

REAL WORLD ECONOMY RTS GAME PROPOSAL

by Tynan Kahar

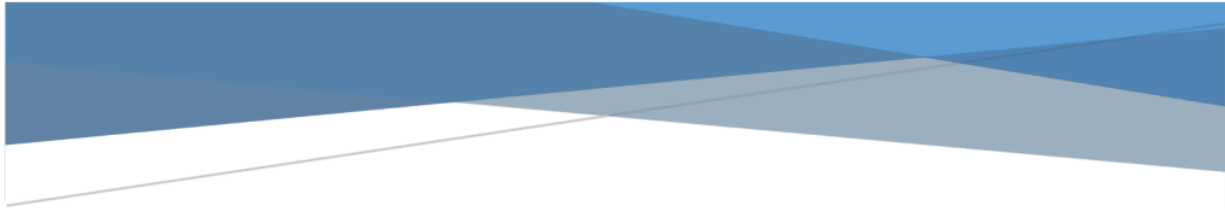
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1. Introduction

For the individual project I intend on researching and creating an RTS game that has a functioning economy, this will be built using Unreal Engine 5. Research: This is a captivating idea, and it intertwines technology and design along with gameplay innovations. One of the biggest staples of RTS games is the resource management element; this is shown in a myriad of different games, some examples of which are Ruin Scape and Age of Empires. However, these games both have flaws in their economic systems that end up with players having too much money or resources. The purpose of this project is to create an economy system that improves and surpasses games that came before it. It will do this by using complete algorithms that will keep track of the amount of money players have and the amount of items and adjust the cost of goods accordingly, along with preventing players from creating hordes of wealth that would destroy the economy if they decided to spend it. This would be done by lowering the value of items that can be sold if they are sold at once.

The motivation that has driven me to create this project is a personal passion when it comes to game development and my love for RTS games, in which I see the fault in resource management and the economic systems in many of my beloved games that I wish to improve upon. And subsequently hope to influence titles that come after to create a more grounded realist economy, rather than just a flat market that means the price of goods and the value of gold are stagnant and not dependent on supply and demand or other market fluctuations.

2. Background to the Proposed Research

The background of this proposal is to delve deep into the economic systems in RTS games and not only gain a deeper understanding of it but to create a game that has an economic system that fills the gap in the industry for an RTS that has a fully functional realistic economic system. There are three main areas of research that this project will take down. The first is obviously the creation of an RTS game, and the second is AI. This would be to control the non-player character as well as any enemy; it could also be used to control specific actions a player could assign to their own units. The third and final as well as the keystone of this proposal is the realistic economic system. As previously stated, there is a complete lack of realistic economics in the RTS genre, and this project intends to show that having a realistic economic system helps to improve immersion and the feel of the games as well as presenting educational benefits, as players that attempt to understand the way the system works will be able to get the most money from these items, as well as uses changing market prices to find a way to make money without even having to find or defeat an enemy.

Looking at the first area, the creation of the RTS game, the trend that this genre is aiming towards is to provide more [5] "deep storytelling, expansive world-building, and an increase in the player agency," and with this game, we are primarily aiming at the increasing player agency; the expansive world and a story could come as secondary factors so that this project aims to change what things players want in their RTS games, as well as that the trends in the RTS genre are ever-changing and evolving. This makes RTS games a perfect area in which to try to add a feature like a realistic economy and attempt to indent it into the genre, as I believe that based on the games I've seen,

adding a realistic economy would drastically improve the experience as well as provide completely new ways to play the game.

The second area that is crucial for this game is artificial intelligence. The constant improvement of AI is what has been pushing not just RTS games but gaming as a whole to a whole new level. AI is an important tool in creating RTS games, as without AI is almost impossible, and almost everything would need it. The enemy would need to be AI to allow them to fight the player or move towards them. This is especially crucial, as the AI in RTS games needs to be able to respond in real time to the actions of the player. This is exemplified by [10] the competitions that use StarCraft to test the use and how competent the AI are and how well they can respond to the actions of a player. As well as this, the AI would also have to control the nonplayer character for pathing and other important choices the AI may use, one of which could be giving the AI what it needs so they use the market to buy goods; this would help stimulate and enhance the realism of the economic system.

The third and final area is the economy itself; this will be the cornerstone of this project, and it is the thing that separates it from just any other random RTS games. [4] This game intends to use economic principles to give each of the stores in the game its economic system this will mainly include supply and demand one of the guiding principles of the economy, it will do this by keeping a database of all the items in each of the stores and using a set price for the default number of good, if the number is below that set mark the price will naturally go up and if it below the price will go down, the way, the areas where each of the stores are located will have generic materials surrounding it, for example, a store in the woods would be surrounded by wood this would affect the price because of the massive amount of wood available in the area, even if it not in the store's inventory, the price will be lower than a store in the desert as even if the store has some wood the complete lack in the area would increase its price.

3. Research Problem statement

The main problem that this project seeks to tackle is the lack of realistic and dynamic economic systems within RTS games, which constrains both the depth of gameplay and the educational value of these games. The majority of current RTS titles employ basic economic frameworks that depend on static resource gathering and predetermined production costs, which do not effectively mirror real-world economic concepts such as supply and demand, market variability, and resource limitations. This simplification diminishes the strategic intricacy of the games and does not involve players in the more complex decision-making processes characteristic of actual economic situations.

4. Research Aim & Objectives

The project aims to create an economic system that will track all of the items in a specific area and have market fluctuations and changes based on the supply and demand of the item. For example, if the player were in a desert area, the price for selling wood would be higher as the area has little access to that resource. If the player were to sell too much, the price he could sell the wood for would reduce, and there would not be as much need for that resource.

An objective of this project would be to have a resource tracking system to track what areas have what items and keep a database of that information. Things that this system will need are quantities and types of items. Along with a system of slowly reducing items to give a realistic impression that

the area is gradually using the resources, this, paired with a slow increase in items that would be specified to be found in that area, would give the impression that the markets would slowly rebalance themselves.

Another objective would be implementing a supply and demand system that would adjust the prices of items based on the amount of that item an area has along with its need for that item. This system would not only look at the data recorded to determine the price but would also have the set demand for an item, which would affect how quickly the price of the item would change.

Another of these projects aims is to create an RTS game that will give an immersive experience for the players and ensure the game is fair and enjoyable. This may include the items that creatures drop on their death or rewards for competing specific criteria; each of the features of the game should be balanced to the level of the players and to the difficulty that provides.

An objective to complete that aim is to have a range of different enemies and resources that the player can collect and sell alone while ensuring that the spawn rate of those resources and enemies is controlled to ensure that someone just stays in one area grinding one political enemy or gathering one resource.

5. Methodology

The methodology I intend to use going forward on this project is strategic. This includes doing literature reviews on the important areas of my research along with using quantitative and qualitative data to help improve the game itself as well as improve upon the approach of the game's key feature, which is the economy system.

5.1 Methods

The method I intend to use is mixed methods. The reason for this is that it uses aspects from both qualitative and quantitative methods; using these would give an array of data and research that will help with the creation of my realistic economic system. This will include a literature review to see if there are any previous economic systems that work in the same or similar way to the way mine intends to work. This will help give me a base like mine as well as use it as an example if there are any faults that I should avoid.

5.2 Materials

The materials that I will require for this project range first on the hardware side, where I will require a GPU to run the game and all of the code and calculations in the background. On the software side, I intend to use Unreal Engine 5 to create the game and use C++ to do any background coding. To get an understanding of the type of game and visual players may want in a game like this, I intend on using surveys and questionnaires in order to get a grasp on how people would feel about a game like

this and what they would want the game to have to improve it. Overall, I intend to use Google Forms or tools similar to gather this data.

6 Project Plan

The timeline I aim to maintain when working on this project is:

21st Oct-21st Nov: is for research to gain a better understanding of how to create an RTS game and all the functions that go into it.

21st Nov-30th Dec: Create the basic game to outline the idea as well as have basic AI implemented.

30th Dec-15th Jan begin working on a rudimentary economic system.

16/17 Jan: interim viva

18th Jan +: Continue research on how to improve all aspects.

1st Feb-1st Mar: begin working on the more advanced economic system

1st Mar-1st Apr: improve gameplay aspects

1st-29th April: Go over the write-up and complete any unfinished parts.

7. References

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A. Rajput, "How Did the Gaming Industry Transform with the Help of Technology?," *300Mind Blog*, Aug. 17, 2023. Available: <https://300mind.studio/blog/gaming-industry-transform/>

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G. Robertson and I. Watson, "A Review of Real-Time Strategy Game AI," *AI Magazine*, vol. 35, no. 4, p. 75, Dec. 2014, doi: <https://doi.org/10.1609/aimag.v35i4.2478>

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[10] Juan Pablo, Botello Deras. Stockholm University, "AI and real-time Strategy Games An In-Depth Look at Monte Carlo in Micro-RTS" Spring 2023 <https://www.diva-portal.org/smash/get/diva2:1784327/FULLTEXT01.pdf>

REAL WORLD ECONOMY RTS GAME PROPOSAL

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

50/100

PROJECT PROPOSAL – ACCA6020 INDEPENDENT PROJECT

Student Tynan Kahar
Mark

Intro / A&O (400 words)		
Project title; Identification of a specific problem to be investigated; Well-defined aims and SMART objectives; Explaining why this project is worth doing; Discussion of what the project needs to do in order to be a success; Description any deliverables that will be produced at the end of the project	20	15
In the <i>Aims and Objectives</i> section, the primary		

purpose is to outline the overall direction and specific goals of the project. This section should start by clearly defining the aim, which is the broad, overarching goal you intend to achieve. For instance, the aim might be to "develop a machine learning model to improve ECG classification accuracy." Following the aim, the section should detail specific objectives—these are concrete, actionable steps that guide how you plan to achieve your aim. Each objective should be measurable and achievable, often describing the main tasks, such as "reviewing existing ECG classification methods," "designing a neural network architecture," and "evaluating model performance using standard metrics." Together, these statements create a clear roadmap, showing how the project will systematically address its goal and contribute to the field.		
Background to the Project / Literature Review (400 words)		
Description of how the work to be done by in the project relates to the work identified in the literature review; Discussion of any ethical issues raised by the project Identifying what has already been done within the field; Topic familiarity; Brief literature review using appropriate sources – 6-8 journal papers and book chapters	20	10

rather than just websites; Selection of relevant models & concepts To align your project more closely with the academic standards, I'd recommend engaging more deeply with relevant scientific research. This will add a necessary layer of rigour, helping to ground your ideas in existing literature and methodologies while also highlighting how your work builds upon or extends current knowledge. Integrating more research will not only strengthen the academic nature of your proposal but also enhance its overall credibility and impact. I'm happy to discuss resources or specific research areas that may be beneficial as you refine your approach.		
Project Design (500 words)		
Clear statement of which development methods are to be used and why they are appropriate; Clear statement of which tools are to be used and why they are appropriate; Clear	30	10

description of how data collected will be analysed A strong candidate for further research.		
Resources / Planning (200 words)		
List of any deliverables; Clear diagram showing both timing and resource use; Completed ethics form; Limited and relevant appendices This needs further expansion and investigation.	15	7
Document Presentation		
Correct spelling, grammar and punctuation; Flow of narrative/fluency; Coherence; Word processed ; Correct use of referencing with	15	8

bibliography; Strict word limit In IEEE referencing, the numerical citation typically appears at the end of the sentence, after the relevant information, and <i>before</i> the full stop. For example: <i>The results showed a significant improvement in performance [1].</i> At this level, the use of first-person language is not acceptable, as it detracts from the formal, objective tone required in academic writing. The emphasis should remain on the research itself rather than on the researcher, so use passive or third-person constructions to maintain appropriate academic standards going forward.		
TOTAL	100	50

