

A Case Study: Probabilities of Job Opportunities in A Water and Sanitation Services Project by Forecasting and Analyzing the Perspective of A Survey Report

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Abstract

The City of Toronto has been asked by the principals of the Water for African Cities' Program to provide development and project management assistance with respect to the implementation of the LVWATSAN initiative. The overriding goal of the Initiative is to improve living conditions of the urban poor in the Lake Victoria Region and protect local and regional environments. A project charter was developed by stakeholders at the City of Toronto, and we are the team of quality managers that has been assembled for this effort. Before work can begin on this project, the team must research and complete the following: (1) Determine the project's various stakeholders. Points will be awarded for identifying as many distinct stakeholders as possible. You should be able to find information on your project from an internet search as these were real projects that I have modified for the purposes of this assignment. (2) Indicate what your group interprets the terms impact and influence to mean. (3) Create an Interview Sheet that you would use to collect and document information that will be obtained from the Stakeholder interviews that you and your team will conduct. Remember to ask questions that will allow you and your team to perform an analysis and categorization of the stakeholders and their requirements afterward. (4) Using an appropriate matrix, classify/prioritize these stakeholders according to their impact and influence. Who are the top 4 stakeholders that you have identified? (5) Give 3 requirements for each of the top four stakeholders. (6) Using the Full Analytical Criteria Method, prioritize the requirements of the top four stakeholders. (7) Make an operational definition for the top two (2) requirements.

The full case details can be found under Appendix 1.

INTRODUCTION

Stakeholders

The various stakeholders of the project include:

1. East African Commission (EAC)-Ministers of Water, Lake Victoria Basin Commission (LVBC) and the Secretariat

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- LVWATSAN was designed at the request of the Ministers of Water
 - LVBC is an NGO that plays the role of a coordinator in the sustainable development efforts of the Lake Victoria Basin
 - Secretariat provides policy guidance for the initiative
2. Governments of Tanzania, Uganda and Kenya
 - Source of Funding
 3. African Water Facility (AWF) of African Development Bank (ADP)

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- Source of Funding
 - 4. European Investment Bank (EIB)
 - Source of Funding
 - 5. Citizens of targeted nearby towns
 - Potential for economic growth, improved water and enhanced level of sanitation
 - Citizens of the 15 targeted towns in the 5 Partner States
 - Lake catchment provides the livelihood of 30 million people in the combined population of the nearby countries
 - 6. Mwanza Water Urban Water Supply and Sanitation Authority (MWAUWASA)
 - Mandated the role of implementing authority for potable water and sanitation services in 3 Tanzanian towns
 - Includes MUWASA and BUWASA
 - 7. Local Governments and City Councils
 - Required concerted action to address the gap in supply and demand for water and sanitation services in the nearby towns
 - 8. City of Toronto
 - Approached for assistance with the implementation of the initiative
 - 9. Employees of aiding organizations
 - 10. Local industries
 - Benefits of water sector reforms should be scaled up to reach the local businesses
 - 11. UN-HABITAT-Water for African Cities' Program
 - LVWATSAN designed and main project undertaken by the UN-HABITAT
 - 12. Community based organizations
 - Initiative fostered community involvement to help tailor to the needs of the people
 - Actively participated in public meetings and consultations of the impacts of the project
 - 13. Public representatives
 - Provided continuous feedback from the public on the outcomes and impact of the initiative
- [1]

Impact vs. Influence

When considering the terms impact vs. influence: The word "impact" has a range of different meanings and can be used in a variety of contexts. In the context of this case study, our group interprets the term impact as the significant effect that something has on a situation or individual. At its roots, impact means to hit something solidly. On an individual scale, we believe impact to be interpreted as the sudden change in perspective [2]. Fortunately, modern studies have developed methods for observing and quantifying the magnitude of the impact. The degree of impact can be categorized as either positive or negative. For example, in this case study, we are exposed to the negative impacts of urbanization on the local environment and the ecology of the Lake Victoria Basin. The term 'influence' denotes the power to affect someone's or something's character, growth, or attitude, or the effect itself. In other words, it is the capacity to indirectly persuade the development of someone's fluctuating emotions, opinions and behavior. In contrast to our interpretation of impact, we perceive influence to be a substantially more gradual and indirect process. Influence on an individual can take many forms such as socialization, peer pressure, conformity and obedience.

Interview Sheet

We should consider identify issues, opportunities and threats, project plan, collect and analyze data, and forecasting results before preparing the following Interview Sheet [3]:

- What are the short- and long-term goals for this clean water and secured sanitation project?
- Who would be the sponsor of this project and who will identify the scope of the project?
- What are the stakeholders' definitions in this project?
- Who are the employees, customers, or clients?

- What are the social and environmental impacts expected from this project?
- What are the top 5 major opportunities?
- Are there any competitors? Who are the top competitors?
- Are there any timeline, scope or technological limitations?
- What are a few factors of quality and product deliverables?
- Who would execute and monitor the budget financing and purchasing decisions?
- Who will integrate the resources, policies?
- Who will mitigate the risks?
- What are the stakeholders' roles of product success?

Figure 1 shows Project stakeholders interview session



Figure 1. Project stakeholders interview session.

Top Stakeholders

Using the L-shaped matrix for customer prioritization we've categorized and prioritized the top 4 stakeholders by their impact and influence. (Table 1 and 2)

1. Citizens of targeted nearby towns
2. East African Commission (EAC)
3. UN-HABITAT-Water for African Cities' Program
4. City of Toronto
5. Stakeholder Requirements

Our top four stakeholders are:

1. Citizens of targeted nearby towns
2. East African Commission (EAC)
3. UN-HABITAT-Water for African Cities' Program
4. City of Toronto

Table 1. Score and their meaning

Score	Meaning
10	Row is much more important than column
5	Row is more important than column
1	Row and column are equally important
0.2	Row is less important than column
0.1	Row is much less important than column

Table 2. Top 4 stakeholders by their impact and influence

Customer Prioritization Matrix	East African Commission	Citizens of targeted nearby towns	City of Toronto	UN-Habitat Water for African Cities' Program	Row Total	Relative Decimal Value
East African Commission		1/5	5	5	10.2	0.31
Citizens of targeted nearby towns	5		10	1/5	15.2	0.47
City of Toronto	1/5	1/10		1/5	0.5	0.02
UN-HABITAT Water for African Cities' Program	1/5	1/5	5		6.4	0.20
				Grand Total	32.3	1

The 3 common requirements for the top four stakeholders [4]:

- A. Clean Water and Sanitation
 - i. Achieve universal clean water and improve hydro infrastructure
 - ii. Create better access to clean water for more people in the region
- B. Decent Work and Economic Growth
 - ii. Sustain economic growth and expand job opportunities
 - iii. Create sustainable jobs in up-and-coming markets
 - iiii. Generate strong and clear plans for smooth implementation
- C. Industry, Innovation and Infrastructure
 - i. Advance technology in the workforce and implement quality infrastructure
 - ii. Promote continuous innovation and growth across various markets

Full Analytical Criteria Method

Using the Full Analytical Criteria Method, we've prioritized the requirements of the top four stakeholders. The ROW is compared to the COLUMN consistently throughout [5].

The top ranked requirement for the Citizens of targeted nearby towns is 'A' with a weighted average of 64%. (Table 3)

Table 3. Stakeholder 1-Citizens of targeted nearby towns

Requirements	A	B	C	Row Totals	Relative Decimal Value
A		5	5	10	0.64
B	0.2		0.2	0.4	0.03
C	0.2	5		5.2	0.33
Grand Total				15.6	1

The top ranked requirement for the East African Commission is 'B' with a weighted average of 64%.

The top ranked requirement for the UN-HABITAT-Water for African Cities' Program is 'A' with a weighted average of 73%. (Table 4, 5)

Table 4. Stakeholder 2-East African Commission (EAC)

Requirements	A	B	C	Row Totals	Relative Decimal Value
A		0.2	0.2	0.4	0.03
B	5		5	10	0.64
C	5	0.2		5.2	0.33
Grand Total				15.6	1

Table 5. Stakeholder 3-UN-HABITAT-Water for African Cities' Program (Table 4)

Requirements	A	B	C	Row Totals	Relative Decimal Value
A		5	10	15	0.73
B	0.2		5	5.2	0.25
C	0.1	0.2		0.3	0.02
Grand Total				20.6	1

The top ranked requirement for the City of Toronto is 'C' with a weighted average of 50%. (Table 6)

Table 6. Stakeholder 4-City of Toronto

Requirements	A	B	C	Row Totals	Relative Decimal Value
A		0.2	0.1	0.3	0.01
B	5		5	10	0.49
C	10	0.2		10.2	0.50
Grand Total				20.5	1

Operational Definitions

Using the Customer-weighted requirements prioritization matrix, we were able to identify the top two requirements (Table 7) [6]:

Table 7. Customer-weighted requirements prioritization matrix

Customer-Weighted Requirements Prioritization	East African Commission	Citizens of targeted nearby towns	City of Toronto	UN-Habitat Water for African Cities' Program	Row Total	Relative Decimal Value
A	0.01	0.3	0.0	0.15	0.46	0.44
B	0.2	0.01	0.01	0.05	0.27	0.26
C	0.1	0.2	0.01	0.0	0.31	0.30
Grand Total					1.04	1

The top two requirements are A: Clean Water and Sanitation and C: Industry, Innovation and Infrastructure. An operational definition of clean water and sanitation can be defined by the reduction

of diseases caused by water contamination, regular evaluations of the purity of the water sources and the accessibility to areas with sanitation facilities. An operational definition to describe and measure Industry, Innovation and Infrastructure can begin with access to electricity, ease of starting a new venture (Ease of Business Score) and reliability of legal and financial systems [7].

Model Analysis

The full analysis criteria model is a very useful tool to identify which requirements or needs are most important when compared against a few options. The small team and with diverse experiences worked best to brainstorm ideas and which requirements would be most essential [8]. We found that the matrix squares are filled in by comparing the row to the column and squares can be completed in pairs because the score for A vs. B is the inverse of the score B vs. A (so if one is 5, the other is $1/5 = 0.2$)

Through the analysis, it was identified the top ranked stakeholder due to the direct impact of the project and their influence was the Citizens of targeted nearby towns, who's top requirement was access to clean Water and sanitation with a weighted average of 64%. The top ranked requirement for the East African Commission was decent work and economic growth with a weighted average of 64% [9]. The top ranked requirement for the UN-HABITAT-Water for African Cities' Program was the SGD GOAL 6: Clean Water and Sanitation with a weighted average of 73%. Lastly, the top ranked requirement for the City of Toronto was Industry, Innovation and Infrastructure with a weighted average of 50%. Overall, the top two requirements were A: Clean Water and Sanitation and C: Industry, Innovation and Infrastructure [10].

Survey for Job Field Analysis (Appendix 2)

The purpose of this water and sanitation project was to create a survey to determine what field of study students think will present the best job opportunities in 2025 and if there is a relationship between the field of study of students, preparing utility concepts and their background. In order to accomplish this, the team researched the top job opportunities and the undergraduate programs at Toronto Metropolitan University. The survey was created and launched to gather the age of the respondents, sex, their current field of study and their background/nationality. This report analyzes the responses of 101 students with the goal to create a histogram and a Pareto chart. The histogram illustrates the age of the respondents, where almost 50% of the respondents answered they were between 17 to 21 years old and the second largest group being 22 to 29 years old. The Pareto chart illustrates the jobs that students felt would present the best opportunities in 2025. To achieve a healthy sample for analysis, students were asked to choose the top 3 industries they believed presented the best job opportunities in 2025, providing a larger sample to create the Pareto chart. (Table 8 and Figure 9) The analysis of the Pareto chart revealed that the vast majority of students believed that the Computer & Data Science industry presented the best job opportunities, followed by Medical Professionals, Computer Programming and Information Technology [7]. Whereas, students felt that jobs in Art & Music and Coaching and Teaching would present less opportunities in 2025. It proved to be more challenging to determine if there was a definite relationship between the field of study of students and their background, however, the data collected did reveal most students were currently studying or completing an undergraduate degree in Business Management or Accounting, Economics & Finance and also believed that these programs would present the best job opportunities in 2025.

SURVEY RESULTS

Below are graphical illustrations of the data that was collected for this survey: (Figures 2–10)

Table 8. Data used for Pareto chart.

Job Industries	Number of Responses
Computer & Data Science	46
Medical Professional (Doctor, APRN, NP RN etc.)	32

Computer Programming including IoT devices, Blockchain, etc	30
Information Technology and Support	29
Artificial Intelligence	25
Health Support Services (PSW, Counsellor, CNA, LPN etc)	22
Engineering (Architectural, Civil, Electrical, Mechanical, Mechatronics etc.)	20
Medical Technician (MRI Technology, CT Scan Technologist, Radiologist etc.)	18
Robotics	18
Sales and Support	16
Engineering (Chemical, Biochemical, Biology, Environmental, Geology etc.)	14
Administrative Services and Support	13
International Development and Trade	11
IaaS/SaaS Development and Support	7
Travel and Hospitality	6
Other	5
Art and Music	4
Coaching and Teaching	4

Sex

101 responses

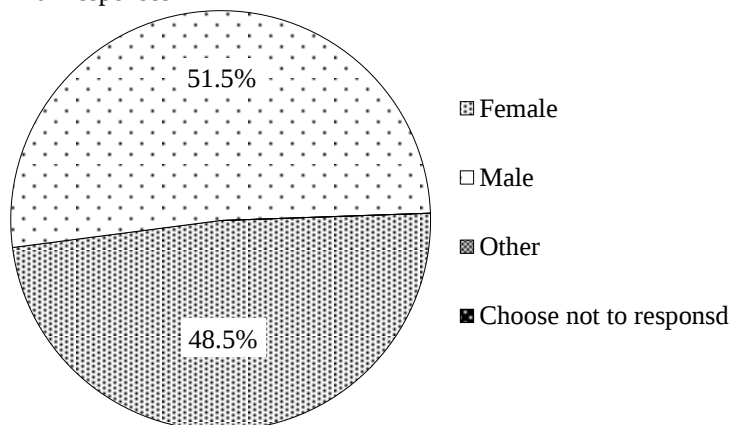


Figure 2. Sex of respondents.

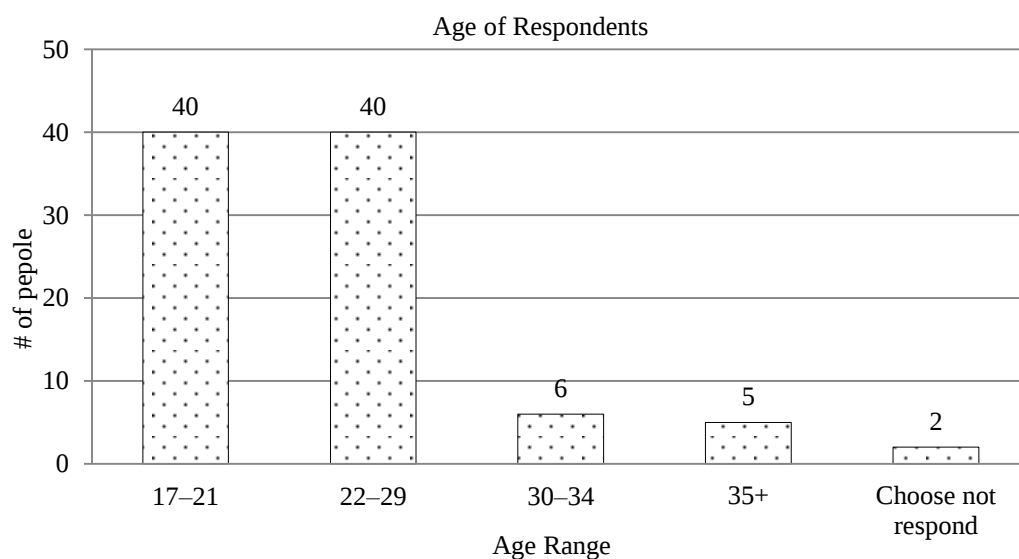


Figure 3. Histogram of age of respondents.

Ethnicity (select all that apply)

101 responses

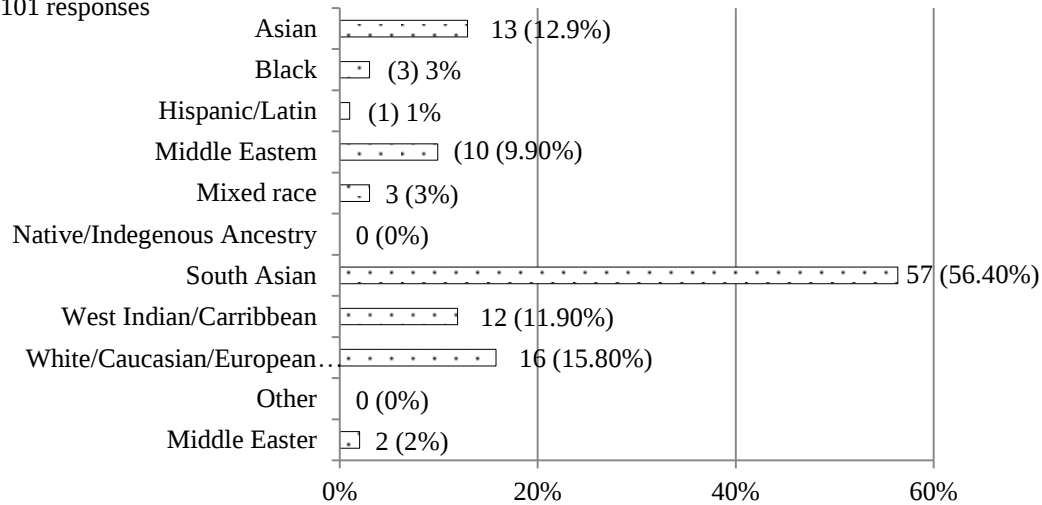


Figure 4. Ethnicity of respondents.

Are you an international student?

101 responses

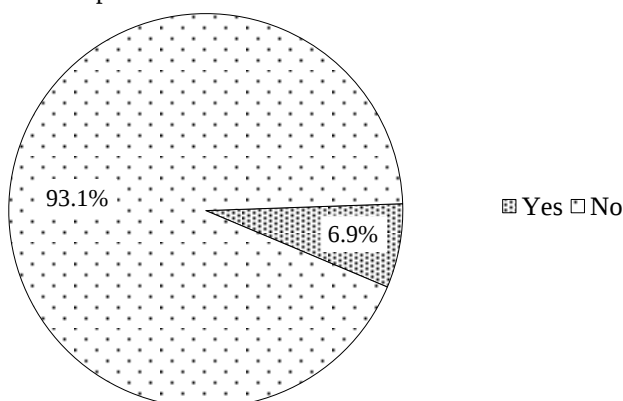


Figure 5. Student status.

Highest level of education completed or currently studying

101 responses

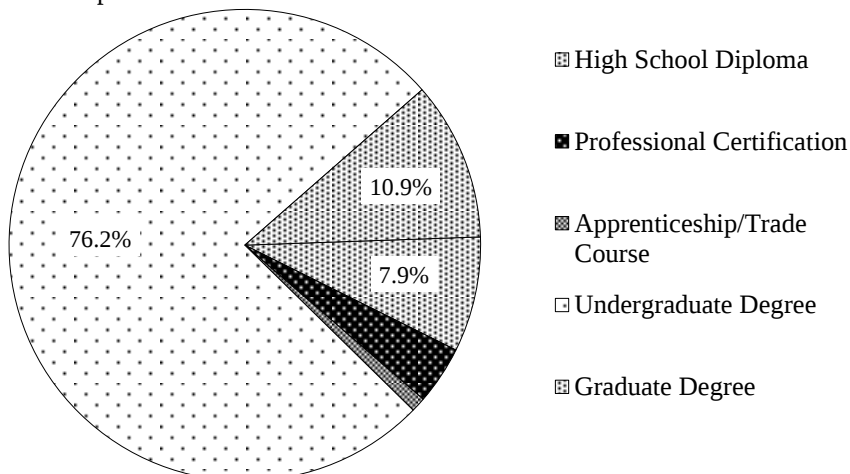


Figure 6. Level of education.

What field of study/undergraduate program are you currently studying?

101 responses



Figure 7. Current field of study/undergraduate program.

Highest level of education completed or currently studying

101 responses

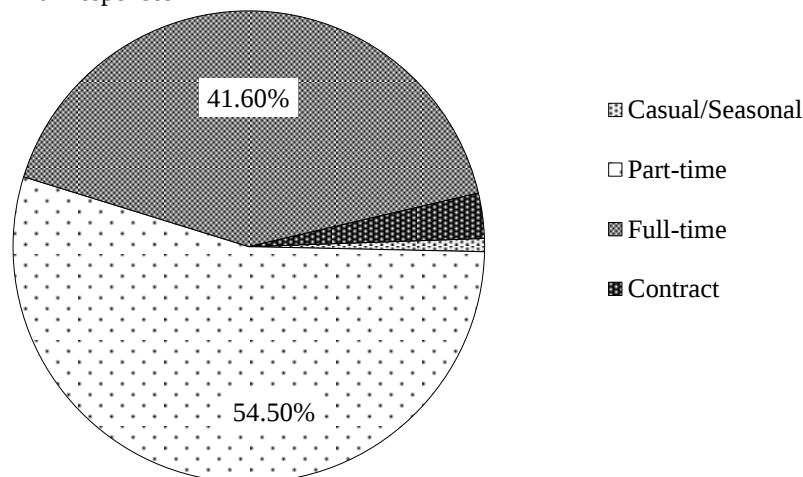


Figure 8. Employment status.

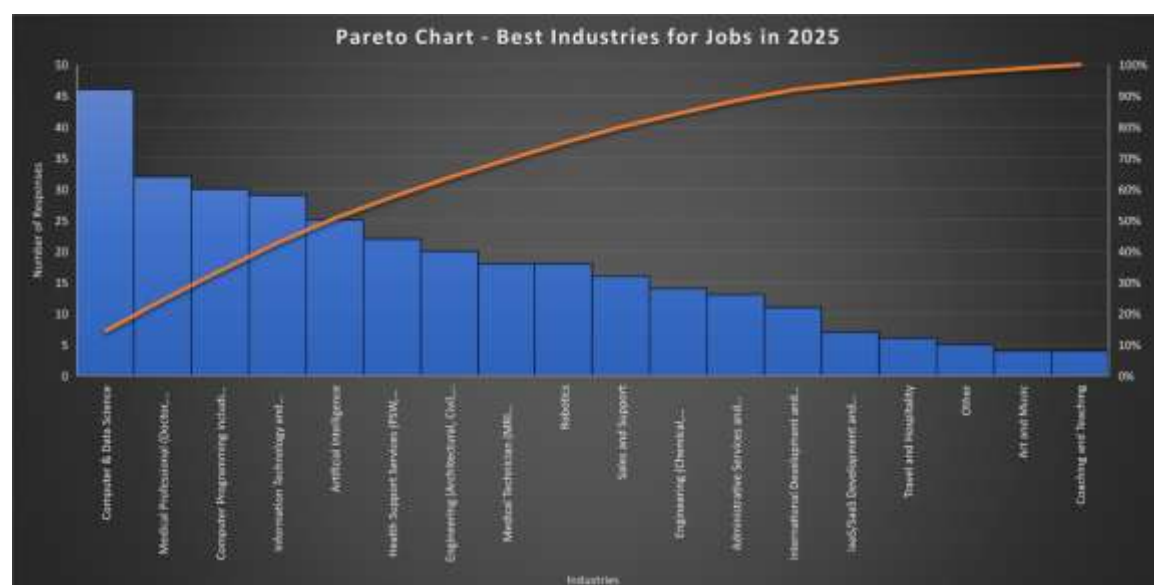


Figure 9. Pareto chart of industries with the best job opportunities in 2025.

What field of study/undergraduate program do you think will present the best job opportunities in 2025?
101 responses



Figure 10. Field of study/undergraduate program students felt had the best job opportunities in water supply and sanitation survey project.

DISCUSSIONS

After a careful analysis of the data collected and the charts, we determined that there was not a clear relationship between the field of study of students and their background. The survey received a balanced number of respondents that identified as male or female and as expected, most were either currently studying or completed an undergraduate program [11]. It was also not clear if ethnicity or student status played a role in the respondents choices, though it was interesting that out of the 101 respondents, more than half were South Asian and no one identified as Native/Indigenous Ancestry.

An analysis of the Pareto chart revealed that the first 5 industries received slightly over 50% of the votes. These top responses for the best industries in 2025 all fell within the STEM (Science, Technology, Engineering and Mathematics) field, and included Computer & Data Science, Medical Professional (Doctor, APRN, NP, RN etc.), Computer Programming including IoT devices, Blockchain, etc, Information Technology and Support and, Artificial Intelligence. However, most students indicated they were taking a business related course or social service course [12]. When asked which program they felt would provide the best job opportunities, students again choose business related courses, with social services and arts also topping the list [13].

Lessons Learnt

The majority of project managers are used to compensate for maintaining a high level of consumer trust through the final product's quality. Currently, the company is working to improve the quality techniques it employs in each stage of the manufacturing process. Quality has been mentioned but rarely used as a component on projects, and it provides little information of relevance to project managers who work with intellectual processes rather than production action details. Project managers have sought advice on how to integrate the required quality and maximize efforts in project implementations in order to achieve success.

REFERENCES

1. Analytical Criteria Method. (2022). Retrieved from <http://www.syque.com/improvement/Analytical%20Criteria%20Method.htm#:~:text=The%20Full%20Analytical%20Criteria%20Method,the%20second%20set%20of%20tools>.
2. Envision2030: 17 goals to transform the world for persons with disabilities | United Nations Enable. (2022). Retrieved from <https://www.un.org/development/desa/disabilities/envision2030.html>
3. Full Analytical Criteria Method. (2009). Retrieved from <https://static1.squarespace.com/static/5cbc5f7b7980b3434f44ad6c/t/605b9d3f33b45219c43da966/1616616767384/Full+Analytical+Criteria+Method.pdf>.
4. Managing for Quality and Performance Excellence, Edition 10e, by James R. Evans and William M. Lindsay
5. Project Quality Management: Why, What and How by Kenneth H. Rose

6. The Guide to Stakeholder Interview Questions. (2022). Retrieved from <https://adamfard.com/blog/stakeholder-interviews>.
7. What is involved in collecting data—six steps to success | Ontario Human Rights Commission. (2022). Retrieved from <https://www.ohrc.on.ca/en/count-me-collecting-human-rights-based-data/6-what-involved-collecting-data-%E2%80%93-six-steps-success>
8. Looking ahead: The Top 5 careers in 2025. (2022). Retrieved from <https://www.ncu.edu/blog/looking-ahead-top-5-careers-2025#gref>
9. Managing for Quality and Performance Excellence, Edition 10e, by James R. Evans and William M. Lindsay
10. Project Quality Management: Why, What and How by Kenneth H. Rose
11. The 30 best high-paying jobs of the future. (2022). Retrieved from <https://www.businessinsider.com/best-jobs-future-growth-2019-3>
12. Undergraduate Programs. (2022). Retrieved from <https://www.torontomu.ca/programs/undergraduate/>
13. Best Jobs of the Future: 2025 to 2050. (2022). Retrieved from <https://toughnickel.com/finding-job/Best-Jobs-of-the-Future-2050>

APPENDICES

Appendix 1

Case Details

Lake Victoria Basin covers an area of 250,000 km² with the lake taking 68,000 km². The basin has a population of 35–40 million people, with rapidly growing secondary towns, which has resulted in unplanned, spontaneous, and unsustainable growth, run-down and non-existent basic infrastructure and services and significant negative impacts on the environment and fragile ecosystem of the lake. The lake is a major-transboundary resource for East Africa Commission (EAC) countries with a high potential to accelerate the growth of the towns around it if well managed and the potential sustainably harnessed. (African Great Lakes Information Platform, n.d.)

The Water for African Cities' Programme places great emphasis on improving sanitation among the urban poor and enhancing the technical and managerial capacity of local utilities to absorb and manage increased levels of investments in the water and sanitation sector. It develops interventions to help utilities mitigate the effects of climate change through improved water conservation practices, energy audits, and the adoption of alternative sources of energy. By developing improved monitoring tools that link water and sanitation provision to urban planning, the program facilitates better allocation of resources and more effective tracking of progress towards the attainment of the water and sanitation targets of the United Nations Millennium Development Goals. (UN Habitat)

The Lake Victoria Water and Sanitation Project (LVWATSAN) has been the main project undertaken under the Water for African Cities' Programme. Lake Victoria is the second largest freshwater lake in the world and the largest lake in Africa. The Lake catchment provides the livelihood of about one third of the combined populations in the three countries or about 30 million people. (UN Habitat)

The City of Toronto has been asked by the principals of the Water for African Cities' Program to provide development and project management assistance with respect to the implementation of the LVWATSAN initiative. The overriding goal of the Initiative is to improve living conditions of the urban poor in the Lake Victoria Region and protect local and regional environments. To meet this goal, LVWATSAN aims to:

- Expedite pro-poor water and sanitation investments in secondary towns
- Enhance institutional and human resource capacities at local and regional levels
- Enhance capacities of local private sector entities in service delivery
- Reduce the adverse environmental impact of urbanization on local environment

- Support economic development in secondary towns through improved water and sanitation, and related income generating activity
- Support cooperation between the countries of the East African Region
- Specific Objectives
- Promote water and sanitation investments in the secondary urban centers in the Lake Victoria Region
- Support development of institutional and human resource capacities at local and regional levels for the sustainable delivery of improved water and sanitation services
- Facilitate realization of upstream water sector reforms at the local level in the participating urban centers
- Reduce the environmental impact of urbanization in the Lake Victoria Basin.

A project charter was developed by stakeholders at the City of Toronto, and you have been assigned as the quality manager for this effort. You have been requested to assemble a team and start work on this project by August 1, 202

Appendix 2

Create a survey to determine what field of study students think will present the best job opportunities in 2025. Correlate your answer with the age of the respondent, sex, their current field of study and their background/nationality:

- Obtain no less than 80 responses to your survey. More responses will receive more marks.
- Do a histogram by age of respondent
- Do a Pareto analysis showing the jobs that students feel will present the best opportunities in 2025
- Is there a relationship between the field of study of students and their background?

Your write up of the report is very important and is the point of this assignment. Your report should be properly *sectioned* as in the report that is linked to below. Note that your report should NOT be so long (inclusive of a title and reference pages).

The FIRST section of the report should be an abstract or an introduction. It should summarize in one or two paragraphs what you did, why you did what you did and your results. If someone were to read ONLY the abstract/ executive summary part of the report they should get to the essence of the report. (Video explaining Executive Summary)

Please check

http://www.ab.gov.ag/pdf/statistics_reports/Antigua_Barbuda_Household_ICT_Survey_2008.pdf for an example of a survey write-up.

Appendix 3

Full Analytical Criteria Method by Zane Scott ("Full Analytical Criteria Method", 2009)

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Row Totals	Criteria Weights
Criterion 1	X					RT1	RT1/GT
Criterion 2		X				RT2	RT2/GT
Criterion 3			X			RT3	RT3/GT
Criterion 4				X		RT4	RT4/GT
Criterion 5					X	RT5	RT5/GT
Grand Total (GT = Σ RTs)						GT	

"The ROW is ____ to the decision than the COLUMN"

Much More Important = 10
 More important = 5
 Of Equal Importance = 1
 Less Important = .2
 Much Less Important = .1

Appendix 4

Project Quality Management: Why, What and How by Kenneth H. Rose

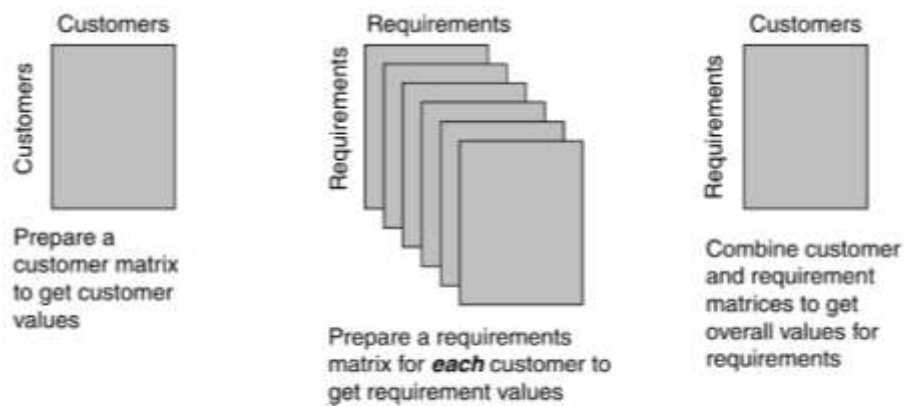


Figure 4.5. Full Analytical Criteria Method.