Behaviour Change through Videogames

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Born	1986/04/29, Trento - Italy
Hometown	Trento
Degrees	B.Sc. and M.Sc. in Computer Science - University of Trento
Teaching	2 years teaching assistant - Computer Architectures
Abroad	Copenhagen, Budapest, Istanbul
Skills	C/C++, OpenGL, Game Design, Real Time Operating Systems, Creative and Technical Writing

Interests

- Videogames
- Manga, Anime
- Writing
- Jazz, Rock, Electronic music
- Walking, exploring

Games for Behavioural Change

Videogames are pervasive in the population:

- 50% of the Europeans plays regularly videogames, with an even distribution between sexes.
- The percentage rises to almost 75% of the people aged 16-34

Videogames may have potential for behaviour changing technologies:

- Socially Pervasive
- Long Term enjoyment

Objective

Assess the impact that games can have on behaviour change.

Applied on walking for the first project, City Spirits, on taking pictures for the second, Magnum Opus
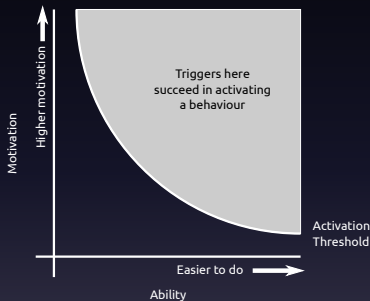
Theoretical ground:

- Persuasive technologies
- Behaviour change
- Game Design
- Urbanism

Persuasive Technologies

Fogg's Behavioural Theory:

Three factors are needed at the same time to activate a behaviour in a person:

- Motivation
- Ability
- Triggers

It is not clear how this model can help changing a person's behaviour.

Organismic Integration Theory (OIT)

Three motivational stages:

- Amotivated
- Extrinsic Motivation
- Intrinsic Motivation

In order for a person to gain a specific behaviour she or he has to internalise the motivation to do it.

Integrated Behavioural Model (IBM)

The likelihood of a behaviour is heavily influenced by the intention to do it, based on three elements:

- Attitude in engaging in a behaviour
- Perceived social norm
- Personal agency

IBM: requirements and evaluation

Requirements

Assessed using IBM
elicitation interviews aimed
at discovering outcomes,
referents and environmental
facilitators and barriers

Evaluation

Direct and indirect
measurement of constructs
using Teory of Planned
Behaviour (TPB)
questionnaires

Ego Depletion

Willpower is not an infinite resource and once it is depleted a person cannot exert self-regulation

Ego Depletion
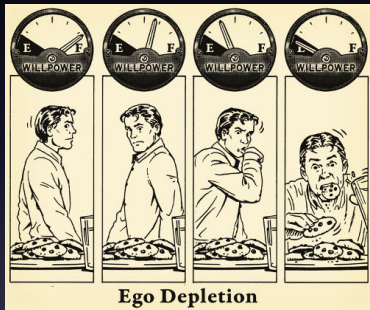
Self-restoration is facilitated by positive experiences

Games can help behaviour change thanks to their entertaining nature

Theoretical Framework

Elemental Tetrad

Aesthetics

Story

Mechanics

Technology

Visibility
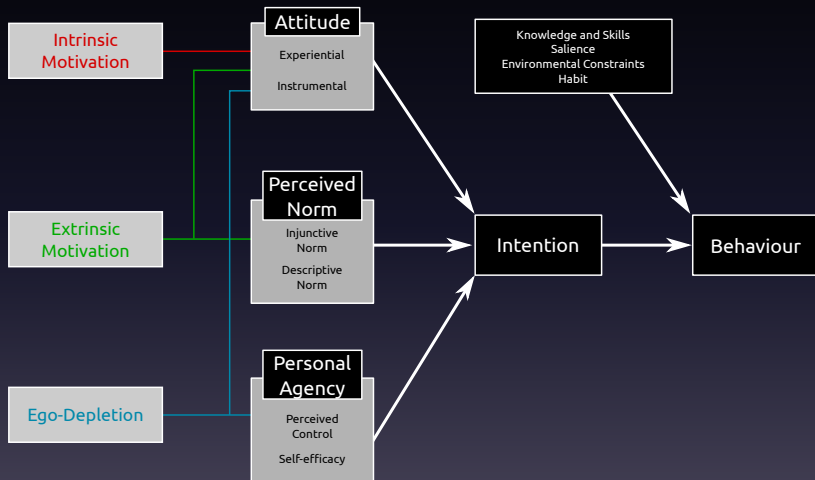
Magic Circle

Games are normally played in confined spaces:

- Locally by limiting the game on a table or in front of a PC
- Temporally by limiting the game session to a fixed quantity of time
- Socially by giving a clear definition of who is playing and who is not

This confined space is called *Magic Circle*

Pervasive game

Expand the *magic circle*.

It is not required for a game to be pervasive, to expand every space:

- Metal Gear Solid - Portable OPs (local)
- Animal Crossing (time)
- Dance Dance Revolution (social)

Metal Gear Solid - Portable OPs

Animal Crossing

Dance Dance Revolution

Pervasive Games and the City

A pervasive game to help people move should take the city into account in the design. Some examples are:

- City map
- City as a practical experience
- Urban layout
- City culture
- City events and flux

City Spirits
Understanding intention determinants

- Open-ended elicitation interviews (following IBM constructs)
- 12 participants: 6 males, 6 females, age 26-46
- Interviews transcribed and thematically analised
- Codes extracted placed in IBM constructs

Interview Results

- Experiential attitude and normative influence have almost no negative impact
- *Weather* and *time* are the most frequent obstacles
- Along with *good weather*, *walking as a collateral activity*, *the location* and *the social dimension* are the most frequent facilitators

Participatory game ideas

- Two Brainstorming sessions to generate more gameplay ideas
- Use of Code Cards designed to present elicitation results

If you walk not for walking then going out is easier	If the place where you walk is nice then you are happier to go walking	Walking in short intervals (10 minutes at least) can help people in walking more
Walk to the supermarket / Walking not as a workout	Flat tracks / Nice environments	
Walking together with someone makes walking easier	Walking alone gives you time to be alone	Having more free time helps people in walking more
Walking is easier if you are already out of home	A bad place to walk into makes walking harder	Bad weather can be an obstacle to walking
	Bad, ugly neighbourhood / Too many vehicles	Both rain or hot weather make you want to stay at home

Example of Code Cards

Brainstorming Results

- Use minigames to fight enemies
- Leave persistant messages in AR space
- Use comparative data to inform the gamer

- Show players and NPC proximity through AR
- Zone exploration opens up new quests
- Guilds, players associations
- Writing a story that appeals both sexes
- Use real elements into quests
- Greater in-game effects during the first 30 minutes of walking

Game Jams

- Focused workshop
- Aims at creating a game in two days
- Participants receive a theme and then propose game ideas

DAT Game Jam - October 2014

- Participants select themselves
- Enlarge the game developer community
- Impossible to test interventions without developing games
- Proposing the right theme results in prototypal games based on a single intervention

DAT Game Jam - Results

Ubiquitous tower defense

- Players have to move fast
- Aligned to streets
- Designed to gradually train players
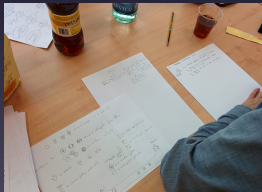
Location-based investigation game

- Investigation makes use of the city
- Engages the players with a story
- Episodic story

Proposed Game mechanics

Story-Driven Role-Playing Game (RPG)

- Division of the urban tissue in in-game zones
- Time-based zone change
- Weather influenced quests
- Zones change based on answers by players

- No levelling up
- Automatic in-game party forming
- Context-based quest generation
- No explicit behaviour intervention

OHR & Radiant^2

- Tangible Game
- Controller created with low-cost components and materials
- Fully hand drawn
- No explicit tutorial
- Story-based mechanics
- Game Designed in parallel with the tangible controller
- Won Jury Prize at CHIPlay 2014 Student Game Design Competition

OHR & Radiant^2 - Responsibilities

- Lead Game Designer
- Level Designer
- Narrative Designer
- Technical Writer
- Driver Developer
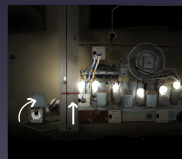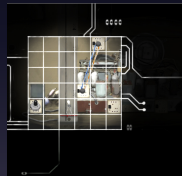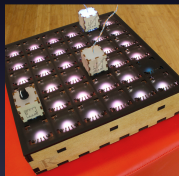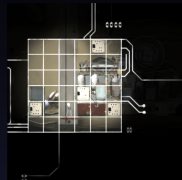
Magnum Opus - GraphiTech

- Game to push people into taking pictures of cities
- Taking pictures become a secondary mechanic
- Uses narrative and F2P mechanics
- Split cities into small zones and pit players on the control of zones
- Use picture density and direction in order to spread out pictures in an even way
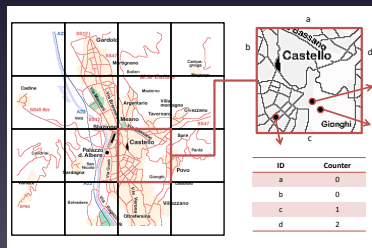
OHR, City Spirits and Magnum Opus

The three games have required a different approach in their design.
This might lead to hints on how games are designed for a purely entertaining aim and how they are designed for a specific, additional, purpose.

Future work

- Evaluation of creature generation formula
- Implementation of the game in Cocos2dx (Or another game engine specific for Android)
- Comparative evaluation (e.g. Magnum Opus vs. Pointification)

Questions?