**ANALYSIS OF SIM4 SIMULATION PROJECT REPORT**

**Logo

Description automatically generated**

**TEAM 2**

**Krishna Kumar Vijayakumaran Nair**

**Mouneesh Gonuguntla**

**Rama Surya Sai Kiran Gundu**

**Dheeraj Addanki**

**Pallagolla Karthik**

**Charagondla Santhosh**

**Table of Content**

1. Abstract
2. Introduction
3. Challenges that our group faced during the start-up phase of the simulation
4. AREAS of SIM which our group found useful
5. Methods that our team used to determine resources and tasks for each simulation
6. Techniques to continue/modify for new simulation:
7. Conclusion
8. References

**Abstract:**

With the help of the Sim4Project, we got a glimpse into how a real-world project would unfold. SIM4 Simulations provided a valuable tool for examining project requirements, bidding on resources, allocating resources, executing managerial tasks, analyzing the outcomes, and offering feedback on areas for improvement. Our team made a huge mistake in period two to make our overall ranking go 4th. Balancing the relevant elements and resources of the project proved to be the most challenging aspect. Throughout this paper we are discussing how are survived the overall ranking 4th even though we forgot to submit the decision in period 2. This project resulted in us developing relevant skills that a project manager should have. By focusing on the relevant elements of SIM4 Project Simulation, the paper seeks to provide a comprehensive review.

**Introduction:**

This paper focuses on exposing and discussing our findings during the Project Simulation assignment in class. During the simulation, students in small groups had to reach a consensus for a decision in each round of the simulation.

The Sim4Projects is a web-based simulation which was developed by “Jeffrey K. Pinto, Ph.D. and Diane H. Parente, Ph.D”. This simulation is basically to understand and apply the concepts of fundamentals of Project Management in various constraints like Time, Functionality, Cost and Resources. This helps the students to have a real-world example as a simulation and pertain a practical set of workings on how to deal with day-to-day challenges in managing projects. The simulation is set by the instructor and played by the students forming into the groups of six members. So, any beginner student curious to know about the working and conceptualization of the project management could use this simulation to work on and skill up on few areas.

An investor in the simulation envisions profiting from the acquisition and construction of houses on land. A simulation replicated every step a company would take in the real world. In each of the tasks during the period, the groups were responsible for identifying the appropriate resources. To convince the resource to join their group, the group’s bid on them. Assessments included decisions regarding training and motivational measures to improve a resource's skills. It was important to observe not only their job function, but also how well they could perform it, how well they could collaborate with the other team members, and of course, how much it would cost to hire them. There was a competition between the teams. As a group, we finished fourth overall. Along with this as a team we need to be concerned about so many different things, like how we manage to meet every week and consider the time for this project, because we are all not from the same space and same workstation. Also, we are not all taking the similar course, so time conflict is a crucial factor we need to discuss. As I mentioned earlier, every week we need to complete 5 tasks, that include Assign Resource to Task, Bid on Resources, Fire the unwanted resource, give training we want and do some managerial actions. Here also the training, managerial action and fire resource is not a mandatory step, but every week we have a different strategy to play, to achieve the strategy we might need to do this.

Firstly, the simulation is done in two parts, one being the practice and the other is actual play. The simulation gives you a brief through a Gantt Chart which is divided into periods. Each period starts when actual play begins and is not quantified based on the real time units like days or weeks, but each period would last for a week. Moving on, each period has four decisions to be made like hiring/firing the resources, allocating the resources to each task, assigning some resources to trainings, and imposing some managerial actions if required.

Before the actual period play, our prof. Gives us a chance to understand the simulation by playing 3 pre-play rounds. During the pre-play round our team reached the first ranking the all the three pre play round with the overall rating for the 100%, 97% 100% respectively. So, my team started playing the SIM4 simulation period with full confidence, as we got a great win in the pre play. We almost use the same strategy to start the game. But things did not work as we expected. As I mentioned earlier, because of lack of proper communication in between the team we made a mistake and that impact our whole team game.

Through this paper we are discussing our strategy, our findings, and our opinion about the sim4 simulation game. During the initial phase of the simulation, where we had to bid for resources and familiarize ourselves with the platform, the first section of this paper will reflect on the problems encountered. As part of the second section, this paper will discuss what were the benefits of the assignment from the group's perspective. A third section will discuss the methods the group used to select the resources used throughout the simulation. On the fourth session, we will talk about the challenges the team faced in a specific week and what decisions were made to overcome the problem and meet expectations. This paper's fifth section discusses how the group might approach a new simulation differently. The paper concludes with a summary of all the topics discussed in the conclusion.

**Challenges that our group faced during the start-up phase of the simulation:**

During the first week of the course, or the first few days of the course, Prof. Seinna Lei divided the students into six teams and guided us over the setup, installation, and game-play instructions for the Sim4Project. The game's instruction manual, which has all the necessary details regarding how to play, was also provided to us by the professor. In addition, the professor emphasized how using Sim4Project will help us improve our project management abilities.

When we were playing the practice game at the beginning of the simulation, we encountered some issues getting all the resources in the right place at the right time to play the game perfectly.

Gaining Information About the Sim4Project: When we played the practice game at the beginning of the game, we didn't know much about the many parts of the simulation. However, after reading the simulation instructions afterwards, we felt like we understood the game better. Each team member had conducted thorough research to gain a deeper grasp of the game, and it was because of this that we were able to make wise selections at the right time to bid for the necessary resources for the task.

In the initial stages of the play, it was challenging to coordinate and contact the team members to schedule a meeting because they all frequently had conflicts. As a result, it was tough to set up a meeting time that worked for everyone. As a result, we decided to hold a virtual meeting instead of a real one. This meeting was scheduled during a time each team member set as a mutually convenient time.

To meet virtually, all the team members agreed to choose Microsoft Teams because we already had a common channel group that was set up for the game. As a result, we planned to have a virtual meeting once a week at a time that worked for everyone. Because of this, we scheduled and joined meetings using the same Microsoft Teams group page. This Microsoft team communication channel has been part of us throughout simulation, including practice sessions and major simulations.

Through this channel, we even used to post and maintain track of all crucial simulation-related documents. We also posted updates regarding the adjustments that were made to the period decisions along with each person's viewpoints and ideas on this Microsoft team's channel. By using Microsoft teams as a communication tool, the team members were better able to coordinate their efforts, share their opinions, and make decisions. They were also better able to stay informed about meeting times and plans for upcoming work. It also aided in effectively strengthening our team, which improved teamwork.

Our bidding strategy, planning, and resource assignment during the practice session produced a wonderful result, keeping us in the lead until the practice play was over. However, we were unaware at the time that everything would eventually crumble. Our biggest mistake was missing a weekly meeting where we usually talk about the requirements for the upcoming period tasks. Due to skipping the crucial meeting it led to a dire circumstance where we ended up lacking the resources we needed for the upcoming tasks of the period.

As a result, we were compelled to allocate the ineffective resources we had for that specific period, and guess what? Our results for that period were so appalling that we ended up in fourth place. Despite coming in fourth, we learned an unbelievably valuable lesson. At this specific time, we learned how crucial it is to keep track of all the tasks that need to be finished before the due date. We also recognize how important it is to show up to meetings at least once a week to discuss the simulation and make timely choices. Even though we ended up in fourth place we had learnt an exceptionally good lesson.

We experienced some difficulties in choosing the most suitable resource for the tasks because, for the most part, we received every resource we bid on except for one. Even in the first play during our practices, we failed to win the plumber's bid, which barely affected our performance. The effectiveness of the task was not fantastic, but it was not terrible either, so we usually assigned the next best resource connected to that task. Even with the bid method we used, we were always going over our resource budget, which was a pressing priority.

Most of the time, when we try to allocate a certain resource to a specific task, we end up exceeding the work's budget. But in the latter stages, we adjusted our bidding technique, opting for one bid for the best resource and one for the medium-skilled resource rather than two bids for the best and most expensive resources, which appeared to work well.

**AREAS of SIM which our group found useful:**

Initially, when we started the game, we had no idea how this was going to be but after the practice period we got some ideas and strategies then we started implementing them in real periods. SIM was like a real-time experience to complete a project. Bidding for the resources and assigning them to the required project and monitoring the results was all part of a real-time experience. In every period we had different tasks to do, and all these tasks were like a real-time experience.

**Interaction with Team:** SIM is totally about the team as we must interact and take decisions. This was the most useful part as it allows working with a team but in an organized way. For taking any small decision we used to have a meeting scheduled and discuss the topic for some time where knowledge sharing happens and later, we as a team used to finalize the decision which best suited to complete the task for the team. It was like a real-time team experience for all of us.

**Improved Skills**: SIM was also useful in improving the skills of each person.

* Communication skills were improved as we used to connect in teams and in person. In any project, communication plays a key role in completing the task and we think the same thing helped us to complete the SIM4 project.
* Second, Leadership skills have been improved for the team as at one point every team had to combine the remaining team members. Leadership skills are important for the project manager, and we have improved them from SIM4Project.
* Decision-making skills have been improved for each member as we took some different decisions. For example, in period 4 we have the best resource for a task, but we took a risk and decided to fire him as there will be more bench penalty charges. Instead of that resource we again offered a bid for another resource with a lower price and assigned him. This made our decision-making skills strong, and we were able to think out of the box.

Besides the four factors like Time, Cost, Functionality and Stakeholders we also accounted to the areas like Teams efficiency which comprises of the many factors in the real world. But the SIM4 has few factors like team cohesion, team composition and team longevity. These areas which are new to us led to know furthermore about how they would improve a team efficiency.

We have analyzed with our result for each of these factors mentioned in the graph beside. At the starting phase we had better percentages in each of these factors and had efficiencies up to 80%. At later stages because of our teams oversight we had seen the lowering of the efficiencies as well. The figure beside explains how the efficiencies got effected by other factors like cohesion, composition, and longevity.

*Figure 1. Team Efficiency from period 1 to period 5*

**Different Issues related to SIM4:** We became familiar with different issues that arise in a sim like the quality of work, satisfaction of stakeholders, cost implications, scheduling the work, and completing it on time. These were all useful issues that we learned from sim and will implement them in real time project

**Methods that our team used to determine resources and tasks for each simulation**

At the initial stages of the simulation, we had practice play for three periods to understand on how to find resources bid them and assign accordingly based on the tasks. Later, we had the actual play for 5 periods. As a group, we have implemented the few methods in assigning the resources to tasks.

To hire the resources, considering that the resources cannot be hired for the following two weeks once fired, we have planned to look up for two weeks ahead. While choosing the resources in each category, looking at the budget that we were assigned for each week and the hourly standard rate we did not choose for the best resources as they cross the budget when assigned and not too little skilled resource rather, we chose the **sufficient** **skilled** person within the budget and meeting the needs so that we could satisfy the stakeholder expectations. Also, while bidding we bid for little higher prices than the standard rates to acquire the resource certainly.

To assign resources we first looked at the critical path each period and analyzed the flow of the tasks. In each period, we had around six to seven tasks which we first noted down the predecessors and the successors. Following the **finish-to-start** method, we prioritized each task based on the dependencies and then assigned the resources accordingly. Also, the tasks which did not have any dependencies were allocated with other set of hired resources resulting in completion of the tasks simultaneously. We would discuss more briefly below period wise.

**Practice Periods (3):**

Initially before we start the periods, we have a pre-play where we had to only hire the resources. As mentioned above, we bid for resources and every resource accepted offer except a plumber. To compensate his role, we managed by assigning other category resources. Moving on to further practice periods we followed the same methods of hiring resources. While assigning the resources to the task at first, we did not know about the critical path and assigned randomly with chosen resource allocation percentage.

*Figure 2. Summary of Period 1 to Period 5.*

**Pre-play**

Based on starting phase of practice period, pre-play is just to bid the resources and hire them. So, we choose the same set of resources from the practice period by bidding little higher from the standard rates.

**Period 1**

As every period has four decisions to make like hire the resources, assign the tasks, allocate to training and impose any managerial action if required. We have assigned the resources to tasks, but we forgot to bid for the next period which resulted in a dip of the graph above (Fig 2. Summary of Period 1 to Period 5 on page 8). We were falling short of an electrician but managed with the plumber as a replacement and assigned the tasks.

**Period 2**

As we failed to hire resources in previous period, we had to assign the same previous resources for the tasks resulted in fall of the cost and functionality of the project effecting the overall percentage which has fallen from 98% to 47% which is clearly seen in the above graph. This is where we learnt a lesson about how important resources are and the skill that they possess will factor the most. As discussed in the risk mitigation plan, we tried to transfer the whole loss into considerable loss by assigning the resources we had without thinking about the cost and functionality. Because of this, the cost and functionality have significantly dropped also, this made us plan resources two weeks prior to the tasks which somehow made our graph stable on later phases.

**Period 3**

In period 3, we had all the resources required for the tasks and assigned accordingly to considering the critical path. We observed some improvement all around after the fall in previous period. Our cost and functionality relatively raised up little. In this period, we have fired the surveyor resource category looking at the next two weeks, there were no tasks related to his skill. We also hired some of the carpenters for next period activities and put them into training for better results. We also planned managerial actions like company sponsor family event to have a good output by the resources for next two periods.

**Period 4**

The practice period was held for three periods which was same until the previous period, but period 4 is again a kind of new tasks unknown with which resource to assign to the respective tasks. We have hired all the required skill set resources but couldn’t assign the right one for couple of tasks. We thought a floor wall could be managed by the drywall specialists which was assumed false and resulted in high cost of the project. This also led to stakeholder dissatisfaction lowering the percentage furthermore.

**Period 5**

We have not made any changes to the resources like fire or bid/hire. We had all of them planned two periods before. The tasks in period 5 were also new and not know whom to assign each task. After discussing within the group, we have made our decisions and assigned to each task having considered the critical path, but we wrongly assigned drywall specialist to installing roof decking which again costed us even more. The time graph above states how our team have understood the critical path and made our decisions which maintained the same 100% most of the periods. Doing so we have observed to rise our graph in each of the four important factors.

This way based on the dynamics of the project we changed our plans and followed few strategic methods in hiring the resources and assigning them to the tasks each period. Though we have fallen short in period 1 we have made sure that we maintained the same until last period.

**One week which affected our team project and made us near to the bottom of the results**

Due to miscommunication in the team, we assigned the resources to the tasks in period 1 but forgot to bid for the resources next week which got affected to our project. So, we did not have proper skilled resources for period 2 which had mainly the Paving contractor for the entire task. The figure 2 in page 8 clearly explains the drop of our results which we almost got to the bottom of the table. As the four main factors time, cost, functionality, and stakeholder are interlinked, because of the wrong skilled resource assigned to the task we have built a time gap between the actual time and the estimated time. In figure 3 the second bar clearly explains the time gap % has increased because of the inefficiency and less effective skilled resource assigned to each task. This also has affected the cost because ineffective resource would take longer time to complete the task leading to more cost each day of work. The below figures are obtained by taking the difference of the actual and estimated to the actual for each period [time/cost gap % = (Estimated – Actual)/Actual]

*Figure 3 Time Gap % and Cost Gap %*

Though we did not have proper resources to allocate in period 2 we have assigned whom we have. Besides, to improve this from our simulation we have planned resources in advance prior to two weeks so that we could get the best resource for lesser bidding and improve the functionality of the project in the later periods. Also having bid for resources in advance we have faced bench penalties in one of the periods which costed us more. Rest we have strictly followed the critical path to make sure the task would be completed on time, but because of improper research about the resource categories we could not improve much further.

**Techniques to continue/modify for new simulation:**

We as a team were always on point with every aspect of the practice simulation, such as estimating the cost of the bid, selecting resources needed for future simulations, and so on. However, our collaboration was not effective in the main simulation, and we were not always attentive to the specifics of tasks.

We need to change our communication channels and how team meetings are conducted. The crucial factor that our team lacked was responsibility. Everyone on the team contributed to each assignment. Somehow, it did not go well, so we believe it is better to assign work to someone who will update the team and seek assistance if necessary.

To be more specific, we will maintain the same strategy for allocating work to resources. We did well as a team in this section by ensuring that everyone on the team agrees on what we are doing and calculating.

In the simulation, we wanted to be as cost-effective as possible, which influenced our bidding technique. Even though we bid higher, we did not receive the needed resources. One of the reasons could be that the other teams outbid us. We will change our strategy of always bidding for the greatest resources in the category. Without a doubt, we used training components to prevent a bench penalty. There must be a change of approach in our termination and training policies.

Each period we followed the critical path, accounting the predecessor and successor to decide the allocation of the resourced accordingly. This led us to achieve the 100% of time factor in our entire project compared to other teams as well. So, we would like to continue using this technique further in professional career as well to make sure the project is on the time

**Conclusion:**

To sum up, participating in the SIM 4 Project was an utterly amazing opportunity that provided first-hand knowledge of what it takes to run a project. To be more specific, the simulation has helped us develop several abilities, including scheduling and time management, risk management, critical thinking and problem solving, and effective communication, all of which we had to apply in the process of the game. We have acknowledged that there have been instances when our plans for a situation didn't pan out, and in those situations, we reacted impulsively and made the required adjustments, which have greatly improved our knowledge.

We also discovered that a project manager's ability to make decisions is crucial because, in the simulation, success depends on making the right choice at the right moment. We are sure that the abilities we have developed via playing these sim 4 project simulations will unquestionably have a significant good impact on our future employment responsibilities.

**References:**

*Home [www.sim4projects.com]*. (n.d.). Retrieved December 3, 2022, from <http://www.sim4projects.com/documents/Sim4Projects(v3.0)-InstructorQuickStart.pdf>