, is the standard markup language used to create web pages. Web browsers can read HTML files and render them into visible or audible web page and this is why it was used for this platform. While MySQL was used to design the database system that the system requires to store information. In order to clearly understand the scope of the design, a system block design and a use case diagram was developed.

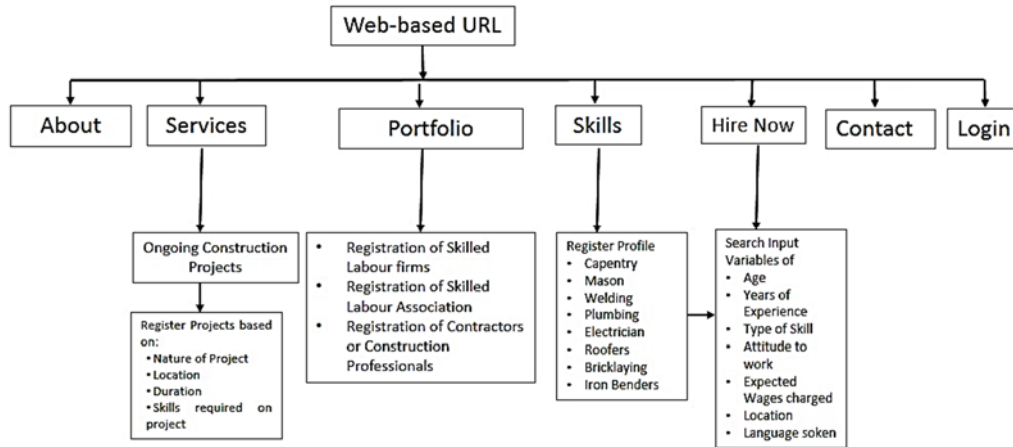


Figure 1: System block design of the web-based recruiting system

Figure 1 showed the system block diagram of the web-based recruiting system for skilled labour. The system has seven (7) main interfaces that ensures that users can adequately interact on the system. These interfaces lead to other interfaces that expounds on the web-based system. Figure 2 presented the use case diagram for the web-based system. This showed the users that can access and make use of the web-based platform. Users such as construction organizations, construction professionals, labour associations, skilled labour sub-contractors and skilled labourers. In addition, the screen shot of the web-based recruiting system were presented. The study been quantitative in nature adopted survey research design to elicit information on the perception of construction professionals on the developed web-based recruiting system.

Construction professionals such as Builders, Architects, Quantity surveyors and Civil engineers are most times involved in recruiting skilled labour for their construction projects. Therefore, these set of professionals were selected to participate in this study. A questionnaire instrument was used in acquiring the attitudinal survey of construction professionals. A total of one hundred (100) questionnaires were circulated via emails and by hand, which resulted in seventy-three (73) questionnaires been retrieved and scrutinized to be free of errors, this represented a 73 percent response rate. The data collected were analyzed with the use of Statistical Package for Social Scientists (SPSS) for statistical calculations.

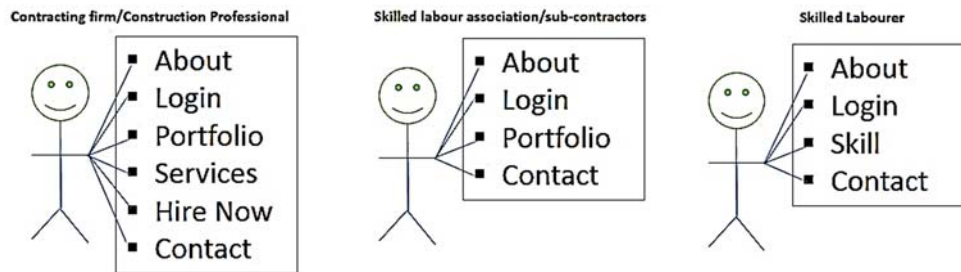


Figure 2: Use case diagram of the web-based recruiting system

### 3.1. Implementation of a Web-Based Recruiting System for Skilled Labour

The web-based recruiting system is designed to be accessed via a browser connected to the internet. The name of the template web-based system was named ‘Ambixo’. Figure 3 showed an overview of the web-based system for

recruiting skilled labour with seven (7) main interfaces. Figure 3 showed the ‘About interface’ which gives a description to users the purpose of the web-based system. The web-based recruiting system helps connect skilled labourers to their prospective employers. Construction organizations are able to surf through a pool of registered skilled labour (carpentry, electrician,

plumbers, masons, painter etc.) and select based on submitted criteria requirement. Skilled labour associations and sub-contractors can also register skilled labourers with them on the system to make them eligible to be selected for construction projects that are within their location. Figure 4 showed the construction company registration interface. Construction professionals are able to register ongoing construction projects and provide details such as type of project, location, type of skilled labourer required on the project and duration of the project. This information would help skilled labourers and their associations to find construction sites that may be in need of their services within specified locations.

Construction firms and professionals on the other hand are able to search for required number of skilled labour based on registration of information that must have been supplied by skilled labourers. Figure 5 showed the skilled

labour registration interface. Skilled labourers are required to provide information such as trade, years of experience, location, contact number, language spoken and age of artisan. These information would help construction firms and professionals to select from the pool of registered skilled labourers. In a case where the artisan/skilled labourer is not IT literate, trade associations can help register their members on the platform. Figure 6 showed the database of skilled labourers available on the platform for selection. The skills include carpentry, plumbing, electrician, tiling, welding, heavy equipment operators, painting and masonry works. From Figure 7, construction firms and professionals are able to submit a query form of the required number and type of skilled labour needed on their construction sites. The query form helps the recruiters to streamline the requirement and those that meet the requirement are supplied for selection and they can therefore be contacted to report to the construction sites.

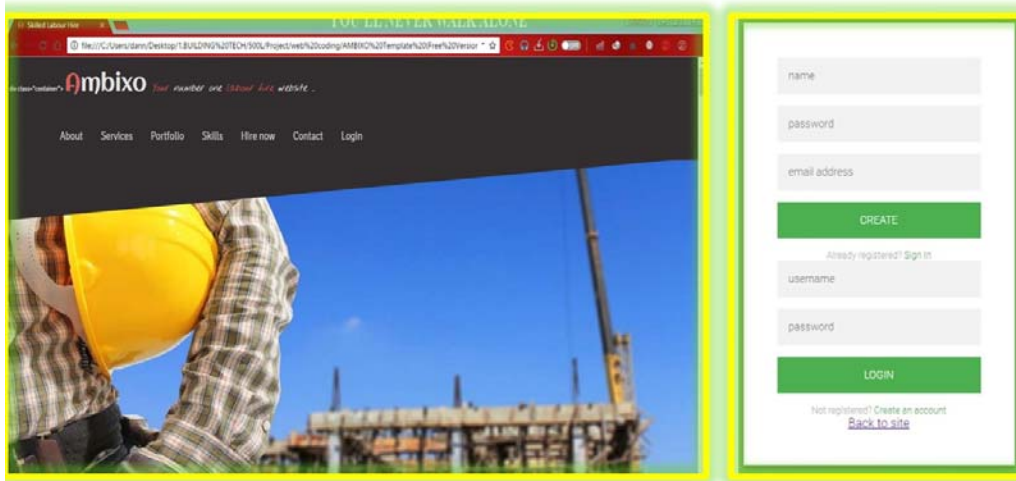


Figure 3: Screen shot of the web-based recruiting system for skilled labour

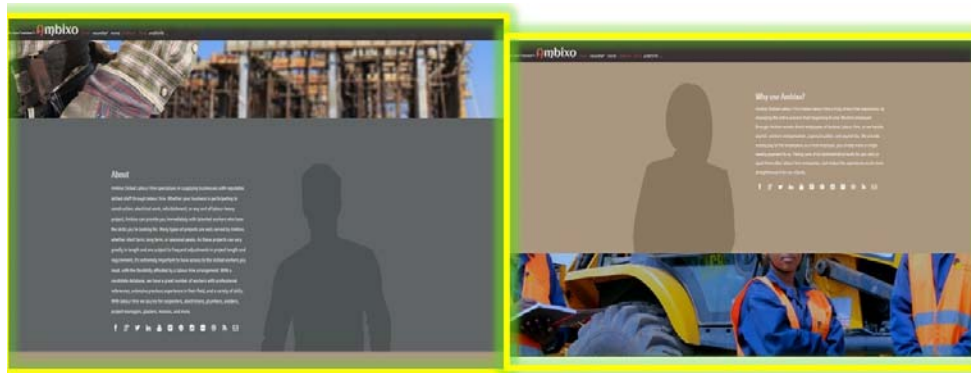


Figure 4: Description of the web-based system

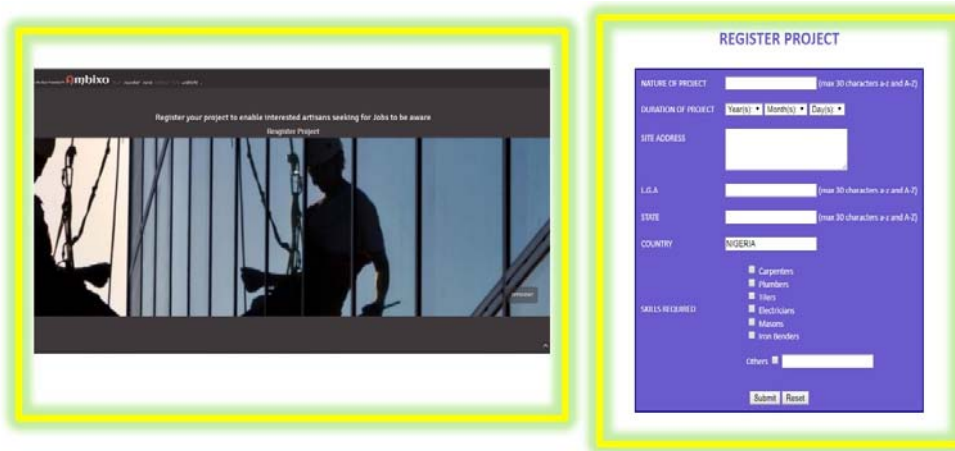


Figure 5: Construction company registration interface

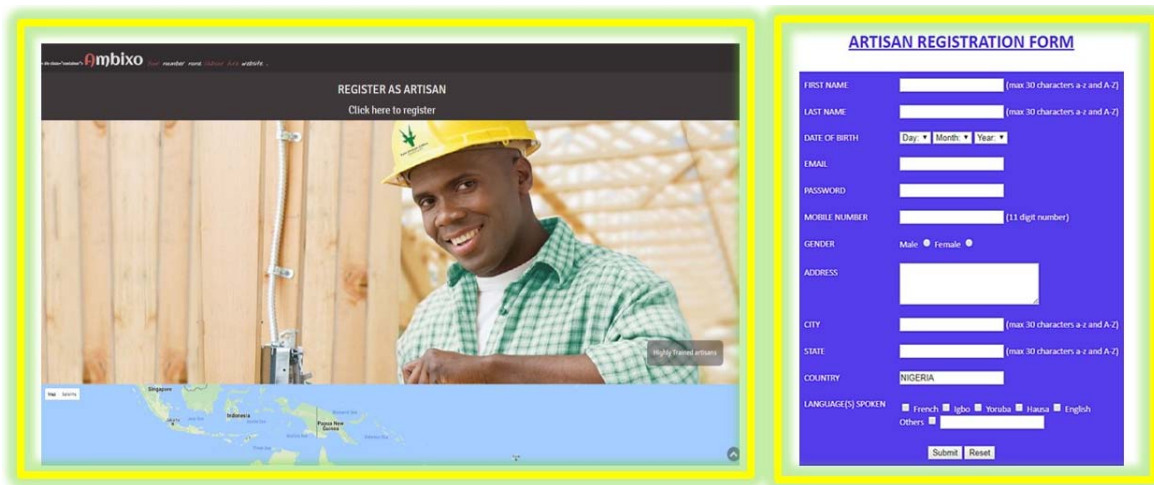


Figure 6: Skilled labour registration interface

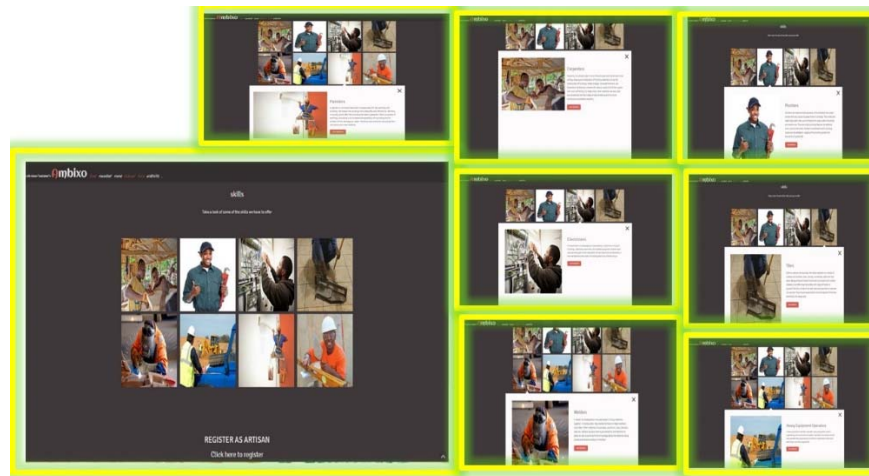


Figure 7: Pool of Skilled labour database

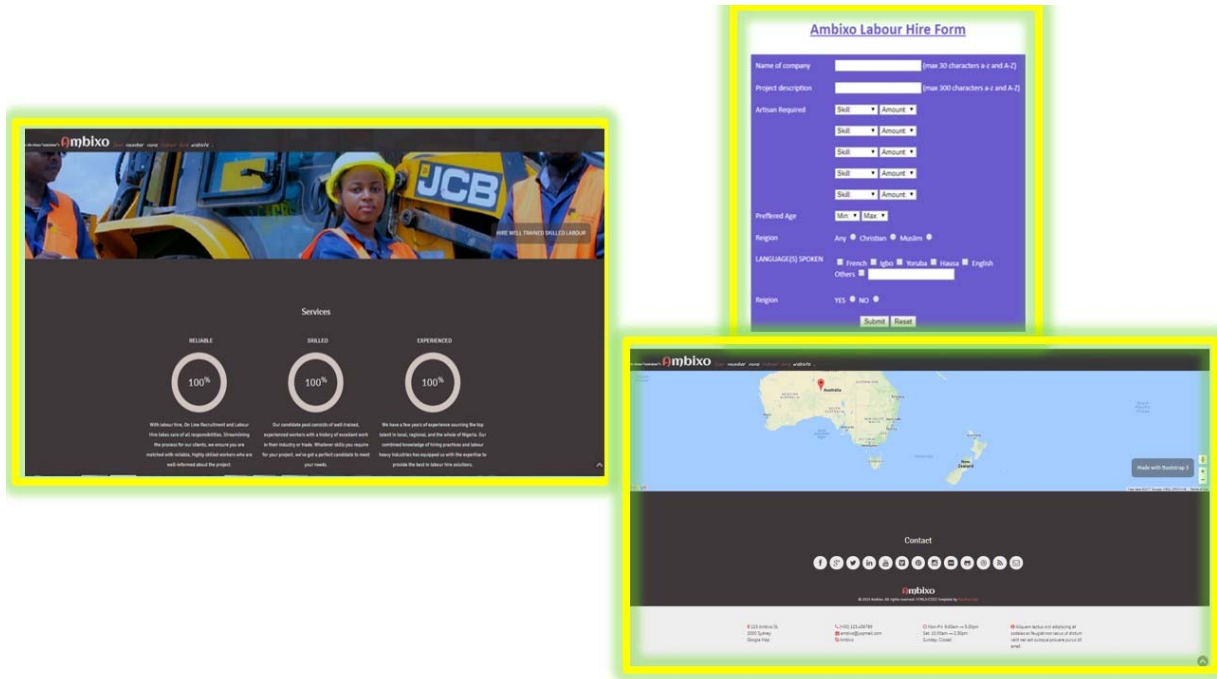


Figure 8: Skilled labour recruiting interface

#### 4. RESULT AND DISCUSSION

Based on the designed web-based recruiting system, the perception of construction professionals were thus sought on the challenges and benefits such platform had for the construction industry. This section presented the results and implication of the phenomenon observed in the study. This section consists of three (3) main sections which include the background information, benefits and perceived drawbacks in the use of web-based system for recruiting skilled labour for construction works.

##### 4.1. Background Information

The background information showed the characteristics of the construction professionals that participated in the study. Figure 9 showed the summary of the background information of the respondents. From Figure 9, the highest academic

qualification of the construction professionals showed that 15 (20.5%) had Ordinary National Diploma (OND)/ Higher National Diploma (HND) degrees, 26 (35.6%) had Bachelor's degree in the variants of B.Sc/B.Tech/B.Eng, 23 (31.5%) had Master's degree in various forms of M.Sc/M.Eng/M.Tech/MPM while 9 (12.3%) had Ph.D degrees. A breakdown of the professional background showed that there were 4 (5.5%) Architects, 25 (34.2%) Quantity Surveyors, 29 (39.7%) Builders and 15 (20.5%) Civil Engineers. The industry experience showed that 45 (61.6%) of the construction professionals had 1-10 years working experience in the construction sector while 28 (38.4%) had 11-20 years working experience. In addition, the study inquired on whether the construction professionals had ever used a web-based system/social media platform to source for skilled labour on a construction project.

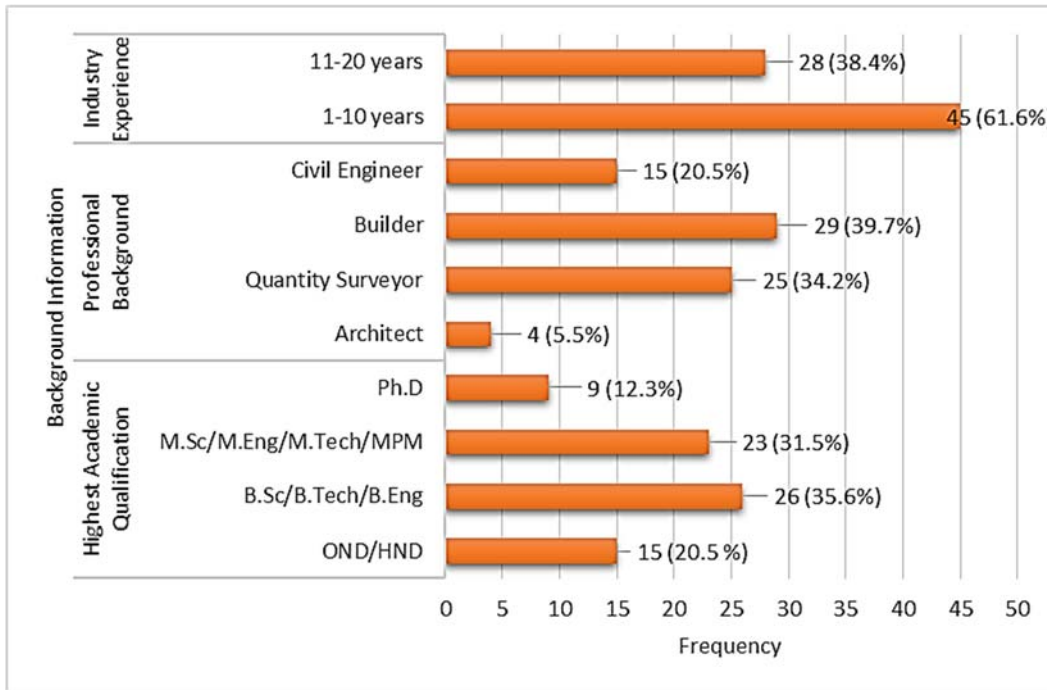


Figure 9: Summarized background information

Figure 10 showed the experience of using a web-based system/social media platform to source for skilled labour. The result showed that 14 (19%) construction professionals had in one time or the other used a web-based system/social media platform to source for skilled labour for their construction projects while 59 (81%) had never used a web-based system/social media platform to source for skilled labour. This result showed a low participation in the use of a web-based system/social media platform in sourcing for skilled labour.

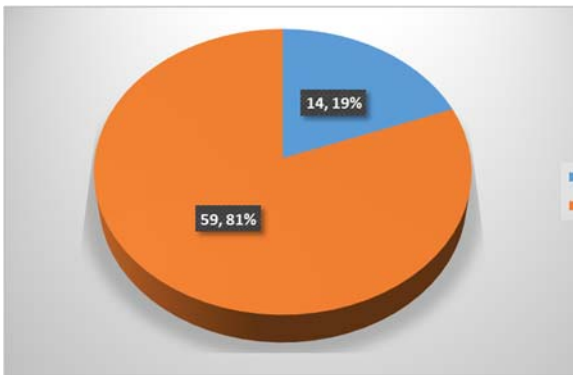


Figure 10: Experience with a web-based system platform in sourcing for skilled labour

#### 4.2. Benefits of Utilizing a Web-Based Recruiting System for Skilled Labour

This section showed the perception of construction professionals on the benefits that could be derived in the use of a web-based recruiting system for sourcing skilled labour on construction projects. The study used a one-way between groups analysis of variance to identify variables which were statistically significant among the groups. Table 1 showed the ANOVA test for the benefits of using web-based systems for sourcing skilled labour. Using the professional background of the respondents, the result revealed that there was a statistical significant difference at the  $p < .05$  level for benefits such as increased availability of skilled labour  $F(3, 69) = 5.170, p = .003$ ; supply of sufficient number required on the job  $F(3, 69) = 9.302, p = .000$ ; faster information exchange  $F(3, 69) = 5.212, p = .002$ ; lower cost in recruitment process  $F(3, 69) = 5.351, p = .002$ ; reduced cost of communication  $F(3, 69) = 4.325, p = .007$ ; proper screening of appropriate skilled labour  $F(3, 69) = 3.562, p = .019$ ; and improved competitiveness  $F(3, 69) = 7.615, p = .000$ . A critical review of these benefits showed an emphasis on availability and cost. The study revealed that in recruiting skilled labour for construction projects, construction professional are mostly concerned with having the sufficient



number of skilled labour which are readily available to the site location, properly screened and obtained through a low-cost recruiting process in order to improve their competitive advantage in the construction industry.

Table 1: ANOVA test of benefits of using web-based systems for sourcing skilled labour

		Sum of Squares	df	Mean Square	F	P value	Remark
Increased availability of skilled labour	Between Groups	12.439	3	4.146	5.170	.003	S
	Within Groups	55.342	69	.802			
	Total	67.781	72				
Supply of sufficient number required	Between Groups	22.825	3	7.608	9.302	.000	S
	Within Groups	56.435	69	.818			
	Total	79.260	72				
Faster information exchange	Between Groups	10.634	3	3.545	5.212	.003	S
	Within Groups	46.928	69	.680			
	Total	57.562	72				
Lower cost in recruitment process	Between Groups	11.314	3	3.771	5.351	.002	S
	Within Groups	48.631	69	.705			
	Total	59.945	72				
Improved data accessibility and availability	Between Groups	1.672	3	.557	1.490	.225	NS
	Within Groups	25.808	69	.374			
	Total	27.479	72				
Reduced cost of communication	Between Groups	7.103	3	2.368	4.325	.007	S
	Within Groups	37.773	69	.547			
	Total	44.877	72				
Attraction of the best skilled labour	Between Groups	6.668	3	2.223	2.425	.073	NS
	Within Groups	63.250	69	.917			
	Total	69.918	72				
Availability of different array of trades to select	Between Groups	3.555	3	1.185	1.724	.170	NS
	Within Groups	47.431	69	.687			
	Total	50.986	72				
Proper screening of appropriate skilled labour	Between Groups	6.749	3	2.250	3.562	.019	S
	Within Groups	43.580	69	.632			
	Total	50.329	72				
Improved competitiveness	Between Groups	18.346	3	6.115	7.615	.000	S
	Within Groups	55.408	69	.803			
	Total	73.753	72				
Reduced paper work	Between Groups	.159	3	.053	.133	.940	NS
	Within Groups	27.321	69	.396			
	Total	27.479	72				
Elimination of the conventional HR unit	Between Groups	1.430	3	.477	.440	.725	NS
	Within Groups	74.735	69	1.083			
	Total	76.164	72				
Faster sorting/streamlining of preferred candidates	Between Groups	32.963	3	10.988	7.067	.000	S
	Within Groups	107.284	69	1.555			
	Total	140.247	72				
Wider applicant outreach	Between Groups	2.441	3	.814	1.209	.313	NS
	Within Groups	46.435	69	.673			
	Total	48.877	72				
Lower cost of advertisement	Between Groups	3.655	3	1.218	2.143	.103	NS
	Within Groups	39.222	69	.568			
	Total	42.877	72				

\*NS = Not Significant, \*S = Significant

In order to have sufficient number and diversity in skill of workers, companies are turning to e-recruiting. From a total of 92% of firms that have adopted social media platforms for their e-recruitment in the United States, [31] reported that the adoption rate for LinkedIn, Facebook and Twitter as an e-recruiting tool is

93%, 66% and 54% respectively. Most of the search is customarily among young graduates. Targeting the younger generation becomes easier due to their affinity for technology. These young generation can be understood by the popular names being associated with them e.g., google generation, digital natives and net generation.

Companies are finding themselves in a tougher talent competition than they have in previous years, and they are already taking actions to reduce the risks. There has been an 85% increase in recruiting activities via social media since 2007 [32]. Web-based recruitment tools are now common and a wide range of companies use them with different integration levels [33]. This is most certainly the case of large companies, as well as most of small to medium-sized ones for recruiting professionals, executive and administrative staff. However, [34] argued that construction organizations could expand their internet recruiting strategies to include the skilled labor workforce to attract workers and obtain a competitive advantage. As this study posits, [35] added that this is an area that may have been overlooked by construction organizations to enhance recruitment of skilled labor.

The findings of this study is corroborated with the study by [14]. Their survey showed that the most common reasons of using online recruiting system in their recruitment were cost-effectiveness (75%), ease of use for candidates (64%), a larger candidate pool (53%), ease of use for the organization (52%), speed to hire (52%), and company policy (50%). The study by [14] showed that there was reduction in the recruitment costs, improvement in the efficiency of the recruitment process and that this form of recruitment could minimize the time taken to hire employees. In the use of web-based recruiting system, [35] noted that the number of entering applications may be extremely large and the problem turns toward selecting the ones that present the best quality potential. This can be solved by introducing the best selection tools on the web-based system that helps eliminate unqualified candidates for the skill needed. This study posits that in order to solve the incessant shortage in the availability of skilled labour needed for construction projects there is need for innovative ICT tools to be able to link the construction professionals to the available skilled labour in any location.

With an adequate and up-to-date database of construction skilled labour, construction professionals can draw up sufficient number that meet their requirement. All the benefits identified in the use of the web-based recruiting system bores down to improving

competitive advantage by construction firms. In order to attain this competitive edge, [36] noted that construction professionals have adopted the use of information and communication technology (ICT) in diverse construction processes. This competitive edge must be attained in fulfilment of consumer needs, avoiding extra costs and faster delivery times which the web-based system intends to deliver by reducing the time, cost of sourcing for skilled labour and obtaining the sufficient amount required for construction projects per time. The construction industry needs to respond to increased competition by attracting globally skilled talents, changes in both workforce attitudes and composition, shifts in the employer/worker relationship and rapid advances in HR technology. New kinds of technical knowledge, skills and abilities would require construction stakeholders to be flexible and willing to deal with the ever accelerating pace and often unpredictable changes in the construction industry.

#### **4.3. Associated drawbacks in the use of a web-based system for recruiting skilled labour**

Having understood the benefits that could be derived using a web-based system for recruiting skilled labour for construction projects, the study posits that there are some perceived drawbacks that could be experienced in deploying and implementing a web-based recruitment process. The study identified seventeen (17) shortcomings for literature. The variables were first tested using mean score to identify the ranking of each shortcomings as perceived by construction professionals. Table 2 showed the mean score of the associated drawbacks in the use of a web-based system for recruiting skilled labour. From Table 2, the drawbacks identified include lack of knowledge about using a web-based system (MS = 4.34), low IT training among skilled labour (MS = 4.32), inaccurate information supplied by worker (MS = 4.05), inability to test skilled labourer's competence (MS = 3.97), inadequate screening of skilled labour (MS = 3.93), poor internet connection (MS = 3.75), high cost of internet subscription (MS = 3.71) and unavailability of ICT tools (MS = 3.67). Lack of personalized response (MS = 3.33) and poor worker confidentiality (MS = 3.26) were least ranked.

Table 2: Drawbacks in the use of a web-based system for recruiting skilled labour

Drawbacks	MS	Std.		Remark
		Deviation	RI	
Lack of knowledge about using a web-based system	4.34	.931	1 <sup>st</sup>	S*
Low IT training among skilled labour	4.32	.621	2 <sup>nd</sup>	S*
Inaccurate information supplied by worker	4.05	.797	3 <sup>rd</sup>	S*
Inability to test skilled labourer's competence	3.97	1.040	4 <sup>th</sup>	MS**
Inadequate screening of skilled labour	3.93	1.032	5 <sup>th</sup>	MS**
Poor internet connection	3.75	1.164	6 <sup>th</sup>	MS**
High cost of internet subscription	3.71	1.112	7 <sup>th</sup>	MS**
Unavailability of ICT tools	3.67	1.155	8 <sup>th</sup>	MS**
Other traditional methods of recruiting	3.66	1.238	9 <sup>th</sup>	MS**
High legal risk	3.59	1.200	10 <sup>th</sup>	MS**
Risk of technical malfunction	3.59	.761	10 <sup>th</sup>	MS**
Résumé information Overload	3.56	.897	12 <sup>th</sup>	MS**
Poor user acceptance	3.49	1.056	13 <sup>th</sup>	MS**
Discrimination based on skilled labourer's personal characteristics	3.40	1.277	14 <sup>th</sup>	MS**
Increased diversity among workers	3.34	1.157	15 <sup>th</sup>	MS**
Lack of personalized response	3.33	.914	16 <sup>th</sup>	MS**
Poor worker confidentiality	3.26	1.131	17 <sup>th</sup>	MS**

\*MS = Mean Score, \*RI = Ranking Index, MS\*\* = Moderately Significant, S\* = Significant

The result of the study revealed that construction professionals perceived that a lack of knowledge about a web-based system for recruiting skilled labour could be a major challenge in the successful implementation of the system. On the part of the skilled labour, construction professionals are of the opinion that the low IT training could hinder the system and for those that use the system there could be questions about the integrity of the information supplied by the skilled labour. This findings are corroborated with findings in [34]. [34] reported that the major obstacles to the use of web-based recruiting system for sourcing for skilled labour include attitude within the construction firm, usage limitations of the internet, lack of IT skills and limited computer and internet access by the skilled craft labor. The study sought to understand if there was any difference in the perception of the construction professionals towards the drawbacks of using web-based systems for sourcing for skilled labour. The study tested the hypothesis;

H<sub>0</sub>: there is no significant difference about the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour in the project delivery process.

H<sub>1</sub>: there is no significant difference about the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour in the project delivery process.

A Kruskal-Wallis test was conducted on the variables among the groups. Table 3 showed the Kruskal-Wallis test on the drawbacks in the use of a web-based system for recruiting skilled labour. The result from the Kruskal-Wallis Test revealed a statistically significant difference in the identified drawbacks to the use of web-based system across the four (4) different construction profession groups (Gp1, n = 4: Architect, Gp2, n = 25: Quantity Surveyors, Gp3, n = 29: Builder, Gp4, n = 15: Civil Engineer),  $\chi^2(2, n = 73) = 25.086, p = .000$ . Table 3 showed that there is significant difference among construction professionals on the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour in the project delivery process at 95% confidence level. This implies that construction professionals have divergent perception about the drawbacks in the use of a web-based system for recruiting skilled labour. Where p value < 0.05, thus, the alternate hypothesis which states that there is significant difference about the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour is accepted and the null hypothesis is rejected.

Table 3: Kruskal-Wallis Test on the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour.

Drawbacks in the use of a web-based recruiting system	
Chi-Square, $\chi^2$	25.086
df	3
Asymp. Sig.	.000

One of the significant findings to emerge from the study by [37] is that, a key implementation challenge to e-recruitment was the cultural approach of the organization towards the innovative tool and the lack of knowledge about the tool within the Human Resource (HR) community. When construction professionals lack adequate knowledge about an innovative ICT tool, there is no doubt that it can create a form of bias towards such tool. Therefore, the need for training and education in order to increase awareness about new technologies in the construction industry.

The internet on the other hand is playing a great role on community development, as it provides an access to different information through search engines and allows interaction between the societies [10]. In the study by [34], construction organizations responded that they want more construction related job web sites that are specific to the construction industry and easy to locate in a search. Based on the responses, it appears that employers experience frustration in locating job-recruiting sites that meet their needs. This may be due to the lack of existing web-based recruiting skill labour sites or the inability to locate the sites during a search. It may also indicate that the existing internet recruiting sites used by the construction industry are insufficient or inadequate for listing job applicants.

Furthermore, in developing countries, the use of web-based recruiting systems may be restricted to individuals or location where the infrastructure to implement information and communication technologies (ICTs) exist, such as in urban centres. This is because ICT infrastructures in the town and cities is more pronounced, leaving many places especially rural

areas with no access to internet [10]. This would make many skilled labourers living in the rural parts unable to access the job information required in the urban centres. As shown in Figure 10, some construction professionals have engaged the use of social media or other web-based systems in sourcing for skilled labour on construction projects, therefore, the differences in the agreement on the drawbacks in the use of a web-based recruiting system for sourcing for skilled labour. The traditional recruitment approach may be a barrier which creates a fear of change (FOC) in the attitudes of some construction professionals towards the use of the ICT tool. While, some of the construction professionals that do not agree with the drawbacks to the use of a web-based recruiting system for sourcing for skilled labour may have participated in the use of such systems and found it rewarding. The key point to note in this study is, knowledge is crucial in increasing the user acceptability of a new technological tool.

## 5. CONCLUSION AND RECOMMENDATION

The study evaluated construction professionals' perception of a web-based recruiting system for sourcing for skilled labour. The study developed a web-based recruiting system which was modeled using a system block design and a use case diagram. The final web design templates were presented in pictorial screen shots. Based on the designed web-based platform, the study revealed that in recruiting skilled labour for construction projects, construction professional perceive that it would benefit the construction industry by increasing the availability of skilled labourers, supply of sufficient number of skilled labour required, lower the cost of recruitment process, reduce the cost of communication, ensure proper screening of qualified candidates and improve competitiveness. The study identified lack of knowledge about using a web-based system, low IT training among skilled labour and inaccurate information supplied by worker as major drawbacks that could be associated with the use of a web-based system for sourcing for skilled labour. The study revealed that there was a statistically significant difference in the drawbacks to the use of web-based recruiting system for sourcing for skilled labour among the construction professionals.

Future research can be focused on the need to measure the cost-effectiveness of using a web-based system in sourcing for workforce in the construction industry. Furthermore, the use of web-based system can be integrated in other factors of production or resources in the construction industry including managing materials, plants and equipment, managing time etc. Aligned with any introduction of new technology is the requirement for increased awareness and new skill development. Training to input data and search the database of any new technology and becoming more aware of what any innovative ICT tool can offer should be a priority in trying to influence cultural change between employers and employees. This training involves technology-related training, courses or development as part of cultural change which can bring about alterations to attitudinal and behavioural bias to innovative ICT tools in the construction industry. A crucial strategy in addressing the stiff cultural bias to new technologies by employees and potential employees is through continuous training and re-training about efficient and effective work delivery. Education is a fundamental element that brings the knowledge about ICT tools and new technologies to the users, up to the point where they can acquaint themselves with the new innovative ICT tool quickly and sufficiently. The world is already a 'global town' where construction professionals and skilled labour cannot afford to be left behind in the traditional approach of delivering construction projects. Through continuous professional development (CPD) courses or trainings, construction professionals can be abreast of latest ICT tools. While the hope that with the increase in many skilled labour's affinity to social media, skilled labourers would soon catch up with the trend of being ICT compliant on several construction projects.

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