

# Constructing a Virtual World Research Tool:

Lessons Learned from the First Iteration in the Development of  
Greenland.

Travis Ross

Indiana University Department of Telecommunications

1: Experimentation in a virtual world.

2: What is Greenland?

3: The Development of Greenland.

4: Possible Future Research.

# Part 1

Experimentation  
in the virtual world.

# Properties of Virtual Worlds



What is the difference?

- Computer Generated
- Physical
- Interactive
- Multiuser
- Persistent



Economies and societies the size of small countries.

The dragons are fantasy, but the markets, groups, networks, powers, norms, messages, symbols, and cognitive processes are real.

The Media Equation (Reeves and Nass) / Proteus Effect  
(Yee & Bailenson)

The Interocular Impact Test: Elinor Ostrom. Larry Lessig.  
Richard Posner. Gary Becker. Byron Reeves.

# Shards

Four copies of one world



Populate each with a randomly distributed sample



Each world can have a different experimental condition

Control



Exp. B



Exp. A



Exp. C



Policy

Gender

Social Networks

Markets

Conflict & Cooperation

Culture

Institutions

Communication

## Part 2

What is Greenland?

# Greenland

The screenshot displays the Greenland game interface. At the top, the title "GREENLAND" is visible. Below it, a navigation bar includes tabs for "Game", "Information", "Clan", "Expansion", "Production", "Prestige", "Military", and "Market". The main area is a hexagonal map with various terrain types and icons. A "Loading..." indicator is present in the top right corner. On the right side, there is a panel titled "Information > Hex Info" for hex 69. This panel includes a photo of the player "tcart" (rank: High King) and a table of resources.

Resource Type	Present?
Mead	No
Meat	No
Scents	No

Additional Resources	Amount Available
Folk	(889)
Wood	(1000)
Stone	(1000)
Ore	(359)
Amber	(198)
Tools	(1000)
Houses	(1000)
Bread	(1053)
Paths	(866)
Salt	(1300)
Silver	(553)
Mead	(645)
Meat	(111)
Scents	(113)

At the bottom, there is an "Actions Log" and "Battle Results" section. The "Battle Results" table has columns for "Starting Hex", "Target Hex", "Action", "Applied Resources", and "Options". The message "You have not submitted any actions this turn." is displayed below the table.

Hex Map

Photo Avatar

1 turn per day

Players submit actions

Military

Trade

Resource Collection

# More Details

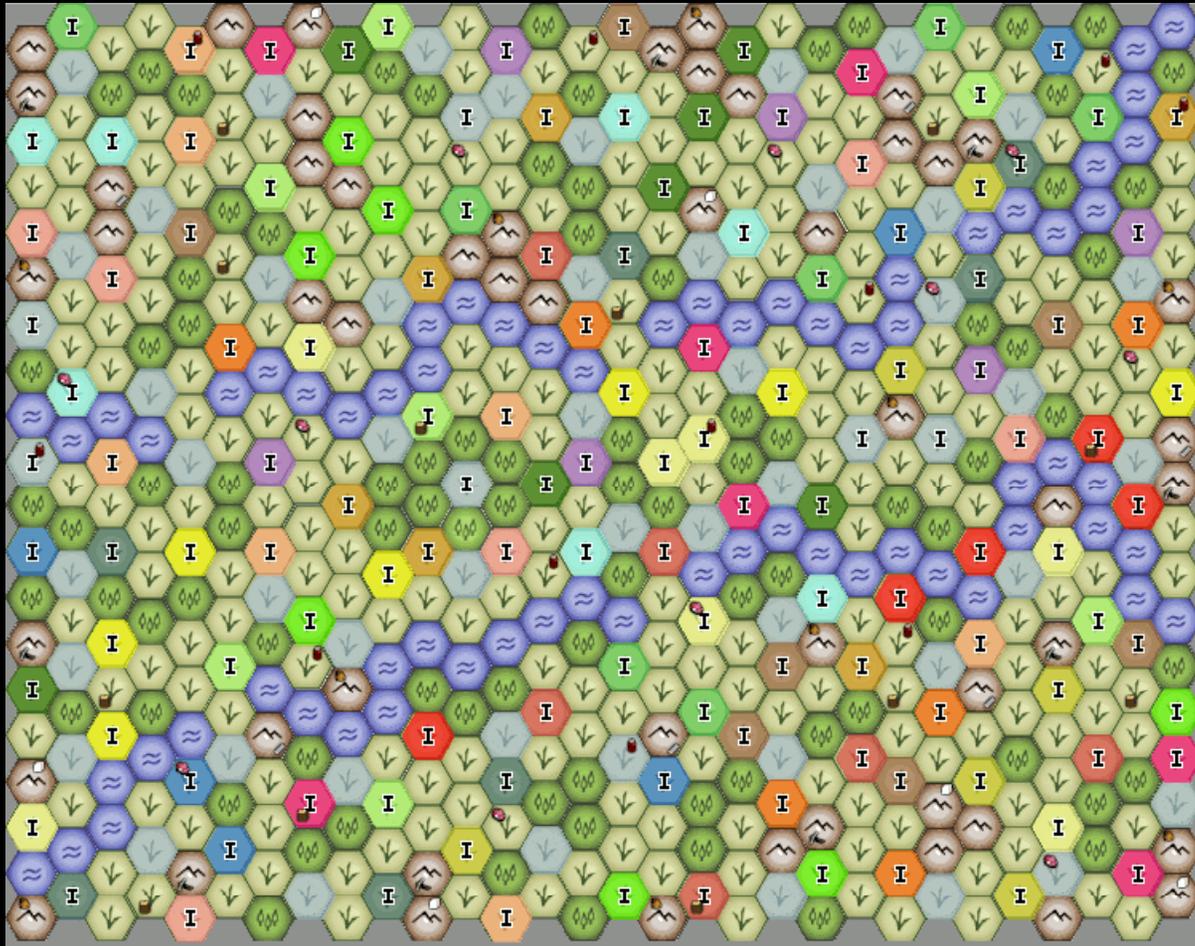
700+ players signed up.

130 active players after first season.

1 Season = 3 months

# Technical Details

Engine  
-PHP  
-MySQL  
-Object  
Oriented  
-Cronjob



Interface  
-HTML  
-PHP  
-CSS  
-AJAX

## Part 3

# The Development of Greenland

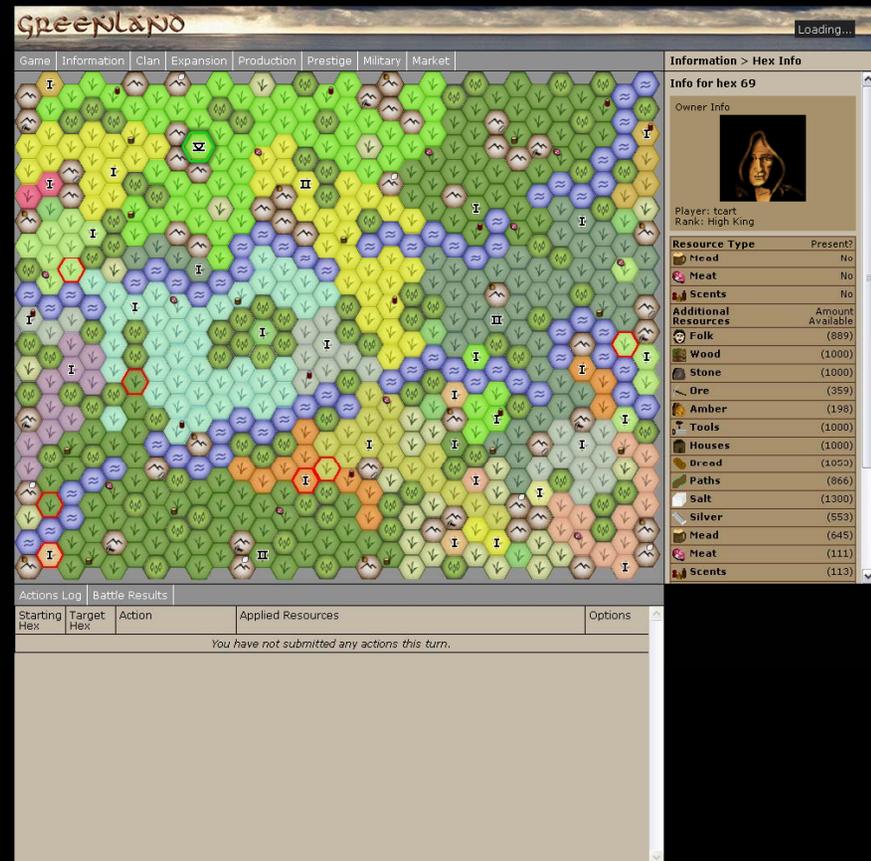
# Why Browser Based?

- Less Complexity in the Development Cycle
  - Less Art Sound and programming assets
- Accessible via a wide range of clients
- Success of other browser based games.

# Browser-Based Virtual Worlds.



World of Warcraft



Greenland

# Tribal Wars

Log out Forum Help Settings Premium Ranking (4919.[37.362 P]) Tribe Reports Mail Notebook Friends

Village Headquarters Barracks Stable Workshop Academy Smithy Rally point Market

Overviews Map ↔ 242616 216616 281616 400000 24000/24000

Hide upgrade levels to classical village overview **Production**



**Units**

- 1998 Swordsmen
- 5797 Axemen
- 1600 Light cavalry
- 1000 Mounted archers
- 300 Rams
- 3 Noblemen

» recruit

generated in 131ms Server time: 16:44:55

# Pardus

Game manual

Nav Overview Messages News Diplomacy Statistics Options Forum Chat

### Status

Quana [8,16] 4078

48 19

0.40 1081663

### Commands

**Dock with starbase**  
Logout (🔒: 10)  
Fill up tank (🔋: 5)  
Collect energy (⚡: 15) x2 x5  
Send distress call

### Ship

Hull: 110

Armor: 37

Check cloaking chance, (🔒: 100)

### Cargo

48 :12

:5 :27

:5

Drop  
Cargo space left: 11t

### Other Ships

Ptoxis  
Xenocide Alliance

Reno  
Space Monkeys

# Nile Online

**Nile Online** BETA  Ver [0.34] SrvTime [9:59:33 PM EST] PHARAOH ACELOGAN [ FORUMS | PRIMER | CREDITS | CONTACT | LOGOUT ] 

**Minalat**



» [8:32 pm] Shipment of 700  from Memphis arrived at Minalat

**Rakhen (40S) » Minalat**  

Units		Raw Materials [!]			Goods [!]		
 0 (195)	 21 (28) <sup>0.11</sup>	 1313 <sup>20</sup>	 2746 <sup>48</sup>	 1305 <sup>46</sup>	 2116 <sup>38</sup>	 3721 <sup>41</sup>	 737
 0 (0)	 0 (0)	 0	 14 <sup>2.75</sup>	 0	 298 <sup>11</sup>	 1842	 1962
 0 (0)		 149	 0	 0	 1955	 1433	 199 <sup>25</sup>
		 62	 385 <sup>5.5</sup>	 620 <sup>15</sup>			

# Player Feedback

Game needs more complexity.

“All I can do is fight.”

“Its a knife fight in a closet.”

The interface is still difficult to use.

# What did we learn?

Games require iterations.

- These should converge with play-testing

Major Bottlenecks in the process are programming and interface design.

Browser based games can be developed with small teams.

# The Loop

Good games go through “loops”

1. Design
2. Implement
3. Test
4. Go to (1) Repeat, Repeat, Repeat

Greenland is at the end of Loop 3

# Fun as an Incentive

How many Players do you need?

- Fifty?
- Hundreds?
- Thousands?

What is the incentive to play over a long period of time?

- Extra Credit
- Money
- Fun?

# What is Fun?

Still lack a formal “Theory of Fun”

Flow Theory

Evolutionary Psychology

The Media Equation, Happiness Hypothesis

Some starting points: Narrative, Resource Acquisition,  
Social Status

# The Attention Economy

Game Developers

Success from creativity & Trial and Error.

Don't be afraid to borrow systems that work.

How do you find systems that work?

Play lots of games

Settlers of Catan, Civilization, Halo, WoW

# Make it Fun

Play-test every chance you get.

- Paper Prototype
- Simple Web Based Prototype

## Identify

- Communication breakdowns & omissions between design and implementation.
- What makes the game difficult or painful to play?

Example: Taxes vs. subsidies

- Questions?
- Comments?

trlross@indiana.edu