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**AN APPLICATION FOR CAREER PATH DECISION MAKING AMONG HIGH
SCHOOL STUDENTS: CASE OF NAIROBI**

NJERU DANIEL NDWIGA

Submitted in partial fulfillment of requirements of Master of Science in Information Technology

FACULTY OF INFORMATION TECHNOLOGY

Strathmore University

Nairobi, Kenya

VT OMNES VNVM SINT

June, 2016

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Abstract

In many developing countries, young people have and are embracing formal education as this has proven to be one of the main ways of alleviating poverty. In Kenya, the level of literacy has taken an upward trajectory for more than a decade now. On the other hand, studies show that majority of Kenyan Students do not receive proper and adequate career guidance in their early ages so as to make informed decisions on which career best fits their preferences. In addition, students neither have adequate information of the available career paths and occupational opportunities neither are they well informed of which opportunity they best fit. Furthermore, Information communication and technology has not been adequately leveraged in education sector to facilitate students in making careers that they best fit. The purpose of this study is to develop an application that can facilitate students in making informed decision about their career aspirations. The study was guided by the objectives: To establish the specific data and information necessary for determining a career path of a student, to review the challenges that exist in the choice of a career path among students, to review the existing techniques that are used in determining the career path of a student, to develop an application for career path decision making and to test the application. To achieve these objectives, a thorough review of the scholarly literature was carried out, the researcher also carried out a pilot study to establish the viability and validity of the proposed solution, and spiral model of system development lifecycle was used to further define, model, develop and validate and implement the system. The researcher further reviewed the solution developed in comparison with the others that exist. Finally, recommendations were made and suggestion of further research work was proposed.

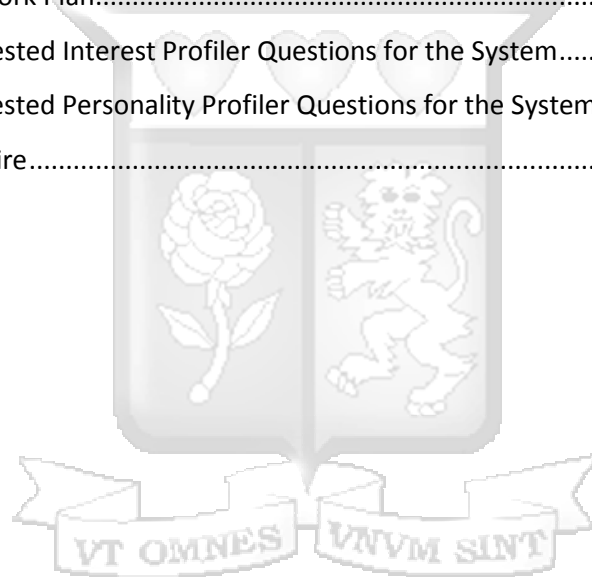
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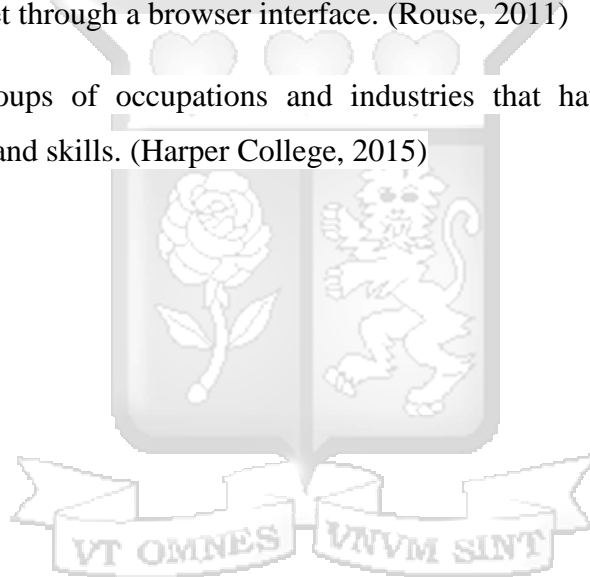
Definition of Terms

A **Career Path** is the journey you take to reach your goals throughout your life. It is the combination of your experiences in life, your education and training, unpaid work and your interests. Career path involves formal education and training, non-formal learning, developing your personal skills and interests, and community services and programmes. (ACIES, 2013)

A **Career Path** is a coherent, articulated sequence of rigorous academic and career courses, leading to an associate degree, baccalaureate degree and beyond, an industry-recognized certificate, and/or licensure. (Harper College, 2015)

A **Web application** (Web App) is an application program that is stored on a remote server and delivered over the internet through a browser interface. (Rouse, 2011)

Career Clusters are groups of occupations and industries that have in common a set of foundational knowledge and skills. (Harper College, 2015)



Abbreviations and Acronyms

CAK	Communications Authority of Kenya
DBMS	Database Management System
DFD	Data Flow Diagram
GDP	Gross Domestic Product
GPS	Geographical Position System
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
ICT	Information and Communication Technology
JAB	Joint Admission Board
KCSE	Kenya Certificate of Secondary Education
KESSP	Kenya Education Sector Support Program
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Examination Council
KUCCPS	Kenya University and Colleges Central Placement Service
MoEST	Ministry of Education Science and Technology
SAT	Scholastic Aptitude Test
SMS	Short Message Service
SSD	System Sequence Diagram
SQL	Structured Query Language
TVET	Technical and Vocational Educational Training

Acknowledgements

First, I give thanks to God for the strength and breath of life for the two years that I have been pursuing my studies. I am highly indebted to everyone who contributed towards the success of this piece of study. My appreciation goes to my wife Rachael who has been my accountability partner in this venture. Her support has gone a long way in realizing this achievement., to Robert John Lawrence for mentorship and financial support, to Mom and Dad for their unquenchable love, support and inspiration, to classmates for the positive criticism and encouragement, to friends like Cyrus Maina, Stephano Mmari and others for their feedback during research process, to the Strathmore University Management for their well thought co-ordination of the research development activities and to my supervisor, Dr. C. Wekesa for his insights, sacrifice, and corrections throughout the research process.



Dedication

This work is dedicated to my son Bryanrob and to my Pre-school teacher, Teacher Lucy.



Chapter One: Introduction

1.1 Background of study

The economy of Kenya has grown at an average rate of 3.7 per cent for the last 15 years. Research has shown that without ICT, the growth would have been at 2.8 per cent and per capita income would be stagnating. There is an approximately one-quarter of Kenya's GDP being supported by information communication and technology. Additionally, Kenya has been ranked among the top five African countries with the fastest growth in telecommunication, infrastructure, and mobile money innovations such as M-pesa of Safaricom, Equitel of Equity Bank among others (Ogutu, 2015).

On the other hand, internet penetration in Kenya has been a key contributor to the development of ICT in the country. According to (CAK, 2015) Internet subscriptions has increased from 2.7 million in 2006 to 12.3 million subscriptions in 2011. The same report indicated that the growth in satellite subscriptions had also increased by 75 percent from 727 in 2006 to 1278 in 2012 while the national bandwidth had increased from 5.5 percent to 57.7 percent. Notable is that towards the end of the year 2013, the number of internet subscribers had increased to 19.6 million which totals to 49.7% of the Kenyan population. Further, due to availability and affordability of smartphones today, the number of internet subscriptions in Kenya by the year 2015 stood at 60.4% of the total population with 99% being mobile data internet subscriptions. This clearly shows that there is an upward trajectory in terms of utilization of ICT in business processes of Kenyan economy. Indeed, it is evident that ICT plays a major role in our day-to-day lives, addressing challenges facing Kenyans in general. Particular sectors such as finance, health, education, agriculture and the Government are quickly embracing technology for dissemination of information, enhancement of service delivery and to reach their customers more effectively and efficiently (CAK, 2015).

Education is at the core of the Government's strategy to achieve vision 2030 and also attain high level of quality and relevance. The government recognizes that education, training, science and technology fundamentally equips citizens with knowledge and skills that enable them to make informed choices about their social and economic growth hence leading to the overall growth of the economy (MoEST, 2013)

In 2005, the Ministry of Education developed a Kenya Education Sector Support Program (KESSP) that focused on ICT as one of the priority areas with aim of mainstreaming ICTs into teaching and learning process. The National ICT policy, further, embedded this intent as a national priority and provided the impetus for the ministry to develop its sector policy on ICT in Education (Kagwiria, 2014). Despite of this brave move to integrate ICTs in education, training and research, a number of issues have remained as barriers to full attainment of the desired goals. This include: Access, funding, inadequate ICT facilities, high cost of development of interactive e-learning content, ICT not embraced as medium of instruction and management tool, inadequate capacity for teachers, absence of ICT curriculum, dynamic nature of technology, inadequate capacity for maintaining ICT equipment, minimal use of ICT by the Ministry of Education, science and Technology, inadequate and limited monitoring of the utilization of ICT in School and limited skills by the users on disposal of the e-waste a just to mention but a few (MoEST, 2013).

Regardless of all the challenges, it is still clear that education and training play an essential role in promoting economic growth and social economic development of the nation. TVET and skills development have been identified as major and growing priority within the country. Additionally, university education plays a key role in the development of human resource which is fundamentally important in achieving a sustainable growth of the nation.

This further explains why there has been a constant review of the education system, in quest to curb the existing challenges since the colonial era where education was examination oriented and lacked relevance to the needs of the country (Bathseba, Norman, & William, 2000). The introduction of the 8-4-4 system of education in 1980s was a major milestone in the education system. The 8-4-4 system of education sought to provide life-long education to make individuals self-reliant, self-sufficient and productive in both agriculture and industry. Even though the Kenya's Education system has brought about some positive changes, there is need for a formal and longitudinal way of determining the students' choice of career so as to realize even more successful professionals (Eshiwani, 1993).

Despite of the underlying facts that education is at the core of the nation's economy, many of the youths in the country, and indeed in many countries, are not certain of what career to pursue. This is evident from the statistics that show students keep on changing their area of profession or their pursuits in institutions of higher learning. As a matter of fact, Deliotte (Kayima, Kivisi, & Kasamani, 2015) Shift Index Survey revealed that 80% of the professional in the job market are dissatisfied with their jobs (Shontell, 2010).

Selecting an appropriate career is a critical task that faces all adolescents in all societies. The readiness of adolescents to make such important career decisions needs to be investigated. Since there is absence of proper and adequate career guidance, career decisions are influenced by factors such as academic performance and training policies, gender, available career information and influence from parents and guardians (Bathseba, Norman, & William, 2000). On the other hand, the choice of career and abilities of a given student have solemnly been tagged on the performance in the Kenya Certificate of Secondary Education examination. The Ministry of Education Science and Technology (MoEST) has used this performance as the selection criteria for admitting students to public universities to pursue different career paths. Of interest, the co-curricular activities and the leadership roles of a specific student are not used in making an informed decision of which career path a student should take. This has led to wrong choice of careers, lack of fulfillment in a certain area of profession taken by the young people hence leading to poor performance in the job market.

According to (Michael, 2002), If career planning were done in an efficient manner, students would at the very least be following a career plan of informed decision-making, rather than one of happenstance. There is no structured participation of parents, teachers and students in career path decision making (Bathseba, Norman, & William, 2000). According to (Ndiku, Nyaboke, & Owano, 2014) schools should build a foundation for data driven decision making. This can be attained by ensuring that student data is collected, analyzed, and stored using appropriate techniques on a regular basis under guidance from the principal and data teams (Lachat & Williams , 1996) claims that majority of the high schools lack information system capacity necessary for strategically using data to identify achievement gaps, address equity issues,

determine the effectiveness of specific programmes and courses, and target institutional improvement and shaping the career paths of its students.

1.2 Problem Statement

According to (ACIES, 2013), a career path is the journey you take to reach your goals throughout your life – for example, moving from Graduate Assistant to Tutorial Fellow, Lecturer, Senior Lecturer, Associate Professor and Professor. The milestones in this case correspond to the positions held throughout one's life. Successful career path development involves formal education and training, non-formal learning, development of personal skills and interests, and participation in community services and programmes.

In Kenya, for example, it is common every year to have successful Standard 8 graduates claim they want to become doctors, engineers, lawyers, etc. In fact, it is known that Form 4 graduates do choose totally incompatible careers for their university education – such as medicine first, engineering second, and law third. Further, students are known to choose a line of work because one of their family members works in that line or because that line of work pays well.

From this common case, it would appear that career decision making is made without adequate information. Indeed, career path decision making in Kenya – and many other countries – has not taken an objective approach.

Information systems are used in many aspects of decision making, and it is preferable that young people have the necessary tools to facilitate their choice of careers. There are several information systems tools that have been used in the past to curb the challenge of career choice. For example, (Kayima, Kivisi, & Kasamani, 2015) developed an application that establishes one's capabilities or strengths, personality and matches these attributes to the possible career options. This application achieves this by crawling the web with efficient matching algorithms. This application is ideal for career choice and university choice detection but it would be preferable if career decisions are made out of data that is collected over a period of time. Additionally, it would be ideal if such data is collected from relevant people who influence career decisions among students such as teachers, parents and students themselves.

This piece of study therefore, proposes a web application for career path decision making. The input of the system consists of data of the students' talents and capabilities, skills and academic

performance as observed and collected from the parents, teachers and students. The system uses computational algorithms to map students to at least three career paths. Additionally, the web application will serve the users with the tips of choosing a career paths, available institutions of higher learning and the courses they offer and different career paths as provided by the Ministry of Education Science and Technology.

1.3 Research Objectives

- i. To establish the specific data and information necessary for determining a career path of a student
- ii. To review the challenges that exist in the choice of a career path among students
- iii. To review the existing techniques that are used in determining the career path of a student
- iv. To develop an application for career path decision making
- v. To test the application

1.4 Research Questions

- i. What data and information is most suited to use in career path decision making?
- ii. What are the challenges that students face during career path choice?
- iii. How are the existing web technologies techniques used in career path decision making?
- iv. How can the application for career path decision making be developed?
- v. How can the said application be tested?

1.5 Scope of the Study

The study was conducted in Nairobi County, Kenya. The study sought to gather information together in regard to five major career paths. These career paths include: Information Technology, Education, Development Studies, Medicine and Business Management. In this piece of study, data was collected from corporates and continuing students pursuing the said career paths in learning institutions within the said County. The traits and characteristics of students who would suitably fit in this career were classified and mapped to their respective career paths.

1.6 Significance of the Study

This study is important because it reduces the information gap for Kenyan students who for a long time have struggled with career decision making. It is valuable to students because the application will bridge the gap that exists when people are making career decisions. The learning institutions could use the findings in this study and the application to guide students in making appropriate decisions on university courses and careers. The study is important for KUCCPS because it simplifies the process of selecting university courses and ensures that the body achieves maximum results in their placement processes. (Muigai, 2011)

The ultimate goal will be to have successful career men and women who are productive in different areas of profession and hence building the economy.

1.7 Basic Assumptions of the study

The study is carried out under the following assumptions:

- I. Respondents gave accurate, truthful and honest responses to the items in the questionnaires;
- II. The factors affecting career decisions are generalizable
- III. The expected deliverables of this research can be attained within the stipulated timeframe.
- IV. That the data collection instrument is valid and is measuring the desired constructs; and
- V. The sample used represents the whole population and such can be replicated to other areas.

1.8 Limitations

This study is limited in that it will only cater for five specific career paths. The study also will be carried out in Nairobi County only hence some of the factors that affect choice of career path in the rural areas will not be considered. The study also requires involvement of people with deep knowledge in different career paths, e.g. medicine, engineering, education, and biology e.t.c. hence this study would not be complete as such people were not part of the research process. The time constraints was also a factor that limited the research work from exploring an in depth analysis of the different career fields.



Chapter Two: Literature Review

2.1 Introduction

Career information, advice and guidance tries to facilitate transitions in and out of work and learning by providing insight into relevant work and learning opportunities. Career decisions are not a straightforward process and a multitude of factors may influence an individual's choices in regard to any given career (BSI, 2013).

A peer-review of scholarly literature on the topic was done. The chapter explores the decision making process and offers a brief overview of some of the main theories and models around career decision making. The review will also discuss some of the studies that touch on the key issues raised in the objectives. Additionally, statistical data on career path decision making will be discussed. Lastly, a summary of the gaps that exist in the scholarly literature will be discussed.

2.2 Theories on career path decision making

2.2.1 Holland Theory of Vocational Personalities in Working Environment

The theoretical model was developed for career guidance; it offers a typology framework on career interest and environments that is essential for career counseling and guidance. According to this theory, vocational interests (which are an expression of one's personality) can be expressed into eight typologies as shown in figure 2.1 below (Leung, 2008). The eight Holland interest typologies are arranged in an octagon in the order of RIASECLN which are Realistic, naturalistic, investigative, administrative, social, linguistic, enterprising, and creative (Leung, 2008). Accordingly, types that are adjacent to each other in the octagon have the highest degree of similarity in terms of their personality characteristics and vocational orientations, types that are opposite in the octagon have the least degree of similarity, and types that are separated by one interval have a moderate degree of similarity (Holland, 2013)

The degree of resemblance of a person to these categories can be assessed so as to generate a three letter code e.g. SIA, RIA to denote and summarize one's career interest. The first letter of the code is a person's primary interest type, which would likely play a major role in career choice and satisfaction. (Leung, 2008).

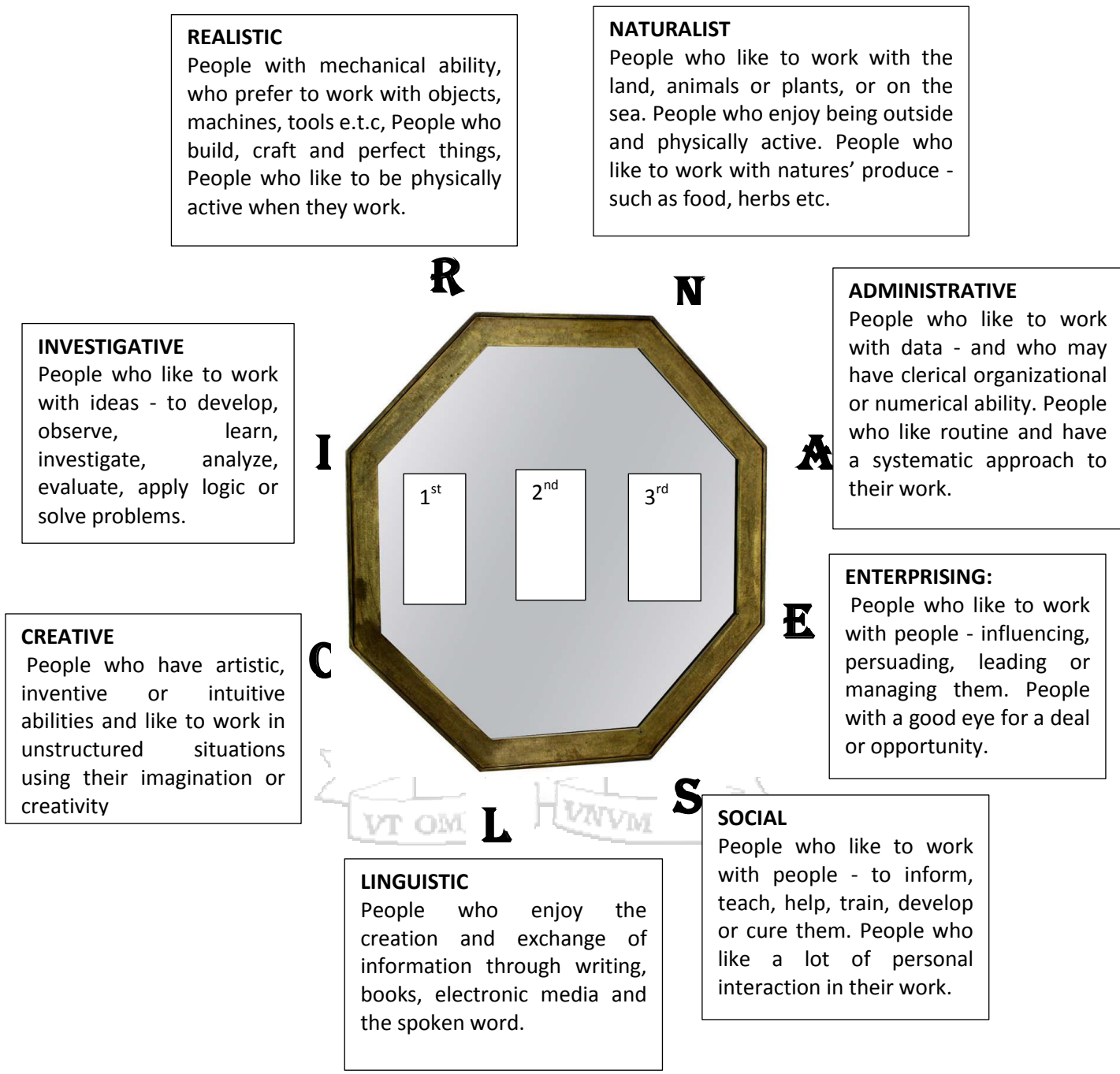


Figure 2.1: Holland's Theory

The second and third letters are secondary themes, and they would play a lesser but still significant role in career choice of an individual (Holland, 2013). Further to this classification, (Holland, 2013) postulated that vocational environments could be arranged into similar typologies.

This is because; the environment of a person significantly influences the choice of career in a person (Leung, 2008). People search for environments that would allow them to exercise their skills and abilities, and to express their attitudes and values. (Holland, 2013). The concept of “congruence” is used to denote the status of person-environment interaction. (Leung, 2008) A high degree of match between a person’s personality and interest types and the dominant work environmental types (that is, high degree of congruence) is likely to result in vocational satisfaction and stability, and a low degree of match (that is, low congruence) is likely to result in vocational dissatisfaction and instability (Holland, 2013). In addition to congruence and consistency, another major concept in Holland’s theory is differentiation. Differentiation refers to whether high interest and low interest types are clearly distinguishable in a person’s interest profile. An interest profile that is low in differentiation resembles a relatively flat line in which high and low interest types are not distinctive. In contrast, a differentiated interest profile has clearly high and low scores, suggesting that the crystallization of interest might have occurred, and readiness for career choice specification and implementation. (Leung, 2008)

2.2.2 Parsons Theory

This model/theory is a talent-matching approach which was later developed into Trait and factor theory of Occupational choice. The theory is centered on the concept of matching. According to this theory, occupational decision occurs when people have achieved: 1. an accurate understanding of their individual traits (Aptitudes, interests, personal abilities), 2. Knowledge of jobs and the labor market, and lastly Rational and objective judgment about the relationship between their individual traits and the labor market, this can be summarized as shown in figure 2.2 (Career New Zealand, 2015).



Figure 2.2: Parsons Theory of Career path Decision making

Parsons theory suggests seven stages that a career counselor should work through with clients. These are:

Collection of personal information: This helps in creating a statement of key facts about the person.

Self-Examination: a clear self-analysis is done in private through the guidance of the counselor. The counselor records all the tendencies and interests that can impact on the choice of a career choice of the person.

Decision making by the client: the counselor ensures that the decision and choice of vocation is entirely made by the client while the counselor takes a role of a guide.

Analysis: the counselor analyzes and tests the clients' decision to see if it is in line with the main quest

Mapping with vocational field: the counselor should be familiar with the industries hence point the client to the best training, apprenticeships or classification of industries and vocations that exist in the market.

Induction and advice: a broad-minded attitude coupled with logical and clear reasoning is critical at this stage.

General helpfulness: the counselor helps the client to fit into the chosen work, and to reflect on the decision (Career New Zealand, 2015).

2.2.3 Color Q Personality Style Self-Assessment Theory

According to Zichy, matching who you are with what you do seem like common sense, but the truth is that most people don't have jobs that truly complement their personalities. She argues that growth does not require significant change, or what we emulate, for example the "role models" because we are somehow innately inadequate. It is paramount for us to understand and accept dynamics of our own genuine style; its unique strengths and weaknesses and abilities. It also means that, in time we tone down some of our blind spots. Color Q personality style assessment model is a ten minutes self-assessment quiz that helps one to identify his/her specific personality type hence helps one to: Identify the type of work that you will inspire and exhilarate, determine the kind of boss and work environment you need to thrive, confirm the rightness of the path you're on or help you to find a better one. (Zichy, 2007).

The Color Q model is about coding people. It is a tool for understanding the sometimes incomprehensible behaviors of bosses, co-workers, friends and mates. The tool profiles people's personality into four main categories namely: Greens, Reds, Blues and Golds. (Zichy, 2007)

Greens personalities were described as empathetic, humanistic and creative people. They are people who need an environment that is supportive and egalitarian and that provides the chance to impact the lives of others. They are gifted in their understanding of people's motivation, and they have unusual ability to influence and draw the best out of the other. They also excel in written and verbal communication and in ability to position ideas. Reds personalities were described as action-oriented, spontaneous and focused on "now". People in this category of personality need freedom to follow their impulses, which they trust over the judgment of others. They are cool-headed and ever courageous, they get things done and handle crisis better. They mostly fit in careers that provide freedom, action, variety, and the unexpected; they bring excitement and a sense of expediency. Finally they resist schedules and hierarchies and they have a low priority on long term planning. Blues personalities are theoretical, competitive, and always driven to acquire more knowledge and competence. They are unequalled when it comes to dealing with complex, theoretical issues and designing new systems in organizations. They are

skeptical hence they criticize and set their benchmarks against which they measure everyone and everything. They are also highly precise in thoughts and language and future oriented, trusting only logic, not the rules and procedures of the past. People with these personalities' best fit in strategic thinking positions. Golds personalities are grounded, realistic and accountable people. They form the backbone of institutions of all kinds both corporate and public. They are society's protectors and administrators who value procedures, respect the chain of command, and have finely tuned systems for everything. These personalities get involved in details and are known for following through and mobilizing others to achieve concrete goals. They are most effective in making lists, planning in advance, and dealing with what has worked in the past. (Zichy, 2007)

This theory also established that these categories of personalities can be combined. According to the survey done in this study, the percentage of the population with different personalities was as shown in figure 2.3 and table 2.1 below (Zichy, 2007).

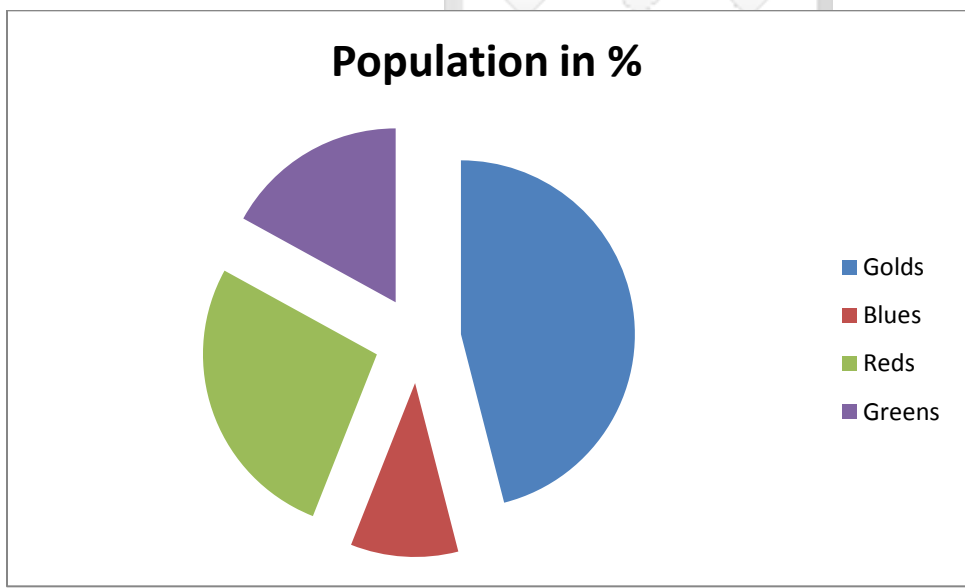


Figure 2.3: Personality Types (Zichy, 2007)

Table 2.1: Personality types (Zichy, 2007)

Golds	46
Blues	10
Reds	27
Greens	17

2.3 Models for Career Guidance Information Systems

2.3.1 Career Guidance information system by Wayzata High School

There are different models for career guidance information systems. The first model was a career guidance information system developed by Wayzata High School. The information system combined educational and career information into a career exploration tool.

It had four main components: occupations, assessment tools, practice tests and education/training. The occupational component allowed students to search the career cluster or title of different jobs and the characteristics of the jobs such as wage, physical demands, hiring practice, skills and knowledge needed. The education component allowed students to find information about different programmes of study in different Minnesota colleges as well as undergraduate schools in the US. The assessment component provided tools for assessing the skills, values, career preference and interests of the student. It used a variety of modules such as the IDEAS profile, skill matching and career cluster inventory. Lastly, the practice component provided practice tests for SAT subjects, OED and PSAT (Muigai, 2014)

2.3.2: An information systems in career guidance and university placement

In this study, a model to help students to make accurate and valid decisions on their degree choice of career based on their KCSE examination results. The researcher developed an SMS and web-based course selection prototype to help students to make quality career choices based on their academic results and personalities. The model used a combination of academic reports, previous cut-off points, subject cluster combinations and the weighted system to predict the top four courses qualifying a student for undergraduate degree. The spiral methodology was used to develop the prototype. The researcher implemented the methodology in four phases: planning, risk analysis, engineering and evaluation phase. The prototype was implemented in four modules: registration, exam results, advisory and the data mining modules. The outcome of this study was an SMS and Web Based model for the selection of university career choices. Some of the recommendations that were made during the research were a research on effects of university course selection on career engagement (Muigai, 2014).

2.3.3 Trained Neural Network for students' placement

A trained neural network can be used to perform the students' placement effectively and efficiently. A study done on "Students selection for university course admission at the Joint Admission Board (Kenya)" using trained neural networks" sought to examine the potential use of artificial neural networks at the JAB for the process of selecting students for university courses. The study established some of the limitations of using trained neural network as transcription errors which they sought to remedy the errors by gathering more data to enable a more comprehensive training of the network. In the recommendations, the study established that there is a need to consider factors such as poverty level, geographical location, the standard of the schooling, and family background as such are factors to be incorporated in determining one's career path because they do affect the overall performance of students (Franklin & Fullgence, 2011).

2.4 Web Based Systems Architecture

Web based architecture consists of a web browser software, Client machine and a server machine. Web browser software, such as Internet explorer, Mozilla Firefox and Google chrome are application software used for retrieving, presenting and traversing information resources on the World Wide Web. A Client machine is the computer machine that is running a web browser while the Server machine is the dedicated computer that receives and executes requests sent to access a specific web page. Figure 2.5 shows 2 tier client/server architecture. This is a simple scenario where the web server is connected to one or more clients as shown below.

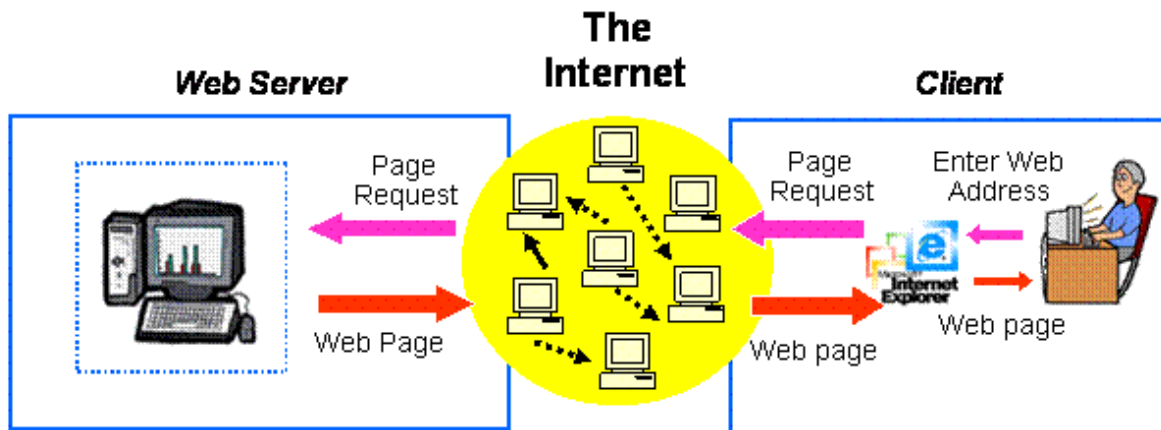


Figure 2.4: Two Tier client/Server Architecture consists of functionalities. These include:

Presentation Services: These services facilitate the information display and user data input facilities. It is the front-end side of the architecture that is essential for user interaction. For example logging in requires interaction in the form of collecting username and password information using a HTML-form.

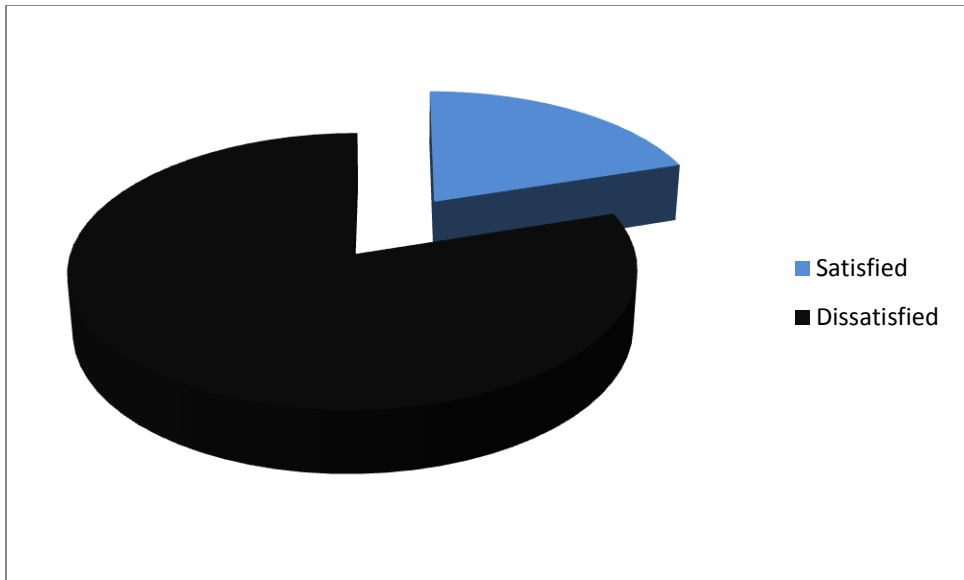
Functional logic: These services facilitate processing and database interactivity. For example user authentication requires the logic unit to read username-password combinations from a database and compare until a good comparison (hopefully) is arrived at.

Data Management: Data, its storage, insertion and retrieval, its management and alteration is central to computing applications. For example a database management system (DBMS) is required for the management of usernames and associated passwords, their owners, etc (Sheffield Hallam University, 2013).

2.5 Statistical Data on career decision making

2.5.1 Statistical data on Career satisfaction

According to a Deloitte's Shift Index Survey, 80% of the professionals are dissatisfied with their jobs as shown by the figure 2.1 below: (Shontell, 2010)

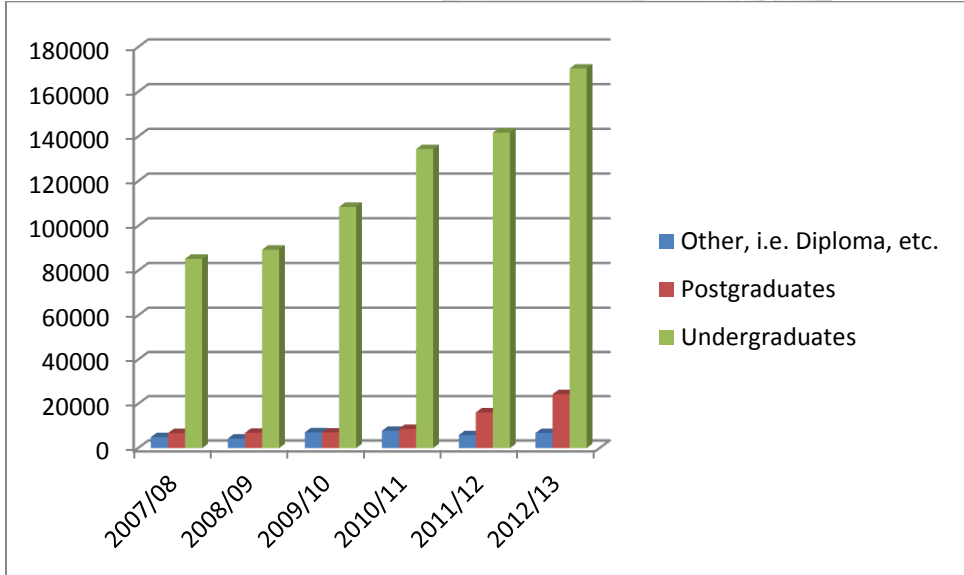


(Shontell, 2010)

Figure: 2.5: Job Satisfaction

2.5.2 Statistical data on students enrollment in learning institutions

Statistics provided by the Kenya National Bureau of Statistics indicate that there is a tremendous increase in the enrollment of students in public universities here in Kenya. This statistics are as shown below:



(KNBS, 2013)

Figure 2.6: Students enrollment in Kenyan Universities

The two statistics above clearly shows that there is great improvement on the level of literacy; however there is a gap in that students are actively enrolling for the wrong degree programs.

2.5.3 Statistical data on high school students in Nairobi County

According to (KNBS, 2013), there has been a tremendous increase in students' enrollment. The figure below shows students' enrollment in secondary schools within Nairobi County from the year 2008 to the year 2014. In the year 2013, the number of students enrolled in secondary schools within Nairobi County had risen to 54, 774. This number has increased the more from then till today.

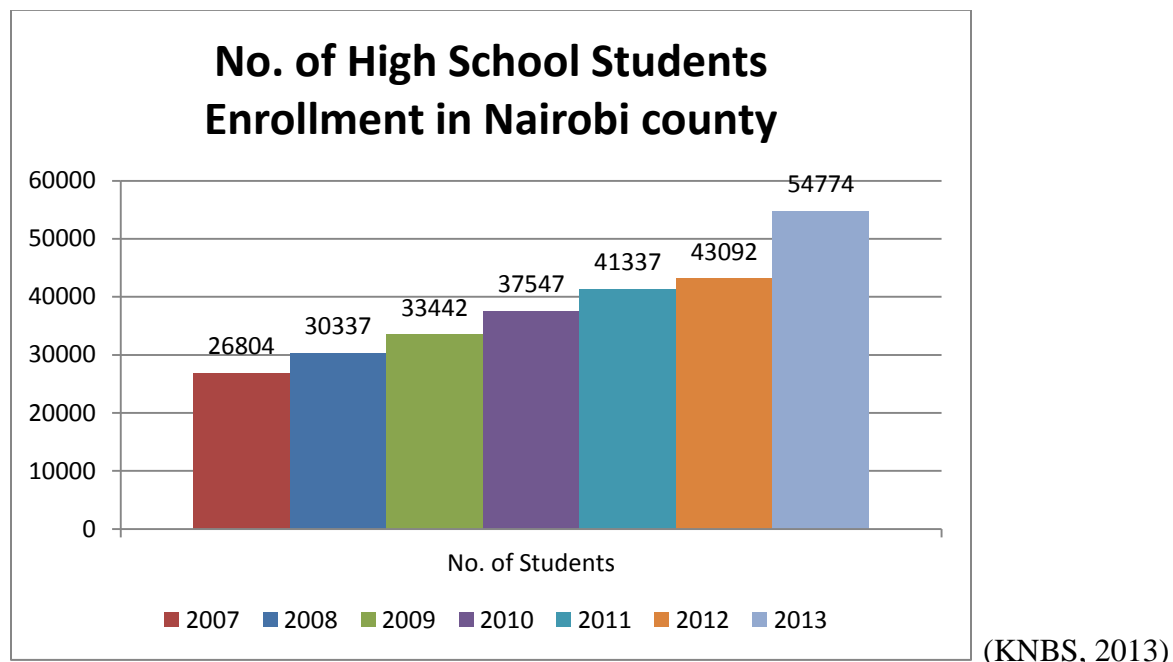


Figure 2.7: High school students enrollment in Nairobi County (KNBS, 2013)

2.6 Architectural model

The conceptual model of the system was developed to act as the road map in guiding the development of different functionalities of the system. A conceptual model by definition is a descriptive model or diagram that shows the key elements in the system of interest and the hypothesized relationships between them. Conceptual modeling is the process of abstracting a model from a real or proposed system. It is almost certainly the most important aspect of a simulation project. The design of the model impacts all aspects of the study, in particular the data requirements, the speed with which the model can be developed, the validity of the model, the

speed of experimentation and the confidence that is placed in the model results. A well designed model significantly enhances the possibility that a simulation study will be a success. Figure 5.1 below shows a model of the proposed system.

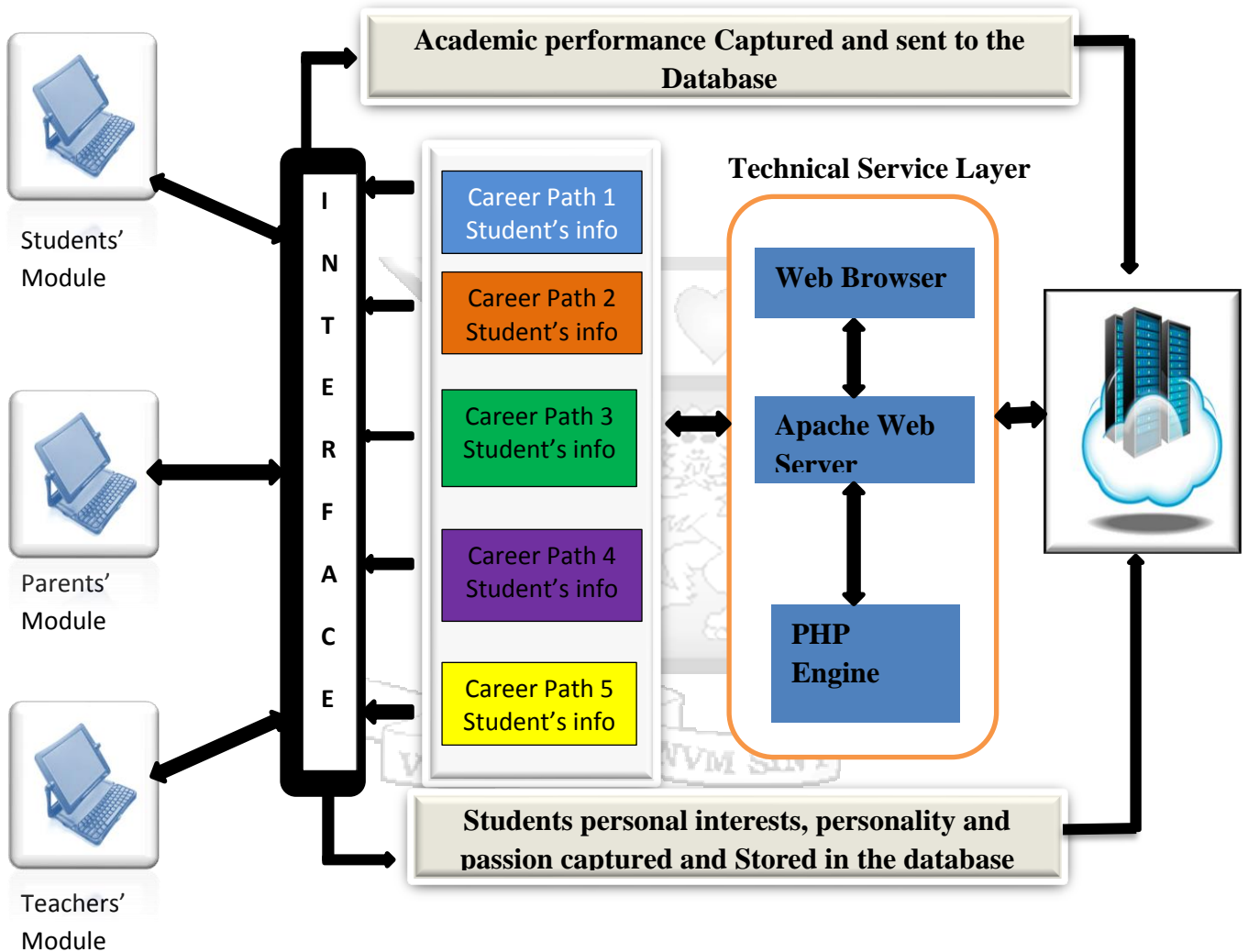


Figure 2.8: Architectural Model

2.6.1 Technical service layer

The layer consists of components that facilitate data persistence and connectivity services. The components in this layer include: web browser, Web server, and scripting engine and data management system. In this layer, the developer will define computational algorithms, for example, an algorithm to determine introverts and extroverts. The components in this layer serve the following purposes:

Web browser invokes a HTTP request for a particular web page e.g. Interests profiler page. The web server then, retrieves the login page and passes it to the PHP after the details are entered for processing. This is followed by the parsing process done by the PHP engine and then connecting to the MySQL Server and sending an appropriate query. The database query is then received by MySQL and processed and the results are passed back to the PHP engine. This is followed by the PHP engine obtaining the results and formatting the HTML document appropriately after finishing running the scripts and returns it to the web server. Finally, the web server returns back to the web browser for the user to view the feedback (Njoroge, 2011).

The system is then able to generate a career profile that contains the personal information and the possible career choice for a specific user of the system.

2.7 Summary

In a world of mounting economic pressure driven by intensifying global competition, passion is essential to the kind of performance improvement needed to succeed. Without passion, people will be choosing between the lesser of two stresses: stress from being unemployed versus the stress of being in a dead-end job. Perhaps that explains why so many graduates are embracing the idea of entrepreneurship. If you can't find a job especially the one you will enjoy, then create one. That simply means that many people are picking passion over a paycheck (Shontell, 2010).

From the literature reviews, it was established that there is a need to bridge the gap between people's personality and inborn traits and their academic performance. Secondly, it was noted that many of the frameworks, for career path decision making, that exist have not been implemented and utilized in Kenyan system of education. This piece of study wishes to establish the gaps that existing in determining career paths among students and develop an application to bridge the gap that exist.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the approach used to carry out the study. The chapter will outline the research design used, the population under question, data collection and analysis methods as well as the research quality. For each of this item, a justification will be given as to why it was deemed the most suitable technique to be used.

3.2 Research Design

According to Business Dictionary, a research design is a detailed outline of how an investigation will take place. It entails how data is to be collected, what instruments will be employed, how the instruments will be employed, how the instruments will be used and the intended means for analyzing data collected.

3.3 Population and Sampling

3.3.1 Population

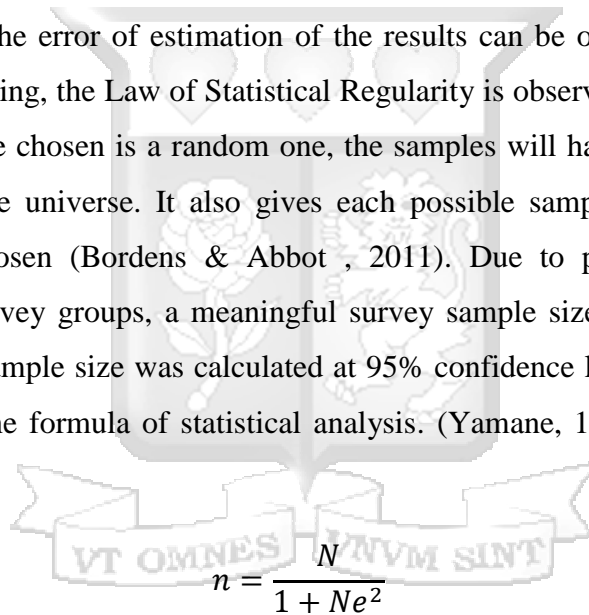
A population refers to the aggregation of cases which meet specific criteria. This aggregation was important because it helped the researcher make generalizations about the population (Polit & Beck, 2004). It was also important that the researcher collected data that was representative of the target population. The researcher observed that there were 240,551 university students in Kenya in 2013 (KUCCPS, 2014). These students were enrolled in 53 public universities, 9 constituent colleges and 5 private colleges. (Muigai, 2014) Statistics showed that the enrollment of high school students in Nairobi county stood at 54, 774 students by 2013 (KNBS, 2013). Furthermore, only 10,000 are accepted into private universities while 53,000 are accepted into public universities (KUCCPS, 2014). The population comprises the following:

Table 3.1: Population Number (KNBS, 2013)

Name	Population
High School Students	54774
Private Universities students	10000
Teachers	10995
Total	75769

3.3.2 Sampling

A sample is a small portion of the selected population. This research will make use of random samples. Random sampling ensures that each sample has an equal chance of being included in the group. The error of estimation of the results can be obtained from the random sample. In random sampling, the Law of Statistical Regularity is observed. This law states that if on an average the sample chosen is a random one, the samples will have the same composition and characteristics as the universe. It also gives each possible sample combination an equal probability of being chosen (Bordens & Abbot , 2011). Due to practical difficulties with responses from large survey groups, a meaningful survey sample size was determined. In this study, a representative sample size was calculated at 95% confidence level and an error limit of 10%, base of the Yamane formula of statistical analysis. (Yamane, 1967). This formula states that:



$$n = \frac{N}{1 + Ne^2}$$

Where:

n= required responses

e^2 = Error limit

N = Sample size

Yamane (1967)

It is important to note that this formula assumes a normal distribution hence the selected target population was assumed to be normally distributed in terms of parameters of career path decision making (Yamane, 1967).

The sample size was therefore calculated as follows:

Table 3.2: Population Number (KNBS, 2013)

Name	Population	Sample
High School Students	54774	165
Private Universities students	10000	25
Teachers	10995	27
Total	75769	217

3.4 Data Collection methods

During the process of data collection, different methods were used to collect both primary and secondary data which was equally useful in gathering sufficient data for consideration in drawing conclusions. The following data collection methods were used during this process:

3.4.1 Questionnaire

Questionnaires formed the major tool used in data collection addressing not only the teachers and students but also the participants from the corporates. The tool comprised of well thought open ended and closed ended questions that targeted to gather data on career path decision making among professionals, teachers engagement in determining career path of a student, and the consideration of talents and passion in selecting a career path among many other. The questionnaires are distributed to a random sample in which a normal distribution was assumed. The questionnaire majorly sought to investigate and collect data on factors that determine the career path of a student. See Appendix B.

Secondary data was obtained from government bodies such as KUCCPS, KNEC and MoEST. This data was vital to add to the primary data collect so as to ensure the model created is truly meets the needs foreseen.

3.4.2 Semi Structured Interviews

These interviews employed flexible and more of open-ended questions so as to determine quality parameters appropriate for career path decision making. The researcher sought audience with specific people both working class and students and all the responses were recorded on an individual level.

3.4 Data Analysis

The researcher used SPSS for data analysis. Graphs and charts were also used for presentation of the results that were obtained from the research.

3.5. Research Quality

The validity, reliability and objectivity are important determinants for the quality of any research work. This helps the researcher to ensure that the results of the piece of study are accurate and true reflections of the results expected in that specific area of study.

3.5.1 Validity

Validity means the degree to which a research instrument measures what it is supposed to measure (Polit & Beck, 2004). The validity of the questionnaire was considered during pre-testing. Pre-testing was performed by presenting the questionnaire to 5 university students selected at random. The students provided feedback regarding the adequacy of the questions, the design of the questionnaire and relevance of the items.

3.5.2 Reliability

This is the likelihood that the data collection instrument would produce the same result each time (consistency) (Polit & Beck, 2004). Reliability is important because it is an indicator of the accuracy of the questionnaire.

3.5.3 Objectivity

Objectivity is a vital component to consider in any given research and especially during data collection and analysis. Objectivity was arrived at by protecting the confidentiality of the respondents to the study. The researcher also complied with the ethical guidelines by Strathmore University on seeking permission from relevant authorities to conduct research, ensuring that participants were informed of their rights to consent to the study. During the research process, the researcher also ensured that he maintained anonymity of respondents.

It was also important for the researcher not to forge data or plagiarize the findings from other studies and to appropriately acknowledge any work done by other scholars.



CHAPTER FOUR: DATA REPRESENTATION AND ANALYSIS

4.1: Introduction

In this chapter, the researcher sought to analyze the data collected using both quantitative and qualitative methods of data analysis.

The study comprised of a stratified random sampling where the researcher first carried out a pilot survey among young professionals to establish whether there was a need to have a decision support system to facilitate career decision making among Kenyan students. The pilot survey was carried out by distributing questionnaires to a random sample of 54 young professionals within Nairobi. A sample of the filled questionnaire is attached on the appendices. The following were the results of the pilot survey:

4.2: Response Rate

There was a sample size of 54 young professionals to be chosen randomly in Nairobi County. A total of 52 professionals responded to the questionnaires that were distributed online using Google forms. 50% of the respondents were male while 50% of the respondents were female as shown in figure 4.1 below

Please indicate your gender

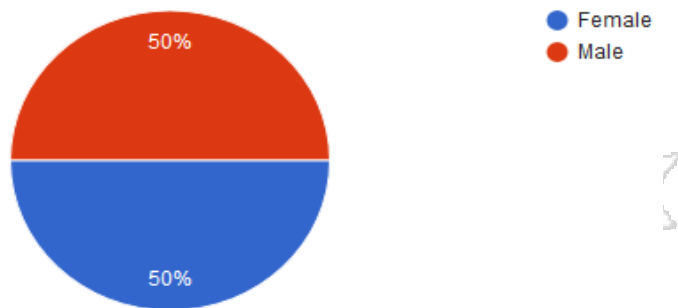


Figure 4.1: Respondents' Gender

4.3 Demographic information and respondents Bio Data

Age bracket

The researcher sought to know the age brackets of the respondents and figure 4.2 below shows the percentages of the age brackets of different respondents. 62% of the respondents were within the age bracket of 20-30 years, 25% were within the age bracket of 31-40 years while 12.5 percent were within the age bracket of 41-50 years. None of the respondents was above the 50years of age.

Please indicate your age bracket

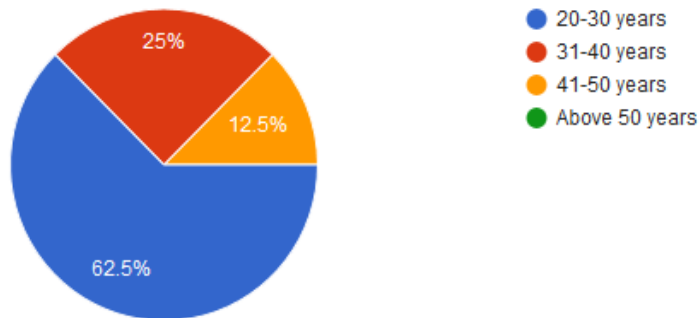


Figure 4.2: Age Bracket

Level of education

All the respondents had attained at least diploma level of education.

The data collected showed that the highest percentage of the respondents possessed a bachelor's degree only. This showed consistency as it was expected that many of the respondents would not have done their master's degree considering the fact that greater percentage of the respondents were between 20-30 years of age. The results are as shown in figure 4.3 below

Please indicate your highest level of education

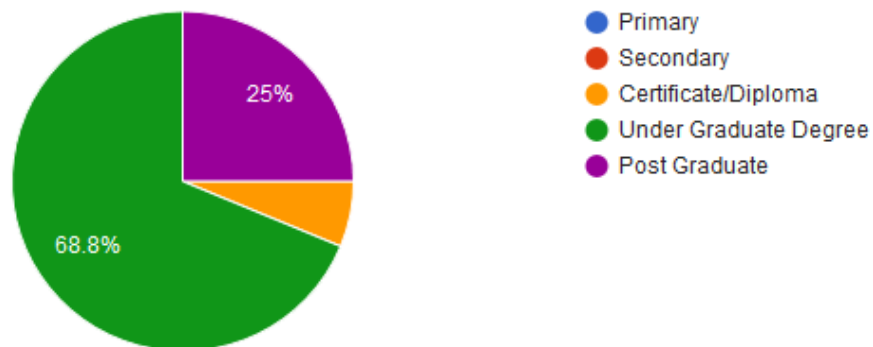


Figure 4.3: Level of Education

Respondents Area of Profession

The respondents were from a variety of areas of profession as it is stipulated in figure 4.4 below. This was important so as to ensure objectivity and enhance reliability of the data collected.

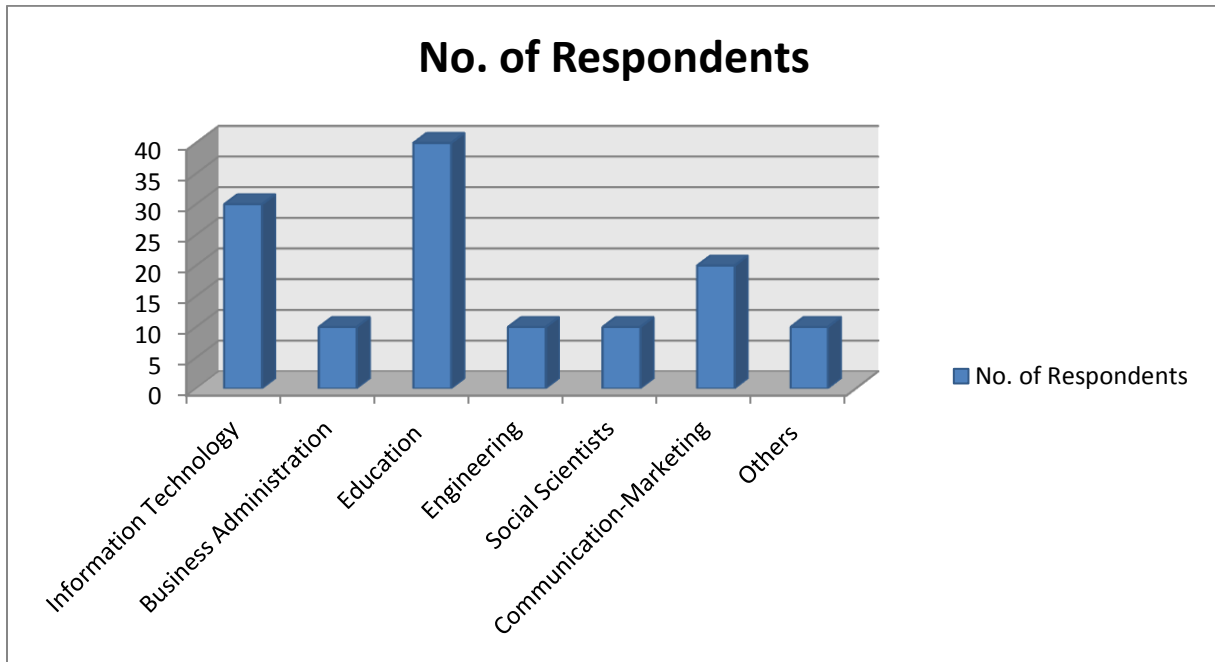


Figure 4.4: Respondents Area of profession

4.4 Factors that influence choice of career

Family background

The research established that family background greatly influences the choice of career. Around 25% of the respondents felt that their children should pursue careers same as their professions. This meant that such would influence their children greatly in choosing a certain career path.

Family Businesses

12% of the respondents indicated that they would advise their children to pursue a career that fitted their family business. This clearly shows that families that run business would tend to influence the children to pursue careers that would fit the business so as to propel the family agenda forward.

Exam performance

50% of the respondents felt that their performance in major exams of the 8.4.4 system of education led to their choice of a particular career. This meant that their career decisions were not made in a very objective manner following their passion and interests. Additionally, 25% of

the respondents felt that, to some extent, the exam performance was a great contributor in choosing their career. This is as shown in figure 4.5 below

I believe my performance in specific exams led to the choice of career

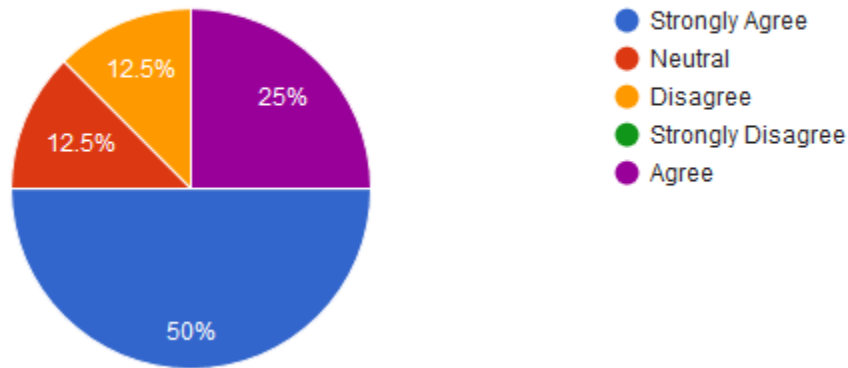


Figure 4.5: Exam performance

Generally it was noted that mentors and parents were among the key contributors in career path decision making. 52.9% of the respondents felt that parents and mentors influenced their career decisions to the greatest extent. A total of 17.6% of the respondents reported that their career decisions were greatly influenced by their interests. This was a very significant fact to establish as the research sought to provide an objective approach to career decision making. Figure 4.6 shows such factors that influence career decisions.

My profession has and/or is being influenced greatly by:

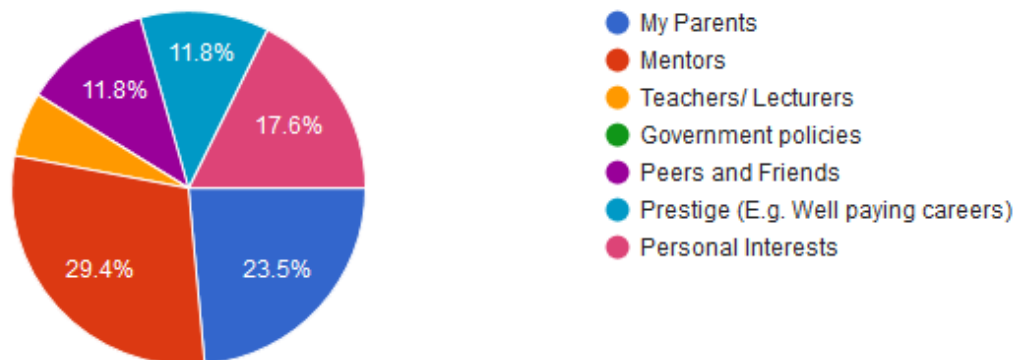


Figure 4.6: Influencers of career decisions

4.5: Use of information systems in career decision making

The researcher also sought to establish how information systems and technology in general has been used in making career decision making. Additionally, there was a need to investigate the availability of all the necessary information needed in making career decisions. 31% of the respondents felt that the information systems tools they had used in the past were not efficient, 18.8% of the respondents had no access to any information system tool useful for facilitating career decision making. On the other hand, due to penetration of interconnectivity, a bigger percentage of the respondents felt they had access to information needed for career decision making. The statistics for this would change with reduced urbanization and internet connectivity. E.g. in the rural areas, it was expected that the access to information would significantly reduce. This statistics is as shown in figure 4.7 and figure 4.8 below.

I have Access to Computer Based Information system that is relevant and efficient in guiding me through my career choices

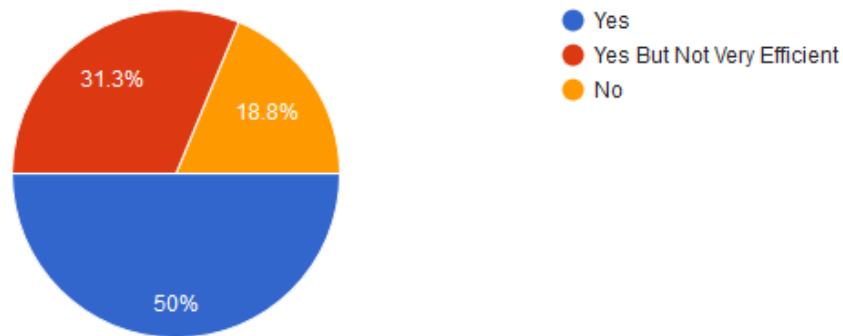


Figure 4.7: Access to information systems for career choice

I have access to all information that i need in making career decisions

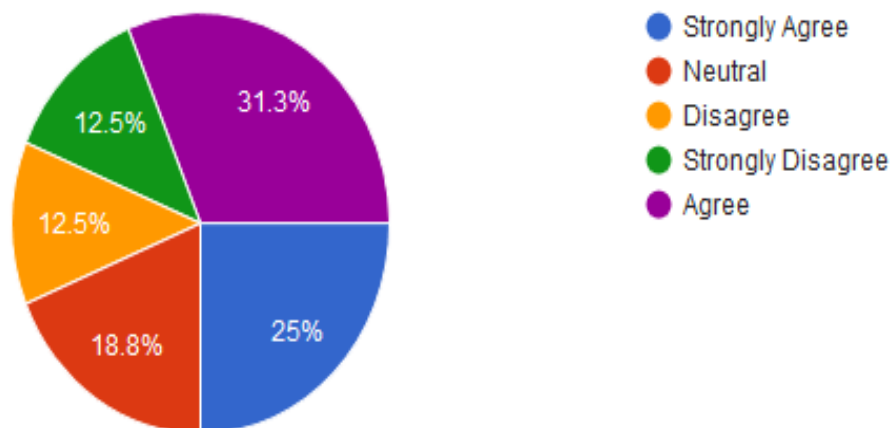


Figure 4.8: Access to career information

4.6 Personality and Career Choice

The researcher also sought to establish how personality of the respondents affected their careers and their general understanding of personality as a factor for career choice. 30% of the respondents did not have clarity of how their personality fits to their career, this is because they may not have clearly established their personalities or they did not bother to establish the connection between personality and career path. 50% of the respondents we clear about their personality and how it fitted to their career. There was a total of 18.8% who were not sure of the relationship between personality are career decisions. This is as shown in figure 4.9 below.

I know, with clarity, my personality and how that fits to my profession

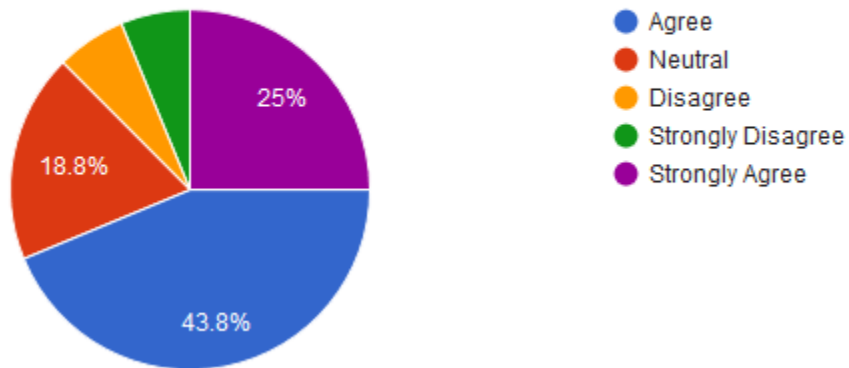


Figure 4.9: Personality and career choice



Additionally, 60% of the respondents felt that given another chance to make career choice, they would investigate on which career best fits their personality. This showed that many of the respondents valued the need to tie careers to personality of an individual. This is as shown in figure 4.10 below

If i had an opportunity to choose a career:

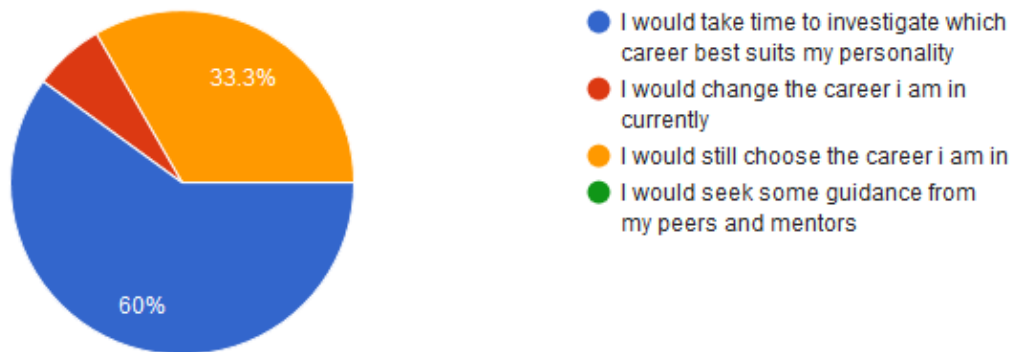


Figure 4.10: Choosing a Career

It was also important for the research to establish how serious the respondents took the exercise. It was established that 76.5% took the exercise seriously and that meant that their responses were objective. This is as shown in figure 4.11 below.

I took this evaluation seriously

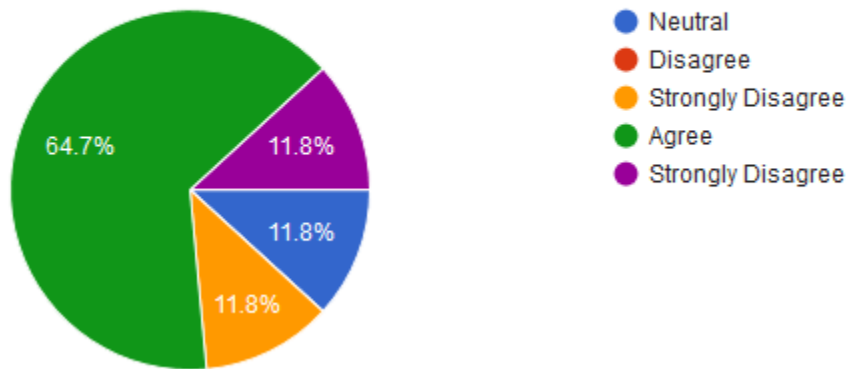


Figure 4.11: Taking the exercise seriously

4.7 General Comments

The respondents were given an opportunity to express their views on how career decisions should be made. This was an open ended question and among the responses, it was noted that generally, the respondents felt that parents should not force their children into certain career paths. Some felt that career decisions were made depending on which career is “cool” and fashionable or out of the regulations of the government. Figure 4.12 shows some of the comments that were received from the respondents.

Kindly comment on your opinion in regard to how career choices are made in Kenya

The ministry of education should come up with more efficient ways to guide students in choosing careers. information technology can be leveraged

Great stuff

Most people are mentored while others make their own desions on to which career they want.

Most parents force their children to pursue career they didn't get an opportunity to..e.g if the parent wanted to be a doctor and s/he didn't manage then the children are forced this lane and it can be frustrating. In my own Children should be guided in career choice not forced to make decisions.

Parents sometimes dictate what their children to pursue. Wrong answer. Also, making mistake of not matching personal characters and career. Thank you.

Most career choices are determined by the current job market in kenya

Mostly are influenced by the parents

Mainly based on parent advice and market demands as oppose to strength and passion

Based on parents wants most of the time

Mostly, people choose career depending on its marketability.

regulated by Governmental bodies eg. JAB

There lacks structures in Kenya to guide young people in making career decisions. Most young people align their careers to family careers/ businesses or what seems to be paying in the market.

Figure 4.12: General Comments

4.8 Summary

From the pilot study, it was clear that there is a gap in how career decisions are made, and many students have not had an opportunity to choose careers that best suits them or they have lack objective way of making such decisions. Additionally, information systems have not been fully utilized in facilitating students and young professions to make career choices. This pilot study established the need for the researcher to proceed with the proposed research and to establish how information systems can be used to facilitate career aspirers to make their decisions.

CHAPTER FIVE: SYSTEM DEVELOPMENT, IMPLEMENTATION AND TESTING

5.1: Introduction

The chapter focuses on the system development lifecycle. System specification was carried out to define and identify both functional and non-functional requirements of the system. The developer further modeled the system through a thorough system design and analysis process. This was geared towards identifying the specific flow of data from the input to processing and finally the output that was expected from the system. The developer went further to develop the system by creating a robust and scalable career portal that was tested and proofed to be suitable for career decision making among students.

5.2 System Requirements specification

On requirements specification, both functional and non-functional requirements were clearly defined as shown below:

5.2.1 Kenyan Career Portal Description

The web application is expected to provide the following to the users

Personal Career Profile - Users of Careers Portal Kenya are encouraged to create a personal *Career File* to assist in managing their Career Development. Users **sign up** to create their file and are provided with:

Personality Profiler - enabling a user to find out how their interests, personality, skills etc. can tie-in with various different courses and careers. The system will further generate a Career Report, which includes job and course matching with the personality.

Course Profiler – The system will provide information about different careers and the requirement for pursuing a given career.

Occupational Database – Kenyan Career Portal will have over 1000 occupations across all career sectors are profiled; information is provided on typical tasks and activities undertaken in the position, skills required, salary information, various entry routes and the educational qualifications and pathways are outlined. Users can search directly for jobs in these occupations. Video profiles are also provided wherever possible.

Education and Training: The opportunities are outlined along with details on where to find courses that match a user's interests and career aspirations.

Labor Market Statistics: The most up to date Labor Market Information is provided and integrated across all sectors and occupations, clearly indicating where the jobs in demand are now or are likely to be in the future.

Parents and Guardians: The system provides a comprehensive section for parents and guardians to support their students in making informed career and college decisions including a section which answers all the most commonly asked questions.

Guidance Professionals: comprehensive support resources and lesson plans are provided in the guidance section of the site which is entirely free for the guidance community to use.

Subject Choice: a comprehensive section is available on the site on choosing subjects for students in High School. This will seek to Map the students with their personality and specific subjects that they should take in high school

5.2.2: Functional requirements of the system

Stage one of the personality profiler-this returns the results of whether someone is an introvert of an extrovert.

Stage two of personality profiler-this returns the results of whether someone is an idealist, theorists, Stabilizer of Improvisor. This helps to further categorize the users into four other personality levels.

Interest Profiler-This provides the user with the most relevant and common activities that interests them.

Course Profiler- This helps in profiling the courses available in the institutions of higher learning

Career profile gives a breakdown and summary of the person's personality, interests, best suited courses and personal information.

5.2.3: Non-Functional requirements of the system

The system provides a very user friendly interface where the users of the system can easily be able to navigate through the system. The system also provides the users with very easy to understand questions that one can easily answer.

The system has also broken down the evaluations to make it easier for the users to carry out the tests without a feel of tediousness.

The application is a web based system and platform independent hence it can be accessed from anywhere anytime by any device that has internet connectivity.

5.3 System analysis and Design

5.3.1 System Analysis

System Development Lifecycle:

There is various development models that can be used in developing a system depending with the type of the system, the timeline set for the development of the system, and the deliverable expected for the system under construction. Some of the models that can be used include:

Waterfall model

Rapid Application Development model

Spiral model of system development

Prototyping model of system development

Spiral model of system development lifecycle was used in development stage of the system. This model of development combines the features of the prototyping model and the waterfall model.

The steps in the spiral model can be generalized as follows:

- I. The new system requirements are defined in detail.
- II. A preliminary design is created for the new system.
- III. A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.
- IV. A second prototype is evolved by a fourfold procedure: (1) evaluating the first prototype in terms of its strengths, weaknesses, and risks; (2) defining the requirements of the second prototype; (3) planning and designing the second prototype; (4) constructing and testing the second prototype.
- V. At the customer's option, the entire project can be aborted if the risk is deemed too great. Risk factors might involve development cost overruns, operating-cost miscalculation, or

any other factor that could, in the customer's judgment, result in a less-than-satisfactory final product.

- VI. The existing prototype is evaluated in the same manner as was the previous prototype, and, if necessary, another prototype is developed from it according to the fourfold procedure outlined above.
- VII. The preceding steps are iterated until the customer is satisfied that the refined prototype represents the final product desired.
- VIII. The final system is constructed, based on the refined prototype.

This model requires to be used in large project especially where there are teams working on various subsystems of the whole project. The model comes with a challenge of limited iteration due to in cooperation of water fall model. Figure 5.2 below is a sample of spiral model:

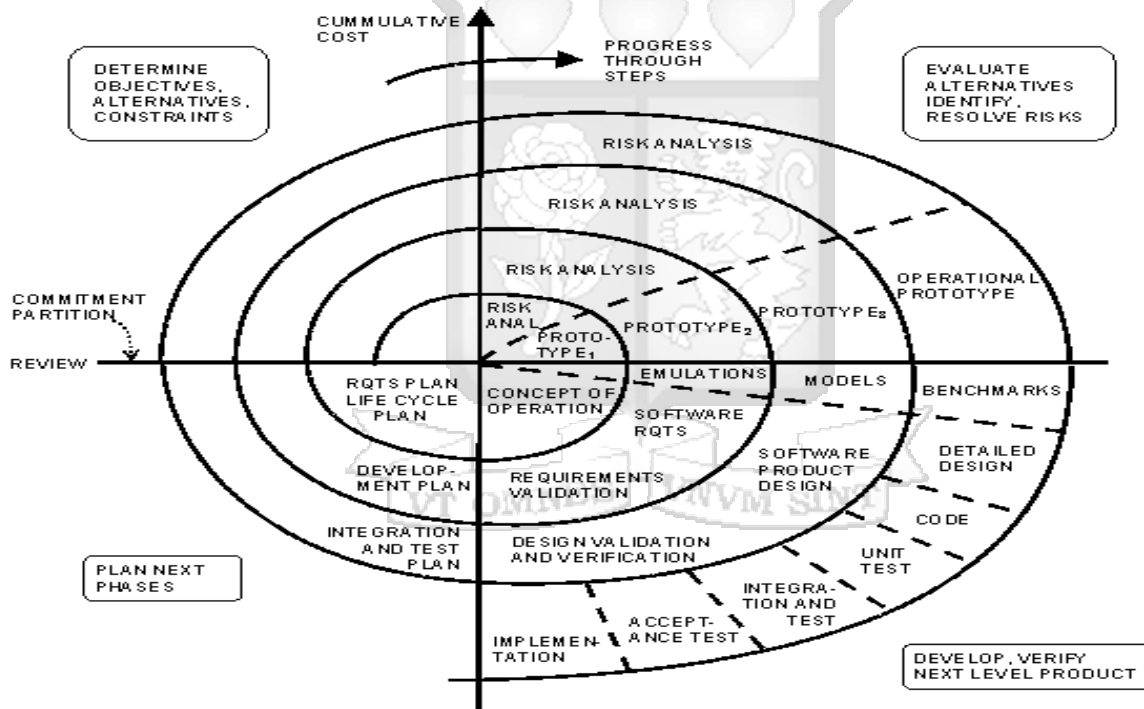


Figure 5.2: Spiral model

5.3.2 System Design

The process of system design consists of developing system models that helps the developer to clarify the requirements of the system as well as define the inputs, processes and outputs of the system. In this stage the following models were developed:

The Career portal consist of various concepts and the relationship in-between them as shown in the use case below:

User Case of the System

System User- Logs into the system and carries out a personality test which further takes him/her to a career profiler.

New User – Creates a personal profile and the information is recorded in the system's database.

System Admin – Maintains the system and liaises with the Web hosting provider to ensure a guaranteed uptime for the system.

Use Case one: User Registration

Primary Actor: New User

Stakeholders and interests:

System admin: Adds a new user into the system, updates users' information and deletes users from the system whenever needed.

Use Case Two: Personality Profiler

Primary Actor: System User

Stakeholders: and interests

System admin: Adds a new user into the system, updates users' information and deletes users from the system whenever needed.

Use Case Three: maintain system

Primary Actor: System admin

Stakeholders and interests

Ministry of Education: Provides the system admin with the relevant and up to date information concerning the relevant careers in the institutions and also in the labor market

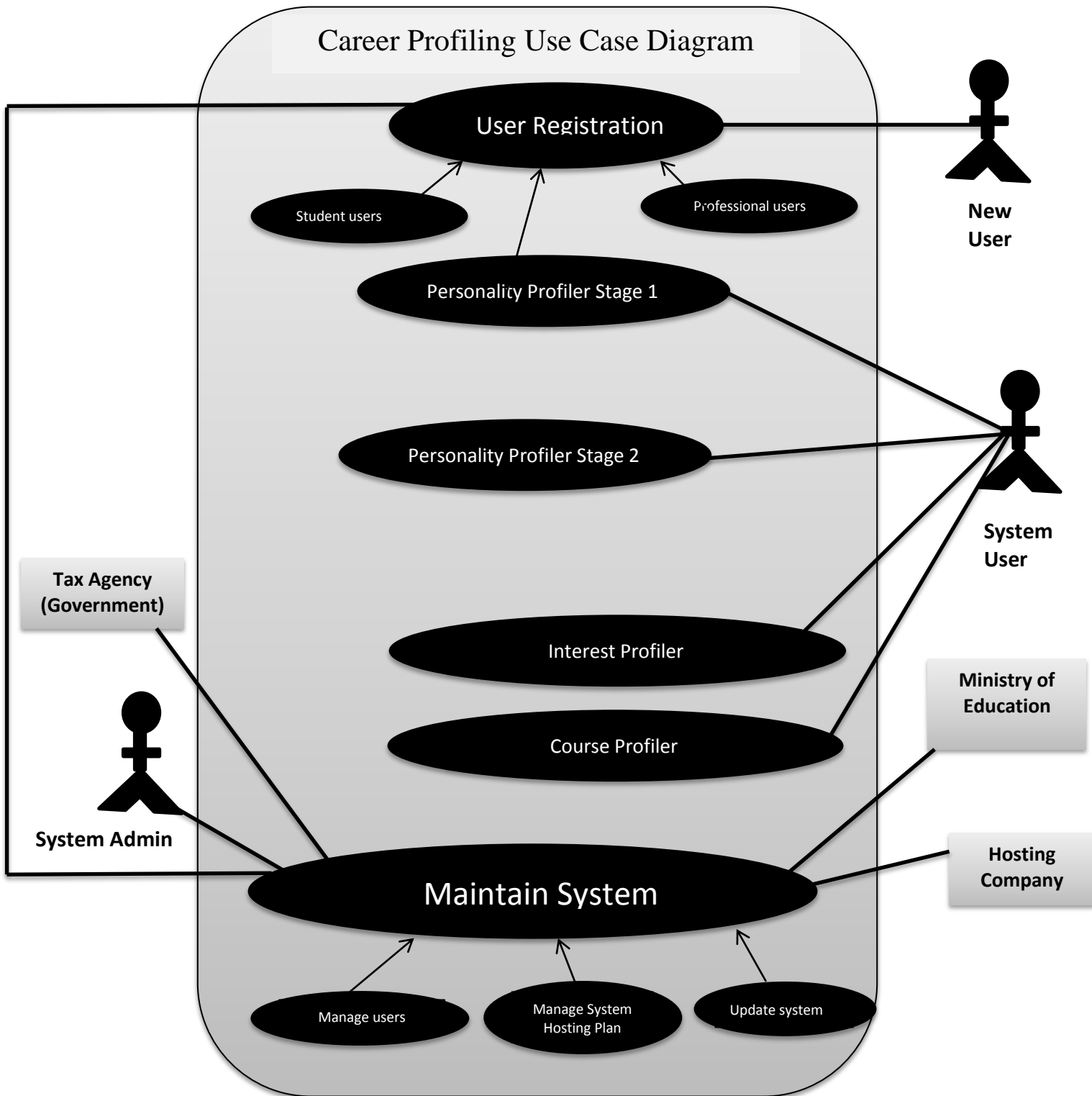


Figure 5.3 Use case Model

System Flow Chat

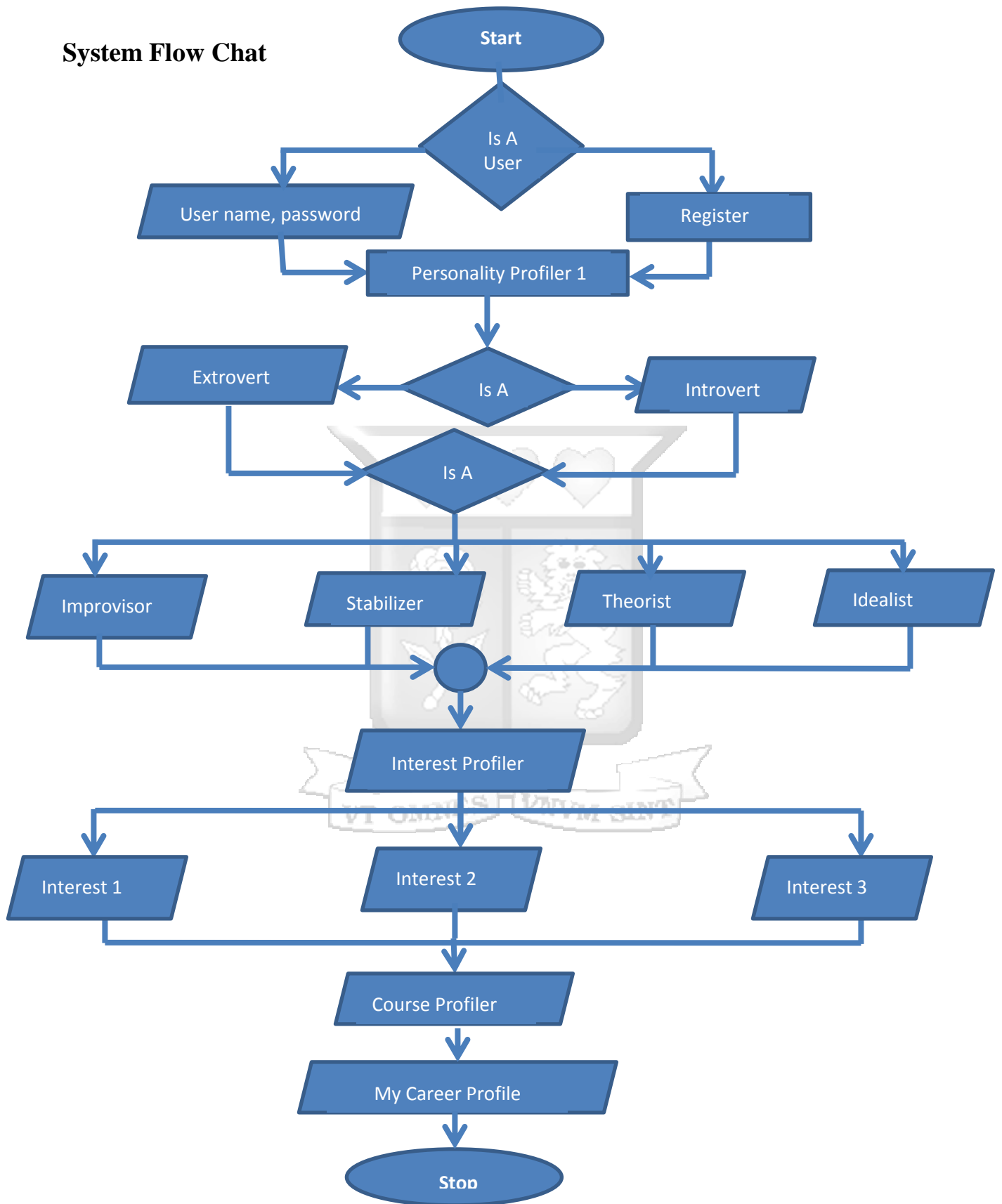


Figure 5.4: Personality Profiler Flow

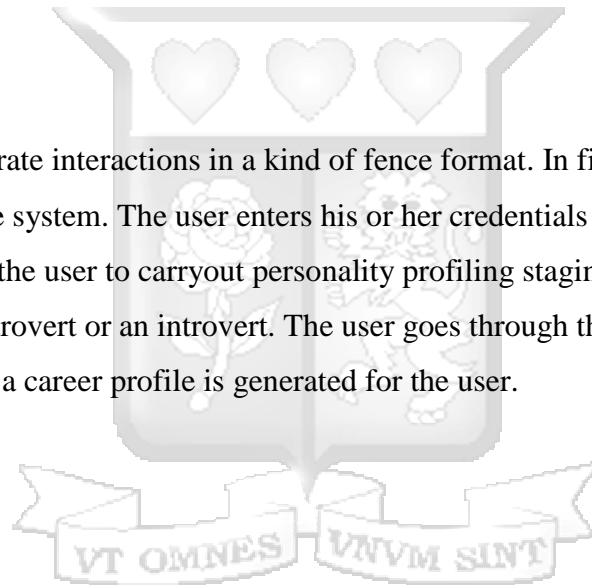
Flow chat

Flow charts are used to logically show how information will flow in the system. They show how different users will see different information according to the privileges given in the system. Additionally, flow charts show the different logical conditions that exist in the system.

In the figure 5.4 above, any user must be authenticated as the true users. In case one doesn't have an account in the system, they are allowed to create an account by registering as users of the system. The user is then allowed to carry out personality profiling starting with the first stage of personality profiling to the third and the last stage of personality profiling. The output of this exercise is a career profile for the user that shows the results obtained from every stage of profiling.

Sequence diagram

Sequence diagrams illustrate interactions in a kind of fence format. In figure 5.5, we show how the user interacts with the system. The user enters his or her credentials or registers as the user of the system. This enables the user to carryout personality profiling staging with stage one which the output is either an extrovert or an introvert. The user goes through the process of profiling to the last stage after which a career profile is generated for the user.



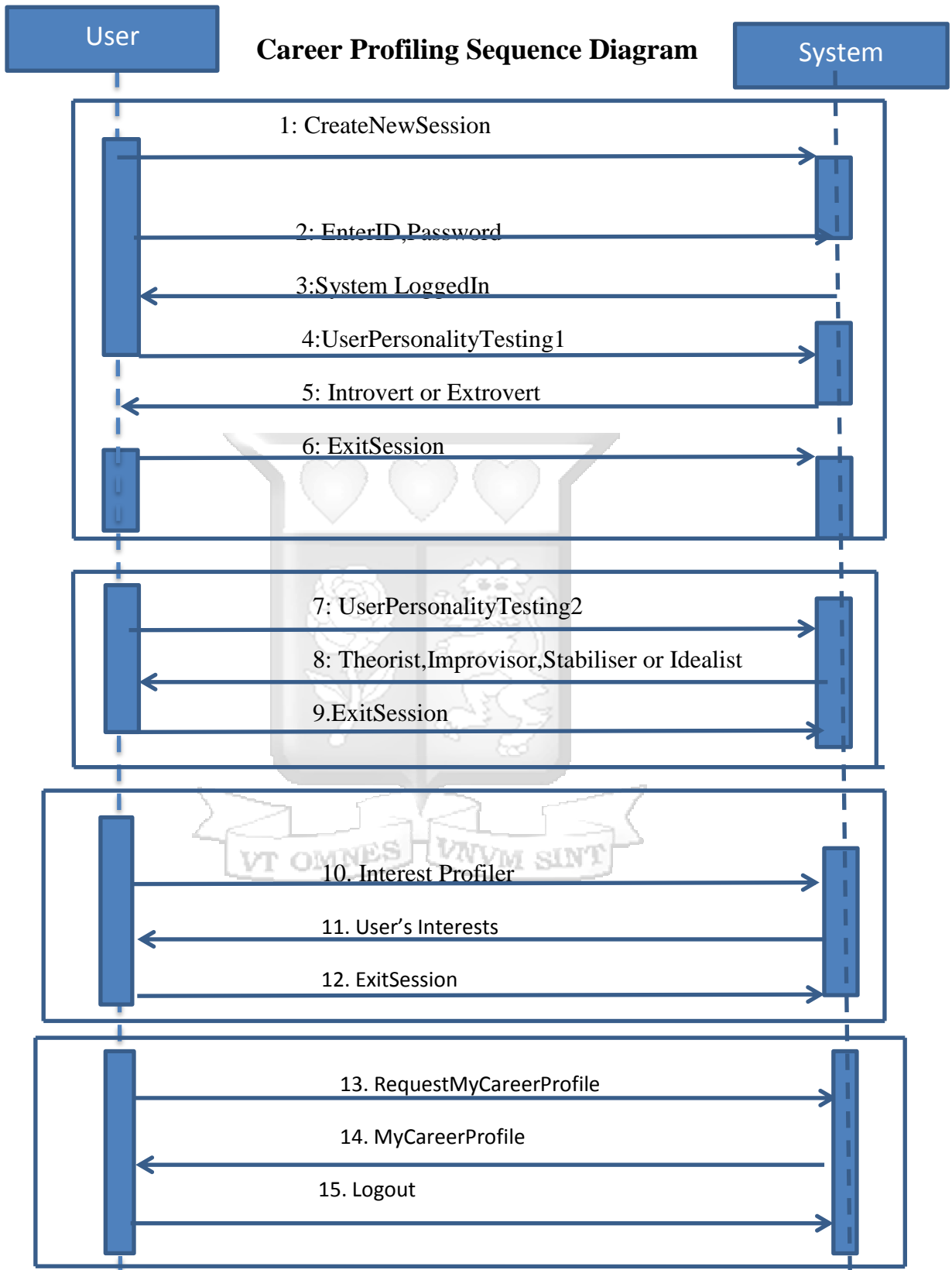


Figure 5.5: System Sequence diagram

Data Flow Diagrams

Context diagram

Context diagram is the first level of data flow diagrams which show the broader picture of the various work flow based functions of the system.

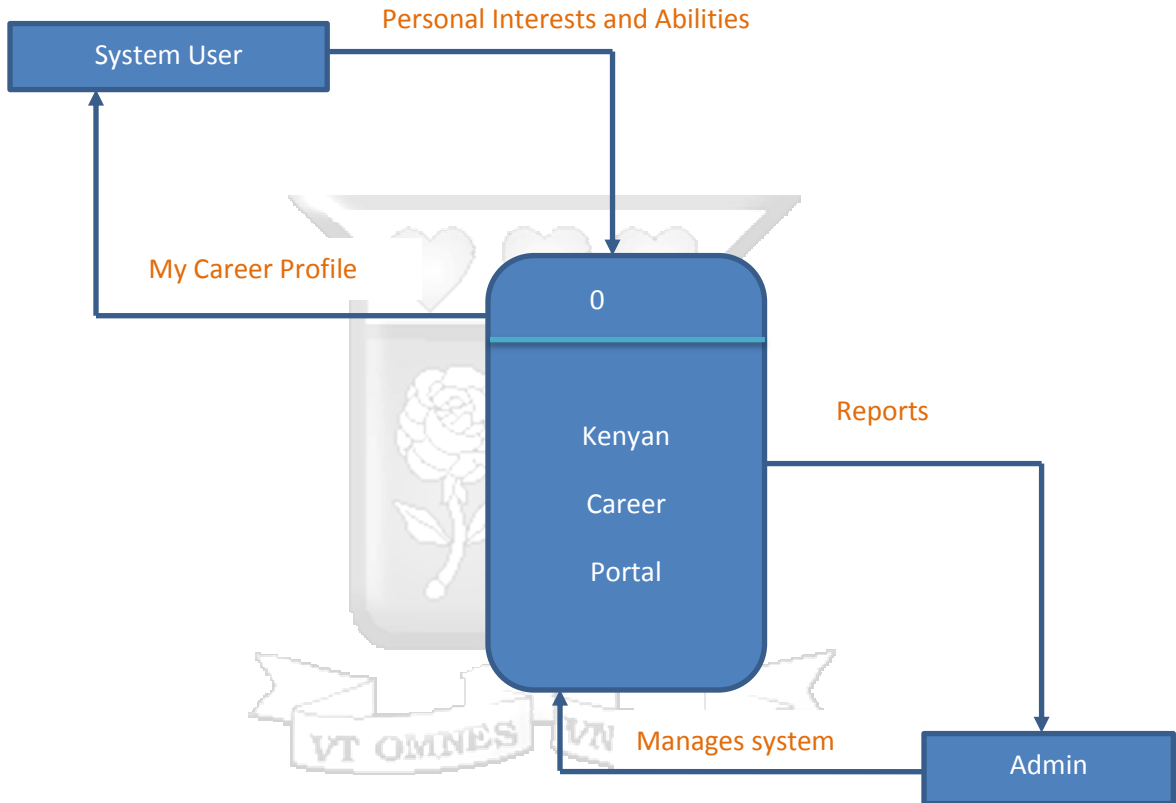


Figure 5.6: Context Diagram

Level 0 Data Flow Diagram

This diagram shows generally the flow of data between different processes within the system. The diagram also shows the entities and data stores that exist in the system hence giving more details about each of the process within the system graphically. The main users who will interact with the system are: the normal users, either students or professionals and the system administrator of the system. The system users are required to have registered as users before carrying out any personality of career test.

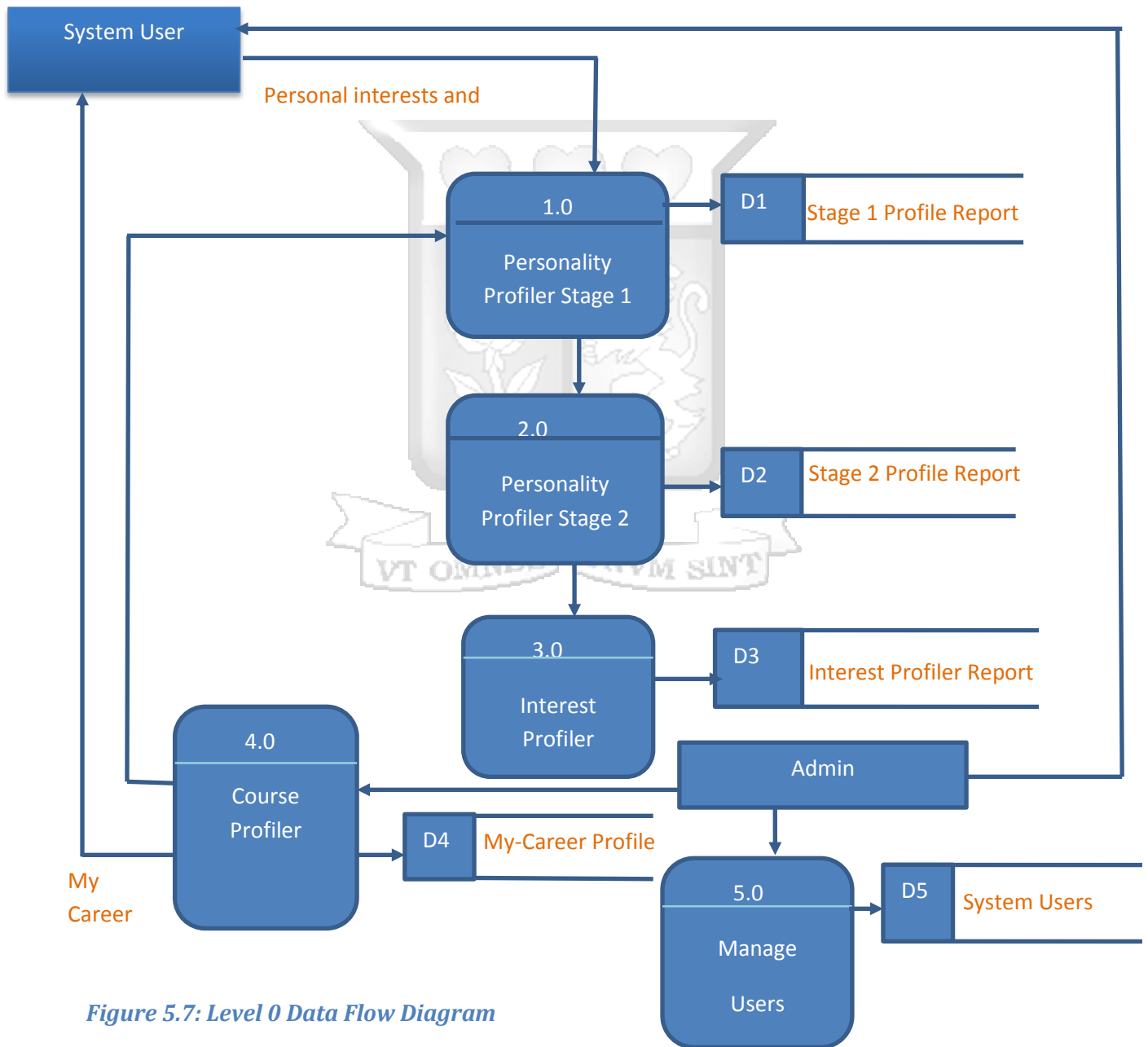


Figure 5.7: Level 0 Data Flow Diagram

Level 1 Diagram: Personality Profiler Stage 2 Process

In the level one of the data flow diagrams, we break down one of the processes in the level zero and show the different flow of information in this process. In my case I have further broken down “personality profiler stage 2” process and show the different information that will be stored in the data stores from this process. D2 is the data store that stores the results of the personality profiling at this stage. On the same note, I have added a new process “Compute Personality Profile” which is related to the first process as shown in figure 5.7 below.

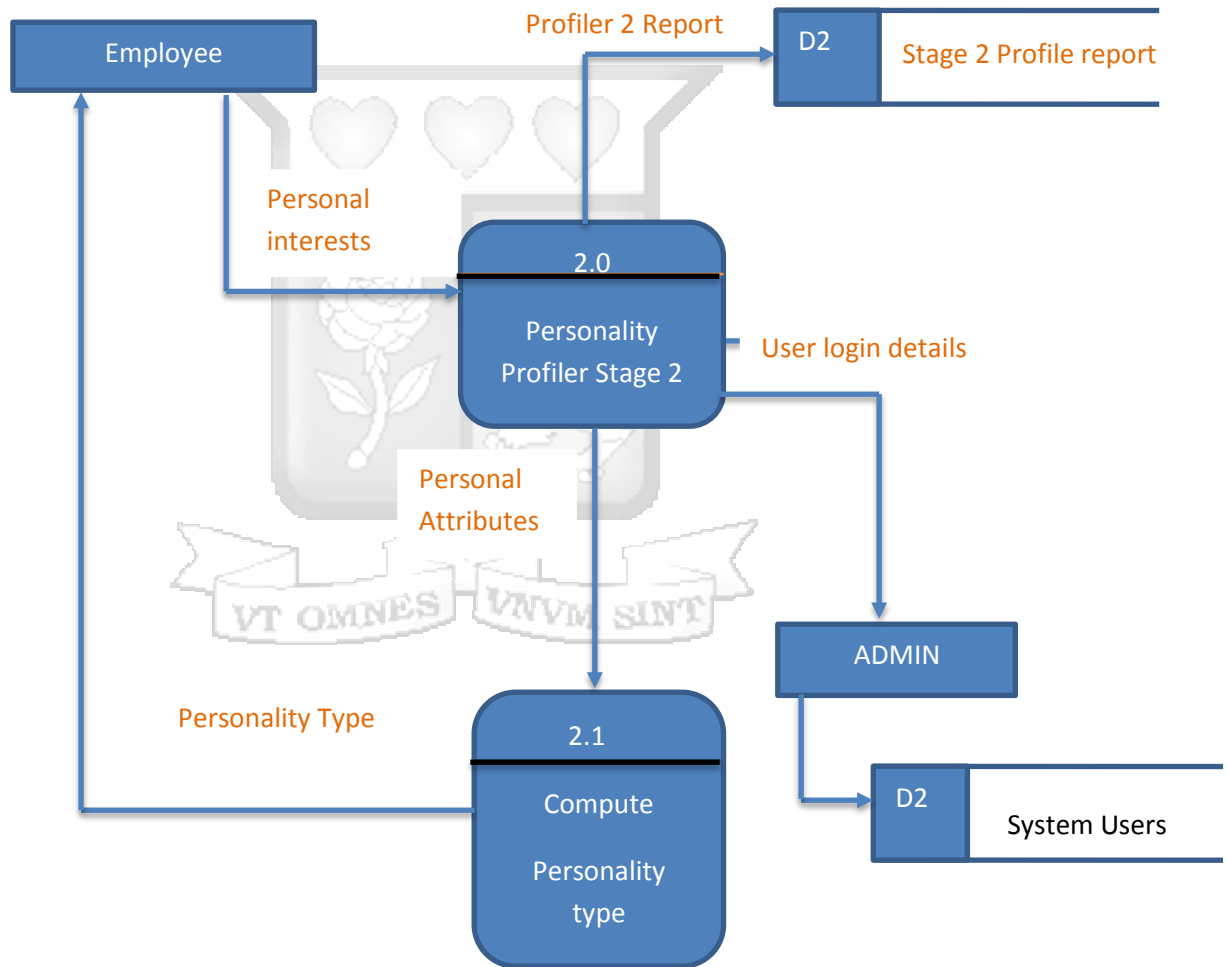


Figure 5.8: Level 1 Data Flow Diagram

5.4 System Development

The System can be accessed on www.careerportalkenya.com.

Kenyan Career portal was developed with an aim of guiding the students in career choices and profiling their personalities, interests and courses available in the Kenyan institutions of higher learning. Figure 5.8 below shows the home page of the system.

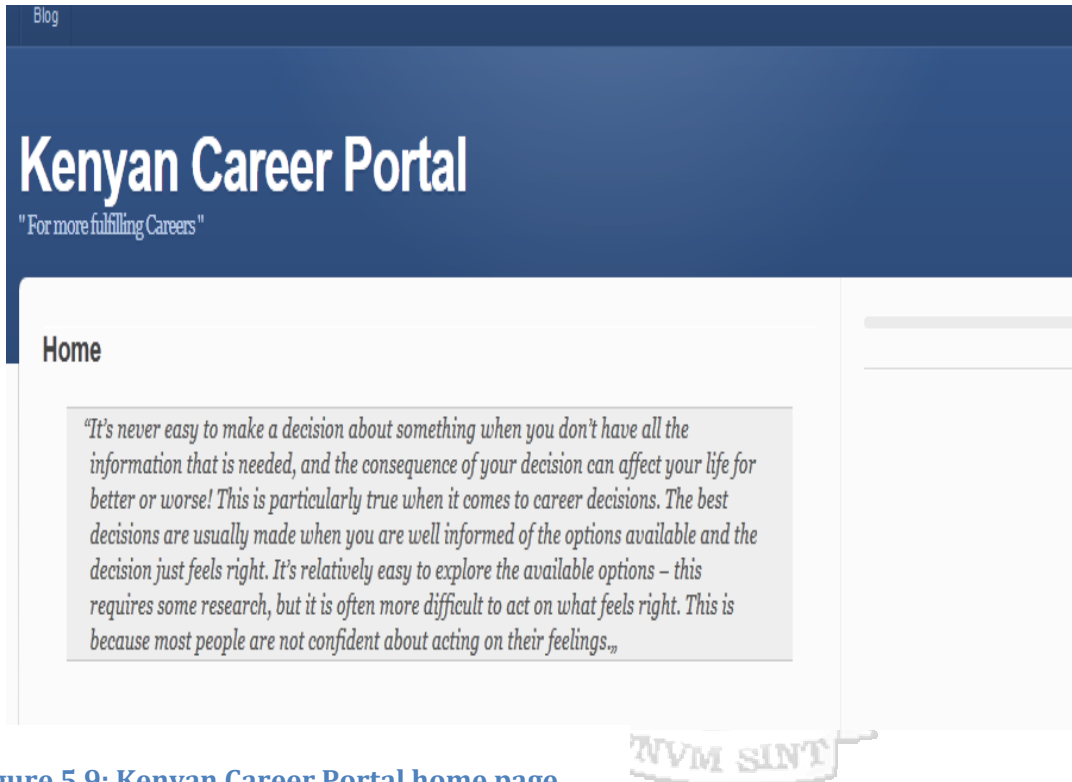


Figure 5.9: Kenyan Career Portal home page

Login/Register

The login/Register web page allows one to register as user or login to those already registered as users of the system.

Username or Email

Password

Remember Me

Figure 5.10 a: Login Page



Login/Register Form

This is a form to where the user can login and register to use the system

Username

0 of 30 max characters

Name

First

Last

Email

Password *

Enter Password

Confirm Password

Strength indicator

Figure 5.10 b: Register Page

Personality Profiler Stage 1 (Introvert/Extroverts Profiler)

This profiler categorizes the users of the system in to two categories; Introverts or Extroverts.

Extroverts

These are people who relish social life and are energized by interacting with friends and strangers alike. They are assertive, go-getting, and able to seize the day. They are also great at thinking on your feet and relatively comfortable with conflict. Given the choice, extroverts usually prefer more stimulating environments that give them frequent opportunities to see and speak with others. They feel bored while in quiet environments and are actively engaged in the world around them and enjoy tapping the energy around their world.

Introverts

This category of people devotes their social energy to a small group of people that they can care about. Introverts are naturally reserved and they think and process before they speak. They have a more deliberate approach to risk, and enjoy solitude. They feel energized when focusing deeply on a subject or activity that really interests them. They are overwhelmed while in overly stimulating environments (too loud, too crowded, etc). Introverts seek out environments of peace, sanctuary, and beauty; they have an active inner life.

The first stage of profiling allows the user to answer set of questions through which the system categorizes the user as either an introvert or extrovert. The questions are as shown in figure 5.10 below. After the first stage, the system allows the user to get into the next stage of personality profiling. This is as shown below in Figure 5.11. This is regardless of the user's results in the first stage of personality profiler.

In stage two of personality profiling, the user is categorized into four main categories, i.e. Theorists, improvisers, stabilizers and idealists. A description and characteristics of each personality type are given on the results provided after the exercise.

Personality Profiler 1

I do most things

- On the spur of the moment
- with a plan in mind

I prefer to be seen as being

- Sensible
- Sensitive

Figure 5.11: Personality Profiler Stage 1

Personality Profiler 2

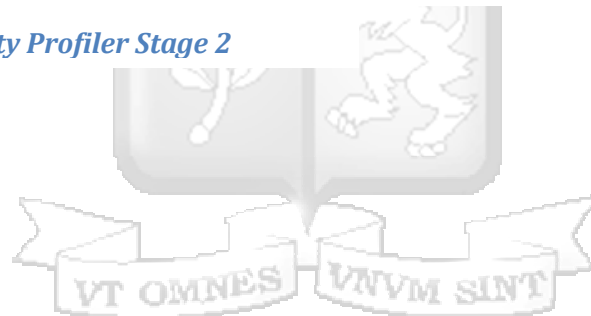
I like to work with:

- My Mind
- My hands

In my daily tasks, It's important for me to have a

- Set of routine
- Change and variety

Figure 5.12: Personality Profiler Stage 2



Interest Profiler Stage

Personality Profiler 3 : Interest Profiler

Which of the Following best Describes your Interest

- Enjoy dismantling computer systems
- Leading a team of students in developing a budget for the school fun day
- Painting a portrait of a person
- To be part of the team tasked with a responsibility of investigating how to achieve school competitiveness through better performance

I would prefer

- to create a piece of art e.g. drawing a portrait of a class teacher
- Prepare a budget for the for the end of the year class trip
- To work with a computer to update records
- To be engaged in developing a new strategic plan for the school as a representative of the students to the Board of management

SUBMIT



User Profile Information

Kenyan Career Portal

Dashboard

Profile

Collapse menu

Personality
Please enter Your Personality

I Like to work with
Please enter i like to work with

In my daily tasks It's important for me to have a
Please enter In my daily tasks It's important for me to have a

Personality 2
Please enter Personality type 2

Which of the following describes your interest
Please enter Which of the Following best Describes your Interest

I would Prefer
Please enter i would prefer

The Career Suggestion
Please enter the Career Suggestion

[Update Profile](#)

5.5 System Implementation

The implementation of the system involved hosting of the web application to enable easy and platform independent access of the system by all users who have internet connectivity. A domain www.careerportalkenya.com was bought and a hosting plan was also bought with Kenya Web Experts. The web application was then hosted and any updates on the system were to be made by the administrator who has full rights to access and update any information in the system.

5.6 System Testing

During System testing, both unit testing and system testing were carried out. Unit testing was done on the following components:

- I. Personality Profiler stage 1
- II. Personality Profiler stage 2

- III. Interest Profiler
- IV. Course profiler and
- V. My Career profile

Unit testing involved checking if all the possible inputs give the required output as predefined in the system



CHAPTER SIX: DISCUSSIONS OF RESULTS

6.1 Introduction

In this study, the author demonstrates the need for an information system for career path decision making. This chapter seeks to evaluate how the researcher met the set objectives, the comparison of the developed system to the existing systems and the advantages and disadvantages of the Kenyan Career Portal that was developed.

6.2 Review of Research Objectives

6.2.1 Review of Objective One:

This objective was aimed at establishing the data and information necessary for determining the career path of a student. This was achieved through a thorough review of scholarly materials and also from the pilot study that was carried out in this research. The research established that academic performance only complements one's personality, skills, talents and abilities. Hence it was established that for a successful career to be achieved, there must be a convergence of skills, experience, knowledge and passion. Hence this formed the basis of the data and information necessary in determining the career path of a student.

6.2.2 Review of Objective Two:

The second objective sort to evaluate the existing challenges and how such affect individuals when making their career choices. This objective was critical in validating the need for the proposed solution. It was noted that 50% of the respondents of the pilot study alluded to the fact that they made their career choices out their academic performances and not necessary out of what they were passionate about. Additionally, while 18% of the respondents had no access to information systems that would facilitate them in making career choices, 31% of respondents felt that the information systems they used were not efficient. This clearly shows that there lacked objectivity in making career choices but also there is lack of proper, well-structured and well-guided information system to facilitate career decisions among student.

6.2.3 Review of Objective Three:

The objective aimed at investigating the current techniques that were used in determining the career path of students. This was carried through a thorough review on existing models and frameworks and procedures used in making career decisions. This helped in not only

consolidating the literature together but also establishing the gaps that exist in this area of study.

6.2.4 Review of Objective Four:

To meet this objective, the researcher needs to develop an application for career path decision making. A robust, scalable Web based application called Kenyan Career Portal was developed and hosted on the domain name www.careerportalkenya.com. The objective was not fully met due to time constraints but the researcher developed a prototype to proof the concept.

6.2.5 Review of Objective Five:

The aim of this deliverable was to have the system tested by the users and a feedback provided by the users of the system on the different functionalities of the system and the user friendliness of the system. This objective was also not fully met due to time constraints but unit testing was done on the system whereby each component of the system was tested e.g. testing of the Personality Profiler Stage 1 and 2, Interest Profiler among others.

6.3 Comparison of the Kenyan Career Portal to other career decision systems

The Kenyan Career portal is best suited for Kenyan Education system as it best suits the needs of the Kenyan people. Additionally, the system is very relevant in providing the necessary information to students who have a strong desire in further their careers in the areas they are passionate about. Unlike other systems that generalize the personality test, this system provides a personal touch to any evaluation or test done. This is by providing personalized messages to the users of the system.

6.3.1 Case Study: GradState Maisha

This is a Kenyan Based web site that was set up with an aim of guiding students on how to make career choices. The site provides the users with some of the available career options/ courses in the Kenya Universities and beyond. The site also provides the user with a search engine to search for a certain course of interest and the region that one would want to do the course from.

GradState Maisha does not facilitate the users of the system in determining their abilities and passion hence Kenyan Career Portal has an upper end in that it provides a platform where system users can create their own career profile that describes their passions and abilities and gives them a clear career mapping to a specific course.

GradState also aims only at linking the users with the institutions while Kenyan Career Portal aims at linking the users with a more fulfilling career path.



CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusions

The aim of the research was to ascertain the challenges that students and young professionals go through in making career choices and developing an information system what would be idea in facilitating objective career decision making as well as provide relevant, accurate and up to date information in regard to career paths and labor market statistics. A thorough literature review was done to establish other scholarly materials that exist as far as career choices and information systems are concerned. This also helped in establishing the information gap that exists in this area.

A survey was also done among young professionals to establish the factors that affect career decision making and how information systems have played a role in career path decision making. The data collected was analyzed and constructive conclusions were deduced hence necessitating the need for this piece of study.

The research established that there is a need for students to be guided in regard to their career paths and such more productivity would be realized in the labor market as professionals would be working in the areas that they are passionate about. Additionally, the value of education would greatly be improved by ensuring that students pursue careers that are well thought and that their decision to pursue a given career is objectively made.

7.2: Recommendations

- I. The Kenyan Career Portal is recommended for adoption by the MoEST as well as KUCCPS as a tool for guiding students before and as they pursue their career options in the institutions of high learning.
- II. The Economic developed and transformation of the Kenyan Economy to a knowledge based economy requires productive and efficient human capital and as such pursuit of rewarding career options would be a great step in achieving this milestone as stipulated in Vision 2030.
- III. Students should be educated on the importance of making informed decisions as far as career options are concerned. Such decisions should be objectively made hence leading to more fulfilling careers.

7.3 Suggestions for Future Research Studies

This research was carried out in the urban centres hence the factors that determine the career choice among students and young professions could not be generalized as such vary with different environments. Hence this necessitates the need for a deeper and longitudinal research work to be carried out bearing different environments to establish the factors affecting career decisions in variety of environments.

Further research needs experts who can engage on defining the interests that informs one to pursue a different career options. This may vary with different disciplines hence people with deep knowledge and understanding on specific discipline would be the key in establishing such facts.



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APPENDICES

Appendix A: Research Work Plan

NO	ACTIVITY	DURATION	REMARKS
1	Scoping of the Research Study	3 Weeks	Done
2	Choice of Research Topic	1 week	Done
3	Research Topic Clarification, problem statement, Research Objectives, Questions and Significance of the research	6weeks	Done
Review meeting with the supervisor			
Seminar Presentation 1			
4	Foundation literature Survey	2 weeks	Done
5	Advanced literature survey	2weeks	Done with minimal corrections
Review meeting with the Supervisor			
Seminar Presentation 2			
6	Proposal of research methodology	2weeks	Done
Review meeting with the Supervisor			
7	Details proposal of research methodology	4weeks	Done with minimal corrections
Seminar Presentation 3			
Review meeting with the supervisor			
Research Proposal Defense			
8	Data Collection	4weeks	
Review meeting with the supervisor			
Seminar Presentation 4			
9	Development of the prototype	6weeks	
Review Meeting with the Supervisor			
Seminar Presentation 5			
10	Data Analysis and interpretation	3weeks	
11	Thesis Report Assessment by Supervisor	1 week	
12	Review meetings with the supervisor		
13	Thesis Defense	1week	

Appendix B: List of Suggested Interest Profiler Questions for the System

1. Watching documentaries on Computer technology
2. Watching investigative movies and following a story line in a movie
3. I seek new ways to promote a product
4. To use debating skills to present your views
5. Study something in depth
6. Leading other students in developing a science project during Kenya Science and Engineering fair
7. Help a small office become more organized by designing a better filing system
8. Drive a van to deliver some goods
9. Create a school magazine using desktop publishing software
10. Participate in music and drama competitions
11. Being part of the Students' leadership in our school
12. Look after animals in a pet shop
13. Playing musical instruments
14. Painting a portrait of a person
15. Help some students who survived during a fire breakout to overcome the trauma
16. Solving mathematical problems and physics questions
17. Act a play during the school thanksgiving ceremony
18. Present an inspiring speech to students during the school closing day
19. Investigate the cause of poor performance in school and present the findings to the school administration in a written and formal document
20. Take charge and lead other students in the administration of a new project
21. Write a song
22. Being a leader of the environmental conservation club
23. Leading the scouting team
24. Listen carefully and hear all sides of an argument
25. Being part of the journalism club members who write and present news during school assembly
26. Prepare a budget for the for the end of the year class trip
27. Plant and grow vegetables in our kitchen garden
28. Spend time reading novels
29. Assemble electronic gadgets such as TV set, Radio, etc
30. Work with a computer to update records
31. Organize all the details of a school club outing
32. Making risky decisions with some level of uncertainty
33. Create a science experiment to test a theory
34. Help to restore confidence in my fellow students who have low self-confidence
35. Design the cover of a new book or magazine
36. Solve problems by applying logical principles

37. Dismantle a computer system
38. Present a computer related project during the science and engineering fair competition
39. Read, summarize and present the theme of a set book during a grammar class
40. Searching for information in the internet
41. Teach and assist other students on a subject that you are good at
42. Emerging the best player in a football competition
43. Help disabled people to improve their daily living skills
44. Care and maintain a flower bed
45. Examine material with the help of a microscope
46. Write or narrate stories
47. Lead a computer game competition among students

Appendix C: List of Suggested Personality Profiler Questions for the System

1. I Prefer
 - Looking for a new solution to a problem at hand
 - Working with what has worked in the past
2. I take pride in being
 - Exercising creativity in solving problems
 - Being realistic when solving problems
3. When someone argues with me, it is more important to
 - Make peace
 - Confront them
4. If there is a chance someone's feeling will be hurt by telling the truth, I will
 - Keep my opinion to myself, or sugar coat the truth
 - Tell the truth anyway
5. When I meet my friends, I usually ask them
 - How they are feeling
 - What they are doing
6. I usually buy clothes
 - For practical reasons
 - Because they make me feel good
7. My friend would describe me as being more
 - Emotional
 - Logical
8. I am usually
 - On time
 - Fashionably late
9. In a relationship, I prefer to be more
 - Personal
 - Spontaneous

10. I like to work with
 - My mind
 - My hands
11. When picking movies, I usually choose one that is
 - Action based
 - Character based
12. In my daily tasks, it's important for me to have
 - A set routine
 - Change and variety
13. When faced with an interesting opportunity, I
 - Am very enthusiastic at first
 - Take the time to understand more about it first
14. It is more important for me to have
 - A predictable day
 - A mentally engaging day
15. The way I prefer to cheer up a sad friend is to
 - Get them about their feelings
 - Take them out for a good time
16. I learn easier by
 - Doing it
 - Reading about it
17. It's more important to
 - Make others happy
 - Follow the set rules
18. I learn things better when they are
 - Presented with facts
 - Told as a heart-felt story
19. When learning, I prefer to
 - Develop my own thoughts
 - Share my thoughts with others
20. When I am making a decision, i
 - Usually think about it for a while
 - Just do it spontaneously
21. The kind of a person I like to spend my time with
 - Makes me think
 - Fun to be with
22. I am
 - Analyzing this test
 - Going with my feelings

23. When it comes to personal matters in my friendships, I consider it
- Ok to discuss with other friends
 - Too private to discuss
24. I would rather have someone who is
- An intelligent friend
 - Practical companion
25. I prefer to spend time:
- Thinking about the things that need to be done now
 - Thinking about future ideas
26. I
- Occasionally break rules
 - Strictly follow the set rules
27. When I travel, I prefer
- Have a well thought plan before the start of the journey
 - Figure out what to do when I get there
28. I prefer to be known to others by
- Entertaining them
 - Inspiring them
29. In most cases, i
- Assume authority is right
 - Objectively question the authority
30. I am more inclined to
- Expressing deep feelings about something
 - Being analytical and observing deep thoughts about something
31. I would rather:
- Fine tune the details needed to complete a task
 - Assist and work as a team to complete a given task

Appendix D: Questionnaire

Introduction:

My name is Daniel Ndwiga Njeru; I am carrying out a research with a title “**An Application for Career Path Decision Making among Students**”. The aim of the research is to investigate factors that influence career choices among students and develop a decision support system that would be ideal in facilitating an objective approach to career decision making among students.

This survey is a research instrument designed to collect information on the factors that influence career decision making among students parents and teachers in Nairobi County. The information collected will be used for academic purposes only and it is expected that the findings from this study will make a significant contribution towards career path decision making among students and professionals. We wish to assure the participants that we will handle the data collected with confidentiality and academic professionalism required.

Kindly fill in the information as directed in the various section of this survey. Note that the Questionnaire targets students, teachers and parents.

The second part of the survey, respondents are required to indicate their perception about the statements given by selecting either of the options. i.e. Strongly agree- to show the statement best describes your interest, agree- to show the statement partially describes your interest, neutral- to show you are not sure about the statement, disagree- to show the statement is somehow not true and strongly disagree to show the statement is absolutely false in your opinion.

We kindly request you to take a few minutes and objectively fill this survey

PART 1: PERSONAL INFORMATION (To be filled by everyone)

Part A of this questionnaire seeks to gather general information about the targeted respondents hence it is to be filled by all the respondents.

1. What is your Gender? {Please tick one (√)}

Male

Female

2. I am a:

High school student

High School Teacher

A Parent

3. What is your age Group? {Please tick one (√)}

10-14 years

14-20 years

20-25 years

25-30 years

30-40 years

40-50 years

Above 50 years

4. What is your highest level of education {Please tick one (√)}

High School Certificate Diploma
 Bachelor Post Graduate Degree

Other (Specify).....
.....

PART II A: CAREER CHOICE TOOLS AND TECHNIQUES AMONG HIGH SCHOOL STUDENTS (To be filled by High school students only)

5. Which class are you in? {Please tick one (√)}

Form One Form Two Form Three Form Four

6. Subjects taken in High school {Please tick (√) all the subjects that you do}

- | | | | |
|---|---------------------------------|--|-----------------------------------|
| <input type="radio"/> Mathematics | <input type="radio"/> English | <input type="radio"/> Kiswahili | <input type="radio"/> Biology |
| <input type="radio"/> Physics | <input type="radio"/> Chemistry | <input type="radio"/> Geography | <input type="radio"/> History |
| <input type="radio"/> Religious Studies | <input type="radio"/> Computer | <input type="radio"/> Business studies | <input type="radio"/> Agriculture |
| <input type="radio"/> Home Science | <input type="radio"/> Wood Work | <input type="radio"/> French | <input type="radio"/> Arabic |
| <input type="radio"/> Others | (Specify)..... | | |

The Part II B,C & D of this questionnaire, respondents are required to indicate their perception about the statements in the tables by ticking or putting a cross after each statement under the columns Strongly agree- to show the statement best describes your interest, agree- to show the statement partially describes your interest, neutral- to show you are not sure about the statement, disagree- to show the statement is somehow not true and strongly disagree to show the statement is absolutely false in your opinion.

PART II B: FACTORS THAT INFLUENCE THE CHOICE OF CAREER AMONG STUDENTS

Table 1: Analysis of factors the factors that influence career choice among students

STATEMENT	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) My parents have/will greatly influence my career choice					
b) Teachers are or have been greatest influencers in career choice					
c) Career Counselors and Life Coaches have/will guide me in choosing my career					
d) My best friend in school influence my choice of career					
e) My parents chose or will choose my secondary school subjects to be taken in KCSE					
f) Availability of school fees (Money) has or will influence my choice of career					
g) Governmental policies do affect my choice of career					
h) I have friends in tertiary institutions and professionals in the job market who advise me on the best career path					
i) My KCSE performance will determine my choice of career					
j) I have access to employment in a family business hence I will pursue a career that fits the opportunity in the family business					
k) I have full information of the courses/Career choices offered in institutions of higher learning					
l) I know of a web application that can guide me in choosing my career					
m) I regularly access online information to find out the best career path					
n) I clearly know my personality and how that fits to my career path					
o) Thinking about career choice at this time is a waste of time					
p) I prefer not to join university or College after forth form					
q) My parents/Guardians and siblings have already determined my career					
r) I have taken this exercise very seriously and my opinions are objective					

PART II C: TEACHERS’ INFLUENCE ON THE STUDENTS’ CHOICE OF CAREER (To be filled by High school teachers only)

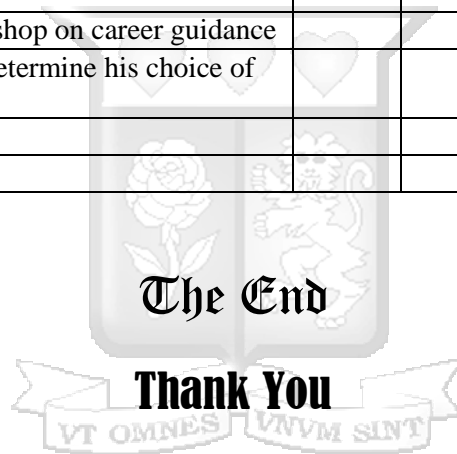
Table 2: Analysis of teachers’ influence on the students’ choice of career

STATEMENT	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) I have adequate information to guide students on their career choices					
b) I believe careers are or should be influenced by students’ personality more that academic performance					
c) I use an information system to guide students on the best career					
d) I take time to guide students on choosing careers in class and during my interaction with them.					
e) I believe the gender of a student is a factor that determine a career choice					
f) The Government has taken career guidance seriously and provided the required guidance to high school students					
g) There is a need for more technology based tools to be deployed in career guidance among high school students					
h) It is absolutely irrelevant to think about career choices while in high school					
i) I used an information system in choosing my career					
j) My career choice was influenced by my parents, guardians and influential mentors					
k) I took this evaluation seriously and my opinions are objective					

PART II D: PARENTS’ INFLUENCE ON THE CHILDREN’S CHOICE OF CAREER (To be filled by parents only)

Table 2: Analysis of teachers’ influence on the students’ choice of career

STATEMENT	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) I believe my child should pursue a career that is related to mine					
b) I want my child to pursue a career that fits to our family business					
c) I regularly give career guidance to my child					
d) I have a useful and accessible information system that I use in guiding my child to choose his/her career					
e) I have access to all information that I need in guiding my child to the career that best suit him/her					
f) I have facilitated my child to attend a forum/workshop on career guidance					
g) I believe performance of my child in exams will determine his choice of career					
h) I know, with clarity, the personality of my child					
i) I took this evaluation seriously					



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