Development of a Web-Based Human Resource Sourcing System for Labour Only Contracts

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Abstract

Nowadays in some areas of Nigeria, it has been noticed that the search for a satisfactory team of labourers (skilled and unskilled) or even the right amount of people to undertake the job has become a laborious activity. Therefore, there is need to build a two-way partnership system linking construction firms with the required skilled labour and vice versa. The aim of this research is to develop a web-based human resource sourcing system for labour only contracts. The study made use of a questionnaire instrument and developed a web-based interface for skilled labour sourcing. The questionnaire was distributed to fifty (50) construction professionals who were selected through a convenience sampling technique. The data collected was analyzed using SPSS v.21. The design of the system was done using hypertext markup language (HTML) for authoring web pages. The study revealed that contractors' sourcing techniques for skilled labour on construction projects were mostly by referral from colleagues and workers from past projects. The study identified the major barriers in sourcing for skilled labour on construction projects as the unavailability of trained skilled labour. The study revealed that years of experience, wages charged and behavior of the worker were major criteria considered while sourcing for skilled labour on construction projects. In conclusion, the study developed a web based human resource sourcing system for labour only contracts that incorporated the needs of the skilled labour and requirement of construction firms. It was recommended that construction professionals and contractors need to harness the benefits of web-based technologies. In addition, there is need to increase the information and communication technology (ICT) trainings of workers in the construction industry so has to have a successful integration of ICT and the construction industry.

Keywords: Construction industry; Human resource; Skilled labour; Sourcing system; Web-based technologies.

INTRODUCTION

The construction industry is one of the largest global employment sectors, providing work for a good number of the labour market (Loosemore *et al.*, 2003). Oseghale *et al.* (2015) recorded that construction workers constitute 6 – 7 percent of

the world's labour force. The construction industry is strategic in every society, as the largest employer of labour which attracts large amount of investment in order to provide necessary infrastructure to nations (Afolabi *et al.*, 2016).

Skilled labour play a pivotal role in the construction labour required for the construction industry. This is because they deal with the special construction activities of installations. A large percentage of the required quality on construction projects are hinged on the dexterity of the skilled labour force (Afolabi *et al.*, 2016). The skilled labour force affects the speed of the project and if they are not present in their required number, it can slow down or even delay the construction process. Therefore, for the success of construction businesses and their products, there is need to attract, retain and develop talented skilled labour force. It is crucial to note that people are an organization's most valuable asset and this is especially true in relatively low-tech, labor-intensive industries such as construction (Loosemore *et al.*, 2003). But the construction industry's employment has been characterized by relatively high rates of attrition among skilled labour which has manifested in periodic labour shortages globally (Tucker *et al.*, 2001; Erlich and Grabelsky, 2005; McGrath-Champ *et al.*, 2011).

The findings of the Chartered Institute of Building survey (2008) indicated that shortage of skilled labour continues to be a challenge for the construction industry. The CIOB (2008) and Afolabi *et al.* (2016) predicted that this issue is likely to worsen as the demand for construction increases due to exponential population growth and housing needs in developing and developed countries. Oseghale *et al.* (2015) reported that from time to time employers in the construction sector in a number of countries refer to the difficulties they have in recruiting labour of the requisite skill. Nowadays in some areas of Nigeria, it has been noticed that the search for a satisfactory team of laborers (skilled and unskilled) or even the right amount of people to undertake the job has now become a laborious effort. In the study by Oseghale *et al.* (2015), about 80 percent of construction managers reported shortage of Bricklayers, Carpenters, Painters and Plumbers on their construction projects. Akindoyeni (2005) asserted that the demand for construction skilled labour force is far above the supply. Researchers have identified contributing factors spurring the shortage in skilled labour experienced in the construction industry (Wells and Wall, 2003; Dainty *et al.*, 2004). Consequently, Odusami and Ene (2011) noted that there have been large incidences of construction firms poaching trained skilled personnel from other firms. In addition, Ogbeifun (2011) explained that due to the decline in the supply of local skilled labour there has been an increase in the use of immigrant workers to balance the equilibrium.

As construction firms needs to succeed and survive, or compete efficiently in the over-all economy in this era of globalization, construction business owners utilize different sourcing techniques for their skilled labour. Some of the external source of recruitment include advertisement, e-recruitment, employment agencies, labour office, education and training establishment (Beardwell, 2007). Other internal sources include through referrals, from past projects as contract staff or personal contact between contractor and the skilled labour. Odusami and Ene (2011) suggested that creating an equilibrium between the demand and supply of construction skilled labour requires thinking out of the box. Therefore, this study intends to develop a web based

human resource sourcing system that uses the preferred criteria of the contractor to seek a good team of skilled labour from a Data Base Management System (DBMS) in order to tackle the shortage of the required skilled labour on construction projects. The questions in the mind of the researcher are:

- What techniques are used by contractors in sourcing for skilled labour on construction projects?
- What barriers are encountered in sourcing for skilled labour on construction projects?
- What are the benchmark attributes contractors look for while sourcing for skilled labour on construction projects?
- How can a web-based human resource sourcing system for labour only contracts be developed?

METHODS

The research strategy for this study was a quantitative research strategy which adopted a cross-sectional survey research design. Since the study is about a two-way partnership system between the employer (construction professionals) and employee (skilled labour). The study sought the perception of the employers which included construction professionals such as Builders, Architects, Quantity surveyors and Civil engineers in order to find out their sourcing techniques, criteria considered in sourcing, barriers encountered in order to develop the web-based skilled labour sourcing system. The sample size from the population was selected by convenience sampling design, due to the fact that the survey respondents were easily accessible to the researcher and the participants showed willingness to the study. The study area utilized for this research was the commercial center of Nigeria; Lagos State. Lagos State has high volume of completed and on-going state-of-the-art construction projects, with most of Nigeria's construction companies having their head offices in the state. A total of sixty (60) construction professionals were selected for the study, while thirty-two (32) were returned and used for the study. The data collection instrument used was a coded questionnaire which had four (4) sections. The data collected were analyzed with the use of Statistical Package for Social Scientists (SPSS) for statistical calculations. In addition, the study developed a web-based human resource system for sourcing for skilled labour on construction projects. A system block diagram to illustrate the architecture of the web-based system was presented in Figure 1.

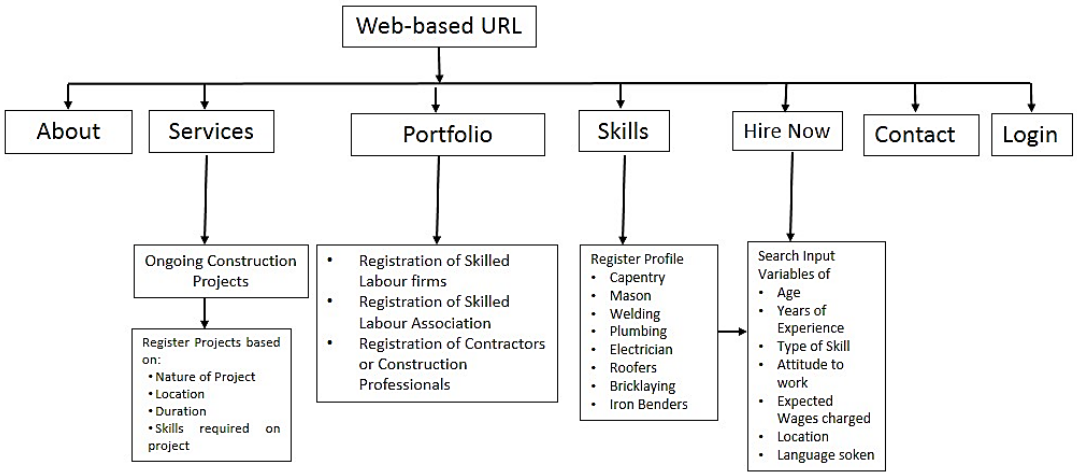


Figure 1. System Block Design of the Skilled labour Sourcing System

The web-based applications uses a web browser as a user interface (called the front-end). Users would be able to access the applications from any computer connected to the internet via a secure, password-protected login page and from that point forward all the data are encrypted. Since this is an ongoing research work, this web application was not hosted on the internet as at the time of this study, the study showed the innovative possibilities of accessing a pool of skilled labour from a repository of skilled labour database. While skilled labourers can access ongoing construction projects closer to their locations. Screen shots of the web-based system were presented.

RESULT AND DISCUSSION

This section presented the results and implication of the phenomenon observed in the study. This section consists of five (5) main sections which include the background information, sourcing techniques, criteria considered in sourcing for skilled labour, the barriers encountered in sourcing for skilled labour in the construction industry and the design and implementation of the web-based human resource system for sourcing skilled labour.

Background Information

The background information of respondents that participated in the study is shown in Figure 2. Figure 2 showed the breakdown of the various construction professionals that participated in the study. Based on the analysis, the breakdown showed that 17 (53.1%) were Builders, 5 (15.6%) were Architects, 7 (21.9%) were Civil Engineers and 3 (9.4%) were Quantity surveyors.

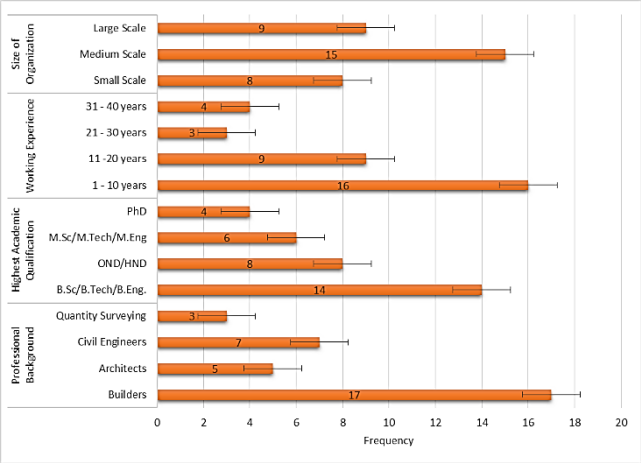


Figure 2. Background Information

The result showed that the Builders had the highest participation in the study. This is adequate for the study as Builders are most times responsible for sourcing for skilled labour on construction sites. Figure 2 showed the highest academic qualification attained by respondents. The result obtained showed that most of the respondents have a form of higher educational qualification. Majority of the respondents had a B.Sc/B.Tech/B.Eng degree as their highest academic qualification with 14 (43.7%), followed by Ordinary National Diploma (OND)/ Higher National Diploma (HND) degree at 8 (25%), 6 (18.8%) had M.Sc/M.Tech/M.Eng degree and 4 (12.5%) had PhD degree. A further assessment of Figure 2 showed the working experience of the respondents. The result reveals that 16 (50%) of the construction professionals had about 1-10 years of working experience, while 9 (28.125%) had 11-20 years of working experience, 3 (9.38%) had 21-30 years of experience, 4 (12.5%) have had a working experience of 31-40 years of experience. Figure 2 showed that 8 (25%) of the construction professionals worked with small scaled organizations, 15 (46.9%) were with medium scaled organizations, and 9 (28.1%) were in large scaled organizations. The result revealed that most of the construction professionals worked in a medium size organizations which is adequate for this study.

Techniques used in sourcing for skilled labour

This section showed the techniques used in sourcing for skilled labour by construction professionals using selected variables from literature. Figure 3 showed the techniques used in sourcing for skilled labour. The result revealed that referrals from colleagues and sourcing from past projects ranked first with a mean score (MS) of 4.31. This was followed by "sourcing on site location, whereby skilled labourer walks into the construction site to be employed which had a mean score (MS) of 4.16, the use of labour subcontractors ranked fourth with a mean score (MS) of 3.78, referrals from other construction firms had a mean score (MS) of 3.47, use of labour organizations/associations had a mean score of 3.41, use of community based groups had a mean score (MS) of 3.38, placement of adverts had a mean score (MS) of 2.88 while the use of social media and online platforms both had a mean score (MS) of 2.84. This result is corroborated by Zimmerman (2000), in that some site

superintendents rely on employee referrals and a "good old boy" network for hiring skilled labor. It is mostly referred to as 'Word-of-mouth' method. Also, Haas *et al.* (2001) noted that contractors typically access a labor pool or maintain and update a database listing of crafts workers who worked on prior projects for the company. These experienced skilled labour follow and move to new projects with the contractor.

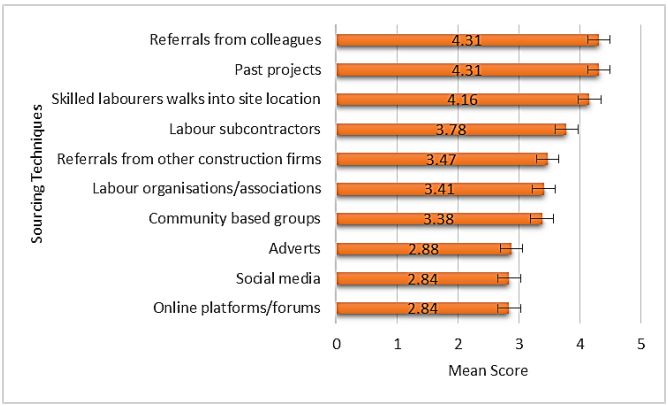


Figure 3. Techniques used in sourcing for skilled labour

Criteria in sourcing for skilled labour

This section showed the criteria construction professionals use in hiring skilled labourers for their construction projects. Based on Figure 4, years of experience of the skilled labourer ranked first with a mean score (MS) of 4.63, followed by the wages the skilled labourer charges for his services which had a mean score (MS) of 4.13, the character or behavior of the skilled labourer is also considered and it had a mean score of 4.0. Other criteria considered include nearness to site (MS = 3.91), tools possessed and certificate of training (MS = 3.84), nature of trade (MS = 3.78), age (MS = 3.63), association affiliation (MS = 3.41), language (MS = 3.35), educational attainment (MS = 3.13), CV possessed (MS = 3.06), religion of the skilled labourer (MS = 2.28) and tribe (MS = 2.22). The experience of a skilled labour is very key in delivering quality on construction projects. Contractors and construction professionals also take cognizance of the wages to be paid.

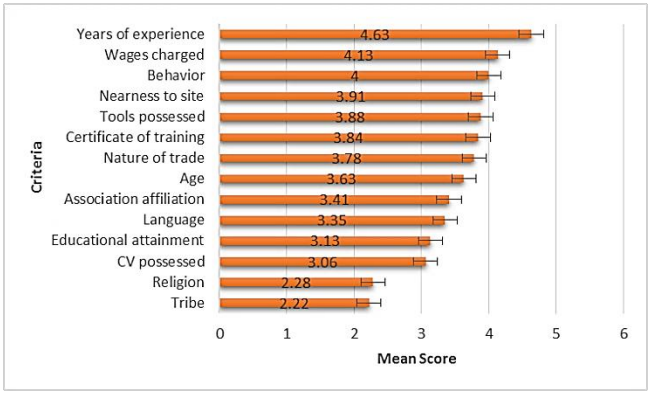


Figure 4. Criteria in sourcing for skilled labour

Barriers in sourcing for skilled labour

Construction professionals encounter some barriers in sourcing for skilled labour on construction projects. Figure 5 showed the barriers in sourcing for skilled labour.

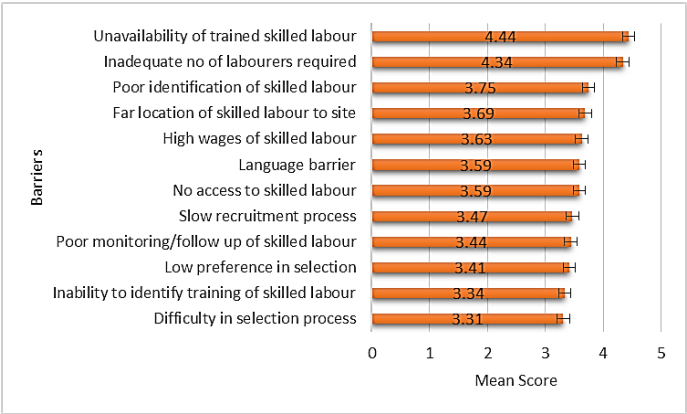


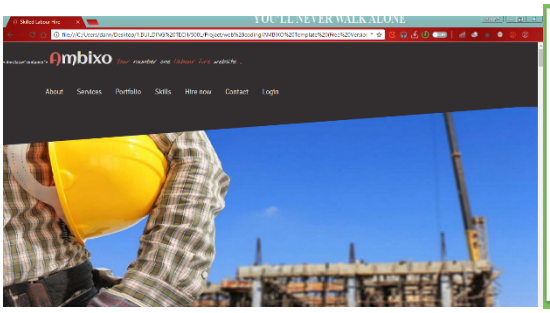
Figure 5. Barriers in sourcing for skilled labour

The figure revealed that construction professionals mainly experience the unavailability of trained skilled labour which had a mean score (MS) of 4.44, closely followed by the inadequate number of labourers required on construction projects with a mean score (MS) of 4.34, poor identification of skilled labour was ranked third with a mean score of (MS) 3.75, far location of skilled labourer to site had a mean score (MS) of 3.69, high wages of skilled labour had a mean score (MS) of 3.63, language barrier and no access/low access to pool of skilled labour both had a mean score (MS) of 3.59, slow recruitment process had a mean score (MS) of 3.47, poor monitoring/follow up of skilled labour had a mean score (MS) of 3.44, low preference in selection had a mean score (MS) of 3.41, inability to identify training of skilled labour had a mean score (MS) of 3.34 and difficulty in selection process had a mean score (MS) of 3.31. The result is supported by studies in CIOB (2008); Odusami and Ene (2011) and Oseghale *et al.* (2015). There is a global shortage of skilled labour making the required number needed on construction sites to be below the requirement.

Design of a web-based human resource sourcing system

In order to easily link the construction professional to the skilled labour required on construction projects, the study developed a web-based human resource sourcing system that can be used for sourcing for skilled labour. The website was designed using CSS, JavaScript and HTML. 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 (Afolabi *et al.*, 2017). Web browsers can read HTML files and render them into visible or audible web page and this is why it was used for this project.

For this project, the website was created offline and was not hosted since it is an ongoing research work. The name given to the website which is designed only for the purpose of this project is Ambixo. The site once opened via a web browser takes you to a login page for registration of username and password either by the construction company or the skilled labourer on the Home page. Once the login data has been created, there is a menu bar that will enable the user to navigate through the website. The options on the menu bar includes about, services, portfolio, skills, hire now and contact us respectively as shown in Figure 6 to 10.



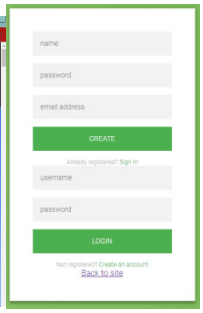


Figure. 6 Ambixo home page **Figure. 7 Login Page**

The 'About interface' gives a description of what the web-based system is able to do and what it intends to achieve. The 'Service interface' shows a database system that stores ongoing projects that contractors or construction professionals may be in need of skilled labourers. Contractors and construction professionals are able to provide the name of the project, nature of project, location, duration and the skills required on the construction project. Skilled labourers can view different ongoing construction projects on this page and search for locations closest to them.

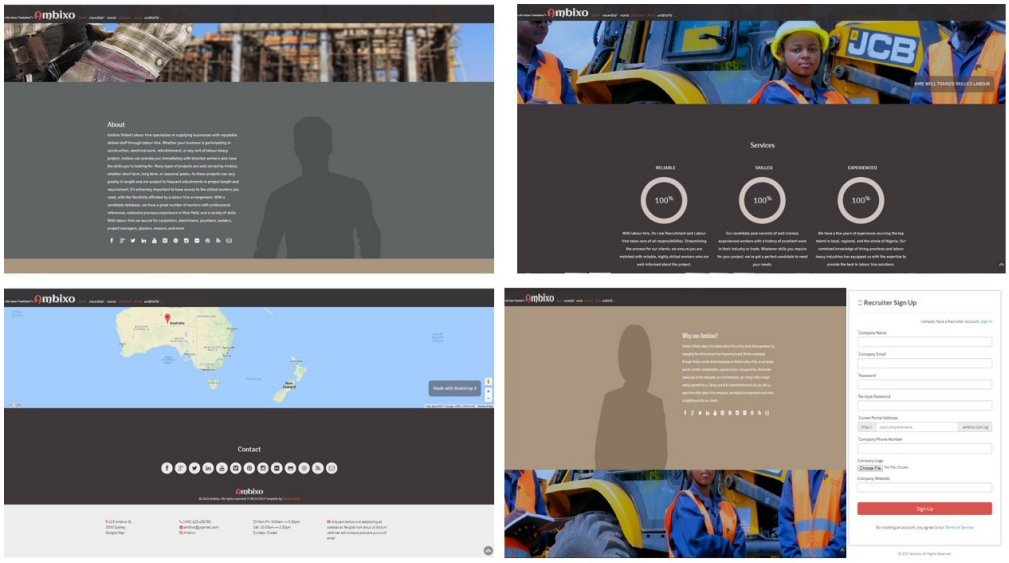


Figure 8. Description, Service, Portfolio and Contact Interface

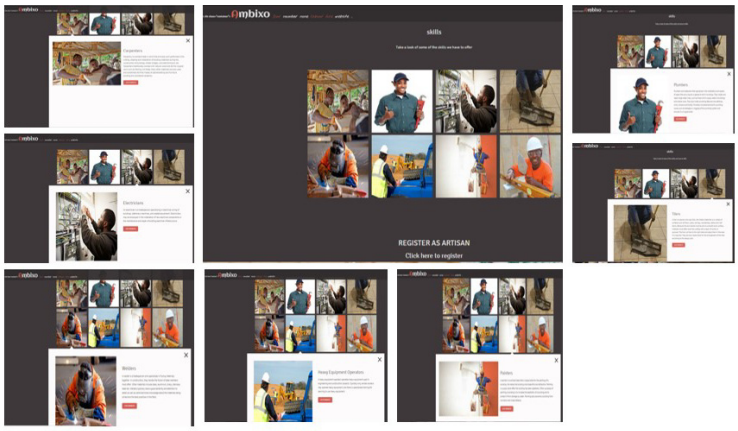


Figure 9. Skills Interface

The 'Portfolio interface' allows the registration of skilled labour sub-contractors, skilled labour association and construction firms. This information would help as a construction directory for construction stakeholders. The web-based system is such that each organization is able to search according to their needs on the portfolio page. For instance, a construction organization can contact a labour association for the supply of skilled labourers in a specific trade. The 'Skills interface' is specifically for the skilled labourer to register their profile based on their trade. The 'Hire Now interface' helps the contractor or construction professional in order to locate the required skilled labour on their construction project. The contractor or construction professional inputs the criteria of age, years of experience, type of skill, attitude to work, expected wages charged, location and language spoken in a query form and an output of skilled labourers that qualify in the inputted data are sorted out for selection. It is important that up-to-date contact information is supplied from time-to-time by all users on the platform in order to aid easy contact when needed.

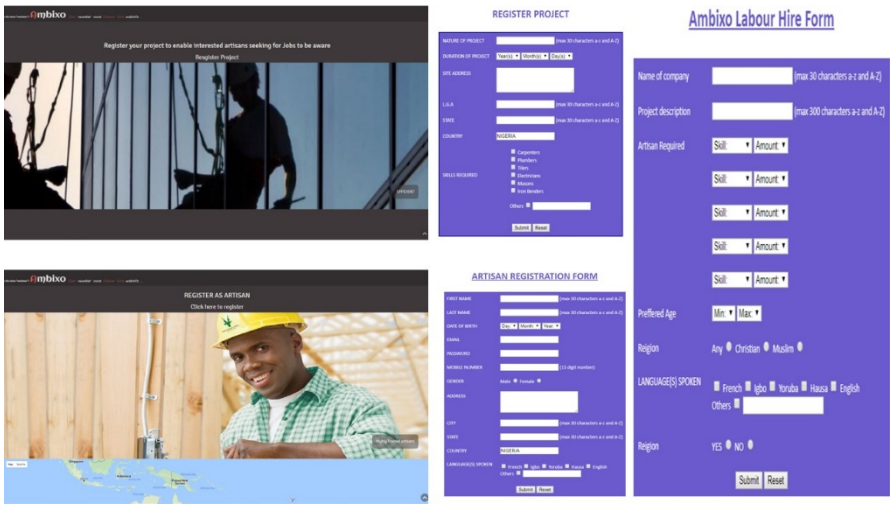


Figure 10. Registration and Hire Form Interface

CONCLUSION AND RECOMMENDATION

The study revealed that contractors and construction professionals mainly use referral from colleagues and workers from past projects when sourcing for skilled labour on their construction projects. The study identified the major barriers in sourcing for skilled labour on construction projects as the unavailability of trained skilled labour. The study revealed that years of experience, wages charged and behavior of the worker were major criteria considered by construction professionals while sourcing for skilled labour on construction projects. Having considered the sourcing techniques, the major criteria considered and barriers encountered in sourcing for skilled labour, the study used these parameters to develop a web based human resource sourcing system for labour only contracts that incorporated the needs of the skilled labour and requirement of construction firms. It was recommended that construction professionals and contractors need to harness the benefits of web-based technologies. The web-based system developed would help to link the skilled labour to construction professionals and vice-versa. With the judicious use of the web-based system, the issues of skilled labour shortage could be minimized. For the use of web-based technologies to be effective and efficient, there is need to increase the ICT trainings of workers in the construction industry so has to have a successful integration of ICT and the construction industry. In addition, internet facilities needs to be made cheaper and easily available to the entire populace in order to support innovative tools.

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