

Simulating a sustainable future:
drawing on NTU's disciplinary and
interdisciplinary knowledge and
capacity

Sustainable Earth Peak Retreat
21 Oct 2015

SE Peak
Retreat
NTU Faculty
Sept 2011

SE@N
2012 -
2013

21 August 2013
Virtual Campus
Showcase and Kick-off
Event

NTU's Virtual Campus Project

Phase one of the SE Peak-funded Virtual Sustainable Campus scoping and showcasing project, undertaken by NTU's School of Computer Engineering (SCE), is now complete. Culminating in a series of presentations and proof of concept projects, including a real-time energy dashboard displaying energy use on campus, the potential for the Virtual Sustainable Campus is to become an ongoing teaching, data, and information platform. Work is underway to explore more advanced possibilities, to both see (through the extensive use of mobile apps, virtual learning tools, and monitoring networks) what's happening in our sustainable campus environment, and to experiment with what new sustainability ideas might look like on our campus.

Project Goals

- ✓ Need for a platform which reflects and communicates the complexity of sustainability
- ✓ Allowing testing of scientific hypotheses and new possibilities related to the interaction of different disciplines in a complex environment
- ✓ Is simulated, but as close as possible to reality
- ✓ Reflects and incorporates the breadth and depth of sustainability knowledge and expertise at NTU
- ✓ Is able to process or generate possible future scenarios in a multi-actor, multi-systems environment
- ✓ Educational tool
- ✓ Excites people and triggers curiosity

Simulated NTU

NTU's multidisciplinary sustainability capacity

In fact, the unique thing NTU may be able to contribute is to model in a simulated urban environment some of the key disciplinary inputs to sustainability and how systems interact

- ✓ economic markets and employment
- ✓ agent behavior, irrationality, and incentives
- ✓ mobility and people (traffic) flow
- ✓ utility management/optimization (water, energy, waste)
- ✓ systemic effects of education, communication, campaigns
- ✓ effects of pollution; livability
- ✓ happiness versus GDP (\$)
- ✓ housing; infrastructure; security

Simulated NTU

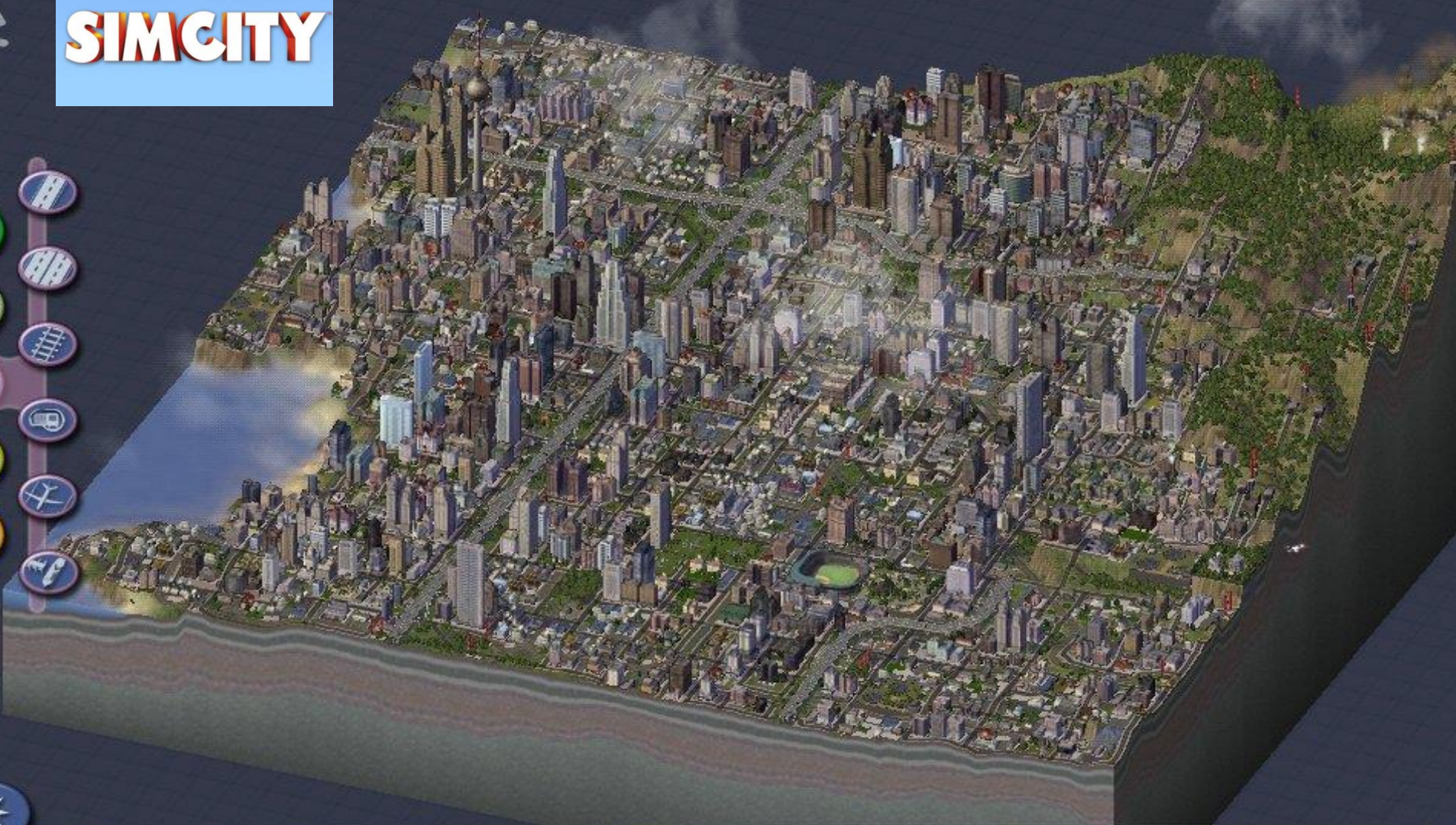
- ✓ on the other hand, a focus on graphics, visualization, or creating the underlying simulation platform (which, itself, is a substantial and expensive undertaking) may not focus us as much as we'd like all of NTU's full range of sustainability expertise and capacity

Idea! Gamification

Franchise a platform from a gaming company (or in collaboration with a gaming company), and spend NTU's time in modding the gameplay environment (the modeling will be complicated, and the programming less so)



SIMCITY



22/3/655

Wiki

Mayor Rating

994,953

109,040

RCI

Monthly Budget

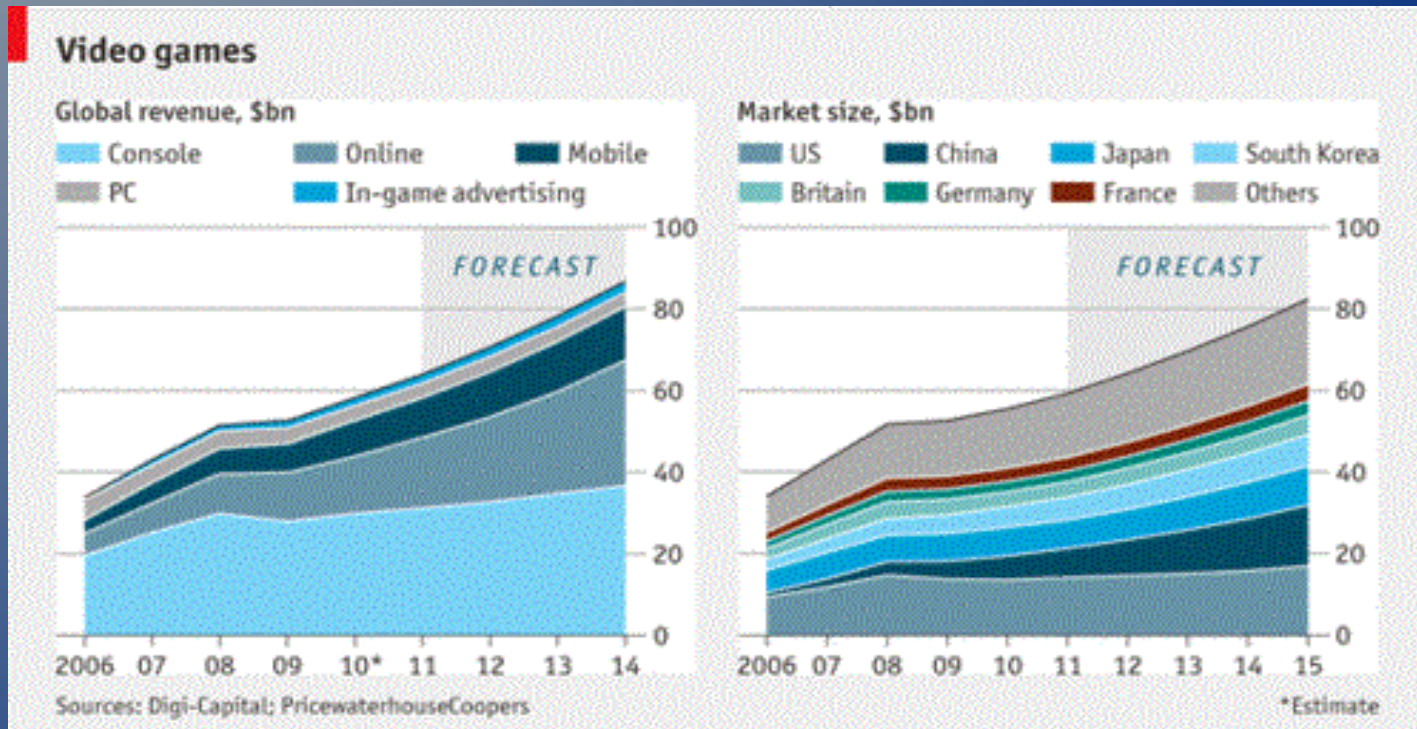
Current Balance	994,953
Monthly Income	931,356
Monthly Expenses	930,025
Month End Cash	996,284

Strange Goings-On At Advanced Research Center Have Wiki Residents On Edge
 Mayor Rocks According to City Blocks

Why Gamification?

- ✓ fun and engaging
- ✓ an effective educational platform
- ✓ a simulation and data gathering platform
- ✓ it's big business - potential corporate collaborators

Why Gamification?



Why Gamification?

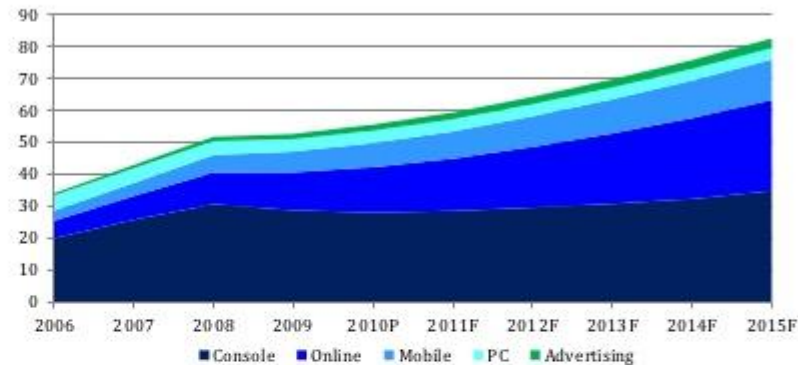
Asia, not America, could dominate the global games market

Online[†] and mobile games should grow total video games market size to \$82B and take 50% revenue share at \$41B (14% CAGR 11F-15F). The historically strong pure console* sector is flat to down

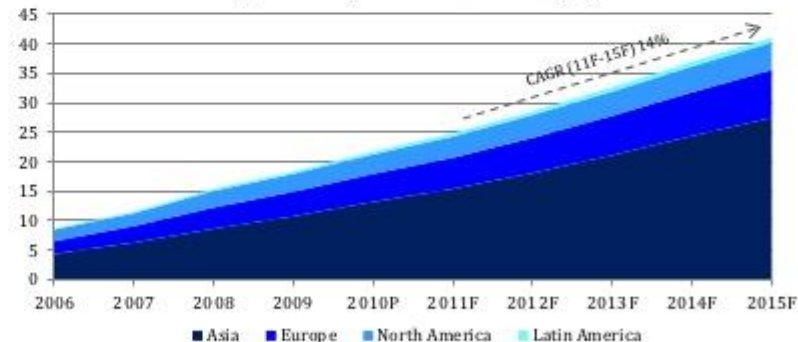
Asia and Europe should take 87% revenue share for online and mobile games (China 36%, Europe 20%, South Korea 12%, Japan 10% in 2015F). North America remains important

Chinese, Japanese and South Korean domestic strength has produced high volume (up to 20M peak concurrent users), low ARPU**, cost efficient games businesses with up to 50%+ operating margins, enabling significant investment in foreign markets

Global Video Games Sector Revenue (\$B)



Regional Online/Mobile Games Revenue (\$B)





Possible Outcomes

- ✓ at minimum, an engaging educational tool (in its creation and through its use) to demonstrate the multi-disciplinary challenges of sustainable development
- ✓ and perhaps more ... generating new ideas and data
- ✓ open access? ... marketing and profile raising if people outside of NTU could use/play it

Next Steps

- ✓ NTU Champions
- ✓ Singapore and international collaborators
- ✓ Corporate collaboration (gaming company)
- ✓ Connecting all of these together
- ✓ Proposal and funding