A JOB MATCHING SYSTEM TO TRANSFORM CASUAL JOB MARKET IN KENYA

(Assignmetoday.com)

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this dissertation contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

This project objective was to come up with job matching application for use by casual workers and employers. The process of identifying challenges, opportunities, desired features and solution was designed to be a rigorous process, involving vast research and participant involvement. Casual job market is largely classified as informal sector, which is less catered for in many fronts. It has not been well served in terms of creation of innovations, sufficient to link-up the players in the industry. With high population of people engaging as either casual worker or employers, the researcher found a fertile ground to explore opportunities, and adopt data communication aspects. Questionnaires and focus group were constituted and used as quantitative and qualitative data collection tools. Extensive literature review was also conducted to explore existing casual matching models, and underlying technologies. The proposed casual job matching application was developed using evolutionary prototyping methodologies. The research produced 21 revisions of the artifact. The application is hosted on the cloud, and is distributed through play store and peer-to peer sharing. Prototyping came out as an important methodology in contribution of knowledge to research.

KEYWORDS: Assignmetoday.com, research, Prototype, artifact, Casual job matching and application, focus group discussion.

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Table of Contents

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

FGD   **Focus group discussions**

IT   **Information Technology**

ODEP   **Office of Disability Employment Policy**

NCWD   **National Center on Workforce and Disability/Adult**

IRE   **Investigative, Realistic, and Enterprising**

KNSB   **Kenya National Statistics Bureau**

SDLC   **Software Development Lifecycle**

SD   **Standard Deviation**

P2P   **Peer to Peer**

DFD   **Data Flow Diagram**

CHAPTER ONE

1.0 Introduction and Background

The era of globalization has given rise to profound changes in the way labor is utilized, specifically in terms of employment patterns and practices, as well as related issues of earnings (Anugwom 2007; Campbell 2018). The use of casual workers in both homes and organizations in Kenya has been on increase, and this has made casual employment in the Kenyan Labor market a subject of intellectual concern (fuzu 2014). Generally, around the world, casual workers are even filling positions that are permanent in nature (Whitehouse *et al*. 1997; Junor 1998; Knox 2016). According to Wandera (2011), casual job market hasn't been well served in terms of creations and innovations, sufficient to link up players in the industry. Casual job market is largely classified as informal sector, which is less catered in many fronts Gusdorf (2008). Wandera (2011) conclusively linked poor framework and systems for casual job market to reduced productivity.

Casual job recruitment is the process of selecting and hiring the most suitable candidates for a task (O'Donnell 2014). Casual job matching is usually an activity of linking those looking for casual job to those with casual jobs (Kalejaiye, 2014). Kalejaive (2014) also ascertains that casual job recruitment in a timely and cost effective manner is a common goal for the above two parties. A practical casual job recruitment solution can help casual job seekers easily obtain recruitment opportunities and reduce the time they need to spend, also free recruitment companies from resources allocated in advertisements and screening (Georgios et al., 2003; Drigas et al., 2004). With the rapid development of the internet and networks, online recruitment platforms have become the mainstream channel for job seekers to hunt jobs and recruiters to find suitable employees (Connelly & Gallagher, 2014). Over the past few years, numerous software systems have been developed and claimed as a solution to the casual recruitment problem. However, Kalejaive (2014) was of view that the traditional recruitment platforms are inefficient, while Greebberg (2010) concluded that the technologies or algorithms used in current recruitment systems are insufficient to achieve quick, satisfactory performance in relation to casual job matching.

This study proposes an innovative casual job matching system. The system has been christened Assignmetoday.com –and aims at simplifying the traditional recruitment process and optimize the existing job matching algorithms. The system will be user driven, and will provide well-built features and intermediary services identified in literature review. The project will first review the existing recruitment systems and platforms, and identify deficiencies of them. Secondly, it will explain the proposed casual job-matching algorithm and intermediary services, followed by the design, testing and validation, and implementation. Thirdly and finally, present results, conclusion and recommendations.

1.2 Statement of the Problem.

 While digital platforms adoption are increasingly taking shape in many fronts, casual job market has been left behind Cecilia (2018). According to Wandera's publication in International Journal of Humanities and Social Science (2011), the casual job market in Kenya hasn't been well served in terms of creation of innovations, sufficient to link-up the players in the industry. The industry is largely classified as informal sector, which is less catered for in many fronts as demonstrated by Gusdorf (2008). Wandera (2011) linked poor framework and inadequate technological recruitment solutions for casual job market to reduced productivity. This shows the need for frameworks and technological efforts that pushes casual job market agenda.

Through literature research, there is little evidence on the existence of innovative casual job matching platform in Kenya. Numerous job-matching platforms exist locally, that seek to link employers with the perfect employee. Majority of existing platforms leverage on the client-server approach, where users only access information, by querying the centralized server. Platforms such as brightermonday.co.ke, fuzu.com, magazine and online ad classifieds, such as; the-star magazine, OLX Kenya and pigiame, operate online using the client-server model. These platforms are largely designed to serve the audience that is well educated and technically gifted. Subsequently, the users of this platform are professionals in diverse professional fields. Current

offline solutions (such as newspaper postings, job boards, recruitment agencies, or simply knocking on doors) are expensive, slow, and often ineffectual. With more and more people now digitally connected, even those at the base of the pyramid are increasingly using mobile connectivity to access job platforms.

This study endeavored to explore the aspects in casual employer/employee matrix and develop a casual job matching system. A key feature of these platforms is their ability to accumulate a large database of job seeker profiles, job positions, and employers. Algorithms and automation enable both job seekers and employers to easily make personalized, sophisticated, and detailed searches. The study further explored next generation technological tools that contribute to increased performance (Mcquarry, 2003 and Skorupa &Severine 2010.)

1.3 Main Objective
The main objective is to develop a job matching application, tailored for the casual job market in Kenya.

1.3.1 Specific Objectives
The study will be guided by the following objectives;

i) To investigate the indicators affecting casual job seekers and employers requirements in a casual employees/employers matrix.

ii) To conduct literature review on the area of job matching, to review and analyze existing local, and international job matching systems, and underlying technologies.

iii) To design and develop a beta prototype platform that integrates innovation, and introduces new technology in the Kenyan job market topology.

iv) To test and validate the developed artifact.

1.4 Research questions

i.   What are the factors that influence casual employers and casual job seekers adoption of a system?

ii.   What are the current preferred methods of posting or bidding of casual jobs?

iii.   What should be considered in designing a casual job matching system?

iv.   What approach should be used to validate, implement and distribute a casual job matching system?

1.5 Motivation of the Study

Information Technology (IT) has become a part of our daily activities. It helps us do tasks seamlessly. Systems are able to keep track of vast information changes in the database. Due to increased information, more analysis can be conducted to solve problems. Meanwhile, the latest development in networking technology especially the Internet Technology has constructed a network of connecting people globally for faster communication in reduced time and cost.

One of the fast growing fields is the online job matching. The researcher is inspired to pursue the development of this platform, by the challenges that casual laborers and casual job employers encounter while seeking to connect with each other. Today, there exist virtually zero platforms that help employers simply access details of would be casual laborers. The researcher was inspired to build a sophisticated system, that borrows the greatest features of existing job matching systems available and implement them in the casual job market. The researcher was also inspired to develop a real solution to a real problem. The system will eliminate all the existing pitfalls associated with hiring casual laborers with little background information. This platform will seek to share information about casual laborers based on the user's recommendations. This means that, only those laborers who have been certified to diligently

commit to their duties will be recommended for consideration in upcoming jobs. The project will also contribute to knowledge in research and entire data communication arena.

1.6 Significance of the Study

The system if adopted will prove a game changer in Kenyan casual employment setup. It will significantly benefit the stakeholders in the casual job industry, including the employers and the employees. The system will be a significant contribution to the academia and tech sector too. The employers will significantly benefit from the development of this system, as it will enable them access data on casual laborers in a particular area much easily. Upon completion of the system, the employers will no longer have to incur costs on long processes in searching for casual laborers. The casual laborers will benefit from the completion of this system, as it will offer them an opportunity to link up to potential employers. Casual laborers will have a fresh experience in work engagements. Traditionally, casual laborers are often forced to wait for long periods of time before they get their next job. This system, will transform this experience for the better. The system will seek to continuously avail numerous casual job opportunities so that the casual laborers are always busy. The system will be a useful addition to the world of academia and practice in the information technology sector. This system will implement a shared framework that is tailored for the casual job market. This design will be an entirely new innovation that will significantly contribute to the advancement in ICT training for the future IT practitioners.

CHAPTER TWO

2.0 Literature Review

2.1 Introduction of Job matching systems

Armengol and Zenou (2000) studied job matching through social networking and word-of-mouth communication. They found that normally when job seekers need new jobs they visit employment agencies, read newspapers, and browse the internet, and mobilize people within their social circles to find suitable opportunities. Armengol and Zenou (2000) argued that although many job seekers underestimate personal-contacts, they often play an important role in matching job seekers to suitable job openings. This is because keeping close social contacts with both the employed and unemployed people helps job seekers in gathering information about job vacancies to help them determine their suitability.

Morgan (2008) defined job matching as the process of assessing job seeker characteristics to determine whether they match job requirements. A study by Smith, Belcher, and Juhrs (1995) described job matching as determining how well a person's cognitive interests, skills, and personality traits match what is required for once to succeed in a particular job. Studying various factors influence job matching Kregel, Banks, and Hill (1991) argued that the job matching process involves screening the strengths of applicants that make potentiate success on a job and weaknesses that might detrimentally influence success. However, Morgan (2008) cautioned that job matching should not be interpreted or implemented as a single process of searching for a suitable, entry-level job for short-term purpose but should instead be perceived as a sequence of meticulously matched career opportunities to satisfy long-term career plan.

The Economist (2013) observed that most casual workers earn hourly or daily wages and are most likely to change jobs yearly. The Economist further attested that most firms that employ

and rely on unskilled workers, for instance, supermarkets, end up vetting millions of applications from viable job seekers. As a result, many firms have turned to job matching systems to not only improve the efficiency of applicant vetting but also promote big payoffs. Greenberg (2010) stated that job matching is a process that entails finding the right person for the right job based on not only one's inherent motivational core competencies, but also a thorough understanding of both the job and the job seeker under consideration. Therefore, Greenberg emphasized the need for job seekers to explicitly understand all the responsibilities associated with a particular job, the structure, and the availability or lack of administrative support. According to Greenberg (2010), understanding job descriptions in particular terms is important in achieving the job match that will influence a job seeker's productivity. On the other hand, Greenberg observed that managers should be capable of understanding newly recruited unskilled labors to help them focus on their inner motivation to get the best of them.

Studying how the internet has influenced job searching and matching quality Mang (2012) observed that internet has significantly revolutionized how workers and firms are matched on the modern job market. The study compared online job boards, newspapers, and other employment sources to determine which method matched job seekers better to available job vacancies. Mang (2012) found that people who often change their jobs, but easily find their new jobs online are better matched than their counterparts that depend on traditional methods of finding a job matching their skills through newspapers, friends, and job agencies.

2.2 State of practice

Studying the influence of robot recruiters in the modern labor market, The Economist (2013) found that job matching systems leverage algorithms and big data to help in matching the right personnel to the right jobs. However, the Economist argued that job matching systems ought to be designed and supervised by humans to avoid any technical problems that might lead to

personnel-job mismatches. For instance, the Economist cited a scenario where a job matching systems might reject all viable applicants because the criteria for finding the correct match was based on a requirement that the viable candidate should have held a similar job title before.

Similarly, Gusdorf (2008) stated that the recruitment process of casual job seekers has significantly changed since the advent of online recruitment. Gusdorf (2008) found that unlike in the past where organizations depended on traditional methods of recruitments such recruitment agencies, use of in-house recruiters, or advertising open positions through local newspapers, trade journals, radios, and televisions, modern recruitment strategies include posting job openings on organizational websites and specialized websites like Career Builder and Monster.com. Gusdorf (2008) observed that many organizations accept online applications.

Similarly, Morgan (2008) observed that there is a myriad of job matching services for all casual workers with and without disabilities, including internet and web-based job matching systems. According to Morgan (2008), web-based systems have become popular among job seekers because of the increasing access of the internet and adoption of internet-enabled devices like smartphones, tablets, and laptops among other smart gadgets. Also, the web provides people with a seamless platform for interacting and sharing personal information. The study found that the first functionality of most of the job matching systems include assessing the interests and skills of job applicants and determining the number of viable occupations that they are best suited for. Morgan (2008) found that although people with disabilities can still benefit job matching serves such as www.peopleresources.org and www.careeronestop.org, they do not comprehensively assess their job requirements, preferences, and skills. However, www.careeronestop.org evaluated the competencies of people with disabilities and www.peopleresources.org examined the availability of particular employment for them. On the other Morgan (2008) acknowledged

that efficiency and productivity of job matching systems are affected, especially when assessing candidates with developmental disabilities such as autism spectrum disorder. These disabilities affected their reading skills, hence affecting the ability to understand and effectively participate in the assessment process.

2.2.1 Concept of Casual employment

Among a range of classifications available, casual employment is variously referred to under the titles "contingent" (Belous, 1989, cited in Lips, 1998), "irregular", "non-standard", or "atypical" (Bourhis and Wils, 2001) employment. casual employment is generally understood to encompass casual employees recruited by short term consultants or agencies which are external to the employer, or those hired directly by the company to be casual employees, contract employees, subcontractors, consultants, leased employees, part-time employees and self-employed. As a distinct labour subset, however, "casual employment" is commonly defined as: A job where the individual does not have an explicit or implicit contract for long term employment, the casual nature of the job being recognized by both parties (Nardone, 1997). The different descriptions and definitions of casual employment, and the linked uncertainty, offers a challenge to scholars of research as any educated guess of the size of the casual workforce depends on the definition that is used (Risher, 1997). Casual employment is a means of job continuity in an era of restructuring, redundancy and unemployment. Such job continuity is replacing job security for many professionals and casual work is a way to stay continuously employed (Brosnan, 1996). Callister (1997) indicates that casual employment can offer long-term advantages to some workers; for example, it can foster lifetime participation in paid work by women. He further found that many casual employees voluntarily take up this form of employment for the flexibility and opportunities for skill advancement that it provides. Casual employment also provides people with the opportunity to "try out" new organizations, industries, and occupations without

the long-term commitment (Lips, 1998). *For the purpose of this study, the words 'casual workers' are used to refer to employees whose services are dependent on the specific job or duty they were hired to carry out. They are laid off at the end of that particular 'contract' and can only be retained if another job comes on stream. The most notable characteristic of this category of workers is the fact that their employment is not permanent (Hamilton, 2006). As a result, casual workers can be retrenched without prior notification (Campbell, 2004).*

Figure 1: Trends of formal and informal employment in Kenya (2016).
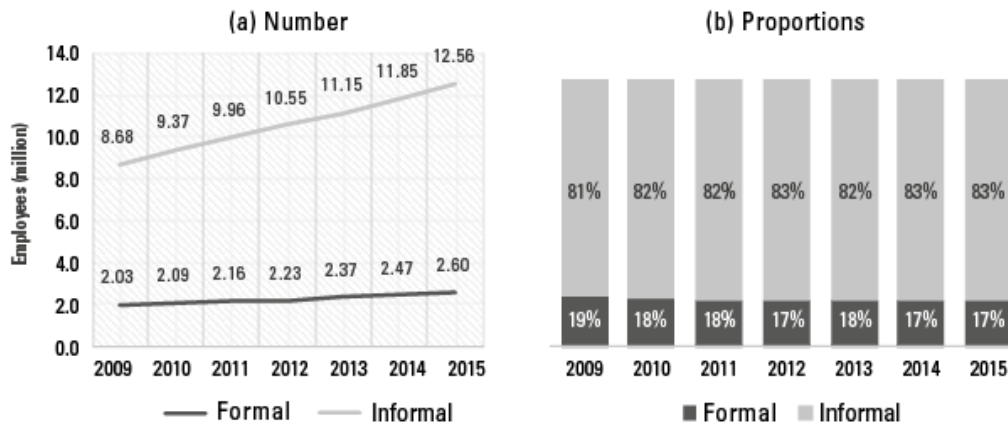
Source: All charts are derived from authors' calculations based on data from Kenya National Bureau of Statistics Economic Survey and Statistical Abstract (various issues)

Figure 2: Illustration of casual job interaction in Kenya.

2.2.2 Existing job matching systems in Kenya

BrighterMonday Kenya is one of the most popular job matching sites in Kenya that creates a pool of human capital for local staffing. It links millions of job seekers in Kenya to create a profile to market their skills and experience in particular fields. Though privately owned by OneAfrica Media, BrighterMonday has operated in the Kenya labor market since its creation in 2006 and has since helped in maximizing the opportunities of local job seekers and employers (BrighterModay, 2018). It allows job seekers with profiles to receive alerts of jobs matching their criteria, hence allowing them to formally apply and interview for such job vacancies. Besides BrighterMonday, Career Point Kenya is another online board site that connects Kenyan job seekers with multiple job vacancies, both casual and specialized career jobs. Its users subscribe to email alerts about potential jobs matching their skills and experiences. Also, it offers advises on resume writing, how one should prepare for different interviews, and offers career advice among other readily available content to prepare jobs seekers for recruitment into various companies. Similar online board sites include BestJobkenya and JobWebKenya among others.

The study established that so far, we do not have job matching dedicated to casual domain, thus development of the application will result to introduction of new emerging technology.

2.2.3 Existing job matching systems across the world.

The U. S Department of Labor, through the Office of Disability Employment Policy (ODEP), created Customized Employment policy aimed at improving the capacity U.S workforce systems to serve the American workforce, including casual workers (National Center on Workforce and Disability/Adult [NCWD], 2006). Therefore, Customized Employment system serves people with barriers to employment, not just people with disabilities, but also casual workers. The Customized Employment system helps casual workers with complex needs to find suitable employment. Like any other job matching system, the Customized Employment system offers

casual job seekers to avail information about their skills and experiences to the employer through a customized process that uses a blend of strategies and services to identify viable candidates. The process of employee section starts with the employee exploration.

According to ODEP Customized Employment system is essential in job matching because it plays an important role in job seeker exploration, which is not only time consuming but also cumbersome. The National Center on Workforce and Disability/Adult observed that a lot of time is spent in comparing job seekers' unique needs, interest, core competencies, and complexities because they form the prerequisites of successful job matching. Therefore, establishing a Customized Employment system tackles the challenges of traditional testing or standardized assessment of casual job seekers by controlling the exploration of job seekers and comparing their skills, experiences, and preferences based on readily available casual workers' information.

Morgan (2008) found that job matching systems use special instruments in measuring preference, skills, and job requirement of candidates with disabilities. Morgan (2008) theorized that assessment was significant in job matching because it provides important information that precedes the development and placement of suitable candidates in a competitive environment. He identified three major instruments that provide data for job matching systems, including Holland's Self-Directed Search (SDS) and Swenson (2005)'s Job Match Pattern. Morgan (2008) stated that SDS is an assessment of preference, job requirement, and employee skills. SDS was derived from a Holland theory that when environments are in congruency with diverse people, there is an increased probability for employees to achieve job satisfaction, stability in their careers, and success in their newly appointed positions. Morgan (2008) found that Holland grouped people and environments as Conventional, Realistic, Social, Investigative, Enterprising, and Artistic. As a result, the SDS helps in identifying applicants' occupational aspirations, self-

estimated core competencies, preferred activities, and categorize particular occupations as either appealing or uninteresting.

The implementation of SDS in the screening of job seekers is based on two or three-letter code (like IRE: investigative, Realistic, and Enterprising) to identify individual's personality type and potentially suitable occupations. Form E is particularly developed for job seekers who cannot read well, especially those with skills ranging from fourth to sixth-grade level. Further, research by (Reardon & Lenz, 1998) has revealed that although Form E is essentially developed for people with forth-to-sixth grade reading level, it is likely to exclude not only non-readers but also second-language learners with developmental disabilities but take part in competitive employment.

On the other hand, Swenson's Job Match Pattern evaluates the degree to which a job applicant's personality traits, cognitive abilities, and abilities suit the requirements of a particular job (Swenson, 2005). This systems groups ability, personality, and interest and identifies characteristics within these groups. For instance, the Abilities group comprise of candidates' general ability and working with both words and numbers. On the other hand, the Interest category deals with things, people, and data while the Personality category constitutes characteristics of polar opposites like assertive-submissive and cooperative-competitive (Swenson, 2005). Therefore, employers using these systems rates job seekers based on each characteristic to find the right match. Afterward, candidates are rated and their ratings compared by human resource personnel to identify the congruence between rating score and the job match pattern.

.One of the global existing Job Matching systems is Career Builder, which has become the global leader in providing human capital solutions. It is an online site that averages 23 million unique

visitors and has proven significant in attracting seasoned professionals and connecting them with matching career opportunities (Career Builder, 2018). The uses of the site are at liberty to post their resumes, subscribe for automatic job alerts, and search for new job opportunities using the search management tool. Career Builder empowers employment by organizing the world's human capital data into actionable information that both job seekers and employers can find and hire suitable personnel. Also, Monster is a job board site that offers millions of jobs ranging from local hourly casual jobs to complex career jobs around the globe (Doyle, 2018). Like Career Builder, users of Monster can upload their resume, detailing their skills and experience, receive career advice, and find more information regarding matching career and salary information. Monster users create an account and set up search agents to allow them to receive alerts through emails in case of new listings that match their criteria (Doyle, 2018). Monster also helps users learn more but potential employers through anonymous reviews from employees.

2.2.4 Desirable attributes of job matching system.
A study by Mang (2012) found that job matching systems provide job seekers access to a wide range of job offers and leverage intelligent filter mechanisms to match identify suitable opportunities in the job market. Additionally, Mang (2012) found that job matching systems offer more comprehensive job description, that adverts in newspapers and magazines, which helps job seekers to understand better the requirements of the vacant position. Also, Mang (2012) observed that the internet offers job matching systems a better targeting approach for advertising. Consequently, they can better screen online applications to efficiently match job seekers with suitable jobs. This means that not only does the matching process of job seekers with suitable jobs in the labor market become more efficient but also improves the quality of job matches.

On the other hand, Greebberg (2010) argued that the adaption of job matching systems is cost-effective, such that firms end up spending less on advertising than traditional advertising

mediums like newspapers. Greebberg (2010) argued that the reduced cost of advertising is attributed with the easiness and quickness that job advertisers can post adverts. Also studying staffing management, Gusdorf (2008) observed that job advertisers prefer the use of online job matching systems because they help them to receive responses from interested applicants quickly, in large volumes, and from diverse groups of people; hence, offering employers an opportunity of achieving diversity. Other benefits of job matching systems are their ability to significantly reduce the amount of time Human Resource spend in identifying and highlighting the right personnel. Job matching systems can screen applications using particular tests to separate qualified candidates from the rest hence saving both time and resources that human personnel could require to meticulously screen every applicant to identify qualified candidates. Moreover, Greebberg (2010) stated that majority of unskilled casual workers largely prefer job matching systems because they can easily submit dozens of resumes by just a mouse click as opposed to seeking face-to-face contact with Human Resource personnel, who are in most cases unavailable or hard to grant every job seeker face-time.

Mang (2012) argued that besides giving job seekers a wider selection of job opportunities, cheaper and faster access to information, and better search possibilities, job matching systems are popular among casual workers because they leverage the capabilities of the internet to offer job seekers a wide range of innovative ways of conducting passive job searches and makes it easier for employers to easily search for applicants. Mang (2012) observed that some job matching systems Monster.com provide job seekers with a platform to upload and maintain online resumes which are readily available to interested employers. By allowing employers to access detailed information about the readily available pool of casual workers, most preferably

information about their skills and experiences helps employers to make informed decisions regarding whom to hire, contributing to better match quality.

2.2.5 Challenges of casual job matching systems.
Although readily available information about casual workers might help employers understand the core competencies and experience of applicants, such information might not significantly impact a job seeker's probability of landing a job. This implies that despite improving the matching quality of casual workers and employers, it does not guarantee better employment opportunities for everyone using job matching systems. Mang (2012) observed that sometimes a low qualified worker might be hired to fill a position where he or she will be required to do too much, making the match unfit. Nevertheless, it might turn out that the worker enjoys and like his or her position but should the employer get a new employer with higher expectations, the employer might end up feeling content in spite of the fact that at that point the matching quality could have objectively improved. On the other hand, job matching systems creates a loop-hole for employers to ask for more information from online applicants, which they would not ordinarily disclose in their traditional application process. Sometimes, such information could be the difference between applicants. Mang (2012) found that some of the job matching systems collected more information from social media networks, which could be costly for job applicants, especially if unfavorable.

A report prepared by The World Bank Group (2015) for the G20 Employment Working Group held in Istanbul in 2015 highlighted the effects of technology on employment, particularly employment of casual workers in Public Employment Service. According to The World Bank Group information communication and technology-enabled machines, smart devices have reshaped the labor market through smart employment techniques. The World Bank Group indicated that adoption of smart technologies in not only hiring the best-suited personnel for

particular jobs, such technologies also risk rendering many of the Human Resource staff that traditionally dealt with job posting, screening, interviewing, and filling positions. The World Bank Group (2015) asserted that although the adaption of technology in employee recruitment is cost-effective, it increases the susceptibility of Human Resource jobs to be replaced by technology or massive reduction in compensations. Also, it creates a wider gap between casual job seekers capable of accessing and using the job matching systems and those who cannot.

Finding suitable employees for a particular job requires more than the screening of personal information readily provided by candidates on job matching systems. A study by Morgan (2008) found that despite the efficiency of job matching systems, they might not be capable of accurately determining candidates' preferences. Morgan (2008) found that accurately assessing candidate preferences is a significant factor in job matching because it increases not only the chances of successful employment but also establishes a job seeker's motivation to work hard towards developing appropriate skills necessary to succeed. Also, correct assessment of a candidate's preferences confirms to the job seeker that the employer values him or her, which potentially rekindles self-motivation. Therefore, employee screening and matching to available job opportunities by job matching technologies do not prioritize assessment of candidates' preferences and interests, which increases the probability of matching candidates to jobs which they might not be overly good at.

2.2.6 Matrix analysis of few local job matching systems against proposed Assignmetoday.com

Table 1: Matrix analysis.

	Model> Criteria	OLX	BrighterMonday	Newpp Adverts	Notices	Assignmeto day.com
1	Accessible	√	√	√	√	√

2	Free Deployment Support	×	×	×	√	√
3	Status reporting/custom notifications	×	√	√	×	√
4	Mobile enabled	√	×	×	×	√
5	Tool sets	×	×	×	×	√
6	Casual matching	×	×	×	√	√
7	Common criteria certification	×	×	×	×	√
8	Community version	√	×	×	√	√
9	Commercial support	×	√	√	×	√

2.3 Technological advances in job matching algorithm

Wowezko (2015) found that the employment process is normally cumbersome because it requires high-level analysis of extracted information about job applicants' skills. Consequently, Wowezko (2015) acknowledged that employment requires thorough implementing machine algorithms that are applied to publicly available data. The algorithms are designed to help employers learn important details about their current personnel needs as a prerequisite to increasing their competitive advantage over rivals by hiring most qualified staff for vacant positions. Some of the algorithms used by Job Matching systems include decision tree, rough set theory,Naïve Bayes and Support Vector Machine, coupled with a TT-TDF measure, which is normally modified to highlight the significance of a sentence in a document during candidate screening. Also, Debortoli et al. (2014) explored how Job Matching systems apply latent semantic analysis (LSA) and singular value decomposition (SVD) to identify congruence between business intelligence and big data adverts. These procedures are important in evoking the standard text pre-processing techniques to verify vocabulary and select items describing

different skills. Wowezko (2015) found that advanced job matching algorithms are more accurate in automating the process of candidate screening by separating applicants based on the congruency of the job description and the candidates' characteristics.

Sarda, Sakaria, and Nair (2014) studied the advancing sophistication and implementation of algorithms by job matching sites to select appropriate candidate. They found job portals of job matching systems use Decision Tree and Naïve Bayers algorithms to rank job seekers based in the congruence of their individual attributes with advertised positions. Further, Sarda et al. (2014) emphasized that job matching algorithms have become flexible to not to the priority but also to the candidates and employers while striking a balance between job seekers and employers' preferences. Algorithms play a crucial role in calculating the suitability of candidate profile and job requirements given by potential employers. Sarda et al. (2014) stated that the recent development and sophistication of algorithms have led to the increased reliance on recruitment. For instance, Sarda et al. (2014) found that Decision Tree, Rough Set-Theory, and Naïve Bayes can now be applied to different factors that were previously perceived as attributes for a particular company.

2.4 Evaluation of current application development methods.
Researcher evaluated the various SDLC methodologies. The evolutionary prototyping became the choice. Ulrich and Eppinger (2012) argue that prototypes serve four main purposes in a product development project. These include communication, learning, integrations and highlight milestones. In a wide literature concerning prototypes, learning and communication are recurring themes. It gives researcher great hand in the process at each stage as compared to waterfall and other models. According to Ulrich and Eppinger (2012), two fundamental questions that prototypes may provide answers to are "*Will it work?*" and "*How well does it meet the customer*

needs?" Prototypes often aid to answer specific questions involving user interaction. These were researcher's main reasons for adopting it. More of prototype is illustrated in Chapter 3.

2.5 Conclusion

Literature for this project was gathered from online/offline academic research databases and Google Scholar while some specialized articles were retrieved through Google using research questions. The literature review was based on more than fifty sources. To cover the evolution of job matching, older studies such as Smith (1995)'s study into factors affecting matching best-suited job seekers to particular jobs were included. Recent studies covering technological advancement in job matching algorithms (Wowezko, 2015; Sarda et al.) were used. Therefore, the literature review covered not only the adoption of job matching systems but also tracks its development, over time, and how modern Human Resource personnel can adopt it without becoming redundant in their responsibilities. Therefore, the literature reviewed comprehensively explores job matching systems with regards to its adoption in Kenya and abroad, its desirable characteristics, challenges, and its advancement.

Since demand for casual laborers has significantly increased, many job seekers are prompted to go round localities trying their lack. However, finding a job can be difficult, especially if job seekers do not know who is hiring. Therefore, there is a need for a reliable way for job seekers to not only keep tabs on available job vacancies but also link up with potential employers. Job matching systems play an important role in the recruitment process. The literature review covered the desirable characteristics of job matching systems such as cost-effectiveness, efficiency, increasing speed of recruitment, and offering people from all works of life a fair chance of securing casual employment. In addition, it explored the challenges job-matching systems present the modern workforce, particularly the casual group.

On SDLC method, evolutionary prototyping was researcher's ultimate choice. Ulrich and Eppinger (2012) argue that prototypes serve four main purposes in a product development project. These include communication, learning, integrations and highlight milestones. In a wide literature concerning prototypes, learning and communication are recurring themes. It gives researcher great hand in the process at each stage as compared to waterfall and other models. According to Ulrich and Eppinger (2012), two fundamental questions that prototypes may provide answers to are "*Will it work?*" and "*How well does it meet the customer needs?*" Prototypes often aid to answer specific questions involving user interaction. These were researcher's main reasons for adopting it. Prototypes often aid to answer specific questions involving user interaction. These were researcher's main reasons for adopting it.

2.6 Conceptual Model.
Figure 3: Conceptual model
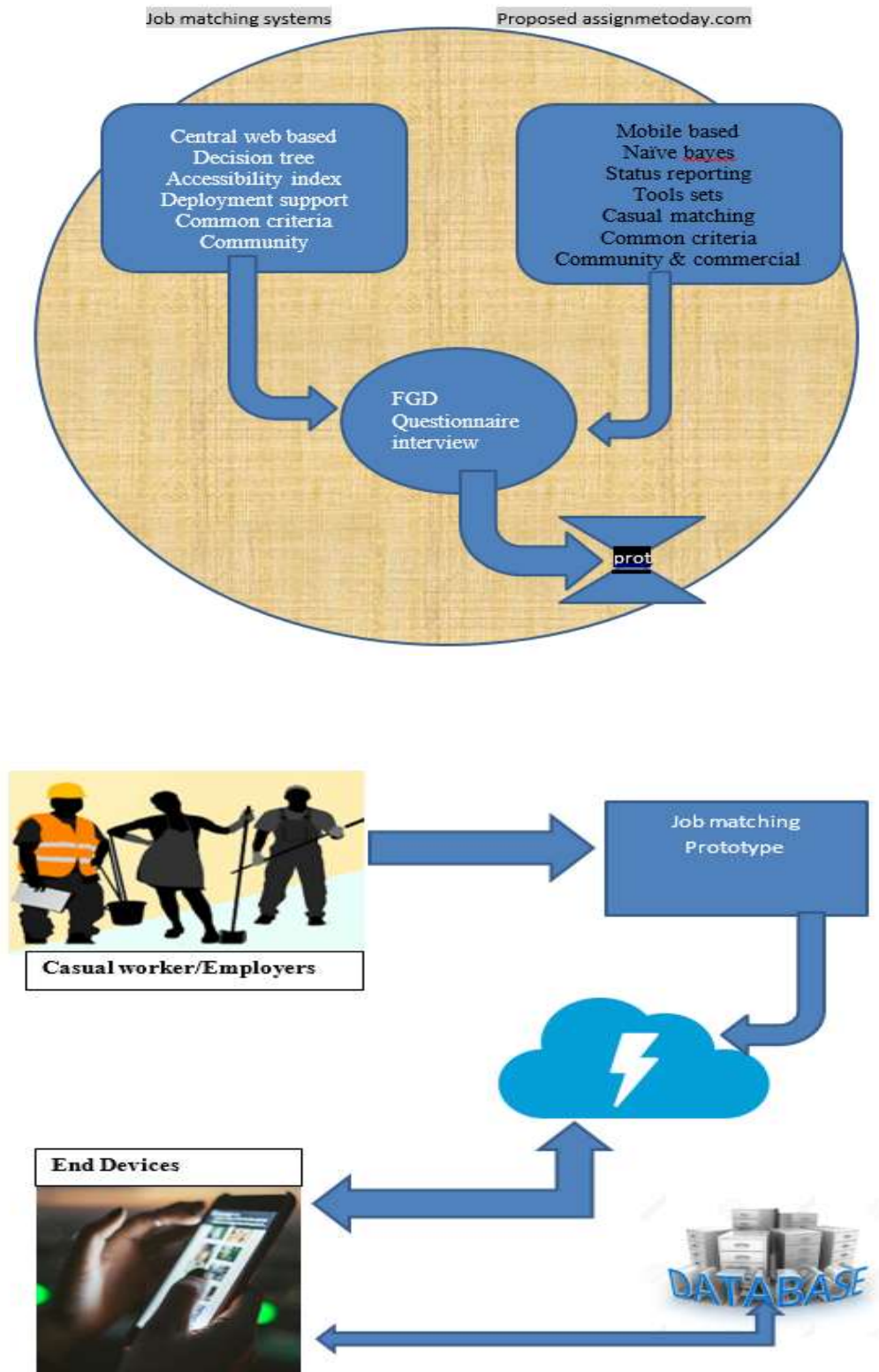
CHAPTER THREE.

3.0 Methodology.

3.1 Introduction
Sha Avison (2014) describes a methodology as a collection of procedures, techniques, tools and documentation aids which will help systems developers in their effort to produce a new information system. Therefore, research methodology defines what the activity of research is, how it will proceed, how to measure progress and what constitutes success. This research involved gathering of relevant data and compiling information in order to analyze the material, and arrive at a complete understanding of the proposed applications and the software development process.

3.2 Research design
This is defined as the strategy, the plan and the structure of conducting a research project according to Carrige (2000). Parahoo (1997:142) describes a research design as "a plan that describes how, when and where data are to be collected and analysed". This study was based on combined survey and prototype research, utilizing focus group discussions and questionnaire. Essentially, focus group research is a method of collecting qualitative data, which entails engaging a small group of people in an informal like group discussion, "focused" around a particular and specific subject topic or set of issues for discussion (Burns and Grove (2003:19). Further details on how researcher constituted and utilized FGDs are found in this document (page 38&39), and FGDs results in Table 3.

The goal of focus group discussion was to gain an insight and understanding about research topic by hearing from people in depth. The main benefit of focus group is that it heavily involves group interactions, which normally reveals and highlights the participants "thinking", attitudes,

perceptions and outline of understanding, including helping to identification of group cultural values, norms, sub cultural.

Use of questionnaire was employed to collect and analyze quantitative data. The results are presented in Fig 4, 5 and 6.

3.3 Data Collection
The researcher collected both qualitative and quantitative data

3.3.1 Sampling Design and Sample Size
Polit et al (2001:234) define a sample as "a proportion of a population". Burns and Grove (2003:31) refer to sampling as a process of selecting a group of people, events or behaviour with which to conduct a study. Polit et al (2001:234) confirm that in sampling a portion that represents the whole population is selected. Sampling is closely related to generalizability of the findings In this study the sampling was non-probable and purposive judgmental. The sample frame included individuals/firms who provide casual jobs and individuals who can accomplish casual jobs. According to KNSB survey, there are 2.5Million Kenyans who engage in this kind of employment. Using non-probable and purposive judgmental sampling, researcher picked Kisumu city as a representative habitat. According to Parahoo (1997:223), in non-probability sampling researchers use their judgment to select the subjects to be included in the study based on their knowledge of the phenomenon. Parahoo (1997:232) further attests purposive sampling as "a method of sampling where the researcher deliberately chooses who to include in the study based on their ability to provide necessary data". The researcher used KNSB statistics of 2.5Million casual workers, and subjected it to judgmental stratified sample calculator. The researcher ended targeting 27 diverse individuals/firms. The type of sampling was considered appropriate by the researcher, considering the high population.

24

Determine Sample Size

Confidence Level:	⦿95% ◯99%
Confidence Interval:	19
Population:	2500000

Calculate	Clear

Sample size needed:	27

According to Crouch & McKenzie (2006), the ideal number of participants in a qualitative research should be less than 20. This helps a researcher to build and maintain a close relationship and thus improve the "open" and "frank" exchange of information. This can help reduce some of the bias and validity threats inherent in qualitative research. In quantitative research sampling, the size of the sample is determined by the optimum number necessary to enable valid inferences to be made about the population. The larger the sample size, the smaller the chance of a random sampling error, but since the sampling error is inversely proportional to the square root of the sample size, there is usually little to be gained from studying very large samples. The optimum sample size depends upon the parameters of the phenomenon under study, for example, the rarity of the event or the expected size of differences in outcome between the intervention and control groups (Marshall, 1996).

On the other hand, social scientists have over the years deferred on the most favorable number of respondents and people who ought to be included in the focus group research. By and large acceptable numbers range between 6-30 individuals who need to be homogenous to some variable (e.g. age range, gender, educational standards etc.).Fewer people participating may not produce enough active conversation while too many people involved in a group may make some respondents may not express themselves (Kruegr and Casey, 2000).

Based on the above studies, 20 respondents were good enough to produce better results since from the fourteen respondents the sample size had reached saturation or redundancy. This study therefore, focused on only twenty (20) respondents (9 women and 11 men, mean age = 23.8, SD = 5.06) .These are the respondents the researcher got relevant data.

In addition, the researcher purposively or judgmentally selected HR specialists from various firms and SMEs, and known casual workers.

3.3.2 Data collection tools and procedure
The research used self-administered questionnaire and focal group Likert charts for data collection. Sample of questionnaire and likert chart found at Appendix.

3.3.3 Data Analysis and Presentation
This study generated both qualitative and quantitative data. Quantitative data collected was analyzed using excel statistical formulas. Data presentation was done through tables and charts. Information generated was also presented statistically .Qualitative data from the Key informants was presented in narrative form, highlighting respondents' voices to compliment some of the quantitative findings.

Completed focus group likerts were edited for completeness and consistency, then tabulated. The data was then coded, and checked for any errors and omissions

3.3.4 Data collection tool pre-testing.
Before commencing the study, pre-testing of the study instruments was conducted. The aim of pre-testing was to assist in determining accuracy, clarity and suitability of the research instruments and to check their validity and reliability (Mugenda and Mugenda, 2012). The pre-testing study was conducted among immediate respondents who were drawn from colleagues at work, either casual worker or casual employers at home. Project supervisor was also involved in

validating it. Adjustments were made in order to make the research instruments more appropriate before the actual field work begun. The responses derived from the pretest were used by the researcher to refine the questionnaire by rephrasing, and editing, thus ensuring that the questions conveyed the same meaning to all respondents. The pretest enabled the researcher to test the appropriateness of the study tool by ensuring that items tested what they were intended to (validity) and that they consistently measured the variables in the study (reliability). It also helped to estimate the length of time for the administration of instruments.

3.3.5 Ethical Considerations in data collection

Neumann (2003) explains that the term 'ethical' is used to mean principle of conduct that is usually considered accurate, particularly by people of a specified group or profession.

Research activities may provoke ethical issues concerning the rights of respondents especially the right of privacy. The researcher obtained an informed consent of the respondents before he could issue them with questionnaires. Additionally, the researcher ensured that the respondents were aware of the information needed from them, the reason for seeking the information and its purpose. Anonymity and confidentiality of all participants was maintained.

3.4 Questionnaire Methodology (Used To achieve objective 1)

A self-administered questionnaire was used to collect data since it guaranteed anonymity and confidentiality. Kothari (2004) stated that use of the questionnaire is one of the major ways to elicit self-reports on people's opinions, attitudes, beliefs and values. The questionnaire contained closed-ended questions to provide specific responses and open ended items for in depth information. According to Mugenda and Mugenda (2012), open ended questions permit a greater depth of response and give an insight into the respondents' feelings, backgrounds, hidden motives and intentions).

For the administration of respondent questionnaire, the researcher visited Tivoli business center, Jomo Kenyatta street, Lumumba health center, and United Mall, all in Kisumu. The researcher approached the clients purposively or by judging by observation, economic activity, physical attributes, and place of work. The researcher introduced himself, established a friendly contact, and explained the purpose of the study. Respondents' consent to participate in the study was sought who upon consenting would sign the consent form and a questionnaire was then handed over for them to fill.

3.4.1 Results and discussion for objective 1

The questionnaire (available at Appendix 1) sought response on a number of casual job matching perceptions besides challenges and measurers that were put in place to tackle the challenges. This was because the researcher wanted a broad feel of the actual situation of casual worker/employer interaction. The researcher will however only restrict the discussion of the results to the following aspects:

  i.   Casual worker/employer reactions to poor job matching application experiences.

  ii.   Casual worker/employer challenges matching up casual job.

  iii. Casual worker/employer desirable features of job matching application.

Response rate was impressive at 100%. The results were very important to the researcher in next phase of development. Results are presented below in Fig 4,5 and 6.

Figure 4: Casual worker/employer reaction to poor mobile app experiences

QUESTIONNAIRE RESULTS

- WOULD NOT TAKE ANY ACTION — 7%
- ANNOUNCE ON SOCIAL MEDIA — 10%
- CONTACT CUSTOMER SERVICE — 11%
- LESS LIKELY TO GO TO THE COMPANYS… — 17%
- GIVE THE JOB MATCHING APP LOW RATING — 21%
- LESS LIKELY TO SUBSCRIBE TO THAT SYSTEM — 26%
- TELL OTHERS ABOUT POOR EXPERIENCE — 31%
- SWITCH TO COMPETITORS SYSTEM — 34%
- LESS LIKELY TO USE MOBILE APP — 48%
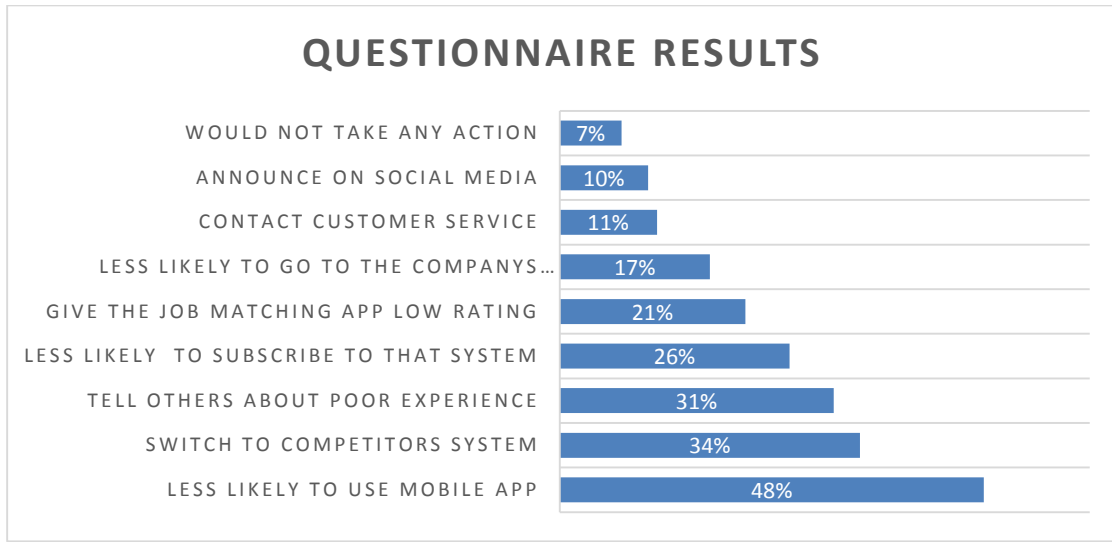
Figure 5: Casual worker/employer challenges matching up casual job.

Questionnaire results

- WEB BASED LOCATION SYSTEM NOT ACCURATE — 64%
- LACK OF PLATFORM TO FACILITATE COMMUNICATION BETWEEN CASUAL WORKER/EMPLOYER — 54%
- NO MOBILE BASED CASUAL JOB MATCHING SYSTEMS AVAILABLE — 94%
- EXISTING CASUAL JOB MATCHING PLATFORMS NOT ADEQUATE — 89%
- LOW POOL OF CASUAL WORKER/EMPLOYER TO CHOOSE FROM — 74%
- TAKES LONG TIME TO IDENTIFY POTENTIAL CASUAL WORKER/EMPLOYER — 75%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Figure 6: Casual worker/employer desirable features of job matching application.

Questionnaire results

Feature	Percentage
PEER-TO-PEER SUPPORT	20%
COMMERCIAL SUPPORT	48%
COMMUNITY VERSION	78%
CASUAL MATCHING	94%
TOOL SETS	65%
MOBILE ENABLED	94%
STATUS REPORTING	80%
DEPLOYMENT SUPPORT	35%
ACCESIBILITY	65%
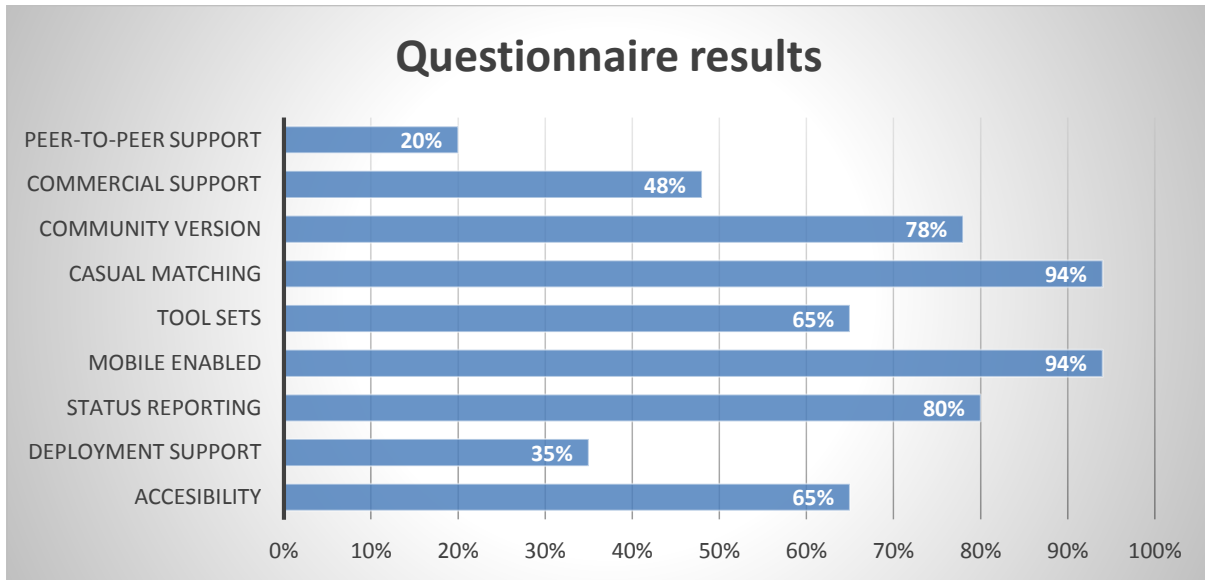
3.5 Focus Group Methodology (Used to Achieve Objective 4).

The objective 4 was best achieved via the focus group methodology that would target casual workers and employers. According to Parahoo (1997:296), a focus group discussion is an interaction between one or more researchers and more than one participant for the purpose of collecting data. The researcher is interested in getting the actual challenges faced by the parties in matching needs and requirements. The challenges gathered and local solutions in place will aid in the development of a featurific application. Kenya has about 2.5 Million casual workers (KNBS 2013). A judgmental sampling tool was used to come up with a sample size in order to give a representative number.

Advantages and disadvantages of focus group discussion

According to Parahoo (1997:298), a focus group discussion offers cheaper and faster way to obtain data, it also offers more comfortable platform in voicing opinions among team.

Again, Holloway and Wheeler (2002:117) state the following strengths of focus group discussion: they provide dynamic interaction among participants stimulates their thoughts and

reminds them of their own feelings about the research topic. Also, participants have chance to ask questions and clarify or clarify unclear views.

On the other hand, Holloway and Wheeler (2002:118) highlight limitations of focus group discussion as: presents researcher with difficulty managing debate and controlling the process, some participants may be introverts while others dominate the discussion and influence the outcome, or perhaps even introduce bias, analysis can be daunting. FGDs are also not replicable. The validity and reliability of the findings are difficult to ascertain on their own.

3.5.1 Focus Group participation.

Focus group interviews was conducted for a period of 2 weeks (4th-30th July, 2018), with two population of casual workers and casual employers. Both groups have at one point used existing casual matching platforms. The main objective of the focus group was to interrogate the group to establish their thought and perception, on convenience and usability of the application. Those who participated were queried and interviewed by focus group facilitator, on the issue of efficiency, effectiveness, attractiveness of the existing system, applicability and acceptability. During the time, interview notes were taken on behaviors, conduct and verbalization. The document was later analyzed for significant incidences like (issues of usability identified) and difficulty in performing tasks. Participants were encouraged to give suggestions on any changes, corrections, comments and on the interface design of the application. Each focus group discussion lasted for atleast 2 hours.

The researcher developed a thematic likert chart, theme that guided the whole focus group discussion interviews. The researcher came up with five queries in each of the two focus group. That was then followed by a discussion that is based on the following themes; efficiency and effectiveness on the application; ease of use; at the perceived features of the system.

Table 2: Characteristics of Participants in FGDs.

Age	Gender	Specialty	Total
18-35	Male	Student/Casual worker	3
	Female	Admin Assistant	3
36-55	Male	Cleaner/Casual	5
	Female	Cleaner-employer	5
56-75	Male	HR manager	2
	Female	Short term contractor	2

Table 3: Analysis of Likert charts

AssignmeToday.com Focus group.						
Total Points Received	61	57	56	53	58	57
Total Points Possible	80	80	80	80	80	80
Mean	3.05	2.85	2.8	2.65	2.9	2.85
Standard Deviation	1.146	0.988	1.005	0.933	0.912	0.988
Response Rate	100%					

Participant Responses		All responses are based off a Likert scale (Strongly Agree to Strongly Disagree)
Participant Identification		Strongly Agree=4, Agree=3, Disagree=2, Strongly Disagree=1
Questionnaire Questions		Number of Likert Scale Opt _4_
Survey Title		Questionnaire Participants _20_
Likert Scale/Questionnaire Participation		Total Possible Participants _20_
Data Tabulation		

	1. Overall, are you satisfied with how it is easy to learn and use job matching system?.	2. Can you successfully complete your task using system?	3. How do you rate quality of data generated by android application?	4. How fast can you post a task on the android app?	5. Would you want improvement on the system?.	6. Would you recommend adoption of assignmetoday.com?
Participant 1	4	4	4	4	4	4
Participant 2	2	3	4	2	3	3
Participant 3	1	2	3	4	4	4
Participant 4	4	4	3	3	3	2
Participant 5	3	3	3	3	3	3
Participant 6	4	2	2	3	4	3
Participant 7	4	3	3	3	3	3
Participant 8	3	2	1	2	2	3
Participant 9	4	1	1	1	1	1
Participant 10	4	4	4	4	4	3
Participant 11	2	3	2	2	4	1
Participant 12	3	4	4	2	2	4
Participant 13	4	3	2	3	3	4
Participant 14	1	1	3	1	3	4
Participant 15	1	3	2	2	2	3
Participant 16	4	2	4	3	3	3
Participant 17	4	2	4	2	2	3
Participant 18	2	3	2	3	4	2
Participant 19	3	4	3	4	2	1
Participant 20	4	4	2	2	2	3

Some oral comments from participants.

"We would certainly use this again and we highly recommend this approach to recruitment. It saves us time in selecting the best candidates for a task" –focus group participant.

"New job matching system to offer user-friendly, mobile design and increased access to casual jobs" –focus group participant.

3.5.2 Direction of the focus group.

Most of the respondents were not satisfied with existing casual job matching systems especially on ease of use, efficiency, effectiveness, mobility, and thus general usability. They therefore strongly recommended improvement of current systems or introduction of new application possibly based on android applications. This was because most of the said they had android phones. The researcher also noted functional and non-functional requirements desired by the group.

3.6 Evolutionary Prototyping Methodology (Chosen SDLC) to achieve objective 3.

According to Davis (1992), prototyping is the activity of creating prototypes. Davis further asserts that prototype is a tangible artifact that explores an idea. It has been considered important in human-computer interaction (HCI) and software development (Lim et al., 2008). Prototypes are an excellent tool for capture and enhancing knowledge in an organization when developing products (Wheelwright & Clark, 1992). Wheelwright & Clark (1992) also states that systematic study of the types of problems that can and should be solved in each prototyping cycle during the development work can help identify new ways to plan and realise the prototyping cycles. When not working with a stated prototyping process, engineers who are going to develop a prototype

starts from the beginning every time, they can indeed accumulate knowledge themselves, but there will be no systematic knowledge transfer from one project to another.

In this research context, prototyping played an important integral role in the overall development process. This was my choice because Prototypes and prototyping research have a particularly strong and well-established role in the fields of software development and HCI (Mackay and Fayard, 1997, Djkstra-Erikson et al., 2001). Another obvious reason for the strong foothold of prototypes is that creating a new iteration of a product, test, learn and use the generated information in the next version of a prototype is quick and cost-effective. Prototype also server four main purposes of learning, communication, integration and milestones as illustrated in previous literature review.

Prototypes often aid to answer specific questions involving user interaction. For example, by allowing intended customers handle the prototype for assessing usability (Rosenthal and Capper, 2006), incorporating customer feedback in the development process (Herstatt et al., 2006) or even allowing the customer to define functional prototypes throughout the development process (Campbell et al., 2007). In this context, the focus is on validating or verifying certain aspects of the design. In other cases, prototypes are also used to discover new aspects; ones that are unknown or not considered at the outset of the work. Floyd (1984) argues that prototypes may serve as a catalyst for eliciting good ideas while Yang (2005) found that prototypes often lead to new questions that were not considered at the outset of the work. Lichter et al. (1993) used the term *exploratory prototyping* to describe all prototyping activities that aim to clarify the problem.

3.6.1 Summary of justification for using the evolutionary prototyping in SDLC.

- o Prototype Clarifies the requirements needed in a system.

- o Prototype helps find out unknown requirements.

- o Prototype allows requirements Analysis and Design by view

- o Flexible to change research assumptions is a key feature.

- o Prototype provides a method to communicate about Systems and its development.

- o Prototype enables reduced development schedule and minimize cost

- o Through prototype, we are able to build knowledge from experiment

3.6.2 Prototyping tools
- o User interface management system –WINTERP

- o JMeter apache and plugins.

- o CASE tools

- o Hard tools

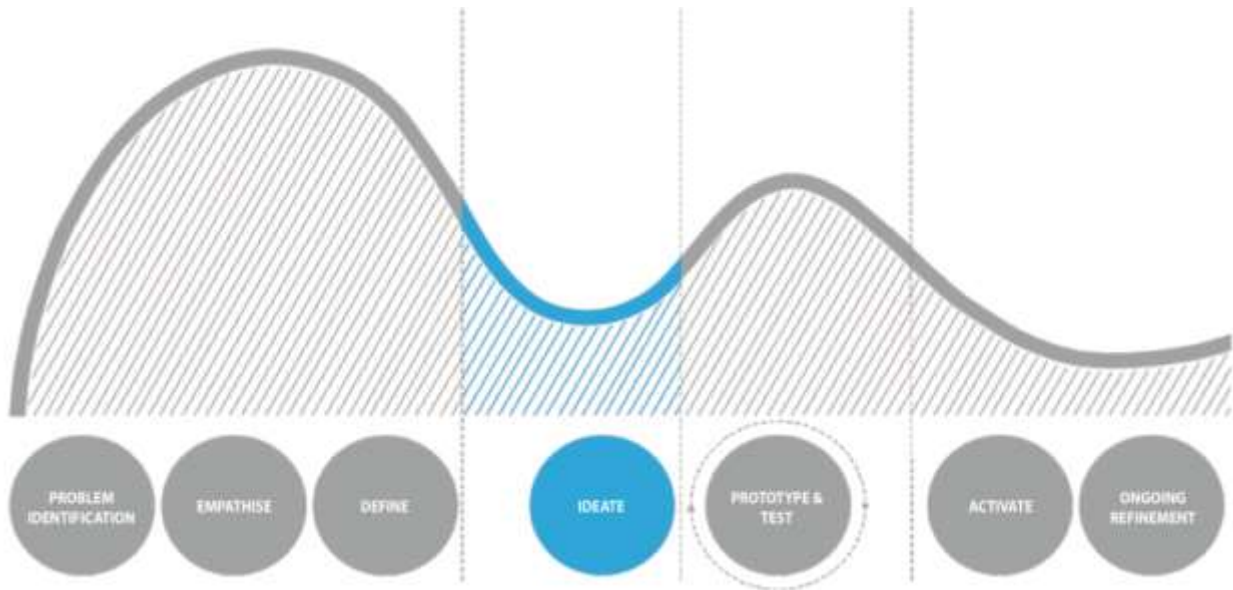**Figure 7: Assignmetoday.com artifact Prototyping process**

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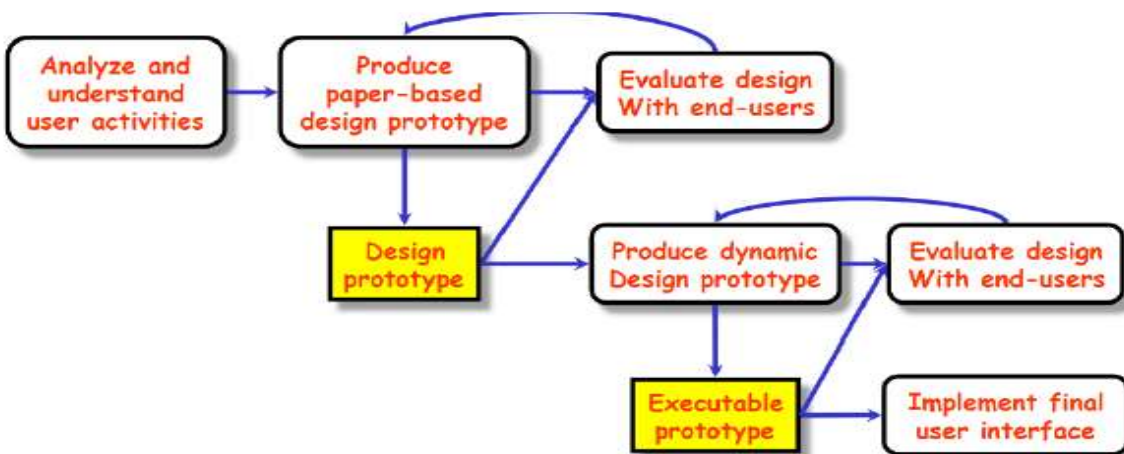
Figure 8: Prototyping process time effort chart

3.6.3 Prototype Development phases and deliverables.

The steps in prototype Development Model are:

***Requirements Planning*:** Defining the concept, the business functions and data, and the scope of the system.

3.6.3.1 Functional requirements of Assignmetoday.com application.

After data gathering from focus groups, the functional requirements were designed to be handled by the proposed application as summarized below:

Table 4: Functional and non-functional requirements analysis.

User Types	Proposed application Functional requirements
Casual worker	✓ Register and Login to the application. ✓ Browse available tasks and view details e.g. task status (if available or expired), price and location. ✓ Make an offer for available job and make further comments. ✓ Wait for employer to accept offer, then proceed with accomplishing task. ✓ Receive notification on any update e.g. new task postings. ✓ Review the employer when task is accomplished. ✓ Receive payment virtually.

Casual employer	✓ Register and login to the application. ✓ Post a new task in any of the categories. ✓ Review own tasks to update or amend it. ✓ View offers and comments from prospective workers. ✓ Receive notifications on updates or changes. ✓ Review worker when task is accomplished. ✓ Submit payment agreed.
Administrator	Unlimited control over the application.

3.6.3.2 Non functional requirements of Assignmetoday.com.

Mobile platform has enabled the creation of large markets for mobile applications and services throughout the few years. A closer look at the thriving mobile applications reveals six major characteristic that they have in common.

Connectivity:- The users of these applications are always online as the system is constantly logged into mobile network for internet accessibility.

Convenience:- A good mobile application should be able to do its job in different contexts and fast varying situations. The designed information architecture and the overall usability of the application must therefore be done with care to create a appropriate and pleasurable interaction.

Localization:- Localization of mobile applications and the opportunity to provide location based information is a fundamental issue that has made mobility exciting and practical.

Reachability:- Reachability is a more social attribute that is brought by the nature of mobile devices themselves. A good and vibrant mobile application should be used anywhere at any given moment and time.

Security:- Security manifests itself in many different ways. The data, which is being transferred and sent over the network, must be encrypted through the network.

Personalization:- Developing personalized content based on individual needs or context is another characteristic of mobile applications. Users want applications that can comfortably fit into their needs and also that perform the way they want them perform.

*User Interface Design***:** Proposal of the functional design, specification of system work flow and processes.
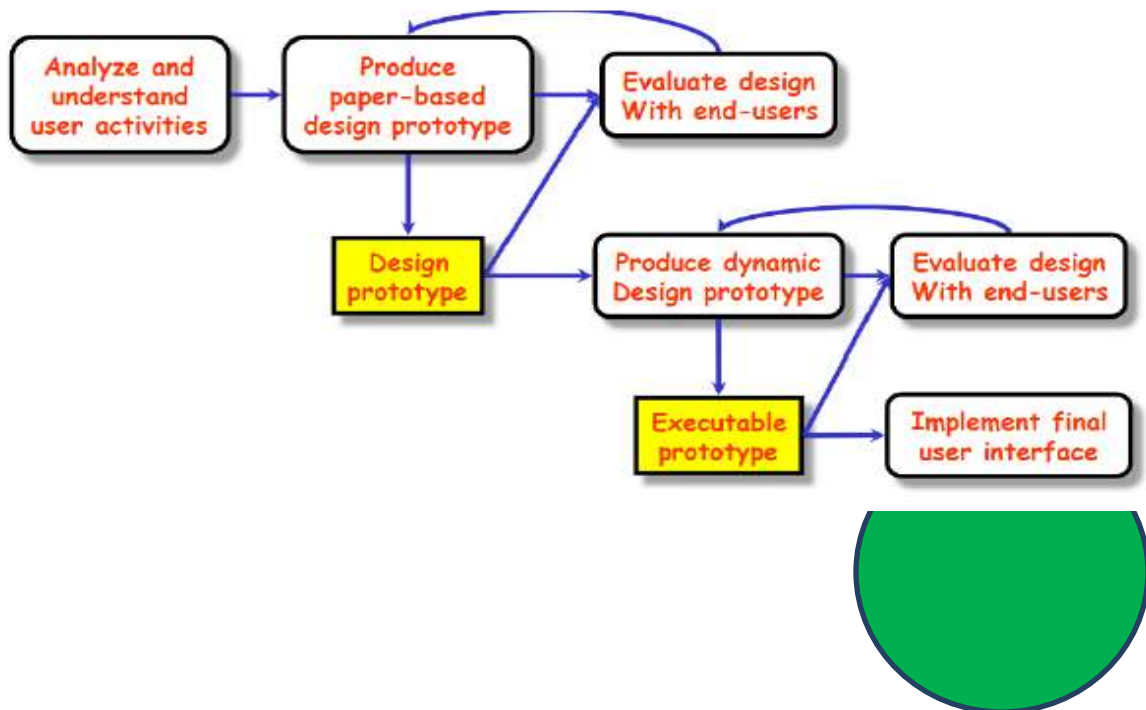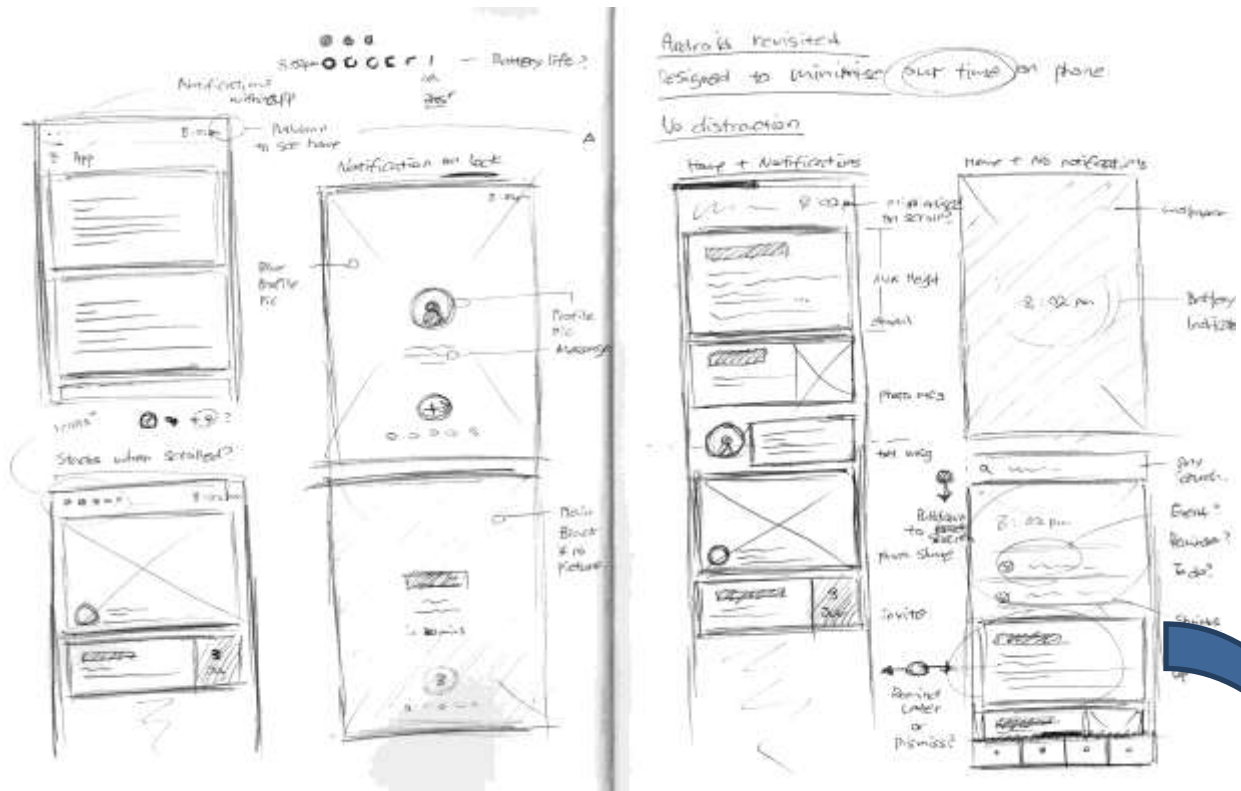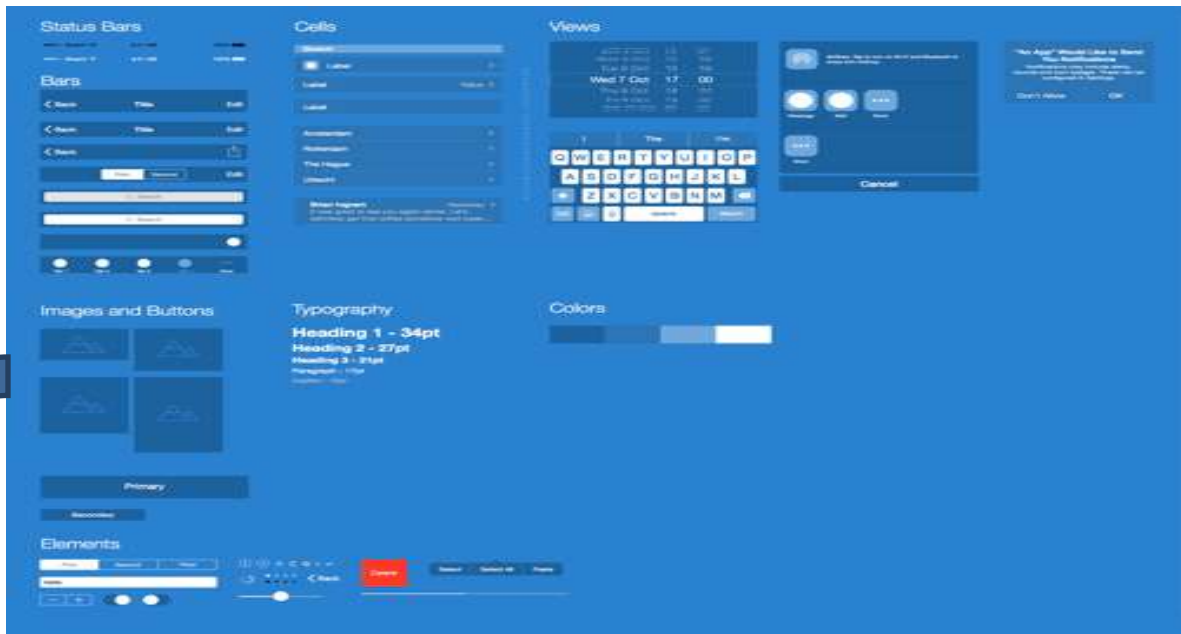
Figure 9: HCI Prototyping using hard tools.

Figure 10: HCI Prototype transformation using soft tools.

Construction: Building a working prototype of main basic features of the system components, demonstration of prototype with the users and collecting feedback. Refining the design based on feedback from the users. Development of the final prototype.

Implementation: Deployment stage, this stage again involves demonstration of the system to the end users who give the final feedback after which the system requirements are deployed this completes the implementation of the application system.

3.7 The Development of the Application.

The proposed application will adopt native mode. This is because native application allows users to quickly learn the app, are easy to discover in app stores e.g. you can search for assignmetoday.com at play store, offers easy access to software/hardware, offer highest security and allows better user experience. Gliffy tool will be used to produce data flow diagrams (DFDs). Gliffy tool is a cloud based tool that offer a lot of features.
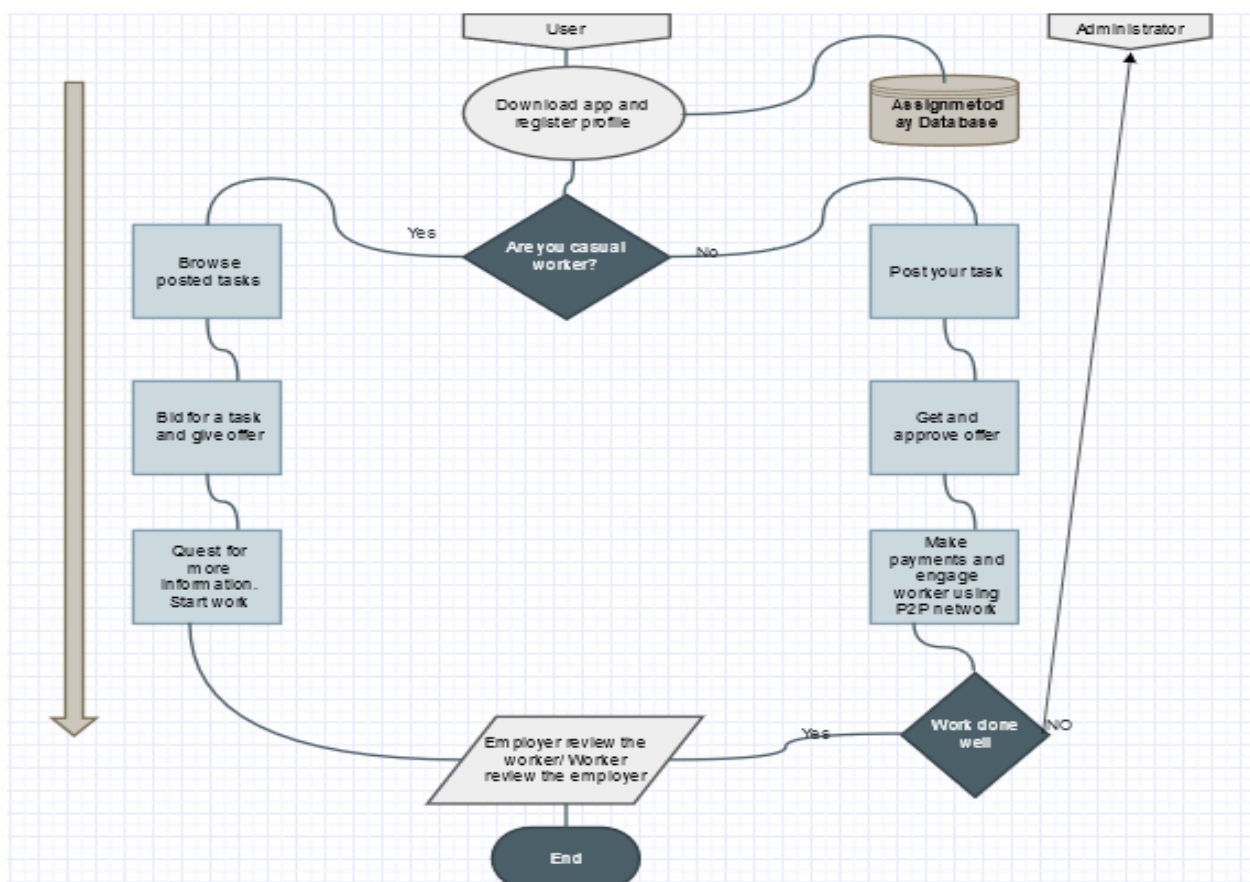
CHAPTER FOUR

4.1 Design of the prototype and discussions.
Proposed assignmetoday.com application functionality is further discussed in this chapter.

The application will interact with users as illustrated in Fig 3.

4.2 The Conceptual design.
Figure 11: Data flow diagram

4.3 Process Modelling
A use case diagram offers a clear graphical view of the system functionality generally provided

by the application in terms of the actor, and their goals with the application. Use-case diagrams

visualize, specify and document the behavior of the system.
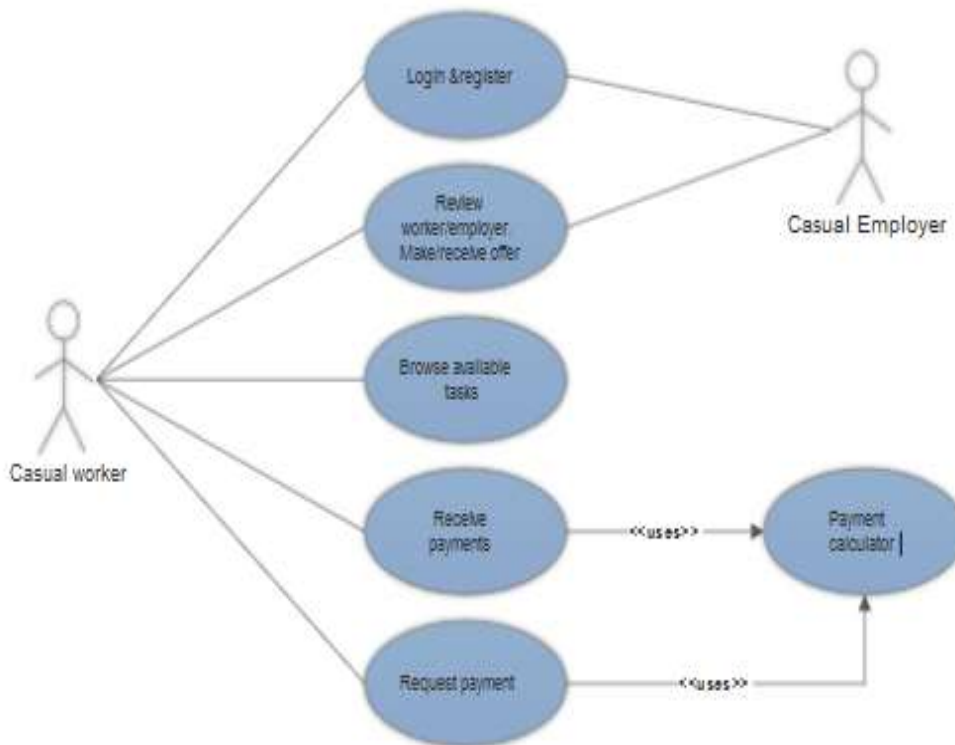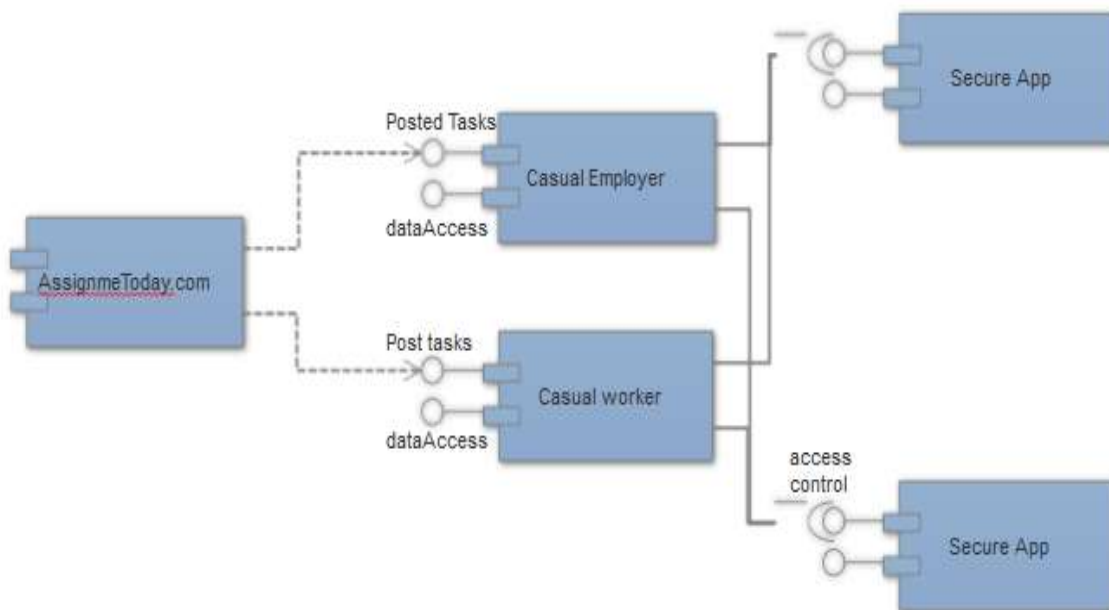
Figure 12: USE CASE diagram

Figure 13: Component diagram

4.4 Database design

Assignmetoday.com database architecture utilized firebase real-time database console. Data is

stored as JSON and synchronized in realtime to every assignmetoday.com connected client.

4.5 Testing and Implementation of the system.
The development and implementation of the application was based on conceptual model

developed by the researcher. Distribution was done using available google play store. The

researcher also availed a dedicated application-landing page (Appendix 3). Testing was done

using JMeter tools with Apache and plugins. Various test results were availed as follows.

4.5.1 Interrupt Test.

```
Assignmetoday.com Interrupt Testing -Pass
*******************************************************************************************
Run the mobile application in low battery and when the battery is full

  Test for Low Battery or Full Battery

    Complete assignmetoday.com app functionality

      Result: Pass

        In both the conditions, the performance should not vary. When the app is running, if the battery is low.

        The objective of this test is to check the  performance of app
*******************************************************************************************
Shut down the device.

  Test for Device Shutdown

    On any of assignmetoday.com functionality

      Result: Pass

        Assignmetoday.com Application starts again successfully.

        The objective of this test is to monitor the application behavior when the device is shut down or restarted
*******************************************************************************************
User should receive a phone call when the app is running.

  Test for Phone Call

    Sign in/Sign Up

      Pass

        Assignmetoday.com Application starts again successfully.

        The objective of this test is to  verify that the app is resuming its state when a mobile got the voice calls

  Run the Assignmetoday.com App in Low Memory

    Sign in/Sign Up

      Pass

        Assignmetoday.com Application starts again successfully.

        The objective of this test is to  verify that the app is resuming its state when a mobile got the voice calls
*******************************************************************************************
User should receive a phone call when the Assignmetoday app is running.

  Test for No Network Coverage
```

Accepting Task Offers

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify if the app displays the proper error message and if the device moved.

Commenting on a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify if the app displays the proper error message and if the device moved.

Editing a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify if the app displays the proper error message and if the device moved.

Making payment

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify if the app displays the proper error message and if the device moved.

Posting a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify if the app displays the proper error message and if the device moved.

Phone Call

Accepting Task Offers

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify that the app is resuming its state when a mobile got the voice calls

Commenting on a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify that the app is resuming its state when a mobile got the voice calls

Editing a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify that the app is resuming its state when a mobile got the voice calls

Making payment

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify that the app is resuming its state when a mobile got the voice calls

Posting a Task

Pass

Assignmetoday.com Application starts again successfully.

The objective of this test is to verify that the app is resuming its state when a mobile got the voice calls

****

User should receive a text message or MMS

Test for Incoming Messages and MMS

```
Accepting  Task Offers
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
Commenting on a Task
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
Editing a Task
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
Making payment
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
Posting a Task
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
Sign in/Sign Up
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to monitor the app, if it shows the alerts properly when the message comes.
```
****
User should turn off mobile data or use a 2G network

Test for No Network Coverage

```
  Sign in/Sign Up
```

Pass

```
   Assignmetoday.com Application starts again successfully.

   The objective of this test is to verify if the app displays the proper error message and if the device moved.
```

Total interrupt tests 22

Test status Pass

4.5.2 Load performance test.

The researcher subjected the system to load tests and obtained the following report.

Table 5: Load and performance test analysis.

Summary Report

Name: Summary Report

Comments:

Write results to file / Read from file

Filename: _____ Browse... Log/Display Only: ☐ Errors ☐ Successes Configure

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
1 /	20	942	584	2867	570.30	0.00%	2.0/sec	14.01	7299.1
2 /wp-content/pl...	20	413	274	1761	321.55	0.00%	2.2/sec	2.60	1183.8
4 /api/load/	20	649	552	973	113.64	0.00%	2.1/sec	0.84	404.0
5 /api/load/	20	352	277	595	96.72	0.00%	2.2/sec	2.61	1218.1
6 /apps/share/lo...	20	338	285	695	99.07	0.00%	2.2/sec	3.65	1712.0
7 /apps/smartba...	20	1036	340	3327	710.46	0.00%	1.6/sec	9.11	5687.0
8 /	20	823	621	1009	102.93	0.00%	1.7/sec	17.20	10414.0
9 /wp-content/pl...	20	494	270	1524	394.61	0.00%	1.8/sec	1.94	1126.0
12 /api/load/	20	682	562	1020	129.10	0.00%	1.7/sec	1.85	1093.0
14 /apps/share/l...	20	313	288	340	14.10	0.00%	1.8/sec	2.97	1676.0
13 /apps/smartb...	20	729	342	2246	400.01	0.00%	1.8/sec	9.80	5687.0
18 /button_info.j...	20	495	355	860	118.04	0.00%	1.8/sec	2.80	1570.3
17 /v1/urls/count...	20	543	463	748	71.48	0.00%	1.8/sec	1.21	682.0
16 /method/link...	20	473	350	788	129.70	0.00%	1.8/sec	1.42	792.0
15 /	20	476	396	840	92.42	0.00%	1.8/sec	1.14	635.0
TOTAL	300	584	270	3327	368.41	0.00%	15.3/sec	40.94	2745.3

In this analysis, the number of samples indicates the number of users per request. The average is time taken by all the samples to execute specific module functionality. In this scenario, average time for Label 1 is 922 milliseconds & total average time is 554 milliseconds.

Minimum: The shortest time taken by a sample for specific label. If we look at Min value for Label 1 then, out of 20 samples shortest response time one of the sample had was 554 milliseconds.

Maximum: The longest time taken by a sample for specific label. If we look at Max value for Label 1 then, out of 20 samples longest response time one of the sample had was 2847 milliseconds.

Std. Dev.: This shows the set of exceptional cases which were deviating from the average value of sample response time. The lesser this value more consistent the data. Standard deviation should be less than or equal to half of the average time for a label.

Error%: Percentage of unsuccessful transaction requests per Label.

Throughput: The number of request that are processed successfully per time unit (seconds, minutes, hours) by the server. This time is calculated from the start of first sample to the end of the last sample.

The following charts and graphs displays the average response rate of each transaction over the course of the entire test.

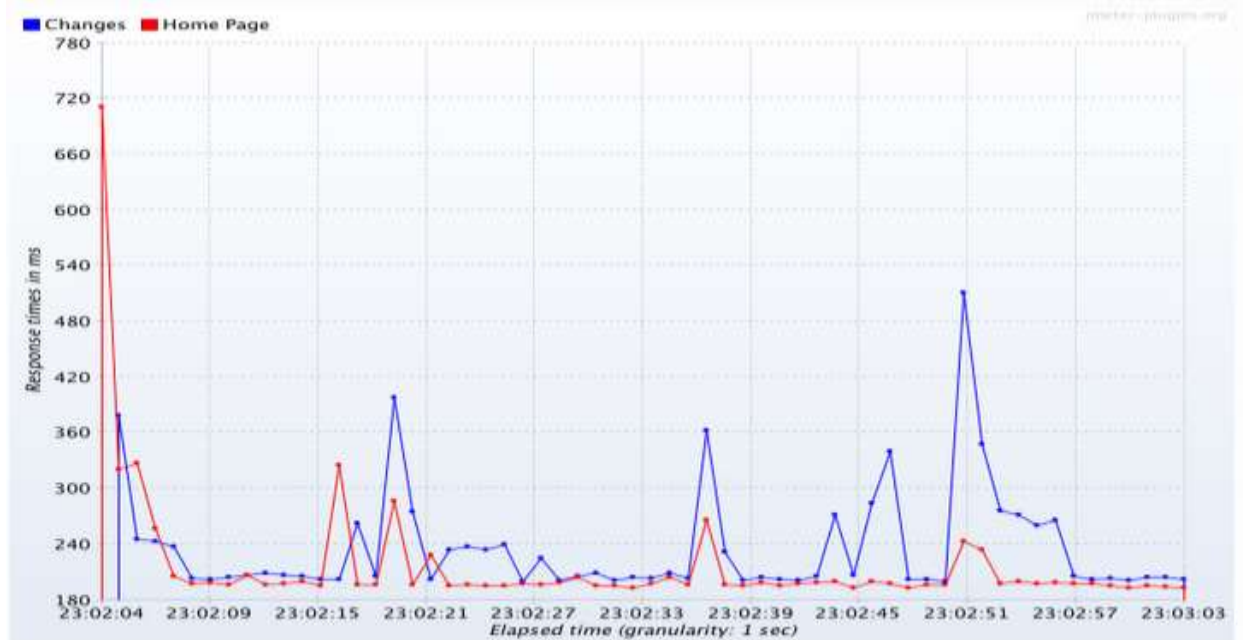**Figure 14: Graph presenting response rate of the application over time.**

Figure 15: Graph presenting active users over time.

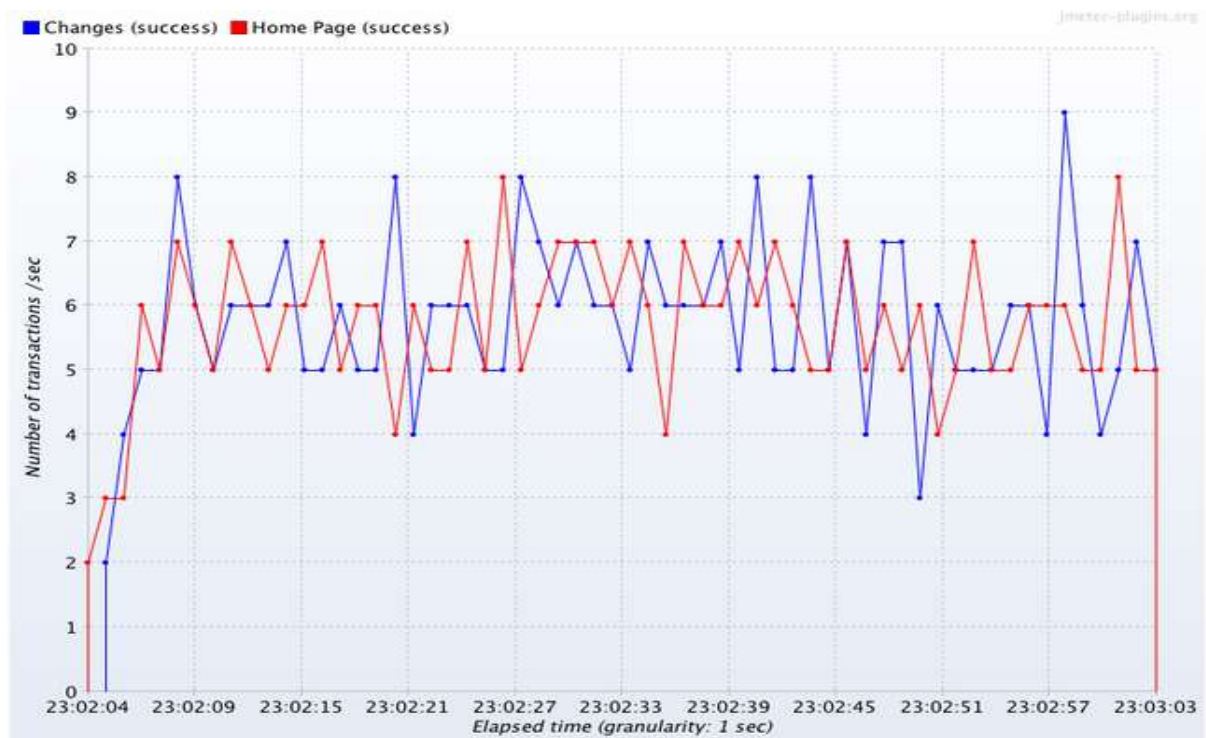**Figure 16: Graph presenting transaction performance over time**
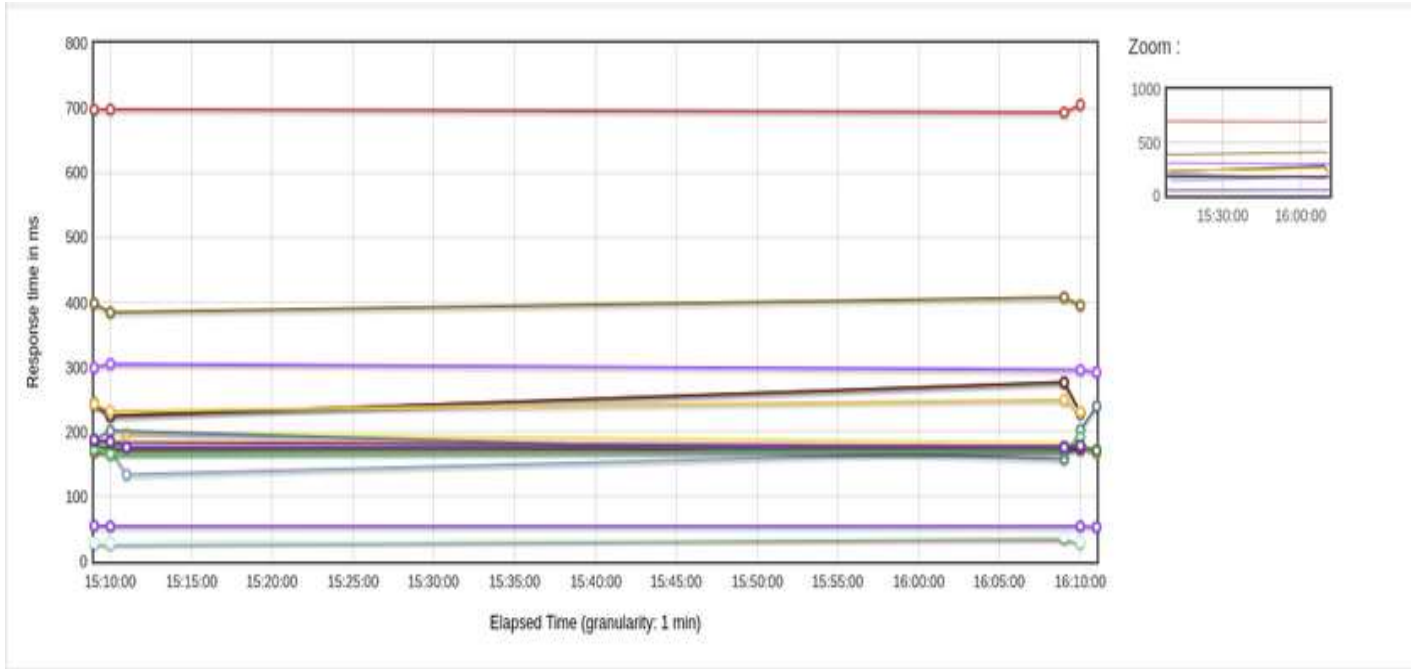

Figure 17: Module performance over time.

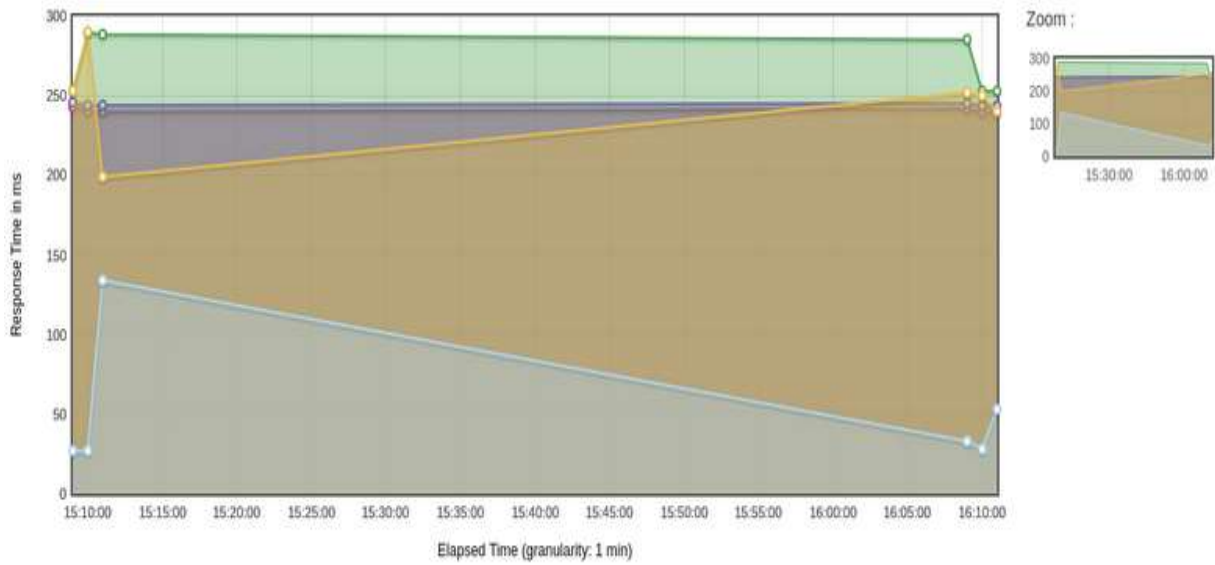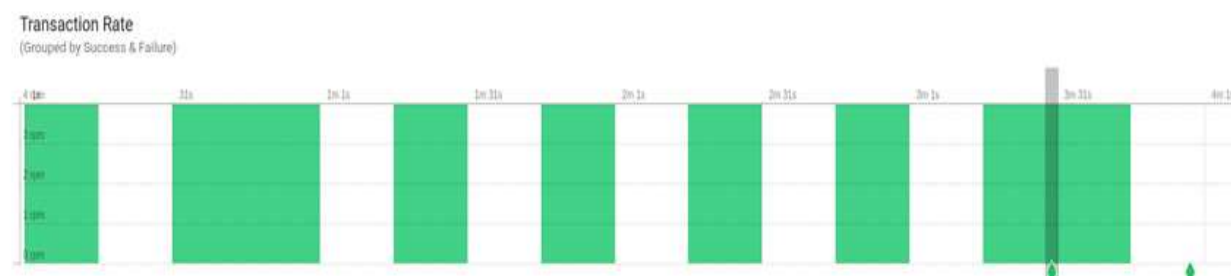*Figure 18: Average response rate of transaction on the application*

Figure 19: Transaction pass/fail count

Response Timing

Average (mean)	35 ms	99th	64 ms
Standard Deviation	11 ms	95th	51 ms
Minimum	31 ms	75th	32 ms
Maximum	67 ms	50th	32 ms
Last	32 ms	25th	32 ms

Transactions

Passed count	10
Failed count	0.0
Total	10
Maximum rate	4 rpm
Average rate	4 rpm

Errors & Status Codes

0.00 %
● 200 OK

Transaction Rate
(Grouped by Success & Failure)

Test running, 9m 33s left

20 users   17 hits/sec   30.2 KB/sec   1.4 errors/sec

SUMMARY   Test Summary

4.5.3 Installation test.

During the research, participants installed the system on different phone models including Nokia models, Samsung, Huawei, HTC 820, Sony j series among others. As shown in table 6, more

than 10 installations were done during the first day of testing. Installation were mainly done by downloading the application from playstore. Other ways like peer to peer sharing were also employed.

Table 6: Installation test result.

Resolution	Device model	Processor architecture	OS Version	GPU	RAM, Mb	Processor	Test Result
1080x1920	Xiaomi Mi3	ARMv7	Androi d 4.4.3	Adreno 330	2ГБ	Qualcomm Snapdragon 800 2,3 GHz	passed
480 × 800	Samsun g GT-I8160	ARMv7	Androi d 4.1.2	ARM Cortex-A9	768 mb	NovaThor U8500 800 МГц	passed
1280x720	Huawei MT1-U06	ARMv7	Androi d 4.1.2	GC4000	2Г6	Hi-Silicon K3V2, 1.5 ГГц	passed
1080x1920	Xperia Z	ARMv7	Androi d 4.4.4	Adreno 320	2ГБ	Qualcomm Snapdragon S4 Pro APQ8064 1.5 GHz quad-core Krait	passed
1920x1080	Samsun g Galaxy s4	ARMv7	Androi d 4.4.2	Exynos 5 Octa	2ГБ	Samsung Exynos 5 Octa 5410/1.6 GHz	passed
1280 × 800	Kindle Fire 2gen	ARMv7	Androi d 4.0.3	Imaginatio n Technologi es PowerVR SGX540	1Г6	Dual-core 1.2 GHz TI OMAP4 4430	passed

Figure 20: Installation of the application through playstore.

4.5.4 HCI Test.

The participants of the research also subjected the system to interaction tests including main

landing page, posting tasks, making offers, notifications, peer to peer communications, network

support, payments, dashboard and settings. The following screenshots illustrate further the

different HCI components.

Figure 21: Application homepage1
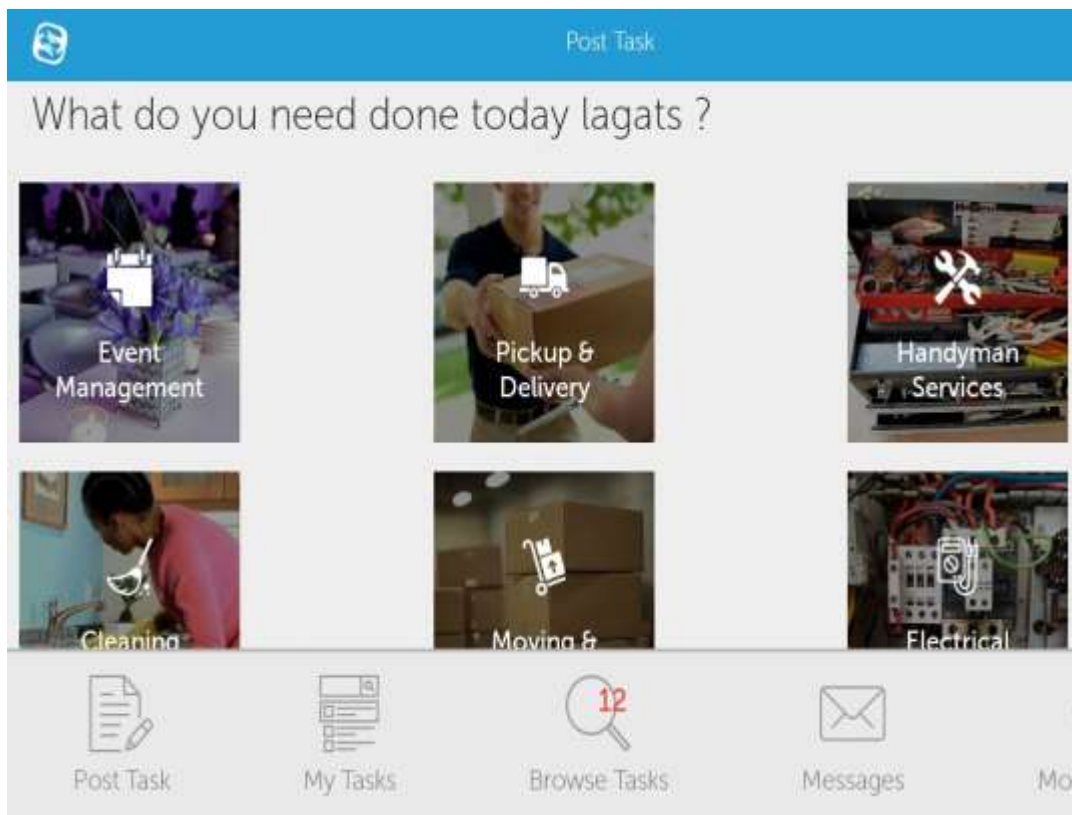
The homepage HCI enables the user to login and engage the application. The user can post task

or browse already uploaded tasks.

4.5.6 Usability Test.
Table 7: Usability test result.

Assignmetoday.com Status for		
	Number of test cases planned	20
	Number of test cases executed	18
	Number of test cases executed overall	78
	Number of defects encountered today	1
	Number of defect encountered so far	10
	Number of critical defects- still open	1

Overall usability status		
	Number of test cases planned	100
	Number of test cases executed	78
	Pass Percentage of the defects	98%
	Defects density	1 per day
	Critical defects percentage	2%

Figure 22: Broadcasting tasks using assignmetoday.com app

After the user logs in, they can browse or search existing tasks, make offers or comments, view status of tasks and even use peer to peer platform the communicate.

Figure 23: Sample Open tasks

Open tasks are available for offers. Anyone logged in can view open tasks and bid any amount. The owner of the tasks makes a decision on which offer to accept. The platform facilitates the two parties to negotiate.

Figure 24: Task details
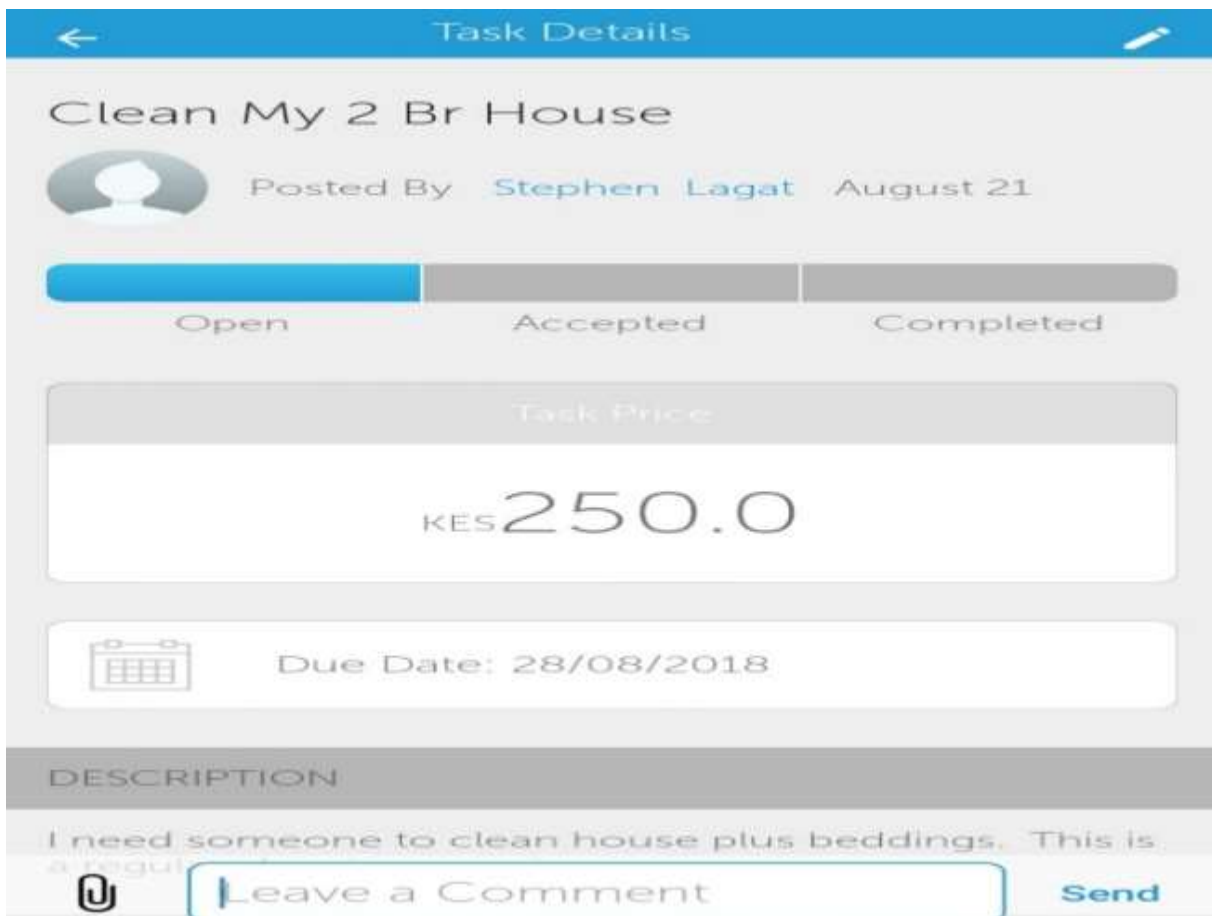
When a user is posting a task, various parameters should be specified. This includes Task price, description, due date, ownership id and any other comments.

Figure 25: Task offers
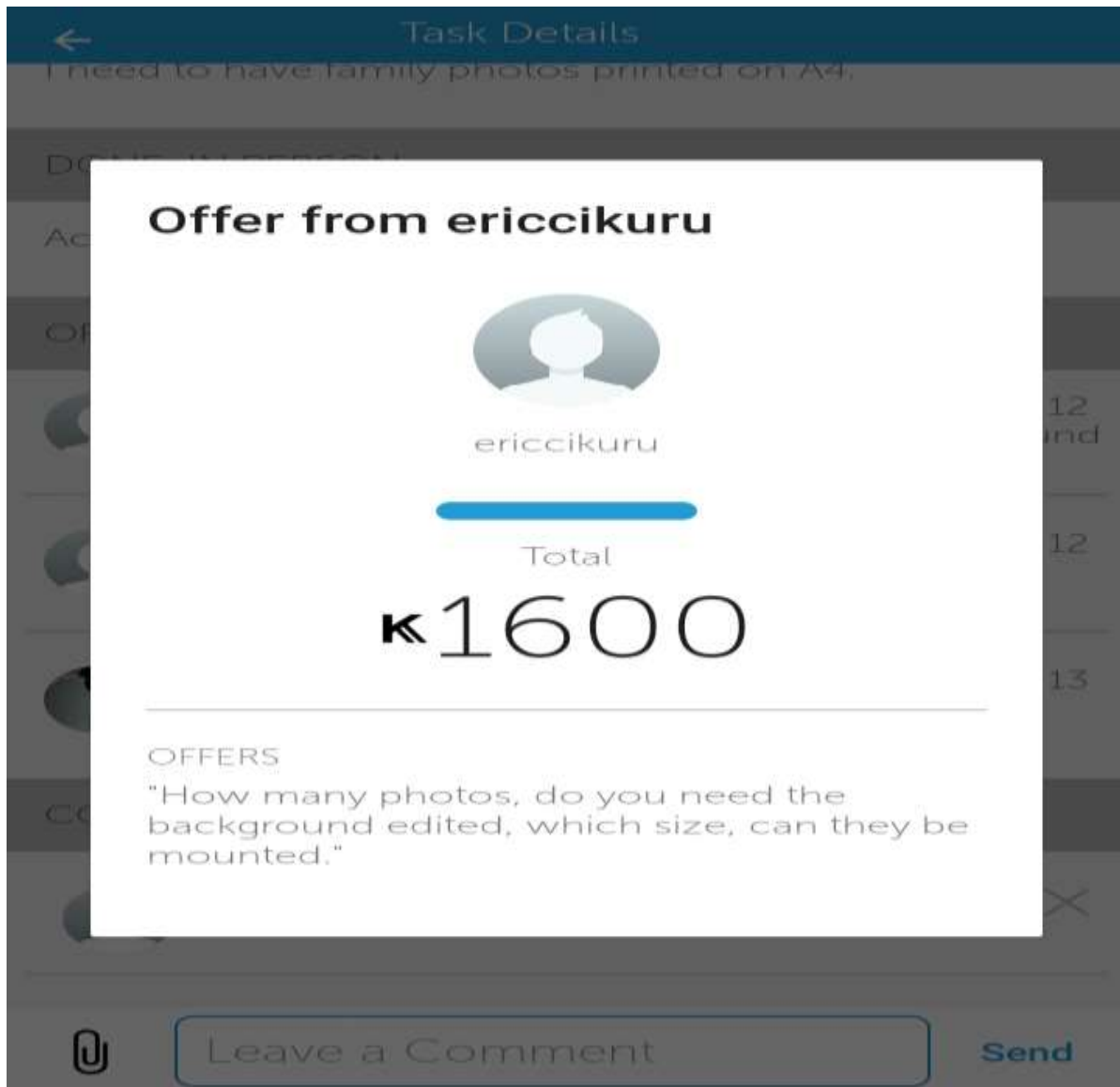
Figure 26: Task Offers
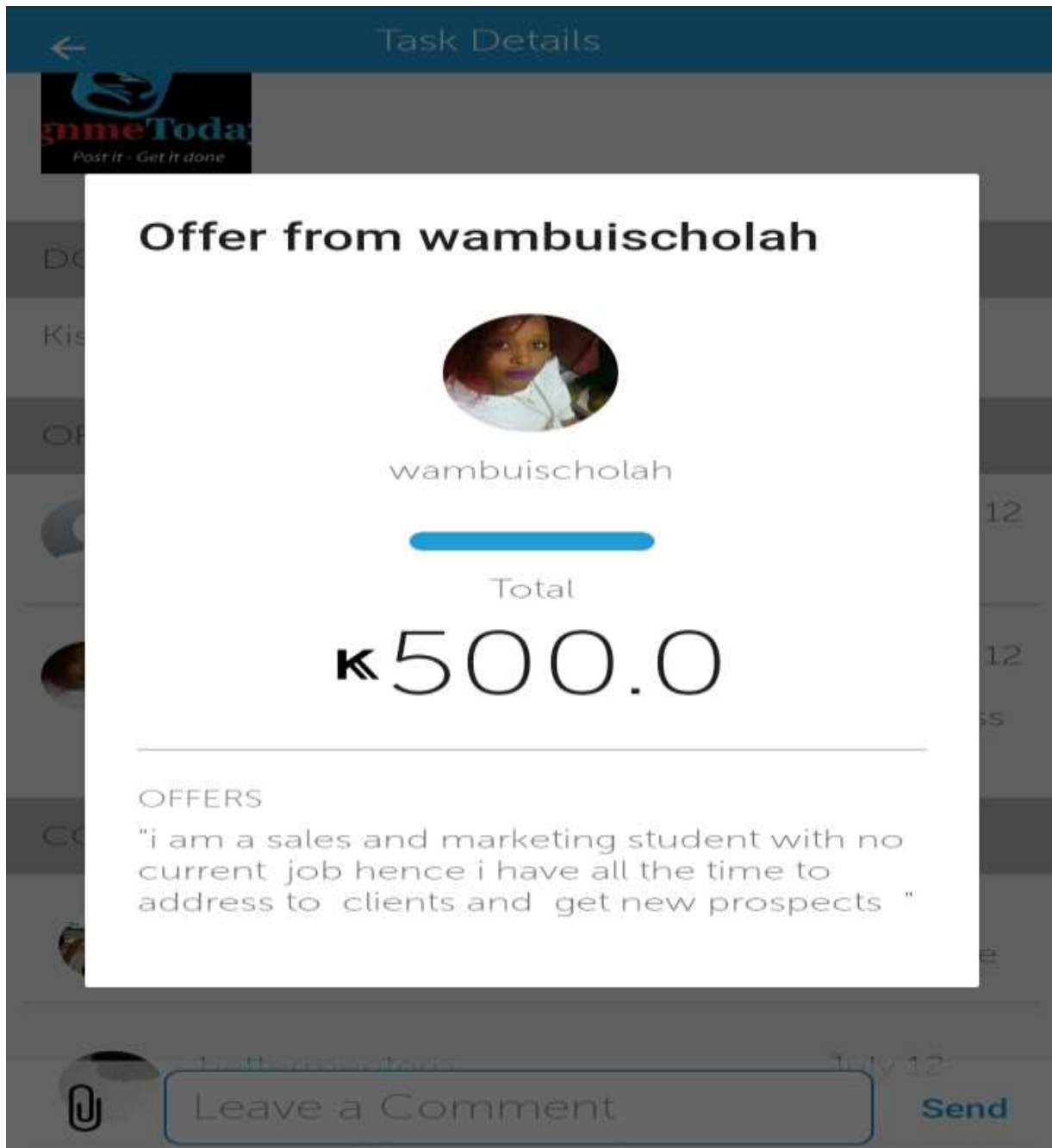
Figure 27: Task offers with comments

Task Details

wambuischolah   July 12
i am a sales and marketing student with no current job hence i have all the time to address to clients and get new prospects

COMMENTS

winfred_mutisya   July 12
Hi, I would like to run your social media page

bettermentgrp   July 12
hi Winfred, what is your offer?

bettermentgrp   July 12
Hi, Winfred, how much? I need one now

lagats   July 12 ✕
Hi, is the job available?

wambuischolah   July 12
i will do it for 500ksh day
A good professional job

Leave a Comment   **Send**

Figure 28: Expired Tasks
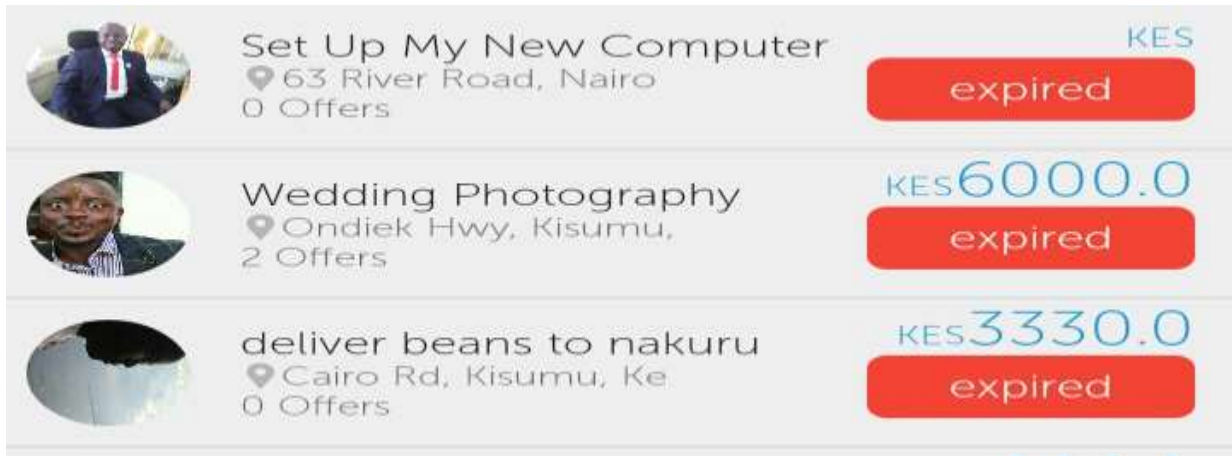
Expired tasks are flagged by the system to indicate the deadline has passed.
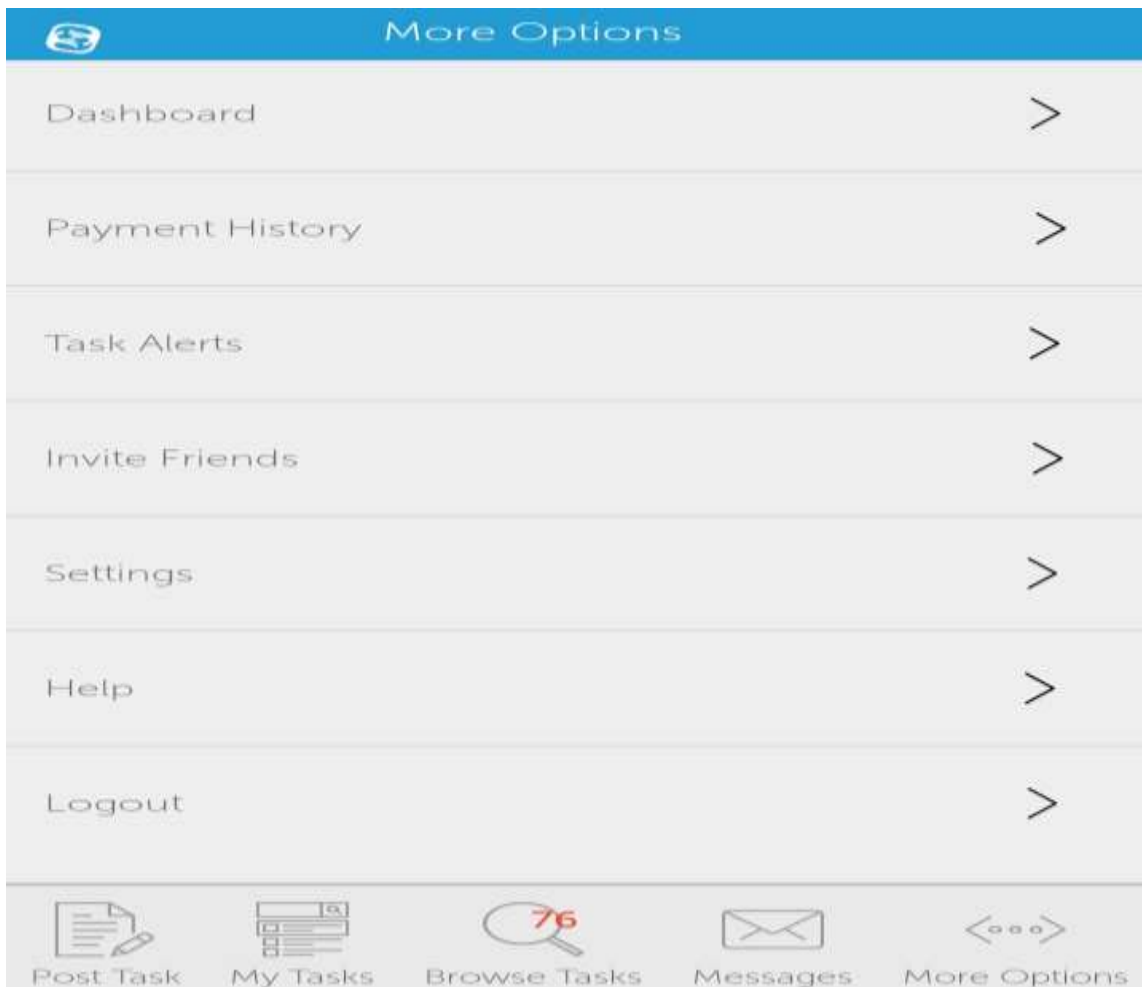
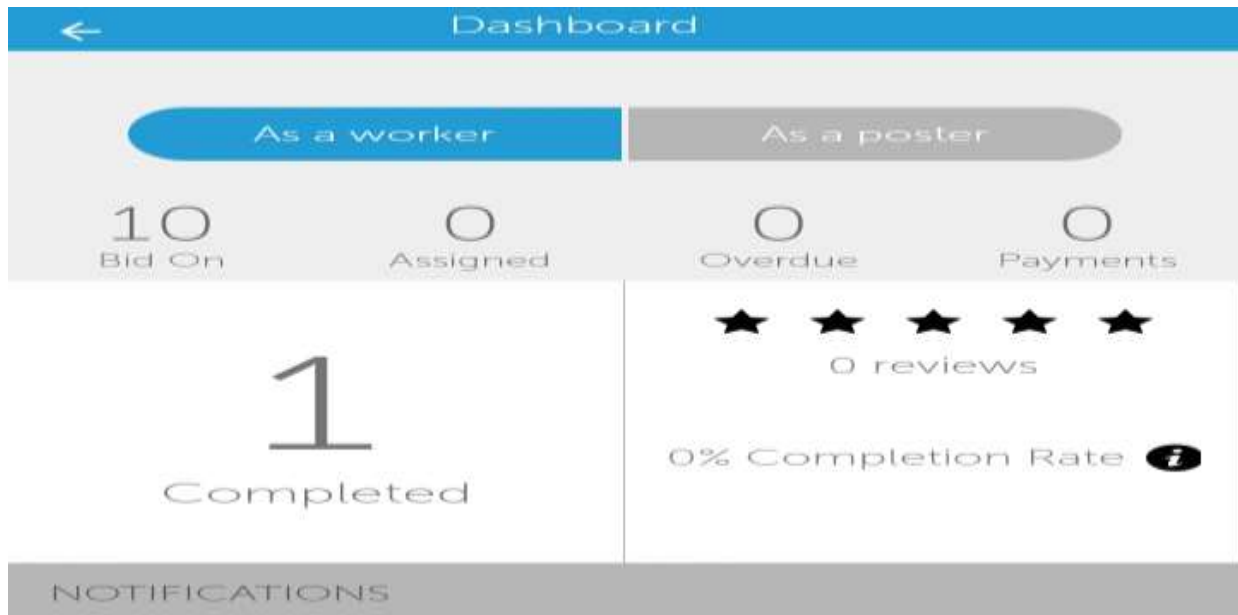**Figure 29: Options prototype.**
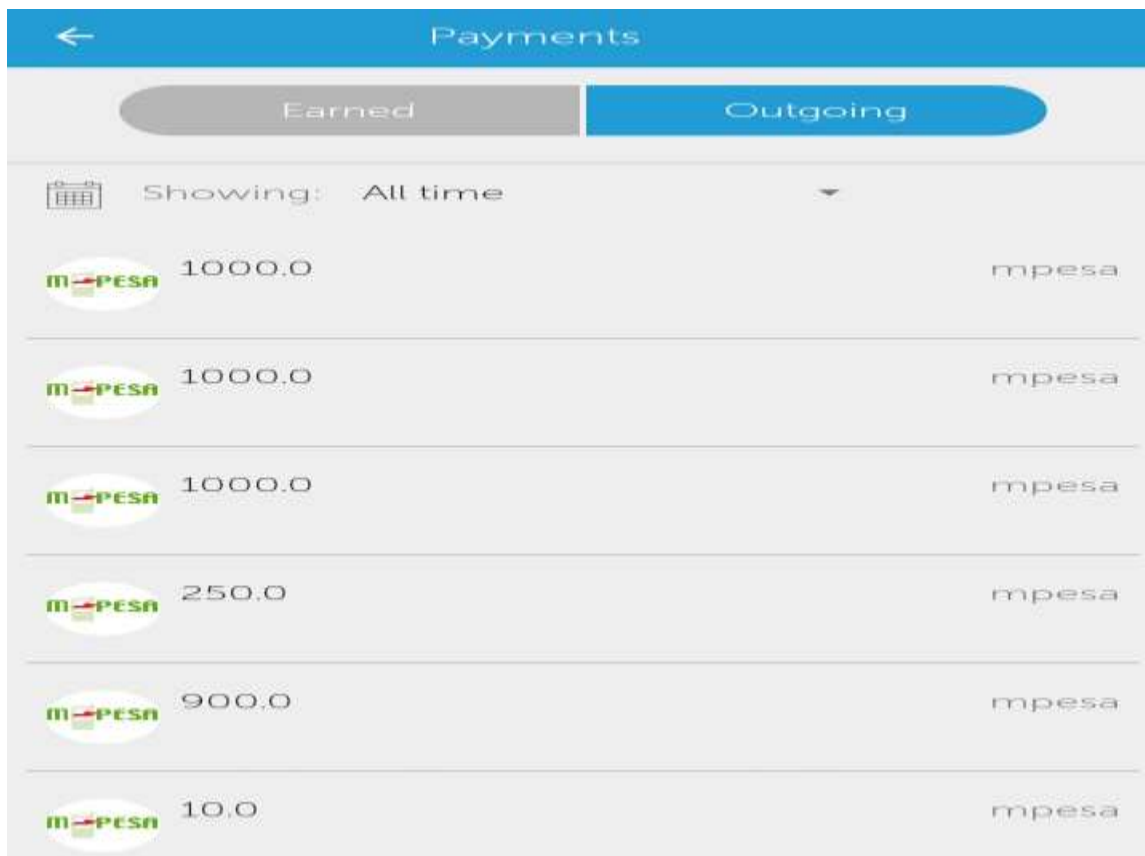
Figure 30: Dashboard

Figure 31: Payments module

Figure 32: Adding a task.
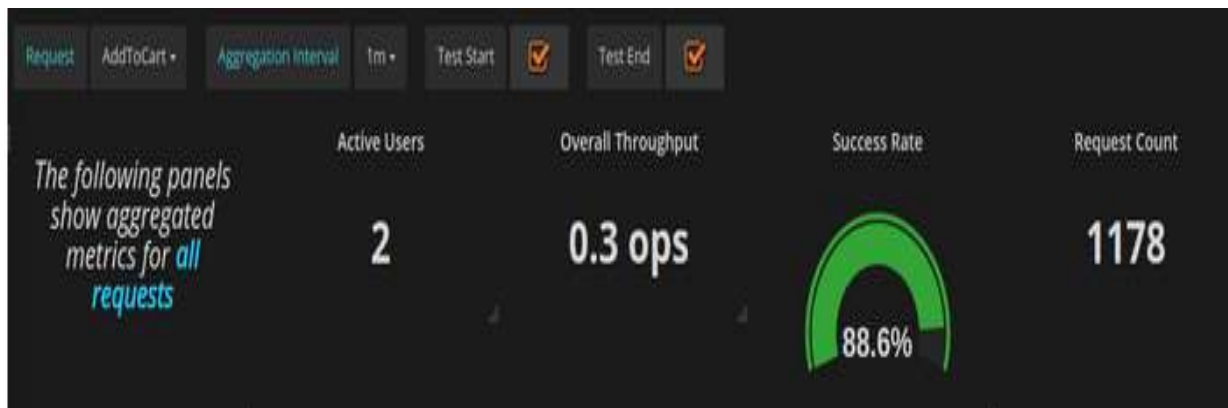

Figure 33:Peer-to-Peer test.

Figure 34:P2P Communication illustration.

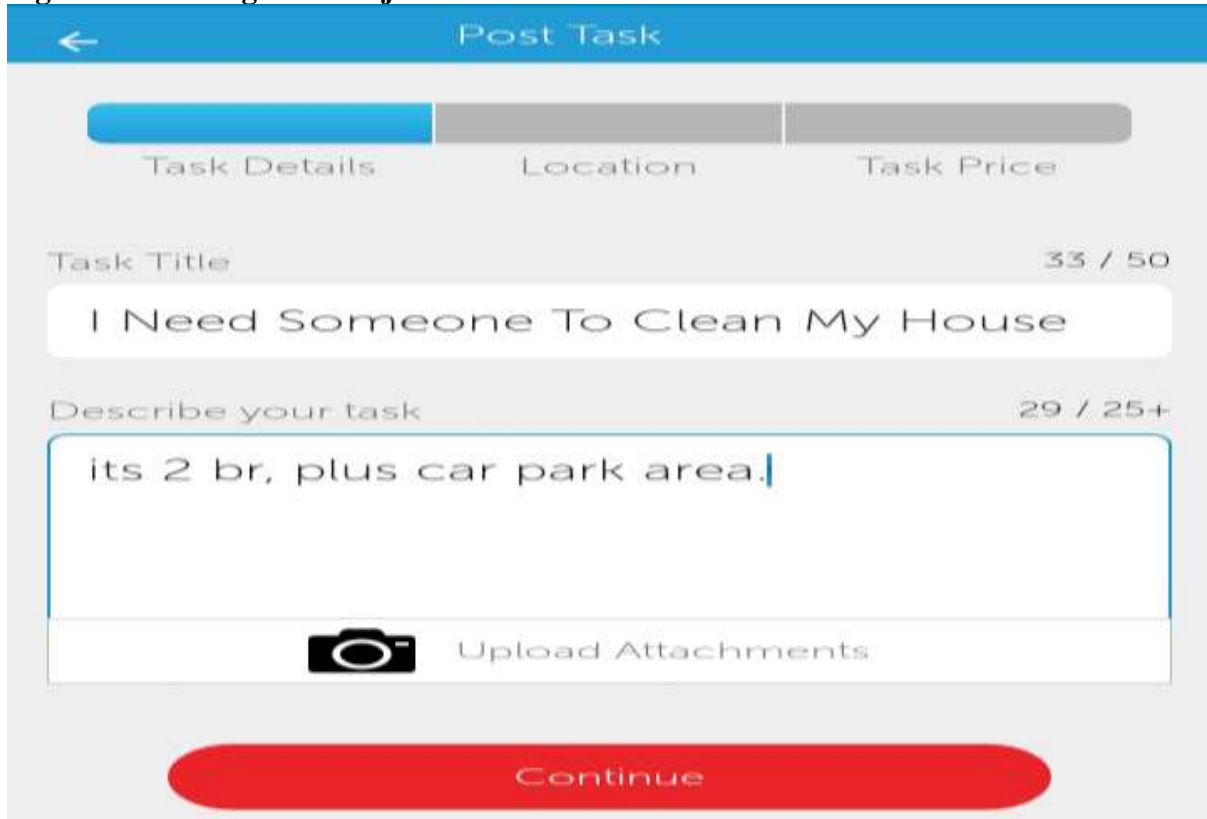
Figure 35: Posting a casual job.

Figure 36: My Posted jobs
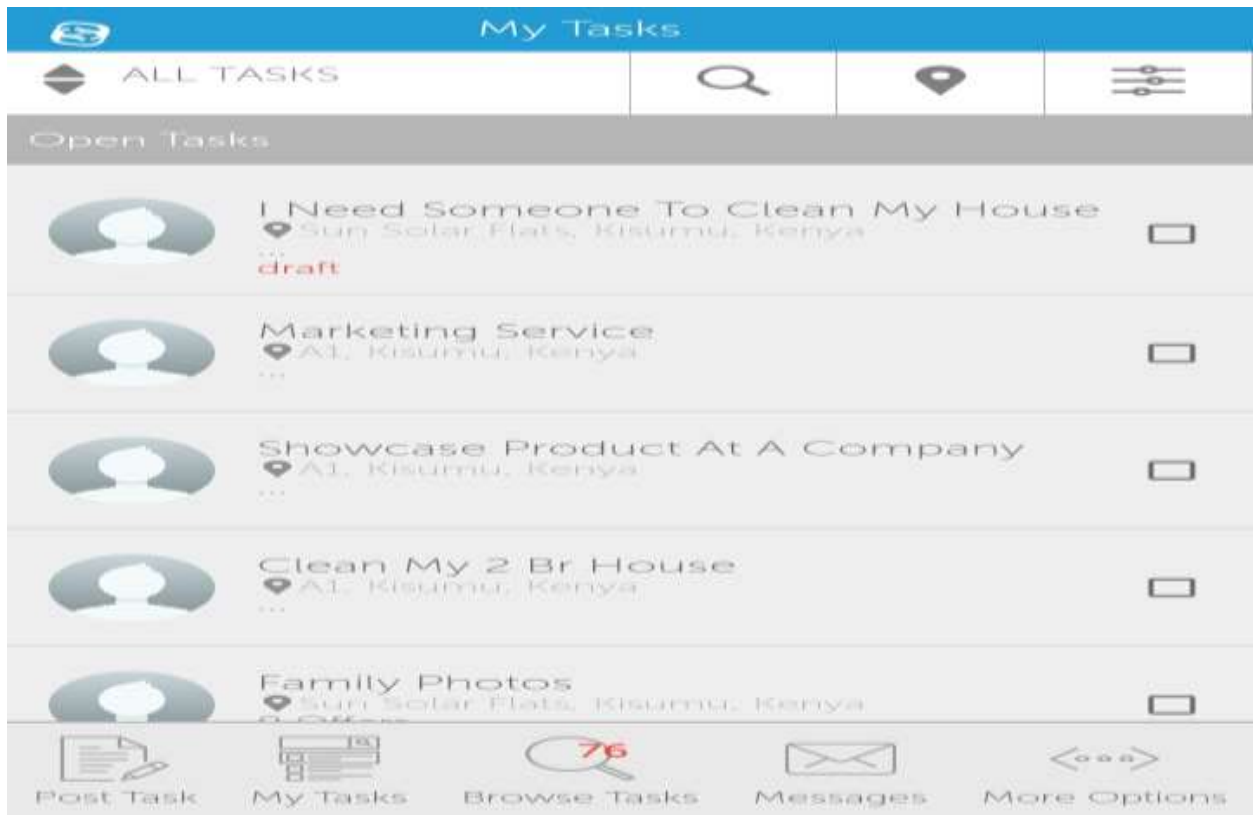
4.5.7 Location tracking Test.

As shown in Fig 37, 820 counts of places API and 38 counts of Geocoding were reported.

Location feature was an important consideration on the application for enhanced security and

tracking.

Figure 37: Geocoding Usage

Source: AssignMeToday [assignmetoday]

Product	Resource Type	Interval	Usage
Places API	Autocomplete - Per Character	Jul 1 - Jul 29	820 Counts
Geocoding API	Geocoding	Jul 1 - Jul 27	38 Counts
Credit	Maps Free Tier	Jul 1 - Jul 29	

4.5.8 Social Network integration tests.

The application link was shared on social media platform (specifically facebook), and total number of
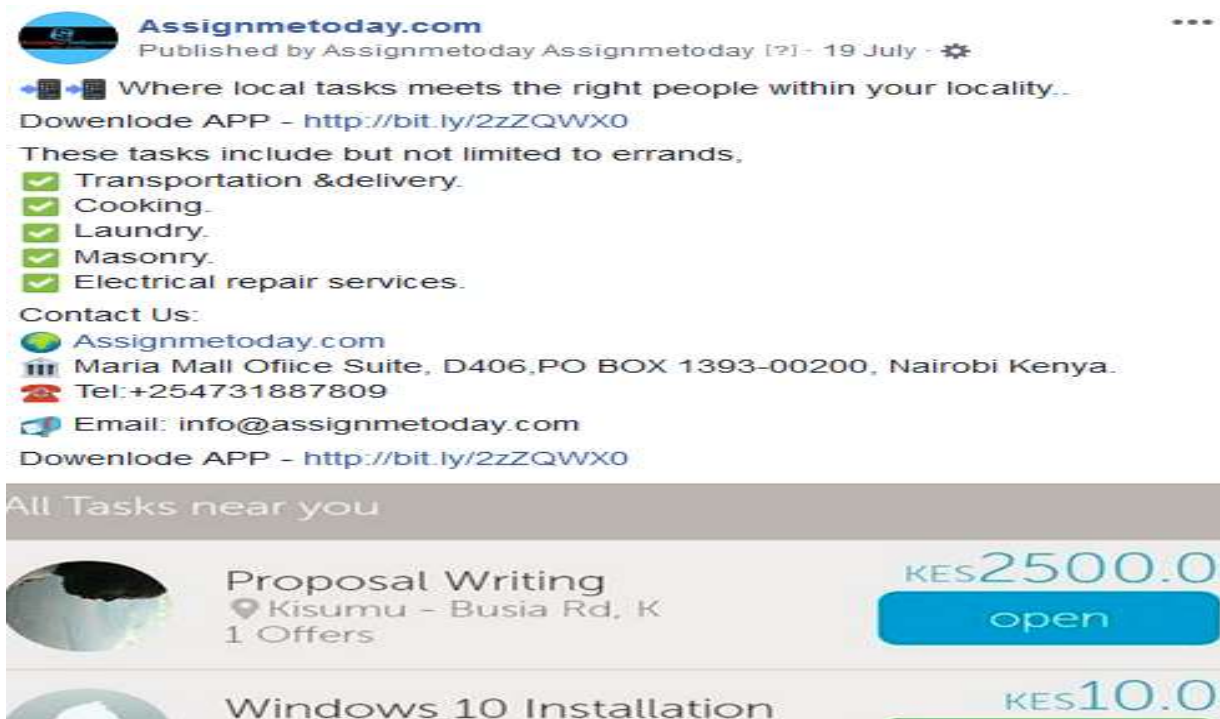
466 users were reached in one day as shown in Fig 38.

Figure 38: Social targeting users.

Figure 39: Landing page design.

4.6 Results and discussions.

4.6.1 Results and discussion for objective 2.
The review of job matching systems and other solutions locally and globally was done in background search and literature review (Chapter 1 and 2). Literature for this project was collected from online libraries, academic research databases and some specialized articles were retrieved through Google using research questions. The literature review was based on more than thirty sources. The review of literature was based on 5 goals that were proposed by (Ocano, Ramamurthy and Wang, 2015). Literature review enabled researcher to make references on job matching systems, state of practice, concept of Casual employment, existing job matching systems in Kenya, existing job matching systems across the world, desirable attributes of job matching system, challenges of casual job matching systems and evolving application development methodologies.

The results of the review guided researcher on different aspects as summarized below.

Definitions of terms and keywords: Definitions were made clear at every stage of the research process. This is evident in all Chapters of the document. Search for background information and literature review helped the researcher to have better understanding of the casual labor market and its dynamics, vague and ambiguous definitions in question, and general understanding of variables.

Matrix comparison: The review enabled the researcher to develop a matrix analysis that was captured and presented in a tabular format. The matrix analysis was very important since it enabled informative evaluation of existing systems, and resulted to summary of proposed features in the new system. This is illustrated in Table 1.

Design comparison: Through review, different algorithms were compared. Naïve bayes algorithm was adopted and was modified to address the existing shortcomings. This is illustrated in Chapter 2 and 3.

4.6.2 Results and discussion for objective 3

According to casual workers and employers who participated in research- as indicated in Fig 9 &10, the new assignmetoday.com application was well received. The application will feature a user-friendly, responsive design; a mobile app; casual job matching tool. These requirements were exhaustively elicited from participants. They were summarized under functional and non-functional requirements as shown in Table 3. Through evolutionary prototyping, the researcher came up with 21 revisions to deliver the latest APK of the application (demonstrated in Fig 25 through 61). The refinement was a very important step to ensure user-centered product that dedicates to the users.

Early in the research process, participants' definitions of prototypes were scanty. Their definitions were not broad and refined. Some later reported actually using prototypes during their previous academic-based courses. For example, only seven participants mentioned early on that prototypes could be used for communication, yet at end of it, all participants reported using prototypes as tools to communicate ideas, learn, and track milestones throughout their project. This was a very important to achievement of research objectives.

The developed system was adequately subjected to different tests. The results were satisfactory.

4.6.3 Results and discussion for objective 4.

Focus group interviews were conducted for a period of 4 weeks (1st -30th July), with two population of casual workers and casual employers (Table 2). The main intention of the focus group was to engage the team to establish their reasoning and perception, on convenience and

usability of the developed application. The researcher designed a thematic FGDs likert chart (available at Appendix 4), five point theme that guided the whole focus group discussion interviews. The response rate was impressive at 100% as presented in Table 3. Most of the respondents were satisfied with the new casual job matching systems especially on ease of use, efficiency, effectiveness, mobility, and thus general usability. Each focus group discussion lasted for at least two and half hours. Participants were encouraged to give suggestions on any changes, corrections, comments and on the interface design of the application.

The focus group generally gave a positive rating, with satisfaction rating of 76.25%. This is illustrated in detail in Fig 3.

Some oral comments from participants.

"We would certainly use this again and we highly recommend this approach to recruitment. It saves us time in selecting the best candidates for a task" –focus group participant.

"New job matching system to offer user-friendly, mobile design and increased access to casual jobs" –focus group participant.

5.0 Conclusion and Research contribution.

5.1 Introduction

In this chapter, the researcher makes summary, conclusion and recommendations based on the research findings and analysis done in previous chapters. The conclusion is a summary of the report, including brief explanation on certain observations, while the recommendation will give suggestions and advice based on the research findings.

5.2 Conclusions

5.2.1   Participants' conceptions of developed prototypes and research.

According to casual workers and employers who participated in research- as indicated in Fig 9 &10, the new assignmetoday.com application was well received. The application will feature a user-friendly, responsive design; a mobile app; casual job matching tool. The requirements were exhaustively elicited from participants. They are summarized under functional and non-functional requirements as shown in Table 4. Through evolutionary prototyping, the researcher came up with 21 revisions to deliver the latest APK of the application (demonstrated in Fig 25 through 61). The refinement was a very important step to ensure user-centered product that dedicates to the users.

Early in the research process, participant's knowledge of prototype was scanty. In very minimal cases were their descriptions as broad and refined. Some participant however reported actually using prototypes during their previous academic-based courses. For instance, only seven participants mentioned early on that prototypes could be used for communication, yet at end of

it, all participants reported using prototypes as tools to communicate ideas throughout their project. This was a very important factor to achievement of research objectives. Prototyping came out as primarily a design activity, although researcher used software development lifecycle methodologies to ensure that software prototypes evolved into technically sound working systems and we used scientific methods to study the effectiveness of particular designs. We can then look at prototypes as both concrete artifacts in their own right or as important components of the design process. Prototype enabled evaluation and feedback, which was central to Assignmetoday.com interactive design. Prototypes answered questions and support research designer in choosing the best alternative. When viewed as artifacts, successful prototypes provided several characteristics:

i. They support creativity, helping the developer to capture and generate ideas, facilitate the exploration of a design space, and uncover relevant information about users and their work practices.

ii. They encourage communication, helping designers, managers, software developers, customers, and users to discuss options and interact with each other.

iii. They also permit early evaluation because they can be tested in various ways, including traditional usability studies and informal user feedback, throughout the design process.

All participants reported using prototypes to test and validate the artifact as demonstrated in Chapter 4.

5.2.2 Assignmetoday.com platform as casual labor connector for the digital generation.

Development of digital platforms will increasingly help connect casual job seekers to employers. These was evident throughout this research process. Platforms such as Assignmetoday.com, can

aggregate large amounts of data in relation to casual labor market, accomplishing two major things.

1. They make it easy to learn and identify available casual jobs in the locality and requirements.

2. They reduce the cost of engaging a casual worker and also allow casual workers and employers to market themselves to a wider audience.

The millions of people at the base of the casual labor market pyramid most times lack the information, and are disadvantaged in terms of social networking and resources to find jobs. To assist them meet their employment needs, we need to adopt more innovative and effective ways of linking them. Digital casual job matching platforms such as assisgnmetoday.com can be used to reduce significantly large information gaps. Such technological implementation can increase overall productivity in casual arena by improving the allocation of labor and skills to the most available and suitable opportunities. This is a direct intervention to Wandera's concern in his publication in International Journal of Humanities and Social Science (2011).

The study concludes that existing offline solutions (such as newspaper prints, notice boards, or simply walking around knocking on doors) are primitive, expensive and slow. With more and more people connected using SMART phones, even those at the base of the pyramid are increasingly using these connections to access job platforms. The main feature of these platform is their ability to have a giant database of casual job seeker profiles, positions, and employers. This gives digital casual matching platforms the following advantages over offline services:

Job information can be democratized: Open access casual job platforms level the playing field, particularly for casual workers; those who do not have professional or wide social networks or cannot otherwise access relevant sources of information. This platform enables gap

between applicants "in the know" versus those with fewer connections or skill can lead to more efficient labor markets and to higher wages for workers. This is illustrated in Fig 29.

Cost for searching jobs is lowered: As compared to offline platforms, digital platforms dramatically reduce time and money spent on the job search for both the casual job seeker and employer. Digital platform enable faster communication, screening, assessment, and matching.

More ways of notification are possible: Through digital job matching platforms such as Assignmetoday.com, job seekers can showcase their skills, experience, references, and other traits to a wide set of potential employers, and freelancers can display their work and provide recommendations. This includes soft skills, digitally awarded badges that validate a specific skill. Digitally awarded badges and endorsements are becoming more recognized, accessible, and legitimate, and can facilitate better job matching.

5.2.3   Future Opportunities with Assignmetoday.com job matching system.
The researcher identifies two main areas of opportunity for the future of digital casual job matching platforms:

1st Opportunity: Digital casual matching platforms can use their valuable discovery of high quality data not only to reveal, but also to actively initiate and advertise the latest, and in-demand skills to job seekers.

2nd Opportunity: Casual job matching platforms can allow job seekers to show case and demonstrate credibility for their skills, increasing the value of progressive learning and enabling long term job advancement. Typically, it is difficult for workers engaged in casual task-based work to build a career with growth potential that will help them progress up the socioeconomic ladder. Casual job platforms can build functions that certify trainings and upgrades in abilities in terms of skills, such as digital certification, employer ratings, and peer endorsements, which

incentivize workers to improve their skills. Through organized online courses or local training centers, users can be awarded with digital badges that certify their technical skills, credentials, or even nanodegrees. These digital badges can help a person to prove their experience and seniority, and support progress.

5.3 Limitations and future work

The research had one limitation. This was the number of participants. With the small sample size, our findings might not be generalizable, but that said, qualitative research aims for depth and transferability rather than generalizability (Daly et al., 2013; Marshall, 1996; Patton, 2014). In this study, we developed an understanding of participants' underlying reasons and motivations for using prototypes, provided detailed descriptions of our participants' actions, and described the research context and the assumptions made (Patton, 2014; Whittemore, 2015)

5.4 Research contribution.

In summary, the research contributed to the following:

i.   Every prototype revision enabled the researcher to identify new innovative features and process.

ii.   Through prototyping for learning methodology, we can quickly test a concept, gather feedback from participants and design a plan with our team. We can share and explore, think and experiment, more and more times.

iii. Project demonstrated leadership through design innovation.

iv.   Value of the process. By developing prototypes as part of the design process, we are helping parties see that we value the whole process and not just the product.

v.   Second chances apply. Prototyping gives researcher numerous opportunities to get their designs right. There is no expectation to get it right the first time. By giving our designs and our designers a second chance, prototyping' can take away a lot of pressure.

vi.   Attention to detail is key. By testing prototypes and making changes as a result of our evaluations and trials, we make much more detailed and precise adjustments and changes to the designs

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APPENDIX 1: QUESTIONNARE USED TO ACHIEVE OBJECTIVE 1

This questionnaire is to collect data that relates to interrogating challenges affecting parties in casual job market in Kenya. This is to address one of my objectives in my research project.

Kindly note that this questionnaire will only be used for the academic purpose of undertaking this project.

Do you offer casual employment or offer casual services in your locality?

☐ Yes

☐ No

Have you ever used casual job matching application?

☐ Yes

☐ No

What is your reaction to poor mobile app experiences?

☐ Would not take any action.

☐ Announce on social media.

☐ Contact customer service.

☐ Less likely to go to company website.

☐ Give job matching app low rating.

80

☐

☐   Tell others about poor experience.

☐   Less likely to use the application.

Indicate challenges or feedback you encounter matching up a casual job.

☐   Takes long time to identify potential casual worker in my area.

☐   Low pool of casual workers to choose from.

☐   Existing casual job matching platforms not adequate.

☐   No mobile based casual job matching systems

☐   Lack of platform to facilitate communication between casual worker and employer.

☐   Web based location system not accurate.

Do you desire for a new casual job matching system to connect workers and employers?

☐   Yes

☐   No

If yes, state what characteristics would you like added?

What kind of mobile platform do you use?

☐   Android

☐   Other

Thank you for your kindness to respond to this questionnaire. Kindly give more feedback on www.assignmetoday.com

APPENDIX 2: Focus group discussion Likert chart

Focus group Question	Member 1	Member 2	Member 3	Member 4	Member..n
1. Overall, are you satisfied with how it is easy to learn and use job matching system?					
2. Can you successfully complete your task using system?					
3. How do you rate quality of data generated by android application?					
4. How fast can you post a task on the android app?					
5. What would you want improved on the system?					

APPENDIX 3: LANDING PAGE DESIGN.