**ASSIGNMENT 1 FRONT SHEET**

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| --- | --- | --- | --- |
| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | Unit 06: Managing a Successful Computing Project | | |
| **Submission date** | 24/2/2023 | **Date Received 1st submission** |  |
| **Re-submission Date** |  | **Date Received 2nd submission** |  |
| **Student Name** | Do Huu Duy | **Student ID** | GCC200018 |
| **Class** | GCC0903 | **Assessor name** | Trung Viet Nguyen |
| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** | huuduy |

**Grading grid**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| P1 | P2 | P3 | P4 | M1 | M2 | D1 |
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| --- | --- | --- |
| **❒ Summative Feedback: ❒ Resubmission Feedback:** | | |
| **Grade:** | **Assessor Signature:** | **Date:** |
| **IV Signature:** | | |

**ASSIGNMENT 1 BRIEF**

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| --- | --- | --- | --- |
| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | Unit 06: Managing a Successful Project | | |
| **Assignment title** | Plan and conduct a small-scale research activity | | |
| **Academic Year** | 2022 - 2023 | | |
| **Unit Tutor** | Do Tien Thanh | | |
| **Issue date** | 03 August 2022 | **Submission date** |  |

|  |
| --- |
| **Submission Format:** |
| **Format:** The submission is in the form of an individual written report that shows how you have manage the project. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Please also provide a bibliography using the Harvard referencing system.  **Submission:** Students are compulsory to submit the assignment on the due date and in a way requested by the Tutors. The form of submission will be a soft copy in PDF posted on corresponding course of <http://cms.greenwich.edu.vn/>  **Note:** The Assignment must be your own work, and not copied by or from another student or from  books etc. If you use ideas, quotes or data (such as diagrams) from books, journals or other sources, you must reference your sources, using the Harvard style. Make sure that you know how to reference properly, and that understand the guidelines on plagiarism. If you do not, you definitely get fail |
| **Assignment Brief and Guidance:** |
| **Introduction to theme The environmental impact of digital transformation**  The amount of data created and stored globally is expected to reach 175 Zettabytes by 2025, a six-fold increase from 2018. This will demand additional hardware and power consumption, which; in turn, will increase the environmental impact of the digital sector and there is already increasing attention on the environmental footprint of ICT equipment and services as they become more widespread in all aspects of human life.  It is the responsibility of everyone to take action in addressing the challenges of climate change, as professionals we must also seek ways that the digital sector can play its part. While digital technologies are one of the sectors that has achieved greater efficiency; achieving about 100 times more computation power from the same amount of energy per decade, it remains unsustainable. The sector must continue to seek ways in which it can continue to support and drive innovation, while addressing the global climate emergency for a greener and fairer future.  This unit will enable students to explore the impact of digital endpoint devices and ways to reduce environmental damage, OR the potential of refurbishing, repairing and reusing digital devices rather than replacing.  **Tasks**  As a member of Research and Development department, you have been assigned a mini project to find out the impact of digital endpoint devices and ways to reduce environmental damages, OR the potential of refurbishing, repairing and reusing digital devices rather than replacing.  You need to do primary research (both qualitative and quantitative research) and secondary research to find out that impact and conduct a report for your research. Even if it’s a mini project, you must apply project management (PM) techniques such as project charter with aims, objectives, cost etc. As for time management, you need to produce WBS and Gantt chart with reasonable tasks and time. A project logbook is required to provide evidence of the project development process and ongoing reflection for every week. This logbook will be needed later for your reflection and evaluation in Assignment 2. As part of the QA (quality assurance) policy, in the report you also need to critically evaluate the PM process and appropriate research methodologies applied.  Your report must have an introduction stating the project aims and objectives. This must be followed by a copy of your project management plan. Your plan should show the milestones when you review with your tutor your ongoing progress so far. You will submit your logbook which shows how you have carried out the project. |

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes and Assessment Criteria** | | |
| **Pass** | **Merit** | **Distinction** |
| **LO1** Establish project aims, objectives and timeframes based on the chosen theme | | **LO1 & LO2**  **D1.** Critically evaluate the  project management  process and appropriate  research methodologies  applied. |
| **P1** Devise project aims and objectives for a chosen scenario.  **P2** Produce a project management plan that covers aspects of cost, scope, time, quality, communication, risk and resources.  **P3** Produce a work breakdown structure and a Gantt Chart to provide timeframes and stages for completion. | **M1** Produce a comprehensive project management plan, milestone schedule and project schedule for monitoring and completing the aims and objectives of the project. |
| **LO2** Conduct small-scale research, information gathering and data collection to generate knowledge to support the project | |
| **P4** Carry out small-scale research by applying qualitative and quantitative research methods appropriate for meeting project aims and objectives | **M2** Evaluate the accuracy and reliability of different research methods applied. |

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# Part 1.

# I. Introduction

## 1. Title

**Solution protects the environment through collection and recycling digital devices.**

## 2. Introduction

As expected, the amount of data created and stored globally is expected to reach 175 Zettabytes by 2025, a six-fold increase from 2018. This will demand additional hardware and power consumption, which; because we must need the hardware device that strong and large storage capacity, so the hardware device that small storage capacity may not use. Besides, there are many old devices and poor quality is thrown away instead of recycling. This will increase the environmental impact of the digital sector and there is already increasing attention on the environmental footprint of ICT equipment and services as they become more widespread in all aspects of human life. It is the responsibility of everyone to take action in addressing the challenges of climate change, we must also seek ways that the digital sector can play its part. While digital technologies are one of the sectors that has achieved greater efficiency, achieving about 100 times more computation power from the same amount of energy per decade. In the fact, there are many digital devices such as Laptop, Camera, Smart Phone, storage hardware device is used a lot and when these devices old, people often throw them away; this will impact to the environment. These devices are difficult to decompose, so this will cause danger to the environment. From that, I propose a solution for the HD company, collection and recycle these digital devices to save the environment and reduce environmental damages. Besides, I may recycle to reuse these digital devices instead of throwing them away. However, the digital devices that we collect and recycle must be using ability.

## 3. Project Management

According to the (apm, 2023), Project management is the application of processes, methods, skills, set plan, set schedule, knowledge and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters. Project management has final deliverables that are constrained to a finite timescale and budget.

## 4. Software Project

According to the (tutorialspoint, 2023), A software project is the entire process of developing software, from gathering requirements to testing and maintenance, carried out in accordance with execution techniques over an appropriate amount of time to produce the desired software output.

## 5. Project Management in software engineer

Setting and achieving project goals while maximizing any resource constraints during a project's lifecycle are all part of the discipline of project management. Software project management is a discipline and talent for organizing and managing software projects for a software engineer. The planning, carrying out, overseeing, and control of software projects are the topics covered by the area of software project management. The technique of managing, allocating, and timing resources is used to produce computer software that meets criteria. When managing software projects, the client and the developers must be aware of the project's duration, budget, and schedule (knowledgehut, 2022)

## 6. Project inception

Project Inception is the initial stage of the majority of projects where the purpose of the project is explored, a solution for implementation is identified, benefits that will result from a successful project completion are defined, the project's time requirement is estimated, and financing requests are made (taskmanagementguide, 2023)

## 7. Project Planning

According to the (tutorialspoint, 2023), planning the software project is a step that must be taken before the software is actually produced. It is there to support software creation, but it doesn't actually entail any specific tasks that are directly related to it; rather, it consists of a number of procedures that make software production easier.

## 8. Project execution

According to the (tutorialspoint, 2023), the project plans' tasks are carried out in this phase in accordance with their timelines. Monitoring is necessary during execution to ensure that everything is progressing as planned. Monitoring is the process of keeping an eye out to determine the likelihood of risk, taking action to mitigate the risk, and reporting on the status of various tasks.

These monitoring measures include:

* **Activity Monitoring:** On a daily basis, all activities scheduled within a task can be tracked. A task is deemed finished when all of its activities have been done.
* **Status Reports:** The status of the projects and tasks that were finished within a certain time frame—typically a week—are included in the reports. Status might be indicated as complete, pending, or in process.
* **Milestones Checklist:** Every project is broken down into several phases when significant tasks are completed (milestones) in accordance with the phases of the SDLC. Every few weeks, a milestone status report is made using this milestone checklist.

## 9. Closing a project

According to the (greycampus, 2023), A project closing is not the same as turning off a computer. Many things still need to be done, and many things could go wrong. The Project Manager taking center stage and will be confirming that all project work is finished and that the project has achieved its objectives during the Close Project or Phase process, including work and objectives that were added along the way as a consequence of accepted modification requests

Actions and activities necessary to satisfy completion or exit criteria for the project:

* Making certain that all documents and deliverables are up-to-date and that all issues are resolved
* Verifying the customer has received the deliverables and has formally accepted them
* Making sure that every expense is paid to the project
* Closing project accounts
* Personnel reassignment
* Reallocating facilities, tools, and other resources for the project
* Adding detail to the final project reports as necessary to comply with organizational policies

# II. Project initialization

## 1. Main aim of the project

Proposing a solution collection and recycling the digital (Laptop, Camera, Smart Phone) devices contribute protecting the environment for HD company.

## 2. List of Objectives

* Reduce the environment damages from the impact of digital devices
* Recycle the digital devices to use instead of throwing away
* Reduce electronic waste
* Promote digital transformation by collecting and recycling old digital devices

# III. Project Management Plan

## 1. Project Scope

According to the (Lutkevich, 2023), Project scope refers to the portion of project planning that entails identifying and recording a list of precise project objectives, deliverables, tasks, costs, and deadlines.

Collection and recycling to reuse the digital devices such as Laptop, Camera, Smart Phone, and storage hardware device, contribute to protect the environment. The solution is a document type and is researched and reported for the HD company.

## 2. The acceptance criteria for this project

According to the (Simplilearn, 2023), Acceptance criteria represent a specific and defined list of conditions that need to be met before a project can be considered completed and the project deliverables are accepted by the client. Before project deliverables are approved, certain performance criteria and prerequisites must be satisfied. These criteria are known as project acceptance criteria. These outline the precise conditions under which the user will accept the project's ultimate product. These are standards that we may assess, meet, and use to demonstrate to our clients that our work is finished.

The acceptance criteria of my project:

* The project cost: The cost of the project must be assured, do not lack and must be smaller $18,000.00.
* The project time: The time of the project must be assured, do not late deadline and must be completed about 40 days.
* The project quality must be assured, including the digital devices must use well after recycling

## 3. Project Quality

According to the (Team, 2022), The process of continuously assessing the quality of all activities and taking corrective action up until the team reaches the required quality is known as project quality management.

Quality management processes help to:

* Control the cost of a project
* Establish standards to aim for
* Determine steps to achieve standards

The device that is collected must be Laptop, Camera, Smart Phone, and storage hardware devices. They are old or broken digital devices, but they are still using ability and the HD company will collect to recycle to use and contribute reduce the environmental damages by these devices. The old devices must be used in a normal way when are recycled. Besides, the environment will be better when we perform collecting and recycling these digital devices.

## 4. Time

According to the (wrike, 2023), Time management is the control of the amount of time spent and the rate of project tasks and activities completion. Planning, scheduling, overseeing, and regulating every aspect of a project is necessary for effective time management.

Table 1 is the time in my project including the start time, finish time, and total days perform the project.

Table 1. Time

|  |  |  |
| --- | --- | --- |
| Solution Protects The Environment Through Collection And Recycling Digital Devices | | |
| Start Time | **Finish Time** | **Number of days of project implementation** |
| January 3, 2023 | March 3, 2023 | 37 days |

## 5. Communication

According to the (Team, 2022), Communication in project management refers to the sharing of ideas and opinions between professionals who are working on similar or related tasks. Usually, a priority of a project leader, communication in project management ensures that each professional working on the project is aware of the goals and expectations.

In this project, I will perform four meetings with the board director of the HD company and my company. There are three meetings online and one meeting offline. In the first online meeting, I will discuss with the board director of the HD company about the project plan including project idea, cost, and time. In the second offline meeting, I discuss with my company about the number of the member that will join to perform the project and in the third online meeting, I will discuss with the board director of the HD company about some additional request, project acceptance criteria and sign contract. In the offline meeting, I spent this meeting solving some small issues of the project that can be accepted with the board director of the HD company.

## 6. Risk

According to the (wrike, 2023), Risk is any unexpected event that can affect your project — for better or for worse. Risk can affect anything: people, processes, technology, and resources. Risks are events that might happen, and you may not be able to tell when.

Table 2. Risk Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Risk Category | Risk | Probability | Impact | Solution |
| 1 | Budget | Lack of cost | Low | High | Carefully calculate the cost of during project initiation to require customers to meet that cost |
| 2 | Resource | The team member gets sick | Medium | High | Human resources must always be backed up for emergencies |
| 3 | Schedule | Late deadline | Low | High | The leader needs to carefully calculate the work to be done and how long does it take to complete to calculate the time and regularly check and survey during project implementation to ensure the work goes on schedule. Besides, the leader needs to monitor project carefully to be timely handling and recalculated time when happens issues |
| 4 | Technical | Equipment for the project is broken | Low |  | Need to check the equipment before implementing the project. Besides, the devices need to have a maintenance schedule and need to have replacement devices when there is a problem |

## 7. Resources

According to the (wrike, 2023), A resource is a valuable asset that is primarily used to support the completion of a specific activity or project. A resource may be a person, a group, a piece of equipment, money, or time. The majority of projects need a variety of resources to be finished. Before a project starts, resources should be evaluated and allocated. Inadequate resource management can cause resources to run out in the middle of a project or cause delivery dates for the finished product or service to be missed.

Table 3. Resource Table

|  |  |  |
| --- | --- | --- |
| No. | Resource Type | Resources |
| 1 | Human | Do Huu Duy |
| Tran Chi Huynh |
| Tran The Tien |
| 2 | Material | Digital Devices (Laptop, Smart Phone, Camera, and storage hardware device) |
| Printer |
| 3 | Cost | $16,890.00 |

## 8. Cost Estimation

According to the (wrike, 2023), In project management, cost estimation is the process of estimating the amount of money and other resources required to finish a project within a specific time frame. An early cost estimate can help an organization decide whether to approve a project, and if the project proceeds, it can help define its scope. A company may decide to scale back the project to match what they can afford if the cost estimation is too high (it is also required to begin securing funding for the project). The cost estimate is used to control all associated costs once the project is underway in order to keep it under budget.

In this project, starting on Tue 1/3/23 and finishing on Fri 3/3/23 and the cost of total project is $16,890.00.

Table 4. Cost Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Task Name | Duration | Start | Finish | Predecessors | Resource Names | Cost |
| Solution protects the environment through collection and recycled digital devices. | **37 days** | **Tue 1/3/23** | **Fri 3/3/23** |  |  | **$16,890.00** |
| Initialization | **6 days** | **Tue 1/3/23** | **Tue 1/10/23** |  | **Duy,Huynh,Tien** | **$2,880.00** |
| Create Schedule Plan | 1 day | Tue 1/3/23 | Tue 1/3/23 |  | Duy,Huynh,Tien | $240.00 |
| Create Cost Plan | 2 days | Wed 1/4/23 | Thu 1/5/23 | 3 | Duy | $160.00 |
| Create Risk Plan | 2 days | Wed 1/4/23 | Thu 1/5/23 | 3 | Huynh,Tien | $320.00 |
| Create Communication Plan | 2 days | Fri 1/6/23 | Mon 1/9/23 | 5 | Duy,Huynh,Tien | $480.00 |
| WBS Diagram | 1 day | Tue 1/10/23 | Tue 1/10/23 | 6 | Huynh,Tien | $160.00 |
| Gantt Chart | 1 day | Tue 1/10/23 | Tue 1/10/23 | 6 | Duy | $80.00 |
| Research | **12 days** | **Wed 1/11/23** | **Mon 2/6/23** |  | **Duy,Huynh,Tien** | **$5,760.00** |
| Identify And Gather Relevant Literature | 3 days | Wed 1/11/23 | Fri 1/13/23 | 8 | Duy,Huynh,Tien | $720.00 |
| Identify Data Sources And Gather Data | 4 days | Mon 1/16/23 | Mon 1/30/23 | 10 | Duy,Huynh,Tien | $960.00 |
| Survey Research | 5 days | Tue 1/31/23 | Mon 2/6/23 | 11 | Duy,Huynh,Tien | $1,200.00 |
| Implement | **8 days** | **Tue 2/7/23** | **Thu 2/16/23** |  | **Duy,Huynh,Tien** | **$4,480.00** |
| Analysis the research that gather | 5 days | Tue 2/7/23 | Mon 2/13/23 | 12 | Duy,Huynh,Tien | $1,200.00 |
| Potential Solution | **3 days** | **Tue 2/14/23** | **Thu 2/16/23** |  | **Duy,Huynh,Tien** | **$1,360.00** |
| Identify Solution | 2 days | Tue 2/14/23 | Wed 2/15/23 | 14 | Tien | $160.00 |
| Evaluate The Feasibility And Effectiveness Of Solution | 3 days | Tue 2/14/23 | Thu 2/16/23 | 14 | Duy,Huynh | $480.00 |
| Final Report | **5 days** | **Fri 2/17/23** | **Thu 2/23/23** |  | **Duy,Huynh,Tien** | **$2,405.00** |
| Write Final Report Summarizing The Research Findings | 3 days | Fri 2/17/23 | Tue 2/21/23 | 17 | Duy,Huynh,Tien,Printer[1] | $725.00 |
| Submit Report To The Appropriate Parties | 2 days | Wed 2/22/23 | Thu 2/23/23 | 19 | Duy,Huynh,Tien | $480.00 |
| Project Closeout | **3 days** | **Fri 2/24/23** | **Tue 2/28/23** |  | **Duy,Huynh,Tien** | **$1,365.00** |
| Document Project Results | 1 day | Fri 2/24/23 | Fri 2/24/23 | 20 | Duy,Printer[1] | $85.00 |
| Disseminate Project Results To Stakeholders | 2 days | Fri 2/24/23 | Mon 2/27/23 | 20 | Huynh,Tien | $320.00 |
| Close Out Project And Archive Project Materials | 1 day | Tue 2/28/23 | Tue 2/28/23 | 23 | Duy,Huynh,Tien | $240.00 |

# IV. Planning

## 1. Word Breakdown Structure (WBS)

According to the (material, 2022), Work Breakdown Structure (WBS) is a method of breaking down a project into individual elements (components, subcomponents, activities and tasks) in a hierarchical structure. It defines tasks that can be completed independently of other tasks. WBS is the foundation of project planning. It is developed before estimation of activity durations.

* The work content of a WBS item is the sum of the WBS items below it.
* A WBS item is the responsibility of only one individual, even though many people may be working on it.
* Each WBS item must be documented to ensure accurate understanding of the scope of work included and not included in that item.

Graphical user interface, text, application, email

Description automatically generated

Figure 1. WBS

Graphical user interface, text, application, email

Description automatically generated

Figure 2. WBS Diagram

## 2. Gantt Chart

According to the (material, 2022), Henry Gantt, an American engineer, created the Gantt chart in 1917. Graph or bar chart with a bar for each project activity that shows passage of time. Provides visual display of project schedule. Gantt charts provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format.

Symbols include:

* A black diamond: milestones or significant events on a project with zero duration
* Thick black bars: summary tasks
* Lighter horizontal bars: tasks
* Arrows: dependencies between tasks

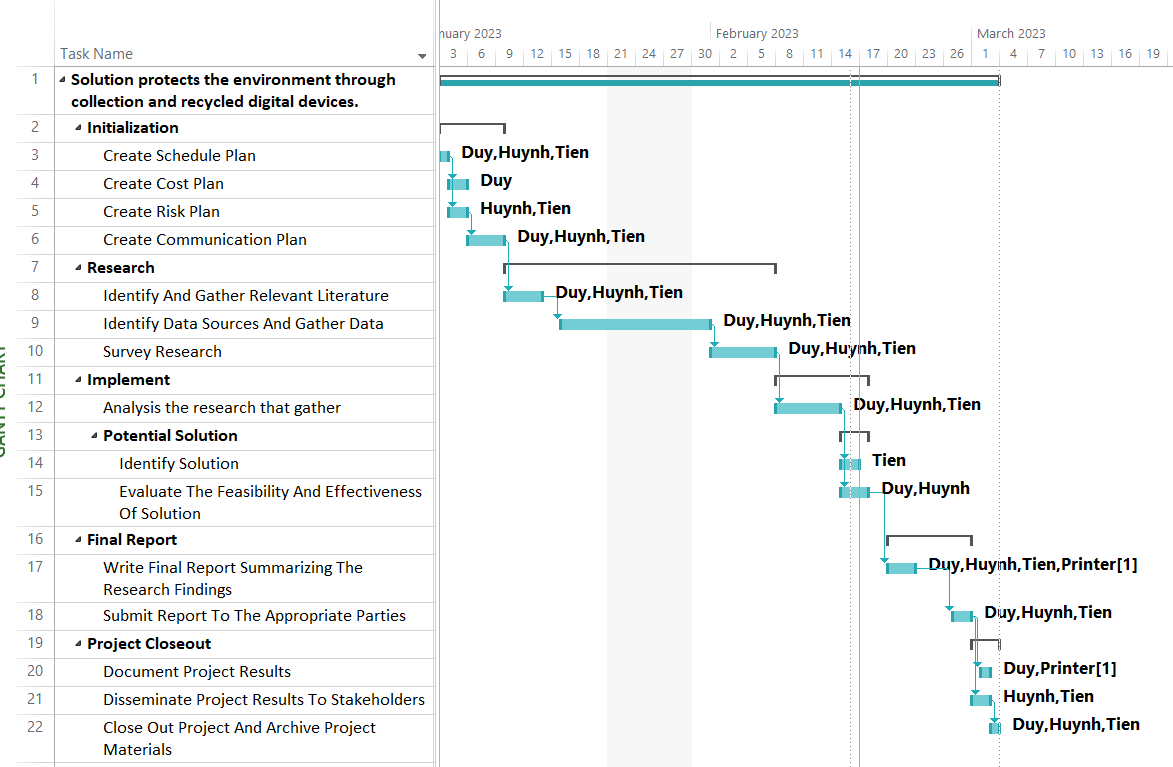


Figure 3. Gantt Chart Diagram

## 3. MS Project

According to the (Keup, 2022), in order to develop timetables, project plans, manage resources, and keep track of time, project managers utilize Microsoft Project. For project management experts, it contains features like Gantt charts, kanban boards, and project calendars. The current official name of the program is Microsoft Project, but it is also referred to as MS Project or Project Professional. Project Online, Project Server, and Project for the Web are further Microsoft Project products with related names.

**Features of MS Project:**

* Project Planning: To plan your work, use kanban boards and Gantt charts. Compared to Microsoft Planner, Microsoft Project has far more advanced planning capabilities.
* Communication & Collaboration: Projects can be completed by teams. Microsoft Teams is an alternative that offers a more affordable communication option.
* Coauthoring: Editing and updating task lists and schedules is a joint effort between stakeholders and team members.
* Reporting: Reports that are already created and can be used to monitor resources, initiatives, and portfolios.
* Roadmap: Track programs and project portfolios.
* Timesheets: Collect project and non-project time for payroll and invoicing.
* Resource Management: Manage resources by requesting and assigning tasks.

**Advantages of MS Project:**

* One of the main benefits is that it interfaces with other Microsoft products like Office 365, Skype, and Sharepoint because it is a Microsoft product.
* It has a similar interface to other MS products.
* It’s part of Microsoft and has the reliability and support that’s associated with an established company.
* Project managers can estimate budgets with the aid of financial management tools in this system.
* It has templates to help users get started, which saves time.

**Disadvantages of MS Project:**

* MS Project Online is a cloud-based solution, however it has a few drawbacks. Even with Sharepoint, which was created to benefit from the cloud, MS Project has significant obstacles there.
* It's challenging to use and learn. Before project managers and their teams feel comfortable utilizing the software, a significant amount of time, effort, and even intense training must be put in it. The project will take longer to implement as a result.
* It is pricey. Again, the costs shown above are per person, per month. As you purchase licenses for team members who need access to the software in order to utilize its collaborative capabilities, this quickly adds up. If not, it's more of a pricey tool reserved just for the project manager.
* It is difficult to share. As was already mentioned, files are saved in the proprietary MPP format, making them inaccessible to people who don't have MS Project. If the program were less expensive, this would be less of an issue, but it adds up if you need an MS Project license in order to open an MPP file. Sharing project files is made very difficult by these numerous needless obstacles.

## 4. Project Monitoring

According to the (Satyendra, 2017), Project management includes project monitoring as a crucial component. It gives insight into how the project is doing so that, when performance dramatically veers off the intended course, the proper remedial actions can be done. It entails the systematic, ongoing collection and analysis of information to monitor the project's implementation against established goals and targets. It is a crucial management tool that, when utilized correctly, offers continuous feedback on the project implementation status and helps identify potential obstacles and successes to enable quick decisions.

Table 5 is the monitoring table in my project

Table 5. Monitoring table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Task Name | Duration | Start | Finish | Predecessors | Resource Names | Cost | % Complete |
| Solution protects the environment through collection and recycled digital devices. | **37 days?** | **Tue 1/3/23** | **Fri 3/3/23** |  |  | **$16,890.00** | **68%** |
| Initialization | **6 days** | **Tue 1/3/23** | **Tue 1/10/23** |  | **Duy,Huynh,Tien** | **$2,880.00** | **100%** |
| Create Schedule Plan | 1 day | Tue 1/3/23 | Tue 1/3/23 |  | Duy,Huynh,Tien | $240.00 | 100% |
| Create Cost Plan | 2 days | Wed 1/4/23 | Thu 1/5/23 | 3 | Duy | $160.00 | 100% |
| Create Risk Plan | 2 days | Wed 1/4/23 | Thu 1/5/23 | 3 | Huynh,Tien | $320.00 | 100% |
| Create Communication Plan | 2 days | Fri 1/6/23 | Mon 1/9/23 | 5 | Duy,Huynh,Tien | $480.00 | 100% |
| WBS Diagram | 1 day | Tue 1/10/23 | Tue 1/10/23 | 6 | Huynh,Tien | $160.00 | 100% |
| Gantt Chart | 1 day | Tue 1/10/23 | Tue 1/10/23 | 6 | Duy | $80.00 | 100% |
| Research | **12 days** | **Wed 1/11/23** | **Mon 2/6/23** |  | **Duy,Huynh,Tien** | **$5,760.00** | **100%** |
| Identify And Gather Relevant Literature | 3 days | Wed 1/11/23 | Fri 1/13/23 | 8 | Duy,Huynh,Tien | $720.00 | 100% |
| Identify Data Sources And Gather Data | 4 days | Mon 1/16/23 | Mon 1/30/23 | 10 | Duy,Huynh,Tien | $960.00 | 100% |
| Survey Research | 5 days | Tue 1/31/23 | Mon 2/6/23 | 11 | Duy,Huynh,Tien | $1,200.00 | 100% |
| Implement | **8 days?** | **Tue 2/7/23** | **Thu 2/16/23** |  | **Duy,Huynh,Tien** | **$4,480.00** | **63%** |
| Analysis the research that gather | 5 days? | Tue 2/7/23 | Mon 2/13/23 | 12 | Duy,Huynh,Tien | $1,200.00 | 50% |
| Potential Solution | **3 days?** | **Tue 2/14/23** | **Thu 2/16/23** |  | **Duy,Huynh,Tien** | **$1,360.00** | **76%** |
| Identify Solution | 2 days | Tue 2/14/23 | Wed 2/15/23 | 14 | Tien | $160.00 | 100% |
| Evaluate The Feasibility And Effectiveness Of Solution | 3 days? | Tue 2/14/23 | Thu 2/16/23 | 14 | Duy,Huynh | $480.00 | 60% |
| Final Report | **5 days?** | **Fri 2/17/23** | **Thu 2/23/23** |  | **Duy,Huynh,Tien** | **$2,405.00** | **0%** |
| Write Final Report Summarizing The Research Findings | 3 days? | Fri 2/17/23 | Tue 2/21/23 | 17 | Duy,Huynh,Tien,Printer[1] | $725.00 | 0% |
| Submit Report To The Appropriate Parties | 2 days? | Wed 2/22/23 | Thu 2/23/23 | 19 | Duy,Huynh,Tien | $480.00 | 0% |
| Project Closeout | **3 days?** | **Fri 2/24/23** | **Tue 2/28/23** |  | **Duy,Huynh,Tien** | **$1,365.00** | **0%** |
| Document Project Results | 1 day? | Fri 2/24/23 | Fri 2/24/23 | 20 | Duy,Printer[1] | $85.00 | 0% |
| Disseminate Project Results To Stakeholders | 2 days? | Fri 2/24/23 | Mon 2/27/23 | 20 | Huynh,Tien | $320.00 | 0% |
| Close Out Project And Archive Project Materials | 1 day? | Tue 2/28/23 | Tue 2/28/23 | 23 | Duy,Huynh,Tien | $240.00 | 0% |

# Part 2.

# I. Primary Research

## 1. Quantitative research

According to the (Bhandari, 2020), the process of gathering and interpreting numerical data is known as quantitative research. It can be used to generate predictions, test theories, and uncover patterns and averages. Comparative study, which gathers and examines non-numerical data, is known as quantitative research (e.g., text, video, or audio). Quantitative research is widely used in the natural and social sciences: IT, Biology, Chemistry, Psychology, Economics, Sociology, Marketing, etc.

## 2. Qualitative research

According to the (Carl F. Auerbach, 2023), Qualitative research refers to a broad family of research methodologies. Qualitative research is research that involves analyzing and interpreting text and interviews and observations in order to discover meaningful patterns descriptive of a particular phenomenon.

## 3. The differences between Quantitative and Qualitative research

Table 6. Compare Quantitative and Qualitative table

|  |  |  |
| --- | --- | --- |
| No. | Quantitative | Qualitative |
| 1 | Testing and verification are prioritized | Emphasis on comprehension |
| 2 | Concentrate on the details or justifications for social events | Concentrate on comprehending from the respondent's perspective |
| 3 | Logical and critical approach | Interpretation and rational approach |
| 4 | Controlled measurement | Measurements and observations made in the wild |
| 5 | Objective "outsider view" distant from data | Subjective "insider view" and closeness to data |
| 6 | Deductively based on hypotheses with a strong emphasis on theory testing | Exploratory orientation |
| 7 | Result oriented | Process oriented |
| 8 | Particularistic and analytical | Holistic perspective |
| 9 | Generalization by population membership | Generalization by comparison of properties and contexts of individual organism |

## 4. List of questionnaires

### 4.1. Quantitative questions

1. Where will we collect these types of digital devices?
   1. Scrap warehouse
   2. Electronics store
   3. Set the staff go to buy in people's house
2. Is technology waste such as digital devices, a cause of environmental impact today?

a. Yes

b. No

1. Should these digital devices be recycled instead of thrown away?

a. Yes

b. No

1. Will the environment be less polluted when digital devices are collected and recycled?
2. Yes
3. No
4. How many digital devices should you recycle in a day to ensure the environment is better in 2025 year?

a. 100 devices

b. 150 devices

c. 200 devices

### 4.2. Summarize of Quantitative questions

1. In question 1, I set this question because I want to know places where I can go to collect the digital devices.
2. In question 2, I set this question with the aim that I want to know whether the technology waste have a cause impact to the environment
3. In question 3, I want to know everyone’s wishes and whether everyone wants to use recycling digital devices to avoid waste.
4. In question 4, I want to know whether when I collect and recycle digital devices, the environment will improve and better. Does it reduce environmental pollution?
5. In question 5, I want to get the opinion from everyone that how many digital devices I collect and recycle in a day to help the environment is better in 2025 year.

### 4.3. Qualitative questions

1. In today's digital age, do digital devices have an impact on the environment?
2. How to collect the digital devices such as Laptop, Camera, Smart Phone, storage hardware device for recycling?
3. Why does collecting and recycling digital devices help the environment?
4. Why does today’s digital age affect the environment?
5. Should we reuse old digital devices?

### 4.5. Summarize of Qualitative questions

1. In question 1, I set this question because I want to know nowadays, the digital devices have an impact on the environment or not.
2. In question 2, I set this question because I want to know the way to help me collect digital devices such as Laptop, Camera, Smart Phone, storage hardware device for recycling.
3. In question 3, I set this question because I want to know why collecting and recycling digital devices does be helpful for the environment.
4. In question 4, I set this question because I want to know why technological development affects the environment.
5. In question 5, I set this question because I want to get everyone’s opinion that we should reuse the old digital devices.

## 5. Evaluation about interview and Survey

In this project, I gave people 5 qualitative interview questions. My purpose in asking these questions is because I want to know people's views on the environmental impact of digital devices and the goals of the questions that I ask are listed in section 4. After interviewing everyone, I learned everyone's views on today's modern trends, they helped me determine the direction of the project on environmental protection through collection and recycling. When it comes to making old digital devices, most people throw away their old, broken and outdated digital devices and from these comes the environmental impact. From these interview questions, I know if this project should be done and if the project, I proposed is suitable and feasible for today's digital modern or not and have I achieved my goal about the questions asked. In this project, when I do these interview questions, the audience that I approach to interview is the students, I approach them for interview because I know today students use Digital devices mainly and I got the answer exactly what I wanted.

After conducting the interviews and collecting the content about the desired answers, I continued to conduct a survey about the ideas proposed in my project. I have given 5 survey questions related to the project with the goal of collecting more opinions from people to make comparisons and evaluations to have the right adjustments and directions in the project. As I mentioned earlier, my project is to do environmental protection through the collection and recycling of old digital devices and based on the results of previous interview questions. I have given 5 survey questions as follows, with the collection of old equipment for recycling, where will I have to collect them and with the goal of helping to improve the state of the environment by 2025, now How many devices do I have to collect and recycle every day to improve the environment and when implementing this project until 2025, how many percent will the environmental condition be improved compared to the present. With the desire to receive measurements to effectively implement the project, the above survey questions have helped me achieve the necessary goals for the project.

To sum up, through interview questions and surveys, I got to know the direction of the project and knew that the project I was working on was feasible in today's digital age. By asking interview and survey questions, I learned more about how to interview and survey for a particular issue. Last but not least, after doing an interview and survey, I got the desired result for the project.

# II. Secondary Research

## 1. Overview

According to the (questionpro, 2023), A study technique known as secondary research makes use of data that has already been collected. To improve the overall effectiveness of the research, existing data is compiled and summarized. One of the main benefits of secondary research is that it frees us from having to gather new data in order to make discoveries and reach conclusions. We can build on our existing knowledge and experience while also saving time and resources.

* Advantages of secondary research
* The majority of the data used in this study is easily accessible. In contrast to primary research, where data must be gathered from scratch, there are numerous sources from which pertinent data can be gathered and used
* As the necessary data is readily available and doesn't cost much if retrieved from reliable sources, this approach is less expensive and time-consuming. The cost of obtaining data starts at a minimum.
* Organizations or businesses can determine the efficacy of primary research using the information gathered through secondary research. As a result, organizations or companies can formulate a hypothesis and assess the expense of carrying out primary research.
* Secondary research is quicker to conduct because of the availability of data. It can be completed within a few weeks depending on the objective of business or scale of data needed.
* Disadvantages of secondary research
* Even if data is easily accessible, a credibility assessment must be done to determine the veracity of the material.
* The most recent statistics and reports are not always available in secondary data sources. Even if the data is correct, it could not have been sufficiently updated to take recent timelines into account.
* The findings of secondary research are derived from the results of all original research. The effectiveness of the study that has previously been done through primary research will determine your research's success to a greater extent.

## 2. List of Articles

Table 7. Book table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Title | Type | Authors | Time |
| 1 | Digital Transformation | Article | Katyeudo K. de S. OLIVEIRA1 Ricardo A. C. de SOUZA | 2021 |
| 2 | Impacts of the digital transformation on the environment and sustainability | Article | Ran Liu, Dr. Peter Gailhofer, Carl-Otto Gensch, Dr. Andreas Köhler, Franziska Wolff | 2019 |

## 3. Summarize Articles that read

### 3.1. Digital Transformation

The article discusses how human, organizational, pedagogical, and technological factors have all been integrated into the digital transformation of instructional processes. To prepare students for the demands of the Fourth Industrial Revolution and the challenges posed by global awareness, such as reducing the causes and effects of climate change based on public awareness, Education 4.0 aims to provide them with a variety of skills, including cognitive, social, interpersonal, and technical ones. Improve students' understanding of climate change by creating projects to lessen environmental issues brought on by human activity, while also teaching students the soft and hard skills necessary for the 21st century's learning and working processes. Digital transformation aims to innovate technology and drivers. In addition, it contributes to reducing climate change and the impact on the environment.

### 3.2. Impacts of the digital transformation on the environment and sustainability

The main goal of the article is to collect data on the opportunities and hazards associated with digital transformation's potential positive and negative impacts on the environment. This paper focuses on digitalization's non-energy, non-GHG implications because there has been a lot more research on its energy consumption and greenhouse gas (GHG) effects. Impacts on water and resource consumption, land use and land use change, as well as biodiversity, are specifically screened. Taking into account the intricate impact pathways associated with the digital transition, this research divides environmental effects of digitalization into direct, indirect, and systemic effects.

## 4. My understanding about the Articles

### 4.1. Digital Transformation

* **My Understanding:** After reading through the above two articles, I understand the importance of digital transformation today. Besides, I know the environment is impacted by digital devices. I understand about today’s digital transformation, contributing to protecting the environment and improving people’s lives through the use of digital devices instead of using the files paper. Besides, apply the digital transformation in education to development and improve quality.
* **I don't understand:** After reading the article, I still do not understand the TADEO method in the article. The article needs to present and explain more clearly the TADEO method. Besides, in the method implementation phase TADEO to apply for the study should present shorter and more concise presentation. I think the article should improve these to the reader easy to read and understand about the information that the article provides.

### 4.2. Impacts of the digital transformation on the environment and sustainability

* **My Understanding:** After reading the article, I have seen proof of the advantages and potential of digital transformation for the environment through this essay. On the other side, the facts provided in the essay helped me to comprehend and better understand the negative effects and hazards of the digital transition on the environment. This article offers additional in-depth research of the non-energy, natural resource, water, and land impacts in addition to data relating to digital transformation's environmental effects, both good and negative. In addition, this article also studies the direct and indirect implications associated with the digital transformation process.
* **I don’t understand:** Even though the effects of digital transformation on the environment and tangible examples of it have been extensively explored in this essay, there is still room for improvement. This page needs to be enhanced since it has not yet addressed legal concerns or provided information on data economy regulations. The discussion surrounding this problem is also not well-defined.

## 5. What can I do if I have more time

In this project, I read two articles named Digital Transformation and Impacts of digital transformation on the environment and sustainability. I understood how the digital change of the world would both have positive and harmful effects on the environment. the environmental dangers and consequences of digital revolution. I also gained greater knowledge about how digitization affects the environment both directly and indirectly. I also learnt more about how the digital transformation process incorporates organizational, technological, and human. With the difficulties brought on by global awareness. Due to the effects of the digital transformation, this is to increase people's awareness of the need to develop programs that protect the environment. I don't have time to elucidate the concerns I still don't comprehend because the project's study time is limited. I'll read more and delve deeper into the information that the two articles above do not cover if I have more time. I'll delve more into the arguments surrounding how the environment will be affected by the digital transition. to have a broader perspective on this matter because, when taking part in the debate, I can find many points of view from many people. I'll also gain greater knowledge about the relevant legal issues. This will enable me to comprehend the law's contents more fully and steer clear of unnecessary legal blunders when carrying out the project. To expand my understanding of this topic in the future, if I have more time, I will find and read additional articles or books about digital transformation and problems with digital transformation content that have an influence on the environment.

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