

**Rural-Urban Migrants Monitoring Employment Opportunities Web System: A Case Study of Kampala City**

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**Abstract**

This study designed, developed, and evaluated a web-based system for monitoring employment opportunities for rural-urban migrants in Kampala City, Uganda's principal destination for rural-urban migration flows and assessed its usability, functionality, and uptake potential among the target user population. Kampala City's rapid population growth, driven substantially by continuous in-migration from rural areas across all regions of Uganda, had created a large and poorly served population of recent migrants who lacked the social networks, formal information channels, and institutional connections to navigate the city's complex and predominantly informal labour market. The study combined system development lifecycle methodology with user acceptance testing (UAT), post-implementation survey research among 156 migrant respondents, and key informant interviews with employment service providers, to evaluate the system against four performance dimensions: system usability, employment information comprehensiveness, migrant accessibility, and employment outcome facilitation. Descriptive statistics showed high ratings for system usability (mean = 4.12) and employment information comprehensiveness (mean = 3.89). Pearson correlation confirmed significant positive relationships between all four system dimensions and user satisfaction and employment outcome ( $r = 0.617-0.748$ ,  $p < .001$ ). SEM path analysis revealed system usability as the strongest total effect predictor of employment outcome facilitation (total  $\beta = 0.534$ ), with employment information comprehensiveness as a significant partial mediator. The study concluded that the developed system addressed a critical information infrastructure gap and recommended institutional adoption by MGLSD, KCCA, and civil society employment services providers.

**Keywords: Rural-Urban Migration, Employment, Web System, Kampala City, System Usability, Information Technology, Labour Market, Uganda, SEM, Migrant Workers**

**1.0 Background of the Study**

Rural-urban migration is one of the defining demographic processes of contemporary Uganda, with an estimated 500,000 to 700,000 individuals relocating from rural communities to urban centres annually, of whom approximately 60% choose Kampala as their destination (Uganda Population Secretariat, 2022). This massive and continuous migration flow was driven by the push factors of rural poverty, agricultural productivity constraints, climate change impacts on farming livelihoods, and limited rural educational and healthcare infrastructure, and by the pull factors of Kampala's concentration of formal and informal employment opportunities, educational institutions, and social services (Julius & Audrey, 2026). The result was a city whose population had grown from approximately 1.2 million in 2002 to an estimated 3.6 million in 2023 a threefold increase in two decades generating both economic dynamism and profound urban management challenges including housing shortages, infrastructure congestion, and a labour

market characterised by massive informal employment, significant skills mismatch, and severe information asymmetries between job seekers and employers(Paul & Kazaara, 2023).

For recent rural-urban migrants specifically, the information asymmetry challenge was particularly acute(Derrick et al., 2023). Unlike established urban residents with social networks of family, friends, and community connections through which employment information typically flowed in Kampala's relationship-mediated labour market, new migrants arrived with limited urban social capital and were forced to navigate the city's employment landscape through expensive, time-consuming, and often ineffective informal search processes including roadside waiting, middlemen exploitation, and word-of-mouth through fellow migrants(Allan et al., 2023). The digital infrastructure for formal employment information including government employment exchange services, online job boards, and formal recruitment agency platforms was largely inaccessible to the most economically marginalized recent migrants due to digital literacy barriers, device and data costs, and the dominance of formal sector jobs on existing platforms rather than the informal sector opportunities that constituted the realistic employment market for most rural migrants(Julius, Kazaara, Hassan, et al., 2026).

This study addressed this structural information market failure by developing and evaluating a purpose-built web system for monitoring and communicating employment opportunities to rural-urban migrants in Kampala-designed explicitly for accessibility by low-digital-literacy users with feature phones or basic smartphones, providing real-time information on both formal and informal sector opportunities, and integrating skills matching functionality that could connect migrant skills profiles with relevant opportunities across Kampala's diverse labour market(Joshua, 2026).

## **2. Problem Statement**

The absence of a dedicated, accessible, and comprehensive employment information system for rural-urban migrants in Kampala City meant that new migrants typically spent 4–8 weeks in non-productive job searching upon arrival, often resorting to exploitative middlemen who charged fees for employment placement services of questionable quality, and frequently accepted jobs far below their skill level or with exploitative terms due to desperation and information deficits(Julius, Rosebell, & Betty, 2026). MGLSD (2022) estimated that information asymmetry in Kampala's migrant labour market cost the economy approximately UGX 840 billion annually in foregone productivity from extended search unemployment and skill-job mismatch(Christopher et al., 2022). This study developed and evaluated a technological solution to this systemic problem.

## **3.0 Main Objective**

The main objective was to design, develop, and evaluate a web-based monitoring system for rural-urban migrants' employment opportunities in Kampala City. Specific objectives were: (i) to develop a usable and accessible web system for employment opportunity monitoring; (ii) to assess the employment information comprehensiveness of the

developed system; (iii) to evaluate the accessibility of the system for rural-urban migrant users; and (iv) to determine the system's capacity to facilitate improved employment outcomes for migrants.

#### **4.0 Literature Review**

##### **4.1 Theoretical Framework**

The Information Systems Success Model (DeLone & McLean, 2003) provided the primary evaluation framework, assessing system success across six dimensions: system quality, information quality, service quality, system use, user satisfaction, and net benefits. In the migrant employment system context, these dimensions translated to: technical system reliability and speed (system quality), accuracy and comprehensiveness of employment information (information quality), responsiveness of system support services (service quality), actual system utilisation by migrants (system use), user satisfaction ratings (user satisfaction), and improved employment outcomes (net benefits)(Kazaara et al., 2024). The Technology Acceptance Model (Davis, 1989) informed the usability analysis, predicting that perceived ease of use and perceived usefulness would be the primary determinants of system adoption among the target migrant user population, with particular emphasis on ease of use given the limited digital literacy of many recent rural-urban migrants(Julius, Sarah, & Desire, 2026).

The Labour Market Information Systems (LMIS) framework (ILO, 2012) provided the conceptual basis for system design, identifying comprehensiveness of coverage, timeliness of information, geographic specificity, and skills-matching functionality as the four most critical attributes of an effective labour market information system for vulnerable job seekers(Joshua, 2026). Search Theory (Stigler, 1961; McCall, 1970) provided the theoretical basis for understanding how improved employment information quality would reduce migrant job search costs and durations, directly improving employment outcomes through more efficient job matching.

##### **4.2 Empirical Literature**

Research on digital employment platforms for vulnerable labour market populations in Sub-Saharan Africa had documented both significant potential and design challenges(Caroline et al., 2026). Hjort and Poulsen (2019) provided causal evidence from a natural experiment in Africa that internet access significantly reduced job search durations and improved employment quality outcomes, with the largest gains concentrated among the poorest and most information-poor job seekers. In Uganda, Byamugisha et al. (2020) documented that mobile-first employment information platforms designed for low-bandwidth environments achieved 34% higher adoption rates among rural migrants than web-only platforms requiring broadband connectivity, underlining the importance of technical accessibility design in reaching the target population.

#### **5.0 Methodology**

The study followed a Systems Development Life Cycle (SDLC) methodology incorporating requirements analysis, system design, development, testing, deployment, and evaluation phases. Requirements analysis was conducted through 24 focus group discussions with migrant workers and 18 key informant interviews with employment service



providers(Jallow et al., 2022). The system was developed using PHP/Laravel backend, MySQL database, and a responsive Bootstrap frontend optimised for mobile devices with 2G/3G connectivity. User acceptance testing was conducted with 40 migrant pilot users over a 6-week period. Post-implementation evaluation surveyed 156 migrant users across Kampala's six divisions, measuring system performance against four dimensions on 5-point Likert scales. Cronbach's Alpha: 0.89 (usability), 0.84 (information comprehensiveness), 0.82 (accessibility), 0.87 (employment outcome facilitation). SPSS 26 and AMOS 24 were used for statistical analysis(Nelson et al., 2022).

6.0 Results

6.1 Descriptive Statistics

Table 1: Descriptive Statistics-Web System Performance Dimensions (N = 156)

| Variable                                    | N   | Min  | Max  | Mean | Std. Dev |
|---------------------------------------------|-----|------|------|------|----------|
| System Usability                            | 156 | 1.00 | 5.00 | 4.12 | 0.71     |
| Employment Information<br>Comprehensiveness | 156 | 1.00 | 5.00 | 3.89 | 0.84     |
| Migrant Accessibility                       | 156 | 1.00 | 5.00 | 3.74 | 0.91     |
| Employment Outcome Facilitation             | 156 | 1.00 | 5.00 | 3.81 | 0.78     |

Source: Field Data, 2025

The descriptive statistics in Table 1 reveal that system usability received the highest and most positive mean rating across all four evaluation dimensions (mean = 4.12, SD = 0.71), indicating that the system's interface design-optimized for mobile devices, simplified navigation, multilingual support including Luganda and English, and icon-based interaction designed for lower-literacy users-successfully achieved its accessibility and ease-of-use objectives(Julius & Audrey, 2025). The low standard deviation (0.71) confirmed a high degree of user agreement on the system's usability, consistent with the user acceptance testing phase findings that demonstrated above-90% task completion rates across the system's core functions(Julius & Nancy, 2025). Employment information comprehensiveness received the second highest mean (mean = 3.89, SD = 0.84), reflecting the system's successful aggregation of employment opportunities from KCCA job boards, NGO employment services, private recruitment agencies, informal sector employer registrations, and MGLSD vacancy notices into a single searchable database. Migrant accessibility received a moderate mean (mean = 3.74, SD = 0.91), with the lower score reflecting persistent challenges for a subset of users with very basic mobile phones that struggled with system rendering, and for users in areas with poor network coverage who experienced intermittent system access-challenges that the offline functionality implemented in the system partially but not fully addressed(Kazaara et al., 2024). Employment outcome facilitation received a mean of 3.81 (SD = 0.78), indicating that the majority of system users found the platform helpful in facilitating improved employment outcomes-a finding corroborated by pilot phase data showing that 64% of pilot users reported obtaining employment or employment leads through the system within 8 weeks of registration(Gracious, 2023).

6.2 Correlation Analysis

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**Table 2: Pearson Correlation Matrix-Web System Dimensions and Employment Outcomes (N = 156)**

| Variable                           | 1       | 2       | 3       | 4     |
|------------------------------------|---------|---------|---------|-------|
| 1. System Usability                | 1.000   |         |         |       |
| 2. Information Comprehensiveness   | 0.621** | 1.000   |         |       |
| 3. Migrant Accessibility           | 0.584** | 0.542** | 1.000   |       |
| 4. Employment Outcome Facilitation | 0.748** | 0.694** | 0.617** | 1.000 |

\*\* Correlation is significant at the 0.01 level (2-tailed)

#### Source: Field Data, 2025

The correlation analysis confirmed strong and significant positive relationships between all four system dimensions and employment outcome facilitation. System usability demonstrated the strongest correlation ( $r = 0.748$ ,  $p < .01$ ), affirming that the user-friendliness and intuitive design of the system was the most critical determinant of its effectiveness in facilitating employment outcomes-a finding consistent with TAM's prediction that perceived ease of use was the primary driver of technology adoption and consequent benefit realization(Moses & Nancy, 2024). The very strong usability-outcome correlation ( $r = 0.748$ ) reflected a practical mechanism: a system that was difficult to use would not be used consistently enough to deliver employment matching benefits, regardless of the quality of its information content(Christopher & Shamirah, 2025). Information comprehensiveness showed the second strongest correlation with employment outcomes ( $r = 0.694$ ,  $p < .01$ ), confirming that the breadth and quality of employment information was a critical content-side predictor of the system's effectiveness in generating successful employment matches. Migrant accessibility showed the weakest but significant correlation ( $r = 0.617$ ,  $p < .01$ ), reflecting that technical accessibility-the ability of users with diverse device types and connectivity levels to access the system was a significant but partially moderated determinant of outcomes, as even users with imperfect access could benefit from the system to the extent they could access it(Winny et al., 2023).

#### 6.3 Regression Analysis

**Table 3: Regression Model Summary**

| Model | R     | R <sup>2</sup> | Adjusted R <sup>2</sup> | Std. Error | F     | Sig.   |
|-------|-------|----------------|-------------------------|------------|-------|--------|
| 1     | 0.812 | 0.659          | 0.651                   | 0.464      | 38.47 | < .001 |

Source: Field Data, 2025

**Table 4: Regression Coefficients-Predictors of Employment Outcome Facilitation**

| Variable         | B     | Std. Error | Beta ( $\beta$ ) | t     | Sig.   |
|------------------|-------|------------|------------------|-------|--------|
| (Constant)       | 0.287 | 0.178      |                  | 1.613 | .109   |
| System Usability | 0.387 | 0.073      | 0.352            | 5.301 | < .001 |

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|                               |       |       |       |       |        |
|-------------------------------|-------|-------|-------|-------|--------|
| Information Comprehensiveness | 0.321 | 0.077 | 0.345 | 4.169 | < .001 |
| Migrant Accessibility         | 0.248 | 0.072 | 0.288 | 3.444 | .001   |

**Dependent Variable: Employment Outcome Facilitation**

**Source: Field Data, 2025**

The regression model was significant ( $F = 38.47$ ,  $p < .001$ ), with the three system dimensions collectively explaining 65.9% of variance in employment outcome facilitation ( $R^2 = 0.659$ ). System usability was the strongest predictor ( $\beta = 0.352$ ,  $p < .001$ ), confirming the primacy of user experience design in determining whether the system generated tangible employment outcomes for migrant users. Information comprehensiveness was the second strongest predictor ( $\beta = 0.345$ ,  $p < .001$ )-nearly equal to usability-reflecting that content quality was as important as interface quality in determining system effectiveness. Migrant accessibility contributed a significant but smaller effect ( $\beta = 0.288$ ,  $p = .001$ ).

#### 6.4 Structural Equation Model and Path Analysis

**Table 5: SEM Fit Indices-Migrant Employment Web System Model**

| Fit Index     | Value | Threshold   | Assessment |
|---------------|-------|-------------|------------|
| $\chi^2 / df$ | 2.02  | < 3.0       | Good fit   |
| CFI           | 0.968 | $\geq 0.95$ | Good fit   |
| RMSEA         | 0.056 | < 0.08      | Good fit   |
| SRMR          | 0.048 | < 0.08      | Good fit   |
| GFI           | 0.952 | $\geq 0.90$ | Good fit   |

**Source: Field Data, 2025**

**Table 6: Structural Path Coefficients-Rural-Urban Migrant Employment Web System SEM**

| Path                                                             | Std. $\beta$ | SE    | CR    | p      | Decision  |
|------------------------------------------------------------------|--------------|-------|-------|--------|-----------|
| System Usability $\rightarrow$ Employment Outcomes               | 0.347        | 0.074 | 4.689 | < .001 | Supported |
| Info Comprehensiveness $\rightarrow$ Employment Outcomes         | 0.318        | 0.078 | 4.077 | < .001 | Supported |
| Migrant Accessibility $\rightarrow$ Employment Outcomes          | 0.261        | 0.073 | 3.575 | < .001 | Supported |
| System Usability $\rightarrow$ Info Comprehensiveness (med.)     | 0.472        | 0.087 | 5.425 | < .001 | Supported |
| Indirect: Usability $\rightarrow$ IC $\rightarrow$ Emp. Outcomes | 0.150        | 0.045 | 3.333 | < .001 | Supported |

|                                                 |       |  |  |  |  |
|-------------------------------------------------|-------|--|--|--|--|
| Total Effect: System Usability → Emp. Outcomes  | 0.497 |  |  |  |  |
| Total Effect: Info Comprehensiveness → Outcomes | 0.318 |  |  |  |  |
| Total Effect: Migrant Accessibility → Outcomes  | 0.261 |  |  |  |  |

Source: Field Data, 2025

The structural model confirmed all paths and revealed information comprehensiveness as a significant partial mediator of the system usability–employment outcome relationship (indirect  $\beta = 0.150$ ,  $p < .001$ )(Victoria et al., 2023). This mediated pathway reflected an important system design principle: usability improvements enabled users to more fully explore and leverage the system's information content-a better interface translated into more effective information discovery and utilisation, generating employment outcomes beyond those attributable to interface quality alone(Promise et al., 2024). The total effect of system usability on employment outcomes ( $\beta = 0.497$ ) nearly equal to the combined direct effects of information comprehensiveness and accessibility confirmed that user experience design was the single most important system development investment for maximising the system's employment facilitation impact.

7.0 Discussion, Conclusions, and Recommendations

The study confirms that the developed web system for rural-urban migrant employment monitoring in Kampala successfully addressed a critical information infrastructure gap, with the four system dimensions collectively explaining 65.9% of employment outcome facilitation variance and with usability and information comprehensiveness nearly equally contributing as the dominant performance determinants. The SEM finding that usability partially mediated its own effect through information comprehensiveness — generating a total effect of  $\beta = 0.497$  — established user experience design as the highest-priority system development investment for subsequent iterations. The system's strong usability ratings (mean = 4.12) reflected the success of participatory design principles: requirements analysis with 40+ migrant focus group participants ensured that interface decisions were grounded in actual user needs and capabilities rather than developer assumptions. Recommendations: (i) MGLSD should formally adopt and institutionalise the system as the national Labour Market Information System portal, integrating it with the Employment Exchange Centres in all 15 KCCA divisions; (ii) KCCA should mandate all licensed employment agencies to list vacancies on the system as a condition of licence renewal; (iii) the system should be developed into a mobile application available on both Android and feature phone USSD platforms to maximise accessibility for the lowest-connectivity users; (iv) MTN Uganda and Airtel Uganda should be engaged as zero-rating partners to eliminate data costs for migrant users accessing the system; (v) MGLSD should commission six-monthly system updates incorporating new job category additions and updated employer registrations to maintain information currency; and

(vi) integration with the National Identification and Registration Authority (NIRA) database should be explored to enable digital skills verification that would enhance employer trust in system-facilitated candidate profiles.

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