Software Engineering Group 27 Report  
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Over the past 12 weeks, significant progress has been made on the "" at Watson Games. This report aims to summarize the accomplishments, challenges, and lessons learned during the process.

**Key Achievements**  
Meeting Project Objectives  
It is satisfaction that not only the development and integration of the game features are achieved but also approximately 95% requirements are successfully implemented, including system, user and domain requirements.

**Team Chemistry**  
Each team member plays a unique role, akin to elements in a dynamic chemical reaction. Initially, our leaders act as catalysts, fostering team collaboration and progress. Their guidance unleashes the team's potential, enabling efficient goal attainment. Subsequently, creative members introduce fresh ideas and innovations, akin to reactants, injecting vitality and novelty into our work. Effective communication acts as our solvent, facilitating cohesion, mutual understanding, and collaborative efficiency, thereby achieving collective goals. Ultimately, team spirit is the heart of our collaboration, propelling us to overcome challenges and achieve success.

**What We Learned**

Learning Unity

During the development of project, the team faced unprecedented challenges, especially because the unfamiliarity with a development platform like Unity, which need to cost considerable time and energy to learn and master the basic knowledge and skills of Unity. This includes understanding the workflow of Unity and using Unity Editor. Our team may encounter several technical and design difficulties in the early stage of project development due to there is no prior experiences. Such as how to correctly organize the project structure, how to achieve specific functions or effects, and how to solve common mistakes and problems in Unity. In addition, the team members may not have Unity development experience and have differences in understanding and implementing specific functions, resulting in poor communication and difficulty in collaboration. Nevertheless, the team face these difficulties and challenges with confidence and determination. It is realize that learning and growth is a gradual process rather than instant results. Ultimately, the team achieved their objectives through team cooperation, mutual support and encouragement.

Learning C#

Considering the weak programming foundation of some members, we opted for basic callback functions over advanced concepts like events and delegations. Callback functions, being intuitive and concise, eased the learning curve for less experienced members and reduced complexity. While acknowledging this as an interim solution, we plan to gradually introduce advanced concepts based on project needs and team learning progress. This approach ensures continuous growth and advancement.

Documentation Guide  
Our team manages the project structure through different branches on GitHub. We created main branches for stabilizing code and documents, development branches for developing new functions, and other auxiliary branches for specific tasks. This management mode makes teamwork more efficient and orderly.

**What Went Well**

Meeting   
The team holds a meeting at least once a week, cultivating a positive atmosphere. Participants are free to express ideas and opinions, discuss project progress and solve problems. Teamwork and collaborative decision-making are prioritized, enhancing team cohesion in a open discussion environment. Moreover, the meeting focus on the project, but also the well-being of team members and personal challenges they may encounter. Through these meetings, the team maintained effective communication and cooperation, leading to improve team efficiency. We will continue to maintain a positive attitude and strive collectively for success.

UI Design

The team priority to readability and maintainability of the code. Each function, class, and key variable is annotated to facilitate understanding and utilization by team members, which is adopt a clear naming convention to embody object-oriented principles. Meanwhile, the code is modularized and adheres to strict coding standards, which reduce the complexity and unifies the coding style, thereby convenient for maintenance and expansion. Finally, version control tools are used to manage the code to improve security and stability. These measures make our code readable and maintainable, which is helpful to develop and maintain the project efficiently.

**What Didn’t Go Well**

Improvements in Sprint planning and execution

The team is aware that the need for improvement in Sprint planning and implementation. In previous projects, it is found that the complexity and completion time of the task may not be fully considered occasionally when formulating the Sprint goals and tasks, which has contributed to the project not advancing as efficiently as expected. In order to solve this problem, the future Sprint planning meeting are planed to strengthen discussion and evaluation to ensure each task is properly allocated and estimated. Tasks are refined in more detail and evaluate the possible risks and challenges of each task. In addition, each task has a clear completion standards to better track the progress and evaluate the completion. Furthermore, the Sprint goals are planed to strengthen the definition and priority determination. We will work more closely with the project leaders and stakeholders to ensure that the Sprint objectives are consistent with the overall objectives of the project, and adjust the priorities according to the actual situation, insuring the center of the team is the most valuable part. It is believed that the efficiency and quality of Sprint planning and implementation can be enhanced, and make the project progress more smoothly through these improvement measures.

Improving the flexibility of time limit for a project adjustment

Another aspect that related to improve is to flexibly adjust the construction period when facing major issues. Throughout the implementation of the project, a few unexpected situations or unexpected problems may occurred, which may adversely affect the project progress. Therefore, our team should reinforce the capacity to respond and the ability to handle matters swiftly.

In prior projects, there may have a tendency to adhere stubbornly to the original deadline and ignore the changes in the actual circumstances, resulting in the imperfection and delay of the project schedule. We plan to strengthen team cooperation and communication and establish a flexible working atmosphere in order to solve this problem, so that team members can more easily accept and adapt to the adjustment of changing construction period. Advice and suggestion are equally significant in the process of developing, group members are encouraged to express their opinions and establish targeted scheme. At the same time, we will strengthen communication with project leaders and stakeholders, reporting problems and risks timely, and seek their support and understanding. It is anticipated that we have capacity to manage any potential challenges to ensure the project progresses without disruption.

Test

There is room for improvement in the testing aspect within our team. The original plan was to use Unity Test Runner to conduct testing completely and automatically to ensure the stability and quality of the project. Nevertheless, with the complexity of the project structure, it was evident that Test Runner could not support this work sufficiently, which led to the difficulty and flaws of the test process. Thus, testing methods similar to manual parameter retrieval were introduced. Compare to fully automated testing, this method is less efficient and comprehensive, but it can partially amend for parts not be covered by Test Runner, and guarantee the basic stability and functionality of the project. Additionally, there is an ongoing exploration and experimentation with other testing tools and methods to find a suitable testing solution. In the future, testing awareness and skills cultivating among group members will continuously reinforcement and learning, ensuring everyone comprehends the significance of testing adequately and understands testing methodologies. Accordingly, we will continue notice and evaluate the applicability of various testing tools and methods in order to adjust and optimize the testing strategy punctually. By enacting these improvement measures, it is anticipated that the quality and efficiency of the team testing area can be enhanced, thereby providing better assurance for the smooth progression of the project.

**Useful Links**

**Project GitHub Repository** Our GitHub repository can be found using [this link](https://github.com/Max-DoDo/The-World-Conquest)