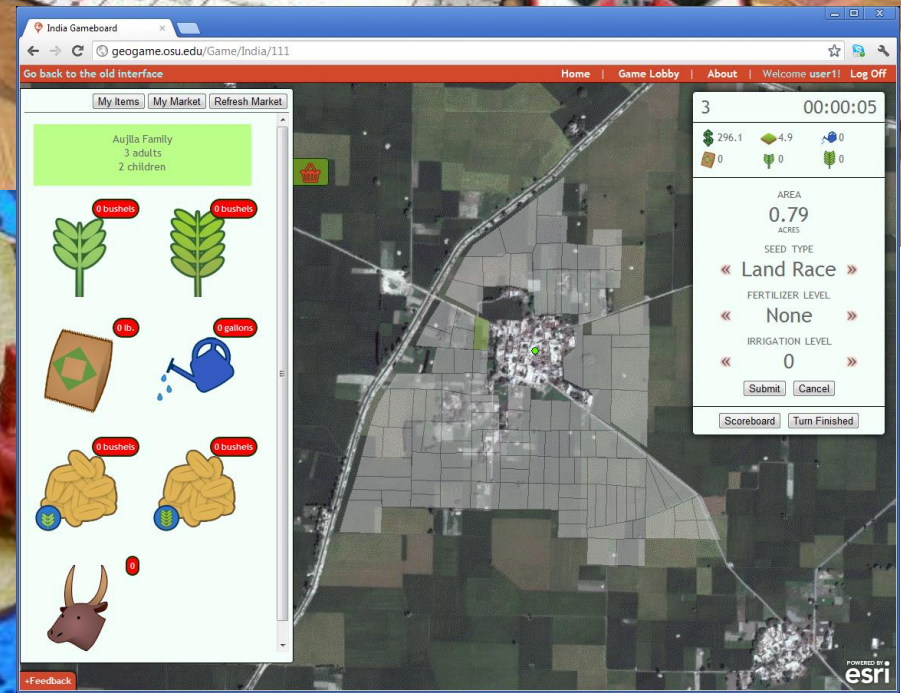


Online Map Games – playful interaction with complex real-world issues

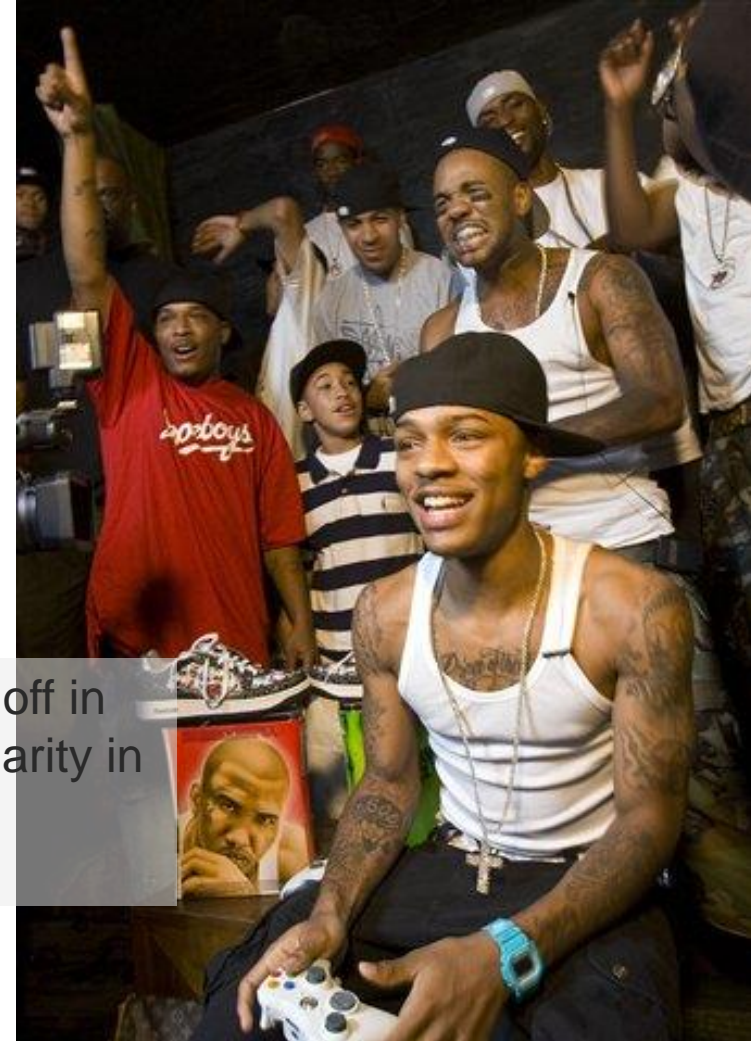
Ola Ahlqvist
Rohan Benkar
Brendon Mikula
Kiril Vatev
Rajiv Ramnath
Andrew Heckler
Zhaoyi Chen
Peixuan Jiang
James Baginski



Videogames

- Increasingly
 - A collaborative social activity
 - Allows access to players across space
 - A virtual meeting spots for game players & developers alike
 - Dynamic, Real-time, Immersive

Rappers Bow Wow, front, and The Game, upper right, face off in an Xbox 360 Madden football video game showdown for charity in Los Angeles, Friday, Sept. 5, 2008. (AP Photo/Mark Avery)



- Computer gaming industry
 - has continued to grow despite a deteriorating economy
 - now rivals the film and music industries in economic activity

Shigeru Miyamoto, legendary Nintendo video game designer, creator of Mario and the Legend of Zelda, plays Tennis with Steven Spielberg on Nintendo's Wii. (AP Images)



What if...?

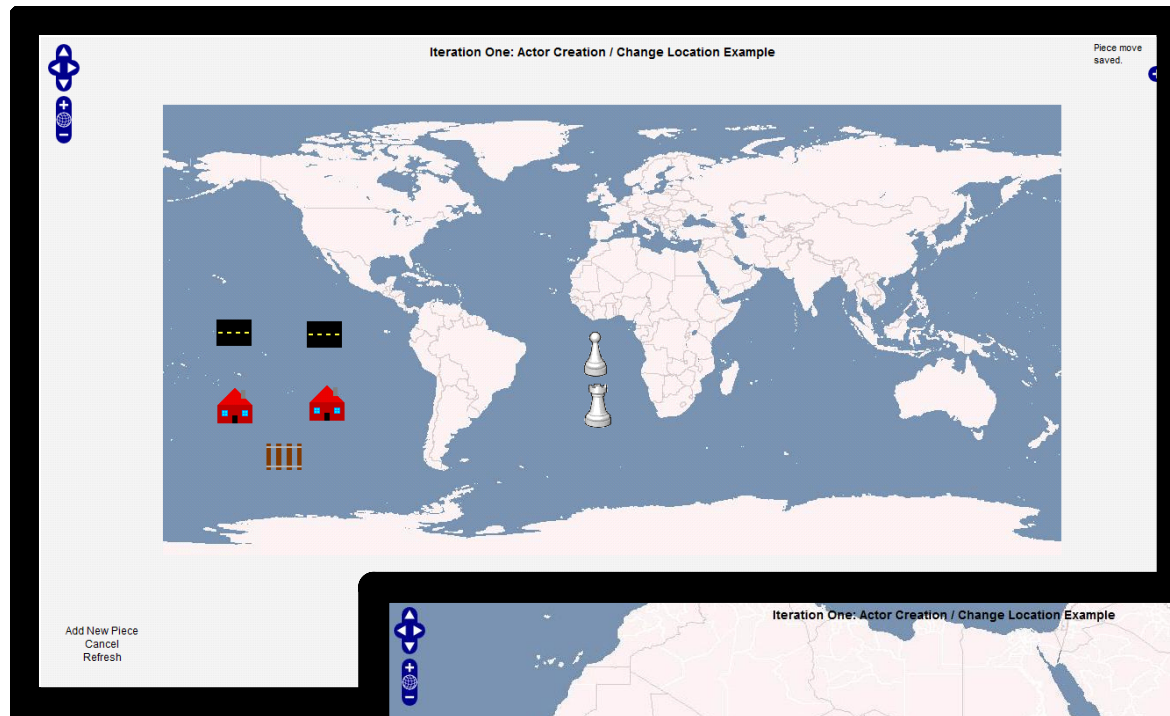
If we could exploit a fraction of this energy?



– prototype development

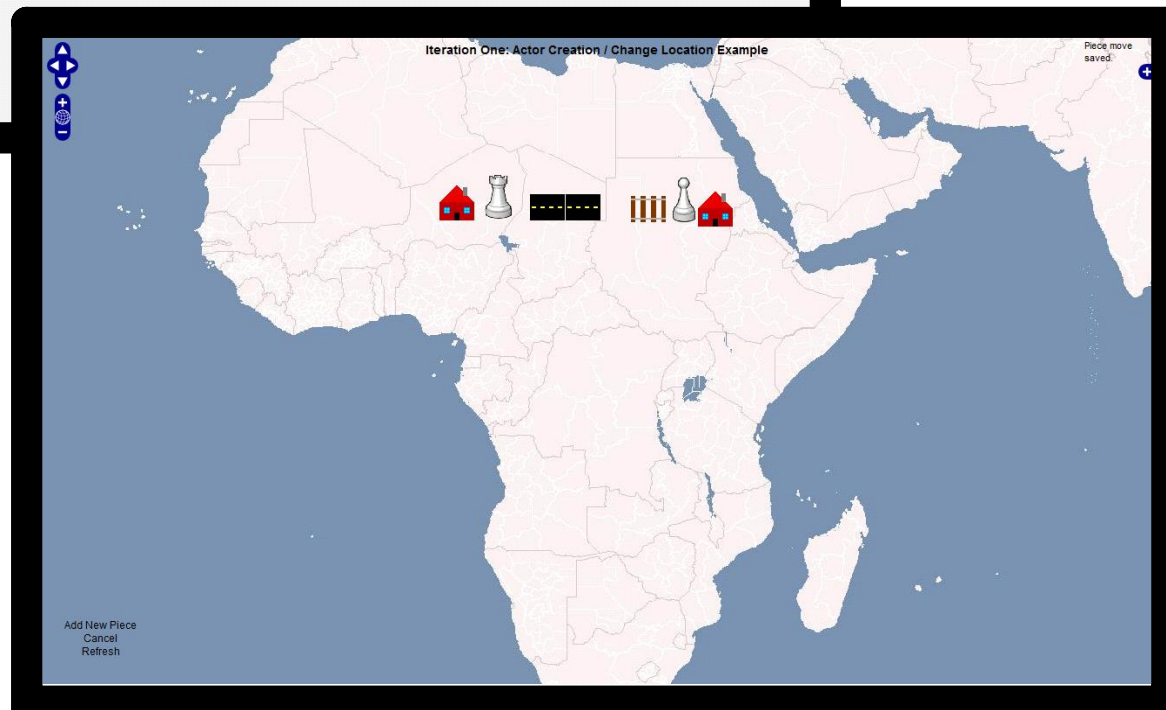
- Goals
 - A fun game that embed some geographic learning
 - To provide a proof-of-concept platform
- Requirements
 - Massive Multiplayer Online Game framework
 - To allow for rich social interaction and collaboration
 - Games played on top of GIS “game board” allowing play to be influenced by real-world data e.g.
 - real-time weather, ground conditions
 - country GDP, demographics
 - historic data
 - Flexible and modifiable rule set

First prototype – March 2008



Multiple users
Real-time editing

Openlayers



Second prototype – November 2008

Multi-user

Real-time editing

Chat

Geodata searches

Google Earth API



Third prototype – June 2009

Web service oriented; pulls data on weather and state GDP

Microsoft Surface Touch interface (because it was soo cool!)



Fourth prototype – 2009-10 – GeoGame Green Revolution



- Realistic Geo-social scenario development:
 - Green Revolution simulation role-playing activity for undergraduate geography instruction
 - Goal to understand what is meant by the term “green revolution” (the breeding of new plant varieties and application of modern agricultural techniques such as chemical fertilizers, herbicides, irrigation, and mechanization) and how it has affected rural households in developing countries.
- Support for Massive Multiplayer Online Gaming
 - Project Darkstar
- Geospatial interface
 - Worldwind

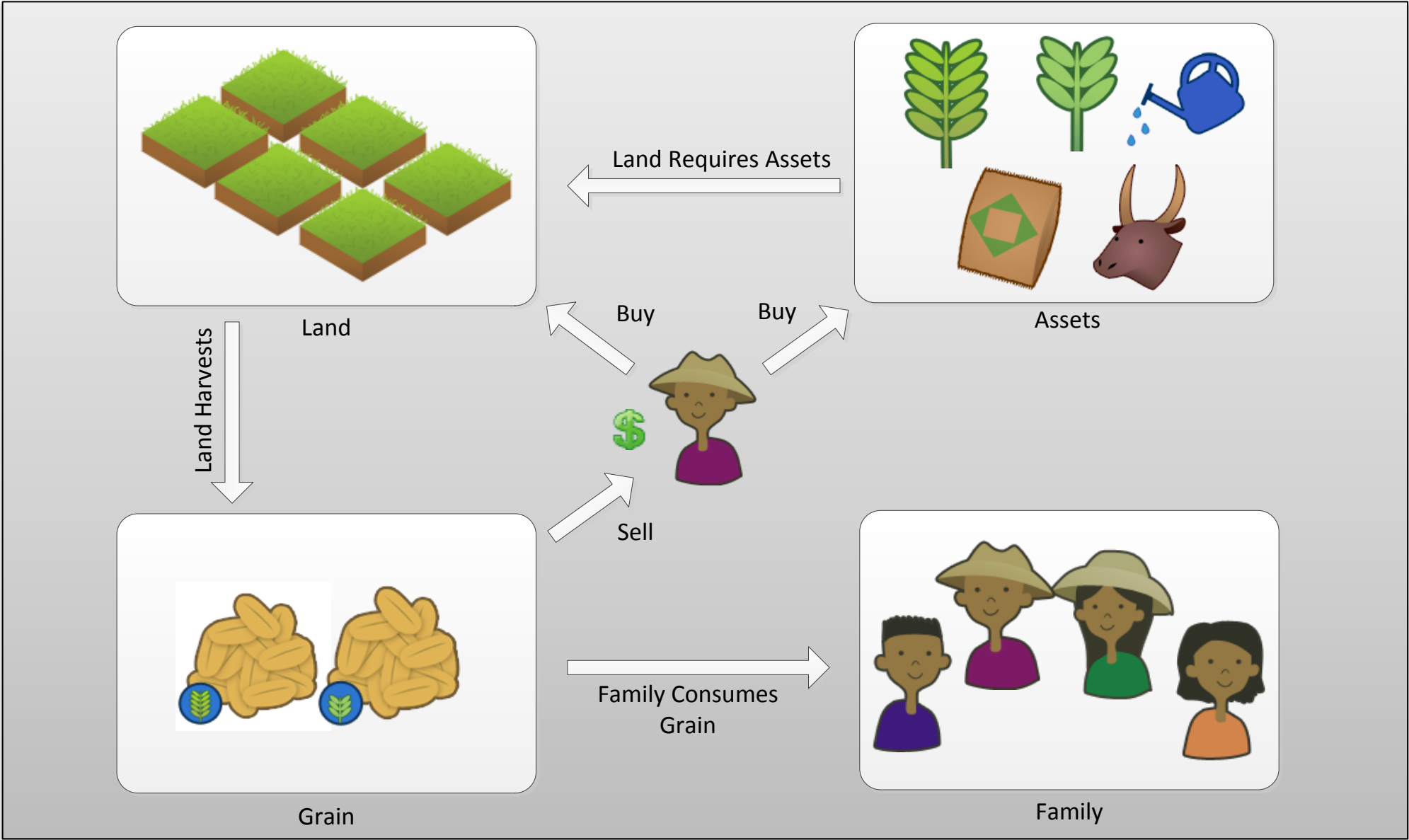


GeoGame is now more than a prototype

- NSF Exploratory Cyberlearning award 2011-2013
 - New award extends work through 2014
 - “How do people learn with a technology like this?”
- Part of instruction in Ohio State course on World Regional Geography
 - User evaluations, instructors & students



Game Description



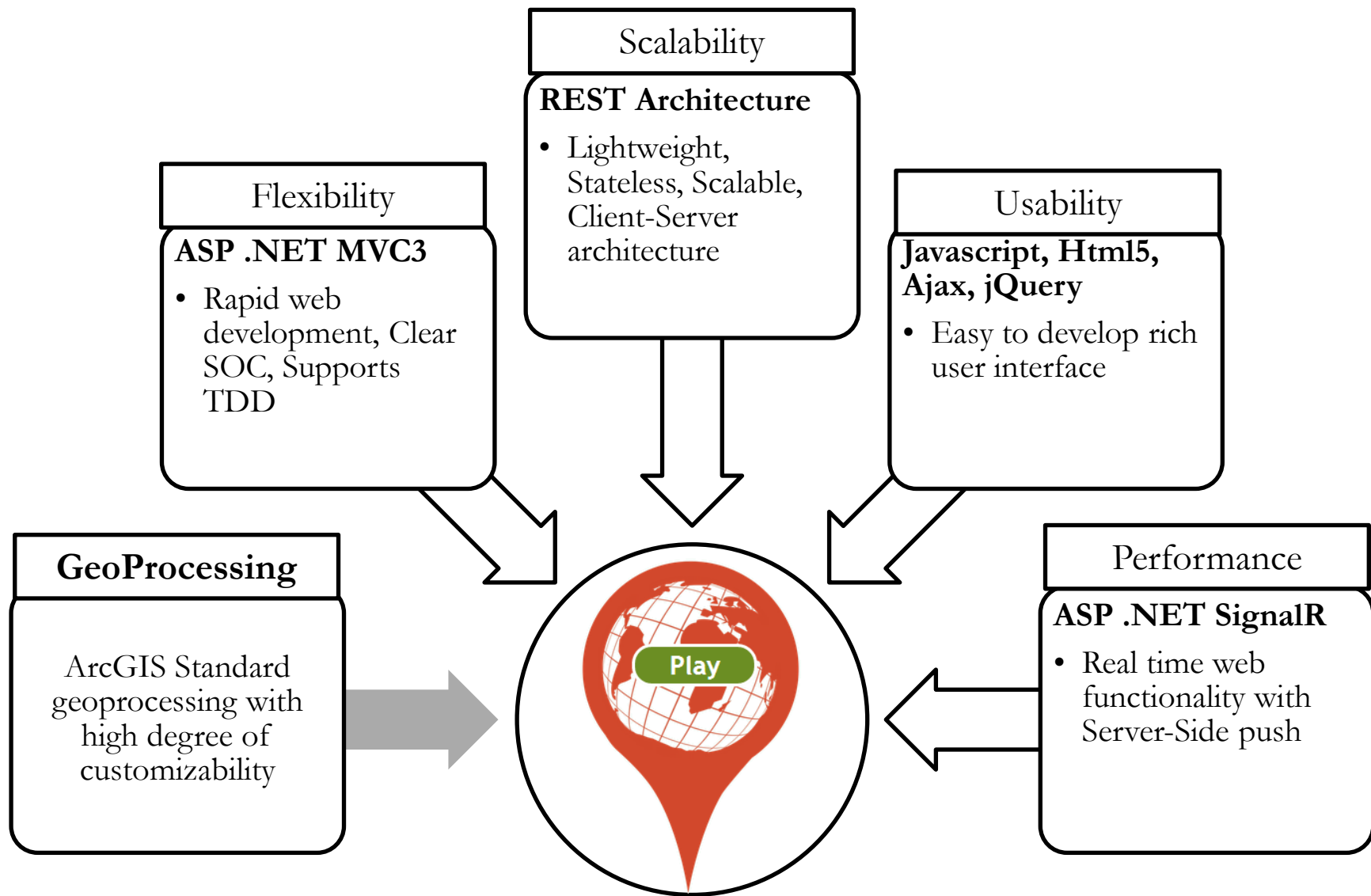
Functional requirements

- A map with GIS geo-processing capabilities.
- User authentication
- Game creation and joining
- Asset trading with other players and with the bank
- Player communication via a forum
- Scoreboard lookup to get the current status of every player in the game

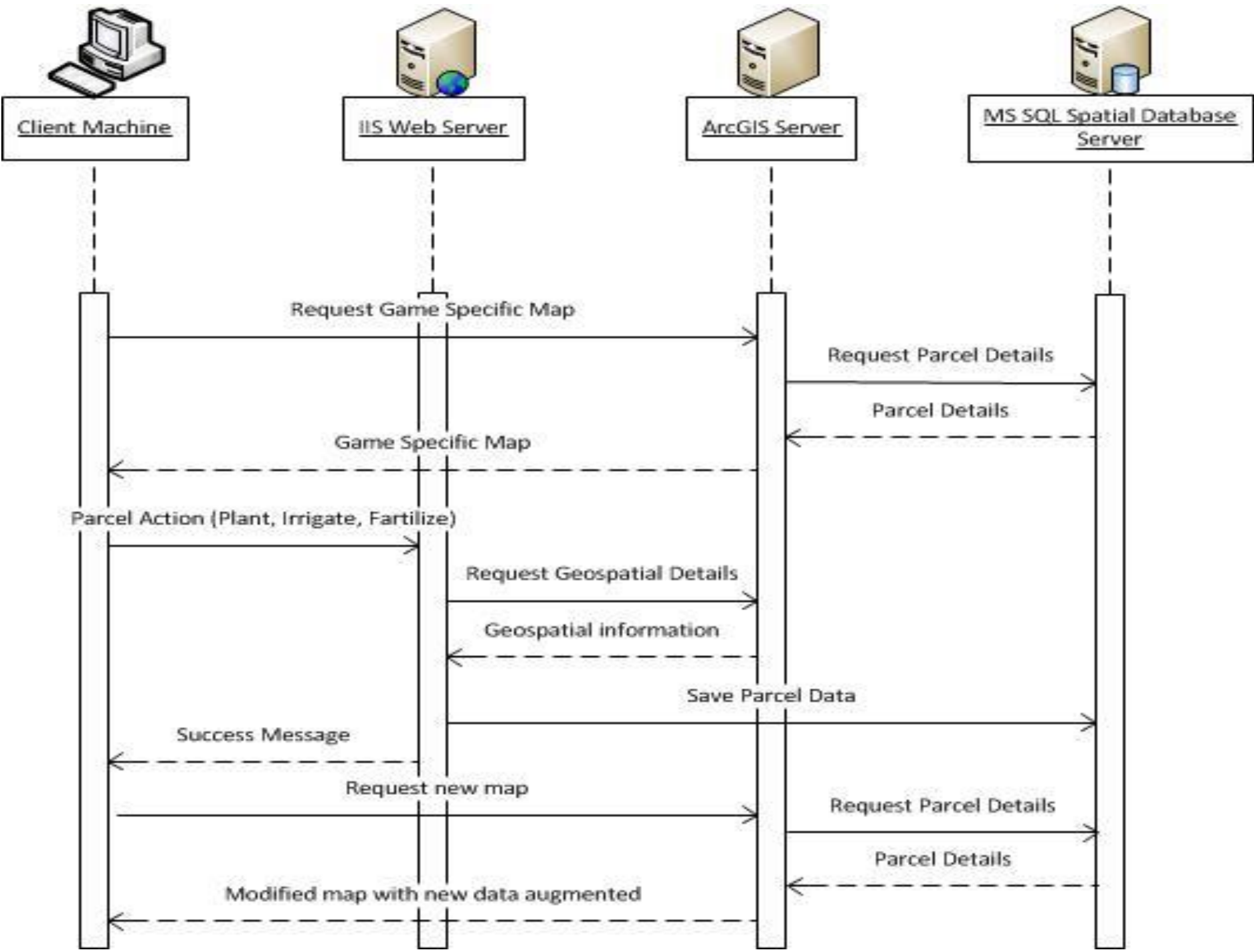
Non-functional requirements

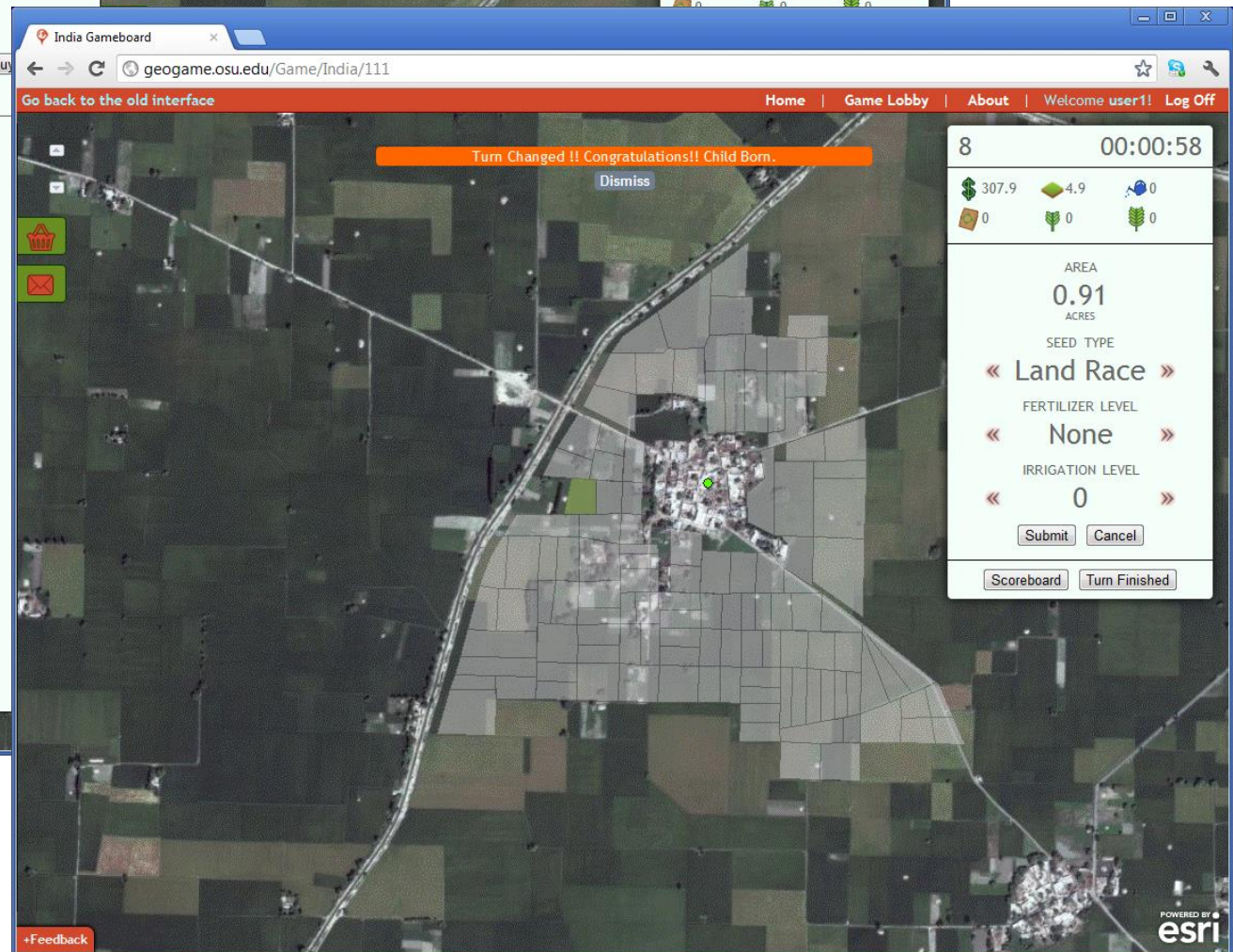
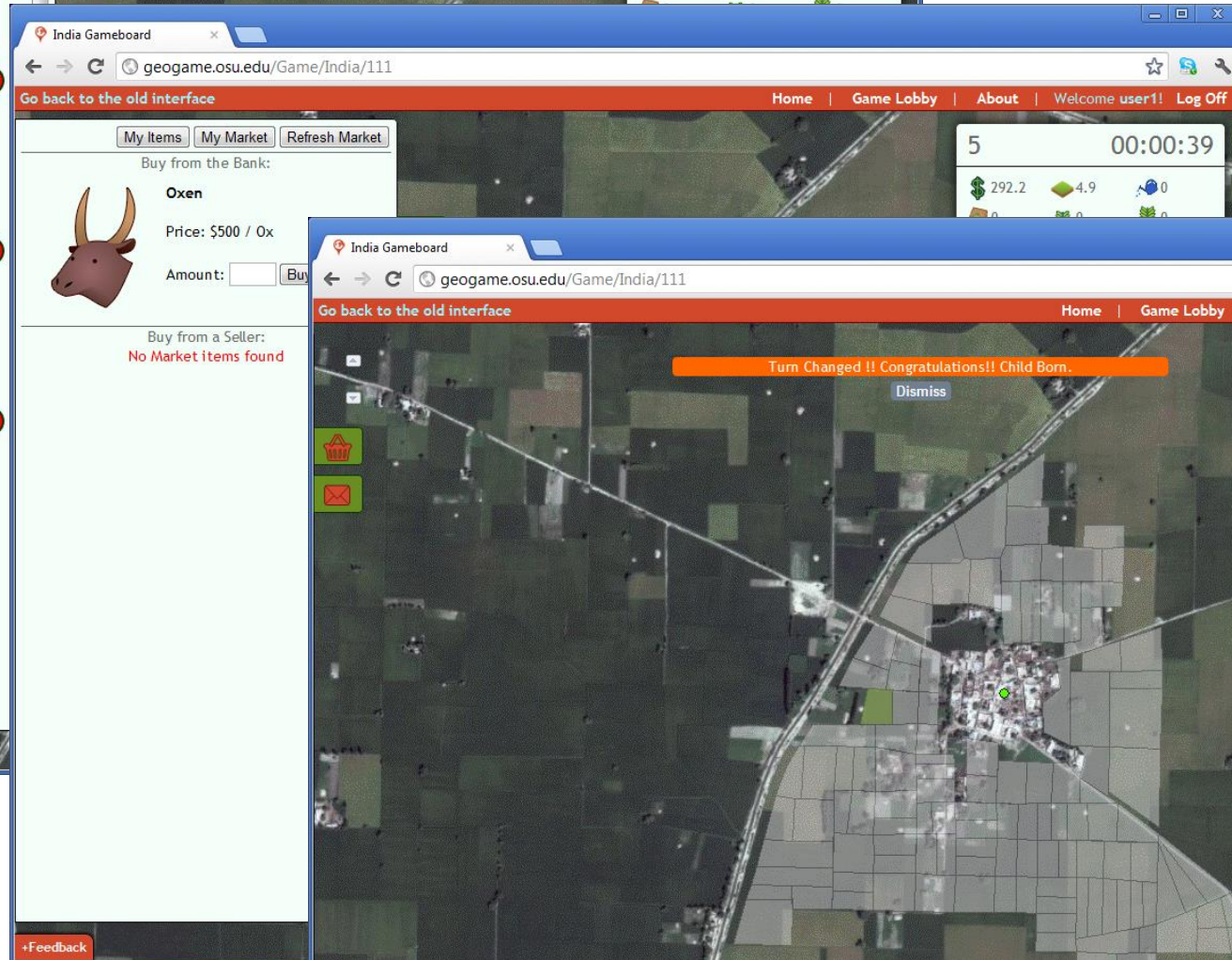
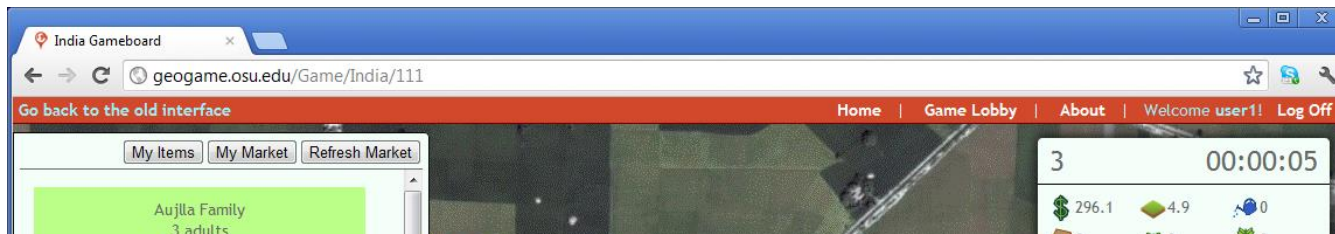
- Flexibility - a framework for flexible and rapid web development to build scalable and easy to maintain web applications.
- Usability - client side technologies for rich and easy to develop user interface
- Persistence - a standard database management system
- Scalability - easy to scale client-server architecture
- Performance - real time web functionality with Server-Side push

Architectural Decisions

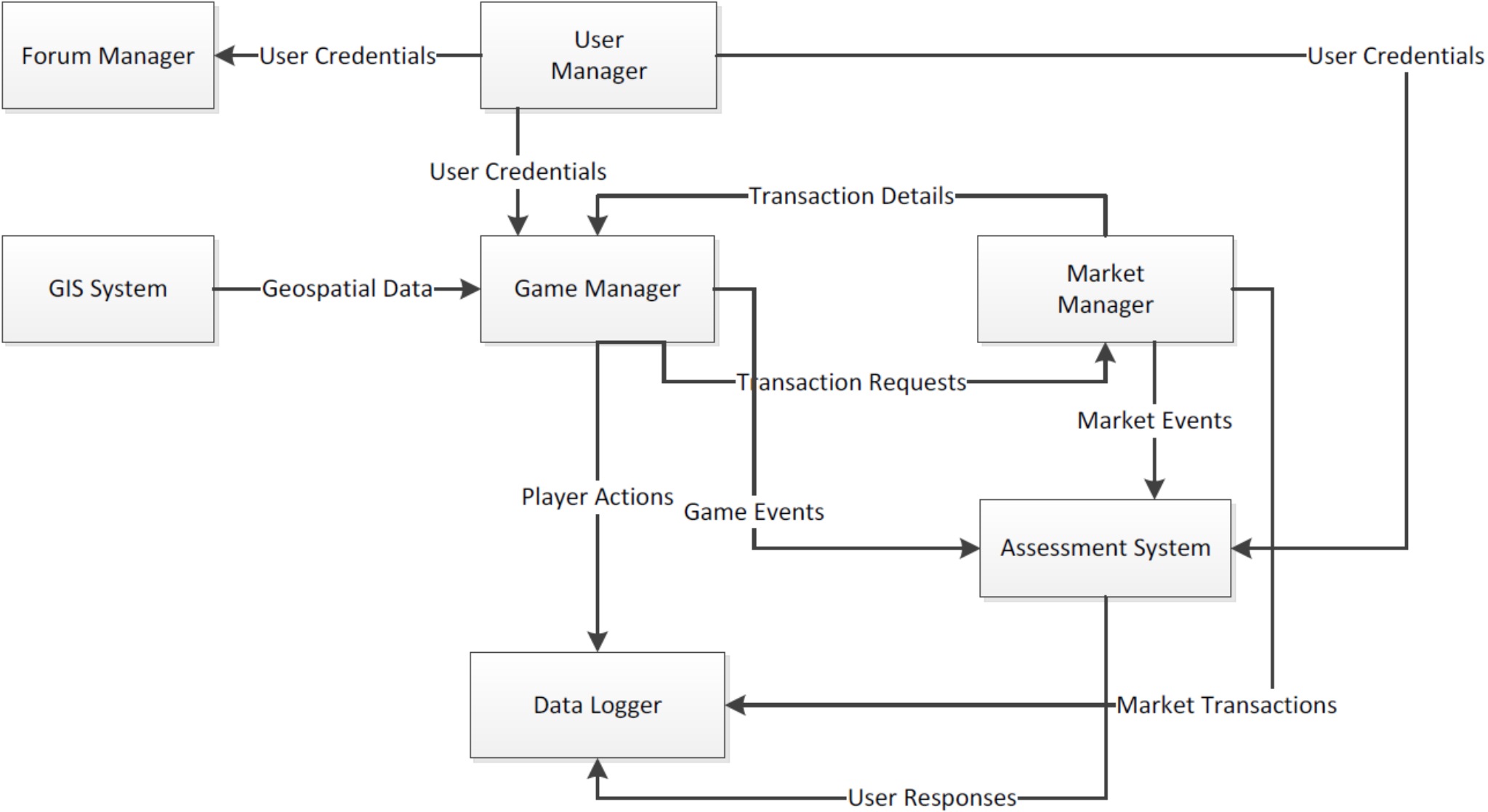


Dynamic View of Server Interactions





Game subsystems



Assessment of learning

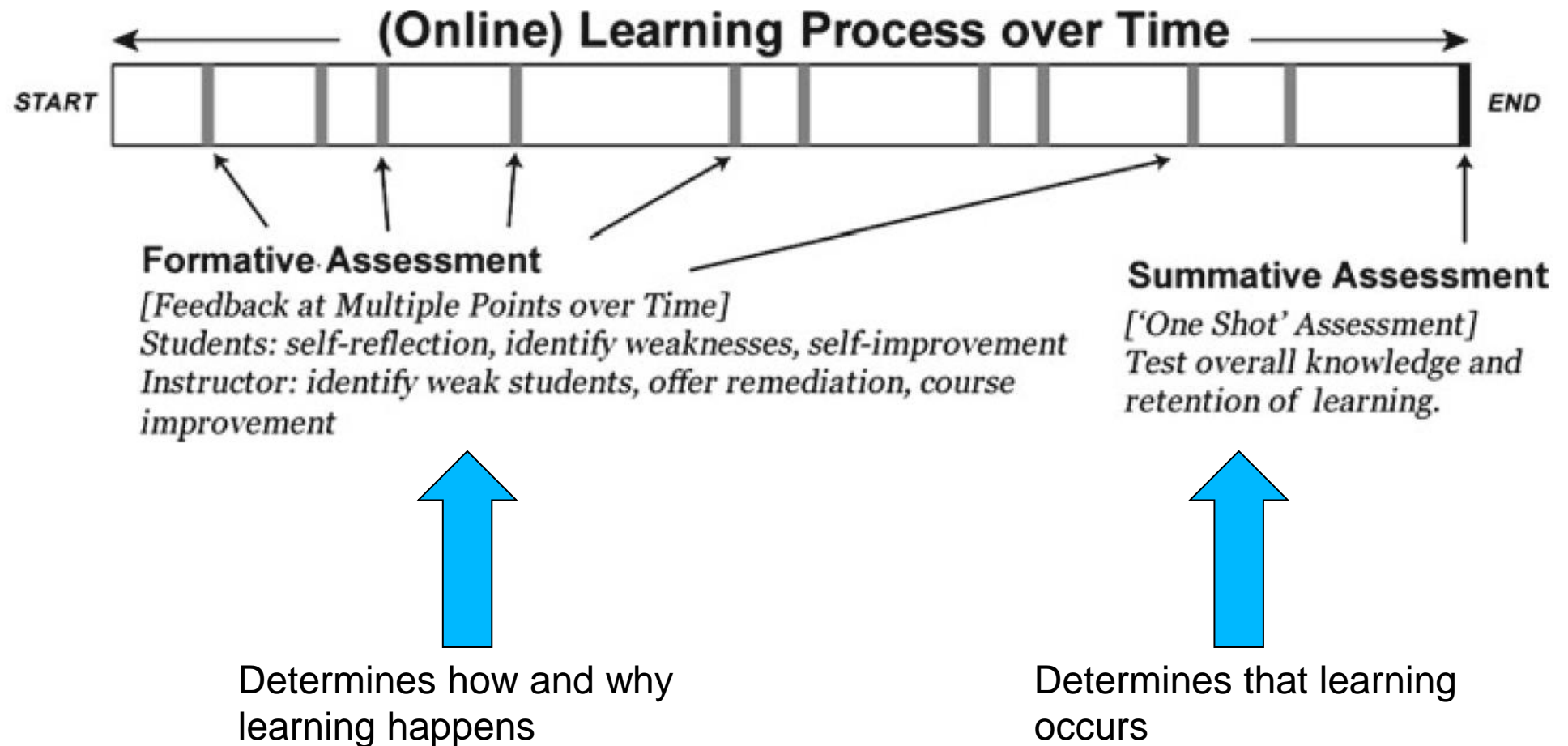
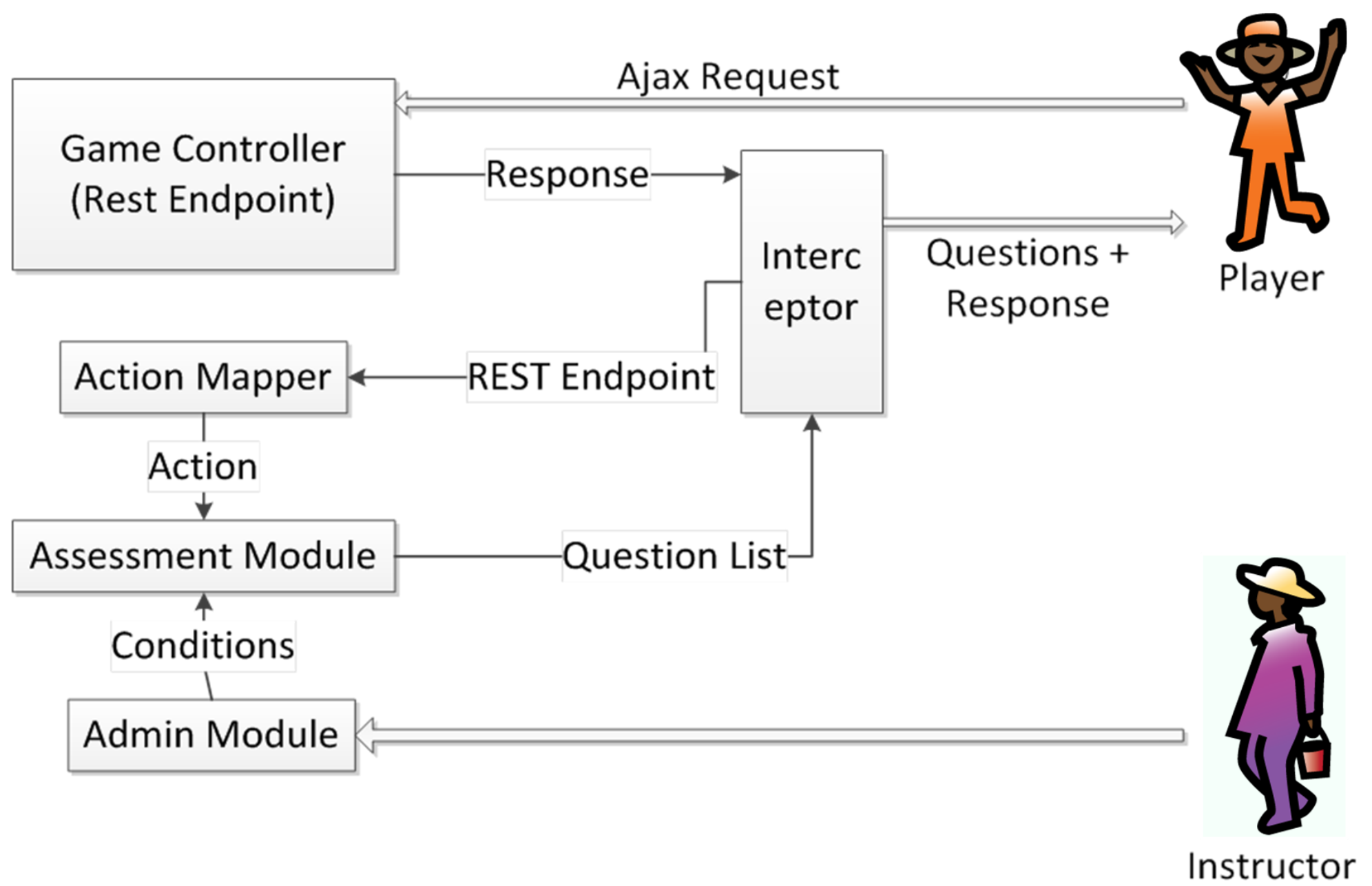


Image source: C. S. Loh, "Assessment in Game-Based Learning," D. Ifenthaler, D. Eseryel, and X. Ge, Eds. New York, NY: Springer New York, 2012, pp. 123-144.

Assessment of learning



Key questions we are investigating

- What key components and functionality that can help and guide others to develop similar learning technology
- How educators can naturally integrate an online, social game activity into the classroom.
- How a virtual micro-experience can generate critical thinking and impact learning about a far-away place when the students can relate to what they experienced rather than what they have read.

Ongoing/future work & Thank you

- Allow for player modification of the game
- Allow for analysis through aggregation, look for emergent properties, play-back, history
- Seek generic model to allow customization for different locations and broader set of applications
 - Education K-12, Community planning, Public policy ...and beyond!
- QUESTIONS?
Ola Ahlqvist, ahlqvist.1@osu.edu