

Economics of Virtual Worlds

Foundations of Interactive Game Design
Prof. Jim Whitehead
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UC SANTA CRUZ



Game Maker/RPG Maker Help Sessions

- Monday, March 5:
 - ▶ 5:30-8pm, Engineering 2, room 215, Game Maker
 - ▶ 5-8pm, Engineering 2, room 280, RPG Maker
- Tuesday, March 6:
 - ▶ 5-8pm, Engineering 2, room 215, Game Maker
 - ▶ 5-8pm, Engineering 2, room 280, RPG Maker
- Details also on the class web site
- Final game projects due in class **Wednesday, March 7**

GDC Expo Passes

- Please see me after class for your GDC Expo Pass:
 - ▶ Logan Murdock
 - ▶ Trevor Prater
 - ▶ Miguel Vidaure
 - ▶ Desiree Machado
 - ▶ Edwin Arbaiza

All Virtual Worlds Have Economies

- An integral part of the playing experience
- An active marketplace makes the world feel “alive”
- Real world economics is the study of choice under scarcity
- The ultimate scarce resource is time
- Players in virtual worlds must choose how to allocate their in-world time
 - ▶ This creates the in-world economy

Objective of Economic System in a Virtual World: Fun

- Real-world economic systems are guided by policy decisions based on ethical choices
 - ▶ Utilitarianism, Kantianism, etc.
- In a virtual world, policy choices are guided by the need to make the world fun
- Central question: **what makes an economy fun?**
 - ▶ Edward Castronova poses this question in “Synthetic Worlds”, p. 175, Univ. of Chicago Press, 2005.
 - ▶ He goes on to describe features that make an economy fun

Consumption and Acquisition

- It is fun to acquire something that you have come to desire
 - ▶ You enjoy using the object
 - ▶ Fun to collect information about the object's qualities and prices, and make a choice about what to buy
 - ▶ Process of making a choice under scarcity is enjoyable, a kind of puzzle
 - ▶ Joy of acquisition, accumulating an empire of objects
 - ❖ One player in Ultima Online had over 10,000 shirts, just for fun

Fair Returns to Work and Skill

- Performing an activity that may (or may not) be fun, and get a great reward for them
- Virtual worlds frequently find players performing boring, mundane tasks to achieve some kind of advancement
 - ▶ Example of player in EverQuest who waited for days near a ruin to await a particular NPC, who carried the Glowing Black Stone
 - ▶ Getting the stone indicated you had waited by the ruins a very long time – you had survived a horrifically boring experience

Creation of Things

- It is fun to make things
- It is fun to take simple things and combine them into more complex things
- Rags-to-riches arc is very enjoyable for people

Mission and Purpose

- A fun economy gives people a meaningful role to play
- Roles need to be individual
- Contributing to some larger-level competition adds to the fun
 - ▶ Contributing to your clan/nation winning

Robust Competition Under Equal Opportunity

- Competing with other people is fun
- But it must be fair

Risks and Bargains

- An economy should have some uncertainty, luck should play a role
- Some actions should be rewarded, and others punished, at random
- A risk system should ideally reward rational risk-taking
- “A world without risk is not just boring, it is empty of things to cherish.”

Property and Crime

- Owning things feels good
- Having things stolen feels bad
- Seeing criminals brought to justice feels good
- For some, committing theft is fun
- Perhaps a fun economy should have property, theft, and jail?

Chaos and History

- A fun economy should have macro-level (world-wide) major events and epochs
- Provides a sense of history
- Upheavals provide opportunities for advancement, as well as for losing wealth
- Overly stable game worlds are boring

Principles of Synthetic Economy Design

- Say you were to create a virtual world
- What design principles would you use in creating this world?
- Castronova offers several proposals in *Synthetic Worlds* (pp. 182-204)

Make Sure There Is Economic Activity

- Key to generating economic activity is trade
- How to get trade? Players must have unbalanced needs.
- Ensure players have many different needs
 - ▶ Food, clothes, equipment, housing, transportation, entertainment, etc., and all require money
- Ensure players can only create a small part of these needs by themselves
 - ▶ That is, do not allow players to be self-reliant without trading
 - ▶ Needs must be met with consumables, not durables
 - ▶ Players must be required to refresh their needed items
- Create specialized economic roles
 - ▶ Each person has something the other wants, since each person specializes in the production of different goods.
 - ▶ Gives each player a meaningful role

Consciously Locate and Publicize Economic Activity

- Marketplaces must be located so as to respect transportation
 - ▶ Eerily abandoned city in EverQuest, with marketplace nearby in a tunnel that is a major transportation hub.
- Important to put geographic distance between resources needed to make things
 - ▶ Have berries numerous in one region, and wheat in another – need to trade to make pies
- Economic activity should generate a buzz – people should be able to notice that the activity is taking place
 - ▶ Marketplaces are social spaces too

Generate Earnings and Investment

- In order to buy things, players must be able to sell things, especially their specialization
- A challenge is setting the wages appropriately

Generate the Value of Things

- How are prices set?
 - ▶ Want to ensure things cost enough to be valuable, but not so expensive they are too difficult to obtain.
- Merchant AI is a common technique
 - ▶ Buys items at one price
 - ▶ Sells items at a higher price
 - ▶ Typically have infinite supplies of money and items.
 - ▶ When players go on quests, they obtain items, which are then sold to the Merchant AI, effectively converting them to money

Problems with Merchant AI

- Merchant AI assumes:
 - ▶ Infinite supply
 - ▶ Infinite demand
 - ▶ At different prices!
 - ▶ Assumption is that the local economy is so small, no amount of import/export will affect global prices.
- If buy/sell prices are too close:
 - ▶ There is no incentive to trade with other players.
 - ▶ Merchant AI is typically more convenient.
- If the spread is larger:
 - ▶ Players can get a better deal with player to player trade

Control the per-capita capital stock

- “Inflation” is a common problem in virtual worlds.
- Typically two issues that are perceived as one problem:
- A gradual increase in price level (actual inflation)
- Gradual increase in the amount of physical capital per player
 - ▶ That is, a real increase in earning power for players: their money buys more stuff

Inflation

- As players perform actions to make money (killing monsters, making items), they are effectively increasing the money supply.
 - ▶ The game just declares there to be new gold pieces
 - ▶ Not a transfer of wealth (the monster never really had the money), but a creation of new money
- More money chasing a fixed, or slowly growing, set of goods, leads to these goods being more expensive.
- Killing monsters and looting cash from them is always inflationary, since it introduces cash without introducing new goods to buy.

Increase in Physical Capital

- Experienced players in virtual worlds accumulate better equipment over time
 - ▶ They sell or trade their old equipment to newer players when upgrading.
- In worlds where gear never decays, the stock of physical capital (gear) increases over time.
- This leads to a decrease in the cost of gear – as players play the game, they create more gear, increasing supply.
- The real cost of the gear decreases over time, making it easier for new players to buy gear
- This has the effect of increasing their purchasing power.
- It has the side-effect of making it easier for new players to go on quests, get cash, and buy better gear.
- Also means that later players have an advantage over early players

Introduce Social Mobility

- One problem is that once players become rich, they stay rich
 - ▶ Not very exciting
 - ▶ Need to make it possible for rich players to lose their riches
- Require rich players to actively monitor a portfolio to keep wealth?

Recover from Breakdowns

- In complex virtual worlds, players occasionally find loopholes that allow them to gain immense wealth quickly
- Leads to inflation, and only those players taking advantage of the loophole getting ahead.
- One solution is progressive taxation of quickly achieved wealth
- Gain too much money in one day, and the system takes 98%.
- Removes incentive to find loopholes.

