University of Central Lancashire
UCLan

Project Report

"Building a Jetpack Factory for Hubro Business"

Submitted by:

Vibhuti Jaiswal

For Completion of Assignment 1 MG4205 (2021-22) Project Management (FT MBA)

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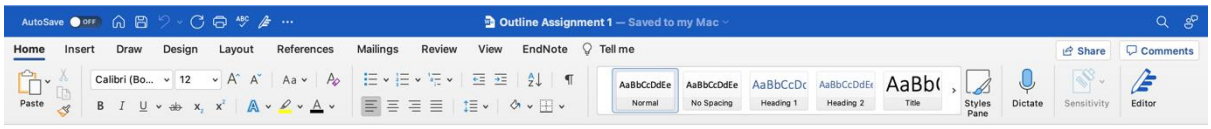

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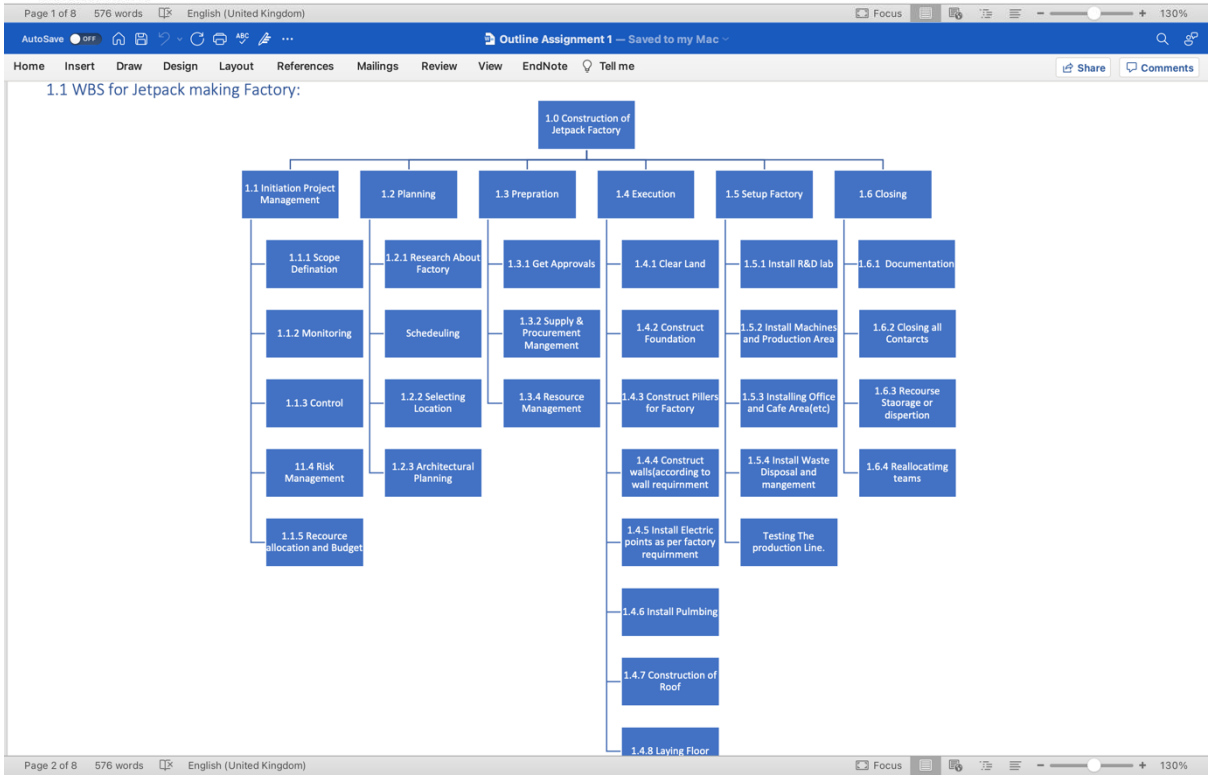

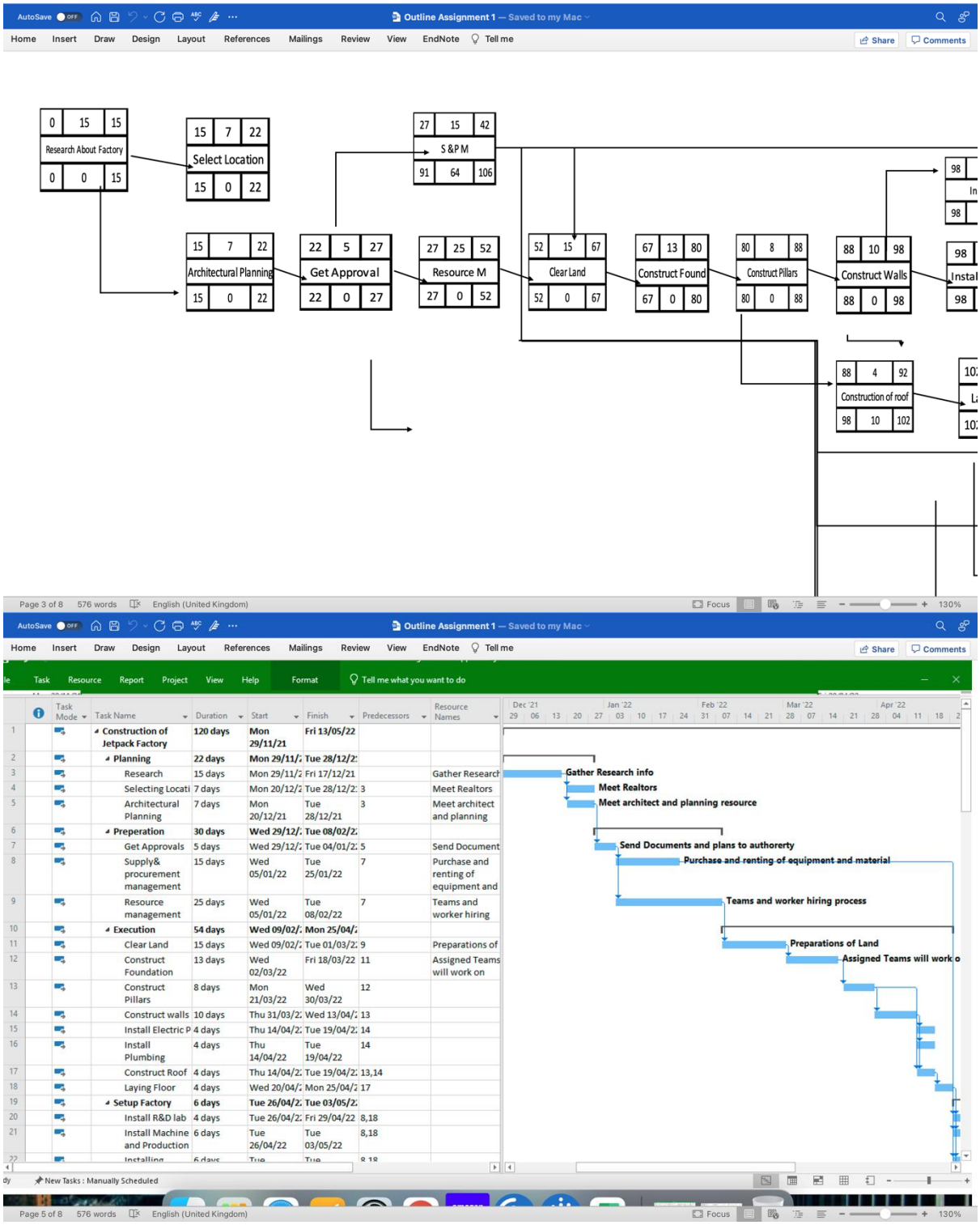
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0 15 15
Research About Factory
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15 0 22
22 5 27
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27 25 52
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52 15 67
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67 0 80
80 8 88
Construct Pillars
80 0 88
88 10 98
Construct Walls
88 0 98
88 4 92
Construction of roof
98 10 102
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Focus 130%

Outline Assignment 1 — Saved to my Mac
Home Insert Draw Design Layout References Mailings Review View EndNote Tell me
Share Comments
Task Resource Report Project View Help Format Tell me what you want to do
Task Mode | Task Name | Duration | Start | Finish | Predecessors | Resource Names
1 Construction of Jetpack Factory 120 days Mon 29/11/21 Fri 13/05/22
2 Planning 22 days Mon 29/11/2 Tue 28/12/2
3 Research 15 days Mon 29/11/2 Fri 17/12/21 Gather Research
4 Selecting Locati 7 days Mon 20/12/2 Tue 28/12/2 3 Meet Realtors
5 Architectural Planning 7 days Mon 20/12/21 Tue 28/12/21 3 Meet architect and planning
6 Preperation 30 days Wed 29/12/2 Tue 08/02/2
7 Get Approvals 5 days Wed 29/12/2 Tue 04/01/2 5 Send Document
8 Supply& procurement management 15 days Wed 05/01/22 Tue 25/01/22 7 Purchase and renting of equipment and
9 Resource management 25 days Wed 05/01/22 Tue 08/02/22 7 Teams and worker hiring
10 Execution 54 days Wed 09/02/2 Mon 25/04/2
11 Clear Land 15 days Wed 09/02/2 Tue 01/03/2 9 Preparations of
12 Construct Foundation 13 days Wed 02/03/22 Fri 18/03/22 11 Assigned Teams will work on
13 Construct Pillars 8 days Mon 21/03/22 Wed 30/03/22 12
14 Construct walls 10 days Thu 31/03/2 Wed 13/04/2 13
15 Install Electric P 4 days Thu 14/04/2 Tue 19/04/2 14
16 Install Plumbing 4 days Thu 14/04/22 Tue 19/04/22 14
17 Construct Roof 4 days Thu 14/04/2 Tue 19/04/2 13,14
18 Laying Floor 4 days Wed 20/04/2 Mon 25/04/2 17
19 Setup Factory 6 days Tue 26/04/2 Tue 03/05/2
20 Install R&D lab 4 days Tue 26/04/2 Fri 29/04/22 8,18
21 Install Machine and Production 6 days Tue 26/04/22 Tue 03/05/22 8,18
Dec '21 Jan '22 Feb '22 Mar '22 Apr '22
Gather Research info
Meet Realtors
Meet architect and planning resource
Send Documents and plans to authorerty
Purchase and renting of equipment and material
Teams and worker hiring process
Preparations of Land
Assigned Teams will work o
New Tasks : Manually Scheduled
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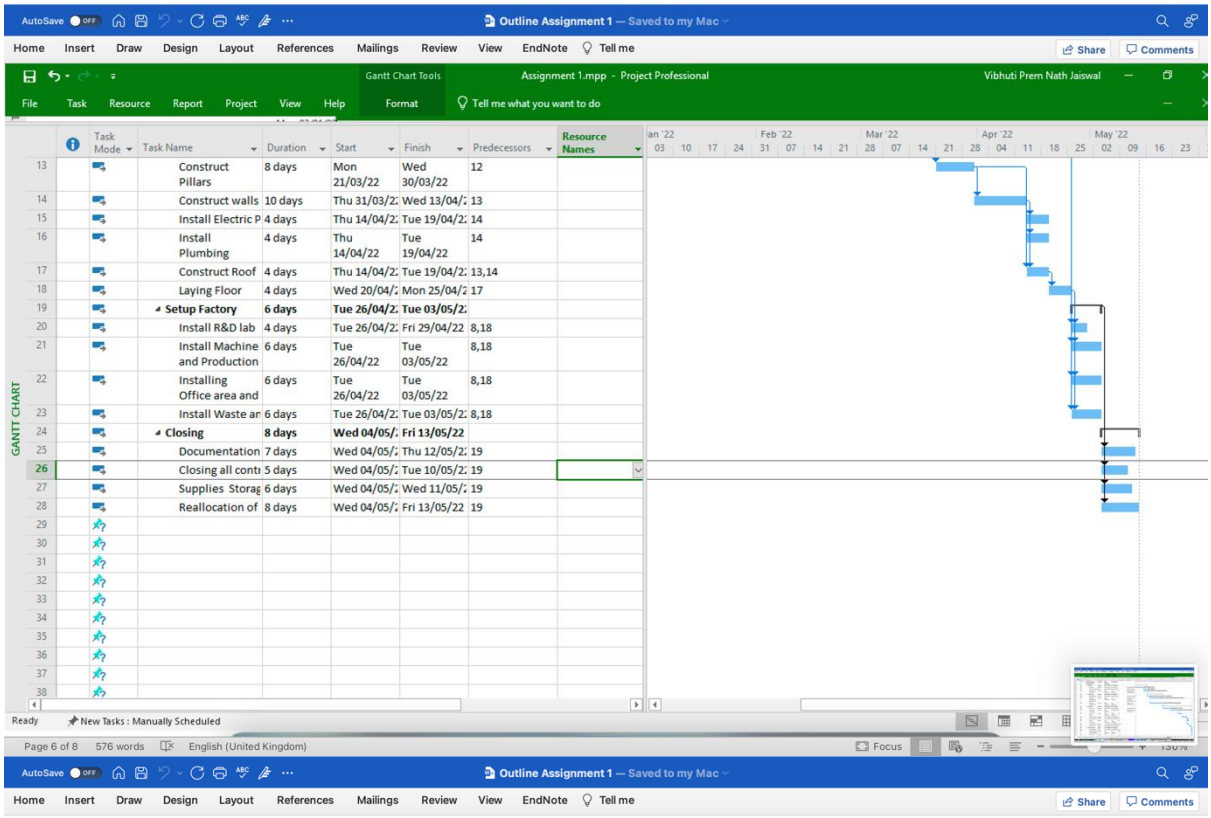

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
13		Construct Pillars	8 days	Mon 21/03/22	Wed 30/03/22	12	
14		Construct walls	10 days	Thu 31/03/2	Wed 13/04/	13	
15		Install Electric P	4 days	Thu 14/04/2	Tue 19/04/2	14	
16		Install Plumbing	4 days	Thu 14/04/22	Tue 19/04/22	14	
17		Construct Roof	4 days	Thu 14/04/2	Tue 19/04/2	13,14	
18		Laying Floor	4 days	Wed 20/04/	Mon 25/04/	17	
19		**Setup Factory**	**6 days**	**Tue 26/04/2**	**Tue 03/05/2**		
20		Install R&D lab	4 days	Tue 26/04/2	Fri 29/04/22	8,18	
21		Install Machine and Production	6 days	Tue 26/04/22	Tue 03/05/22	8,18	
22		Installing Office area and	6 days	Tue 26/04/22	Tue 03/05/22	8,18	
23		Install Waste ar	6 days	Tue 26/04/2	Tue 03/05/2	8,18	
24		**Closing**	**8 days**	**Wed 04/05/**	**Fri 13/05/22**		
25		Documentation	7 days	Wed 04/05/	Thu 12/05/2	19	
26		Closing all conti	5 days	Wed 04/05/	Tue 10/05/2	19	
27		Supplies Storag	6 days	Wed 04/05/	Wed 11/05/	19	
28		Reallocation of	8 days	Wed 04/05/	Fri 13/05/22	19	

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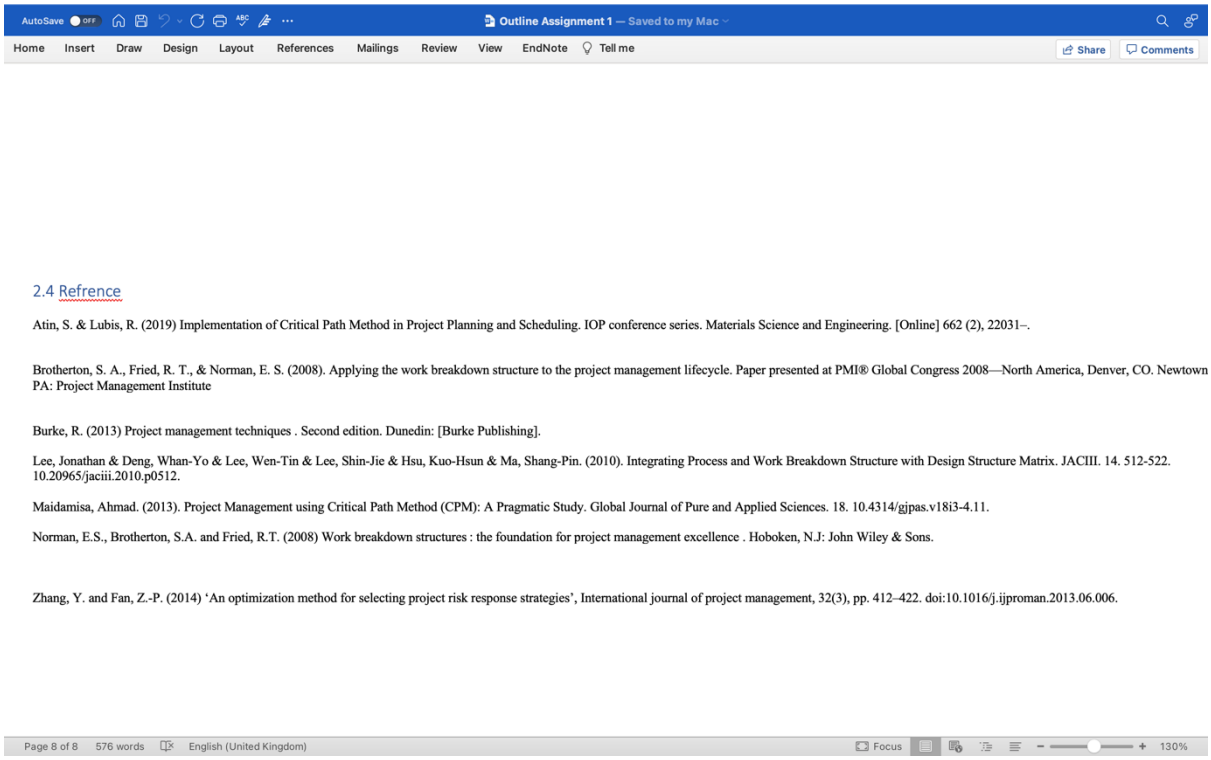
2.1. Critical Analysis

1.WBS plays a crucial role in the planning and Lifecyle of the project, If WBS is designed properly the chances of successful project completion increases also in case of delays or scope creep a well planed wbs could be a he eliminate causes.
2. Resource Breakdown structure is also helpful in creating a better WBS.
3. Fully is the WBS defined good is scope management. More complex is WBS or Underdeveloped is WBS chances of scope creep are high also the resource management is further affected.
4. It also prevents from Out-of-Scope Agreements.
5. Project Risk Management Discussion on the point how WBS is helpful in PRM benefits for that as a project manager.
6. Difficulties to interpret between WBS and Network Diagram Formulation
7. MSP as the tool to help developing and planning and resource management.
8. Gantt Chart provides a very helpful tool for work transition It Provides a proper work traffic control system. but sometimes also limits the possibility of user to modify the plan at later stage
9 Scope creeps are the main concerns around these tools
10. Main point for Discussion is how helpful tools are for risk management in a project

2.2 Evaluation Forms

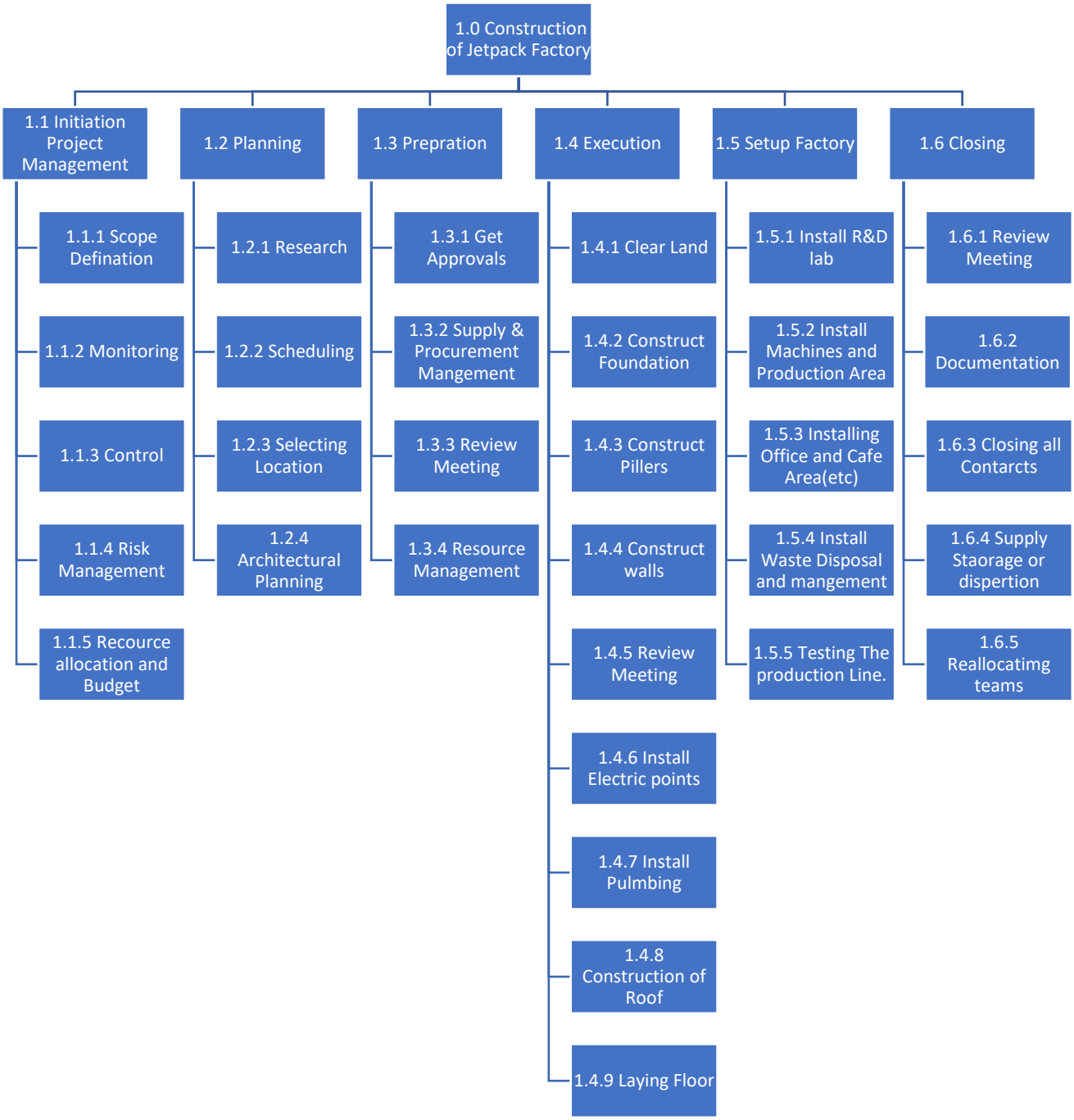
Quarter 1- Basic set up of factory. Worked on Market Forecasts and Research and Development. We accidently bought basic jetpack twice.
It was a war up for the Hubro Business
Quarter 2 - Worked on Production, Contracts and Financing for basic jetpack. We took loan for setting up the factory.
Learnt about How budgeting and decision making will affect business.
Quarter 3 - Profit report of basic jetpack was analysed and we bought and designed the sporty jetpack. Worked on Market Forecasts and Research and Development for sporty jetpack. Stopped production for basic jetpack a the production of sporty jetpack.
Quarter 4 is going in losses we have not yet built another factory. Some of the decisions have to be analysed again for new quarter.



2 Introduction

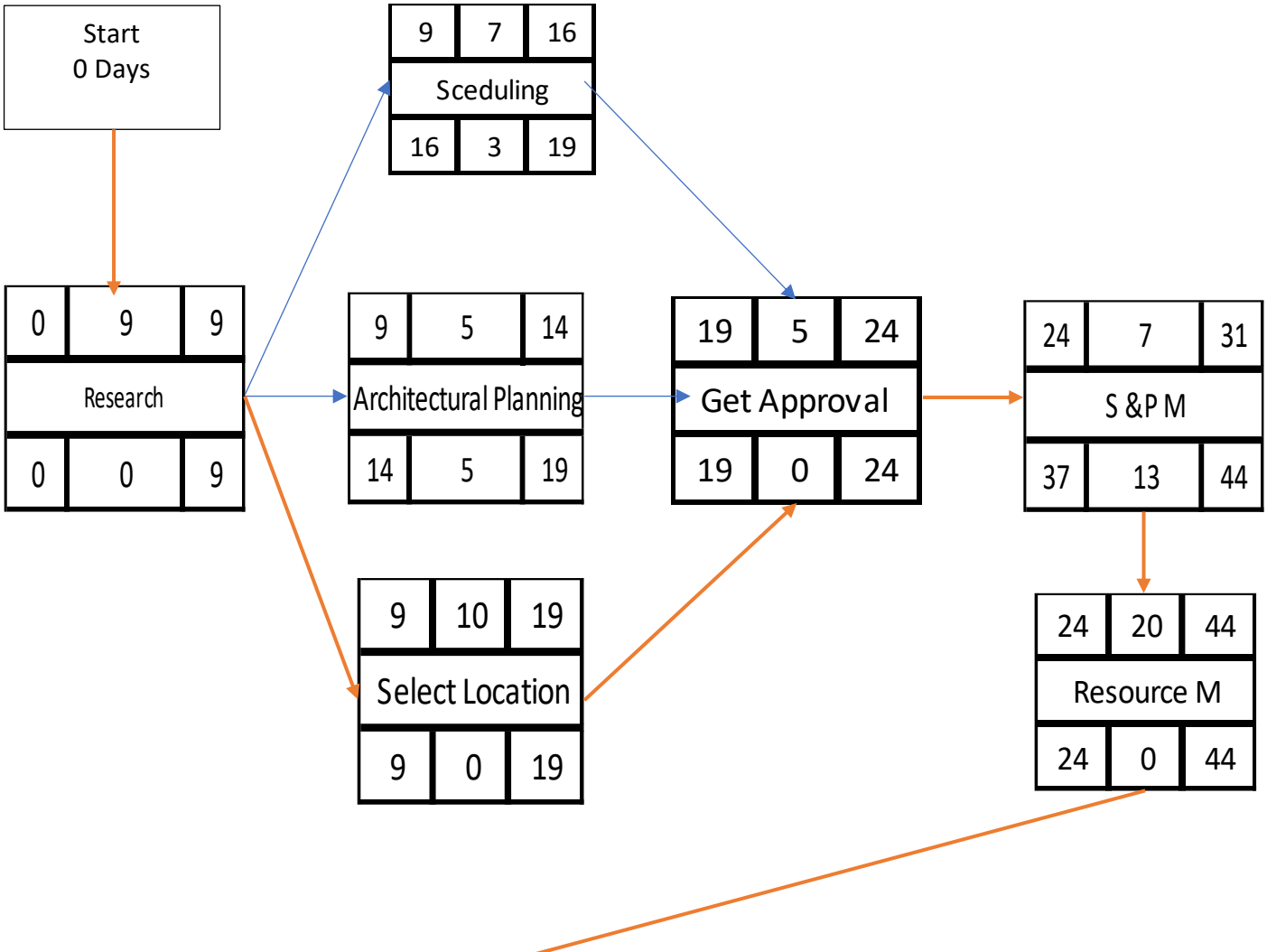
This report focuses on using work breakdown structure, network diagram, and Gantt chart as essential tools for project management. In this project practical implementation of concepts of project management is performed. The first three-parts of the report are schematic graphic description of planning a construction project using initial planning tools: Work breakdown structure, Network diagram, and Gantt chart. These tools determine project plans, document scope, cost, effort, and schedule, guide project managers, and monitor project execution to achieve long-term results (Lee, 2010). Next, a precise critical analysis of project management tools and the success of projects. Then in the last part of the report, Business evaluation and team evaluation are performed based on the results of a business simulation tool called Hubro is discussed to analyse the Project Management skills developed during the first session of the course.

3 WBS for Jetpack Factory:



4 Network Diagram

120 days Project for Jetpack Factory Construction



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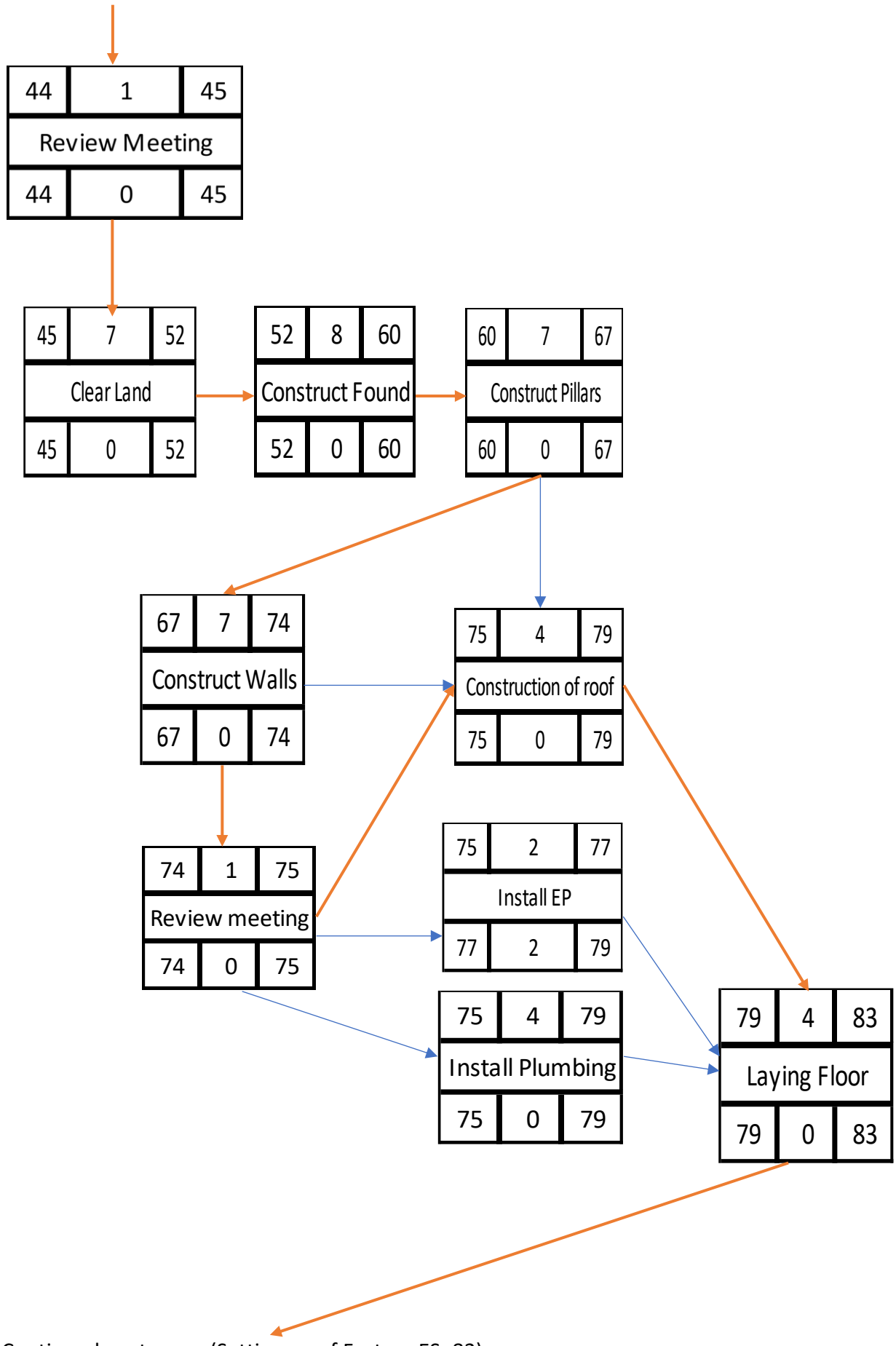

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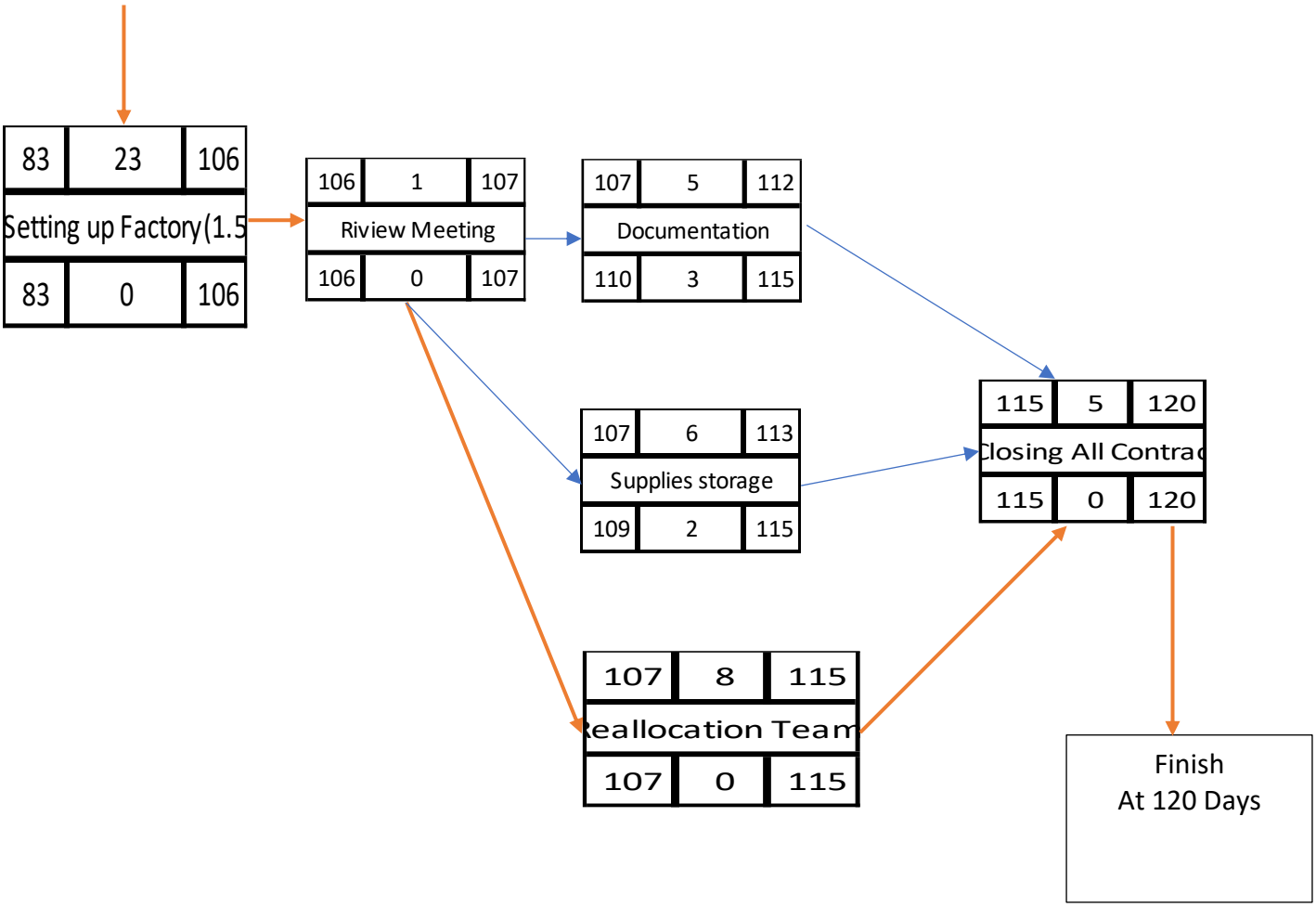
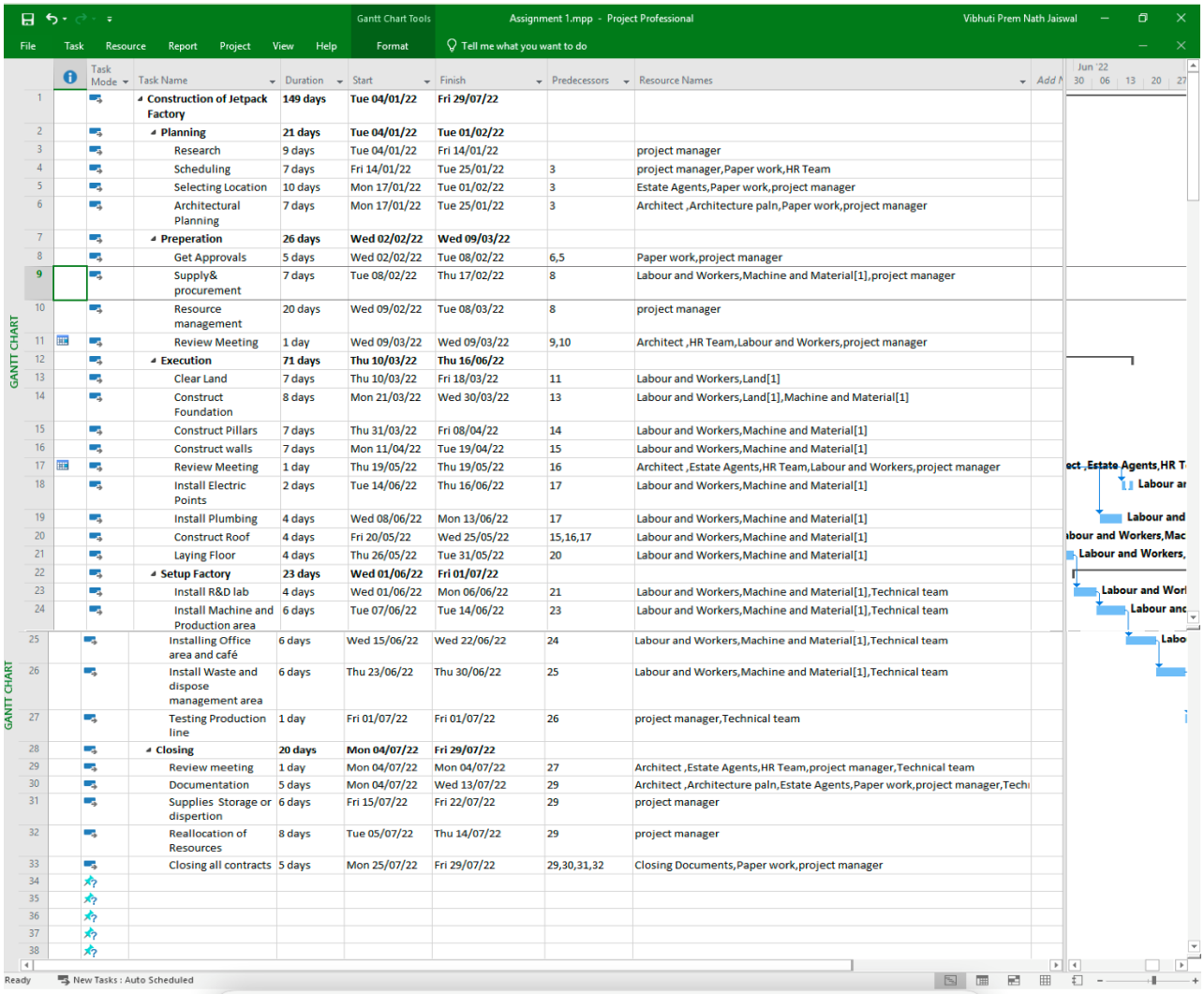


Path with 0 Float is Critical Path Highlighted using Red Arrows. Where Float is nonzero is the slack path.

5 Gantt Chart

Task View:



	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Construction of Jetpack Factory**	**149 days**	**Tue 04/01/22**	**Fri 29/07/22**		
2		**Planning**	**21 days**	**Tue 04/01/22**	**Tue 01/02/22**		
3		Research	9 days	Tue 04/01/22	Fri 14/01/22		project manager
4		Scheduling	7 days	Fri 14/01/22	Tue 25/01/22	3	project manager,Paper work,HR Team
5		Selecting Location	10 days	Mon 17/01/22	Tue 01/02/22	3	Estate Agents,Paper work,project manager
6		Architectural Planning	7 days	Mon 17/01/22	Tue 25/01/22	3	Architect ,Architecture paln,Paper work,project manager
7		**Preperation**	**26 days**	**Wed 02/02/22**	**Wed 09/03/22**		
8		Get Approvals	5 days	Wed 02/02/22	Tue 08/02/22	6,5	Paper work,project manager
9		Supply& procurement	7 days	Tue 08/02/22	Thu 17/02/22	8	Labour and Workers,Machine and Material[1],project manager
10		Resource management	20 days	Wed 09/02/22	Tue 08/03/22	8	project manager
11		Review Meeting	1 day	Wed 09/03/22	Wed 09/03/22	9,10	Architect ,HR Team,Labour and Workers,project manager
12		**Execution**	**71 days**	**Thu 10/03/22**	**Thu 16/06/22**		
13		Clear Land	7 days	Thu 10/03/22	Fri 18/03/22	11	Labour and Workers,Land[1]
14		Construct Foundation	8 days	Mon 21/03/22	Wed 30/03/22	13	Labour and Workers,Land[1],Machine and Material[1]
15		Construct Pillars	7 days	Thu 31/03/22	Fri 08/04/22	14	Labour and Workers,Machine and Material[1]
16		Construct walls	7 days	Mon 11/04/22	Tue 19/04/22	15	Labour and Workers,Machine and Material[1]
17		Review Meeting	1 day	Thu 19/05/22	Thu 19/05/22	16	Architect ,Estate Agents,HR Team,Labour and Workers,project manager
18		Install Electric Points	2 days	Tue 14/06/22	Thu 16/06/22	17	Labour and Workers,Machine and Material[1]
19		Install Plumbing	4 days	Wed 08/06/22	Mon 13/06/22	17	Labour and Workers,Machine and Material[1]
20		Construct Roof	4 days	Fri 20/05/22	Wed 25/05/22	15,16,17	Labour and Workers,Machine and Material[1]
21		Laying Floor	4 days	Thu 26/05/22	Tue 31/05/22	20	Labour and Workers,Machine and Material[1]
22		**Setup Factory**	**23 days**	**Wed 01/06/22**	**Fri 01/07/22**		
23		Install R&D lab	4 days	Wed 01/06/22	Mon 06/06/22	21	Labour and Workers,Machine and Material[1],Technical team
24		Install Machine and Production area	6 days	Tue 07/06/22	Tue 14/06/22	23	Labour and Workers,Machine and Material[1],Technical team
25		Installing Office area and café	6 days	Wed 15/06/22	Wed 22/06/22	24	Labour and Workers,Machine and Material[1],Technical team
26		Install Waste and dispose management area	6 days	Thu 23/06/22	Thu 30/06/22	25	Labour and Workers,Machine and Material[1],Technical team
27		Testing Production line	1 day	Fri 01/07/22	Fri 01/07/22	26	project manager,Technical team
28		**Closing**	**20 days**	**Mon 04/07/22**	**Fri 29/07/22**		
29		Review meeting	1 day	Mon 04/07/22	Mon 04/07/22	27	Architect ,Estate Agents,HR Team,project manager,Technical team
30		Documentation	5 days	Mon 04/07/22	Wed 13/07/22	29	Architect ,Architecture paln,Estate Agents,Paper work,project manager,Techi
31		Supplies Storage or dispertion	6 days	Fri 15/07/22	Fri 22/07/22	29	project manager
32		Reallocation of Resources	8 days	Tue 05/07/22	Thu 14/07/22	29	project manager
33		Closing all contracts	5 days	Mon 25/07/22	Fri 29/07/22	29,30,31,32	Closing Documents,Paper work,project manager
34							
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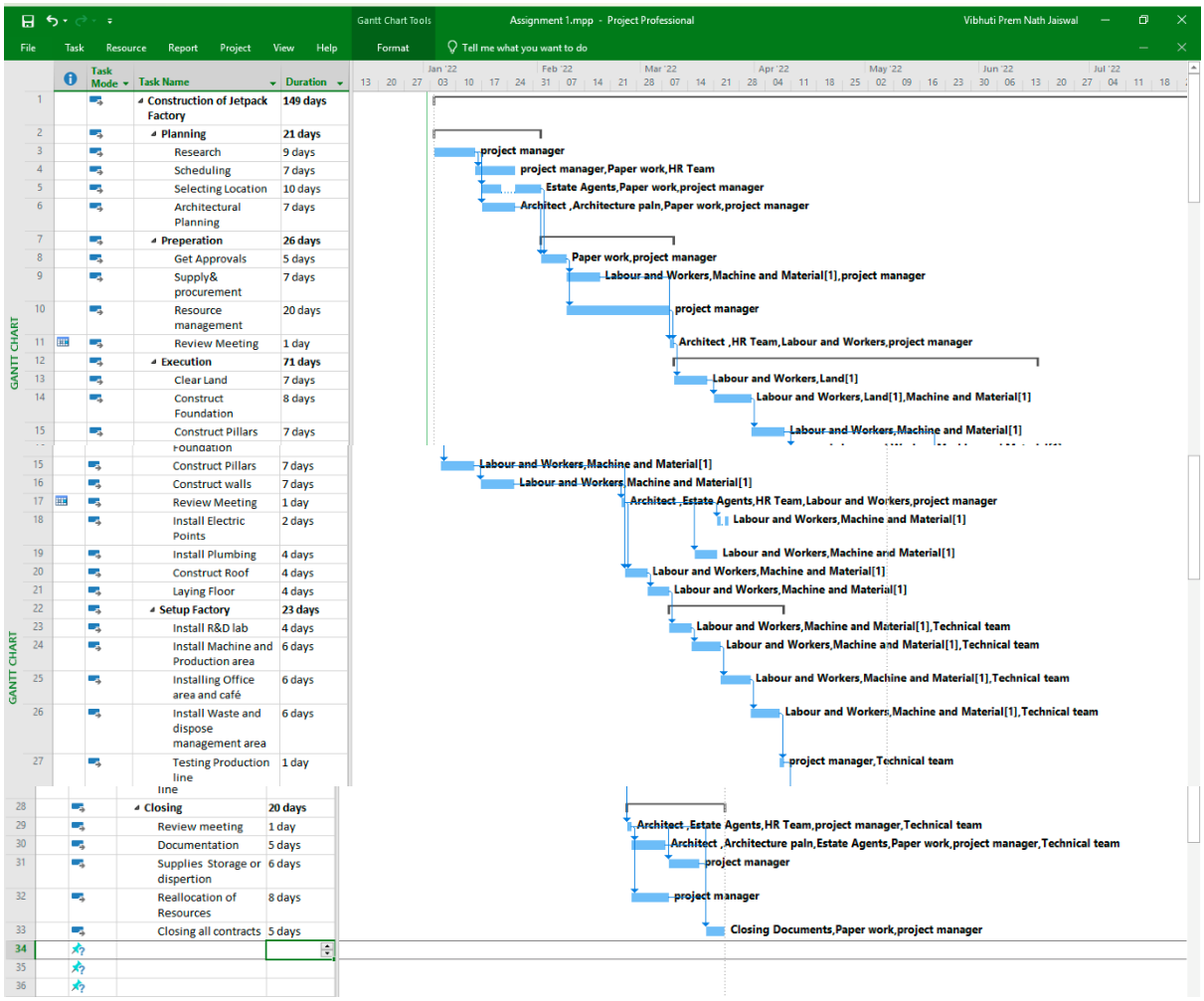
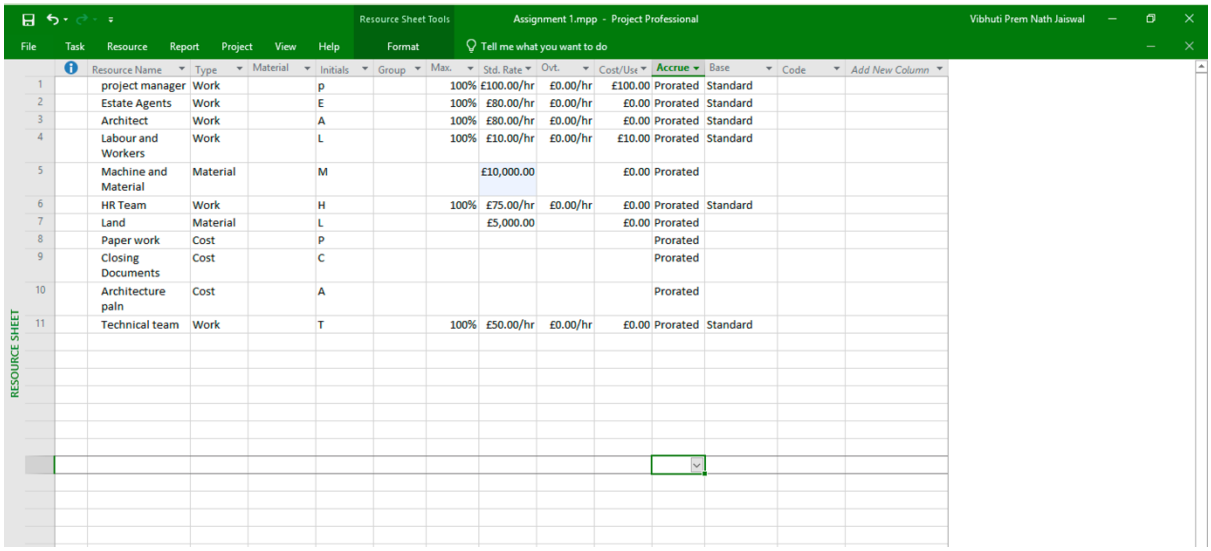
Gantt Chart:



Resource Sheet



6 Critical Analysis for Project Management tools

A project is a collection of activities that result within cost, time, and quality (Swiatek, 2016). Project Management is a systematic method of completing the project within the given constraints. Project Management consists of four phases: initiation, planning, execution, and project close (Burke,2013). Many tools are utilised in project management to make a project a success (Carstens, D.S., Richardson, G.L., 2019). These are some of the project management tools: “Project Charter, WBS (includes deliverables but not money, time, or people), schedule (illustrated as a Gantt chart or Network Diagram), Cost Baseline, Resource Register, Status Reports, Risk Register, Stakeholder Register, Change Log, Issues Log, Requirements Specification, Document, Requirements, Traceability Matrix, Minutes of meetings, RACI Chart, Project Management Software, Storage facilities for project management documentation” (Desmond, C., 2017). Here the report focuses on providing a critical insight on the three tools: Work Breakdown Structure, Network Diagram, and MS Project: Gantt Chart.

Project success has typically been assessed for the "triple constraint" or "iron triangle" of performance, schedule, and budget; however, this definition has shown to be incomplete and occasionally deceptive. (Orhof, O., et.al., 2013). Furthermore, according to the study conducted by Verga Matos, P. et al. (2019), the socio-political dimension is one of the areas where traditional project management tools jeopardize the proximity and high quality of the project team. Thus, this implies that project management tools are successful for projects with a clear scope.

In a project management task, the project scoping is an inevitable task; that defines the statement of work, project specification, milestone schedule, and Work Breakdown structure (Kerzner, H., 2013, pp 520). Statement of Work or Project Overview Statement becomes a critical part of contractor and client understanding of the project; which leads to agreement on the contract work breakdown structure, where scope statement and scope specifications are considered (Kerzner.H., 2013; Wysocki. R.K., 2019). The scope of a project refers to boundaries that define the purpose of the project. The scope management plan is the first and foremost step for a project

manager to follow. A successful project depends on the scope management plan (PMBOK Guide, 2017).

A weak scope definition leads to scope creep, resulting in a project failure (Yarbrough, O.,2018; Abramovici, A., 2000). Scope creep is different than negotiating constraints trade-off. According to Yarbrough (2018), when changes in scope are made within the defined constraints of time, budget, and performance, it is not referred to as scope creep, but when it is outside the defined constraints, then it is a definite scope creep. Scope creep in projects is inevitable (Abramovici. A., 2000). Due to poorly written SOW, stakeholders try to sabotage the project plan (Kerzner, H., 2013; Larson, R. & Larson, E., 2009; Yarbrough, O.,2018). Argo, Work Breakdown Structure becomes indispensable for defining the major constrain for the project which is acceptable by the contractor as well as customer (PMI, 2012)

Work Breakdown Structure is an essential step in the planning and Lifecycle of the project. If WBS is adequately designed, the chances of successful project completion increase. This is an essential part of a project where a project is fragmented into different execution zones and more manageable stages. This tool helps to identify the significant requirement in terms of resources. If a WBS is defined efficiently, then the chances of a clear scope definition are projected (Kenneth H. R.,2006). The degree of control required to efficiently manage the project generally determines the degree of breakdown (PMBOK guide, 2017, pp 102). Work Breakdown structure is an effective tool defined in the era of project management as this provides a high-performance framework for a project; specifies responsibilities for different stages of the project, which is helpful in resource allocation (Zecheru, V. and Olaru. B.G., 2016). Work Breakdown structure has a mapping of all the resources and strategical subdivide task of the project; thus, this is very helpful in the budgeting of the project. Considering all the above purposes served by the work breakdown structure, it is valid to suggest that this provides a solid ground for the project's success by fulfilling the "three constrain of projects."

Project Risk Management is a process for accessing the risk and analysing a suitable solution that can reduce the effect of risk on outcome of the project. According to Zhang, Y. and Fan, Z.-P. (2014), the work breakdown structure-based approach for

PRM (Project Risk Management) is most appropriate. Based on experience of the project managing teams, risks can be identified while finalising the deliverables; and thus, could be easily resolved by setting trade-off between Project scope constrains (Cleland, D.I. et al., 2006). For example, if during the manufacturing of jetpack factory as a project during the construction of roof is a deliverable where risk is identified due to the material or equipment's then prior reaching to the stage of construction of roof budget and timeline could be adjusted to provide the quality project. These gaps can be explored with the client, and any assumptions must be documented and agreed upon by both the customer and the project manager (Cadle, J. and Yeates, D., 2017).

Another important tool that is extensively used in the field of project management is Network Scheduling Techniques. Methods suggested for network scheduling are 1) Program Evaluation and Review Technique (PERT), 2) Critical Path method, 3) Precedence Diagram Method and 4) graphical Evaluation and Review Technique. These methods provide basis for decision making for setting up timeline and budget for a project (Kerzner, H., 2013, pp 598). Critical Path (longest duration for project) and Slack Time are estimated by use of Network scheduling tool, which are helpful in providing the better quality of project. Although PERT/CPM are much trusted methodologies (Mota, A., et.al., 2007) in Project management, but according to Wang (2013), it is a tedious task if performed manually for the complex projects. The same was experienced while converting the WBS of "Jetpack Factory Construction Project" to a network diagram. For the tedious manual network scheduling Wang (2013), suggested Genetic algorithm and Ant colony Optimisation software programming methods. According to Laslo, Z. and Gurevich, G. (2013), PERT method still need improvement for budgeting and time trade-off. More efficient and sophisticated advance network scheduling methodologies are evolving for Network scheduling as this method provides better risk management (Trietsch, D. and Baker, K.R., 2012; Laslo, Z. and Gurevich, G., 2013)

According to Rolfsen, C.N., and Merschbrock, C. (2016), Gantt provided the simplicity and responsiveness required for day-to-day communication in projects and was perceived as the easiest to use. A Gantt chart is a horizontal scheduling bar with time following; this allows both for planning and tracking of a project, but it fails to reveal the impact of change on the project (Sharon, A. and Dori, D., 2017). However, the

Gantt chart may deal with some complicatedness of projects and is a valuable tool for managing any size of the project (PANKAJA, P.K., 2005) but fails to cope up with complexity, ambiguity and uncertainty, and change (Geraldi, J. et.al., 2012). Still, the Gantt chart is critically important tool for project management as this provides portfolio planning and monitoring. This has been a central part of software like MS Project. Thus, earned value analysis and more advancement are in progress for the evolution of the Gantt chart. (Ong, H.Y., et al., 2016)

7 Conclusion

This Report has been a pivot for learning planning as a part of Project management by using the tools such as Work Breakdown Structure, Network Diagram, and Gantt Chart. At the same time, these tools are used to develop the plan for a construction project. The project planning tools play a vital role in defining the scope, monitoring, and setting up milestones for the project. As well as this is very helpful for cost and time estimates and resource allocation for the project. Although the tools are crucial, the evolution of tools is more important for efficient project management. These tools cater for Project risk management but also to optimize the risk and study the impact of change for further expertise development; the Advancement of tools is a must. Thus, work breakdown structure remains the un omitted demand for any project to define a proper scope. Whereas, For Network scheduling, software programming will prove helpful to find Critical paths using new methods of graphical visualization. Thus, the adaptation of newer tools for project management that help to define scope, monitor progress, and provide risk management assistance, will fulfil competent project management purposes.

8 Evaluation

Business Evaluation:

How was the Experience?

Hubro is a simulation tool that has mirrored the real-world challenges companies face. This model trained us in building skills to deal with production handling, new product development, marketing strategies, finance management, assets building. Hubro has also inculcated the market competition and instincts to survive. Initially, it took time to understand the simulation environment. The goals set to achieve were very conservative and profit-oriented, which have not proved helpful. That is why the company has seen the one dimension of good sales revenue.

List Strength and Weaknesses of decisions (Appendix 1 SWOT for Falcon)

Weakness

- The decision to stick to only product production has brought down the firm's market value.
- Limited investment in infrastructure had brought down equity.
- No investments in waste reduction have resulted in increased cost of production and fewer profits. Also, face high competition.
- Limited production resulted in a few missed deliveries of the products.

Strengths

- The key Strength of business has understood the market. Products which have been demanded more in the market helped in earning profits.
- Understanding finance management helped in strategically applying and repayment of the loan with reasonable equity in the market.
- Outsourcing of production helped in increased production on a limited budget.

List Lesson Learned to increase Business Efficiency.

The primary lesson learned in this session of Hubro is that investing in sustainable solutions pays in the long term. A balance between outsourcing and asset building is essential. Loans are suitable for maintaining a healthy business and growing in a

competitive environment. As an entrepreneur, a strategic expansion is necessary. For future reference, market and financial analysis are must to run a successful business, as well as sustainability and cost of production management, plays very essentially part.

Team Evaluation:

How Well was your team performing?

The team is an integral part of any organization. The performance of any business depends on the Strength of a team. Best teams are those who have common interests. The performance of the company is a sober reflection of the group. We started on different pages where research and understanding of the project differed. Many ice-breaking sessions brought us on the same page and version that this project is a good way of understanding the various skill set as a project manager we need to acquire. Due to differences in opinions, we had faced setbacks in Hubro, which led us to analyse, discuss and collectively take decisions.

Strength of Team:

A significant strength of this group has been a conflict resolving attitude, because of which we were able to bounce back from the set of wrong decisions taken. Arpita's interpersonal skills, Sreekanth's knowledge of finance management, Devang's data analytical skills, and Vibhuti's leadership by example and decision-making skills have made this team resilient to survive and be on top in revenue generation by sales in most of the quarters. Diverse work background allows learning and achieving objectives collectively.

Weakness of Team

Fundamental weakness that held us back as a team was a lack of communication and time management. Due to this weakness, we have made some decisions that proved wrong for the Hubro business simulation. The majority of these happened during the second year of simulation. This experience added to our learning that clear communication is a very desirable skill for a successful business. Due to a lack of

communication, work delegation was also neglected. Sooner with the help of tutors, we realized our shortcomings, and within no time, we addressed our mistakes and completed this project in complete collaboration.

Lesson Learned to improve team efficiency.

To run a successful venture team must be in collaboration. The struggle of being on the same page has made this group more resilient, and thus the focus on completing the project was rigorous, and thus the project has been completed successfully. Playing on the team's strengths is desirable for the project to be completed successfully. In the future, we will be focusing more on work delegation and communication within the team to succeed.

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Appendices

Appendix 1
SWOT for Falcon

This evaluation process is an outcome-based evaluation for Company named Falcon for the first four years (Appendix 1). During this time Three different products have been developed by the Company. Overall Ranking of Company has been fourth among the competitors. The goal of this business from the very start was to earn profit and achieve heights. Starting year was timid but proved to be a good start by winning many contracts. Also, assets were a built-in form of production factory. In the second year of business, no other building of a factory or new products because of that Company must bear the loss. In the last quarter of year 2, to recover debts and start new productions company took the loan. As a result of that year 3, went well and revenue of sales and production increased. Nevertheless, assets building and reduction in the cost of production were not dealt with. Therefore, the goals of year 4 become more towards the cost-cutting due to which waste management Research and Development took back seat.

The decisions taken during the first two years have not focused on building a sustainable business, which has given a setback. However, a sustainable business foundation always helps businesses grow (Süß, A. et al., 2021).

- Strengths of the Firm were: Limited Products High Production which resulted in the generation of high sales revenue. Marketing strategy and contract biddings went according to plan.

- Weakness of firm: has been in primitive and shy decision making, which resulted in the non-sustainable business model. Due to less investment, production has suffered.
- Opportunity: As the firm is out of debt and has enough funding, new sustainable measures are possible. Work outsourcing proved to be beneficial.
- Threats have been a very high competition in the same product line.

Appendix 2

List of Abbreviations

CPM Critical Path Method
PERT Program Evaluation and Review Technique
POS Project Overview Statement
PRM Project Risk Management
RACI Responsibility Assignment Matrix
SOW Statement of Work
WBS Work Breakdown Structure