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Luisa Collina, Laura Galluzzo, Anna Meroni
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For further information on Cumulus Association:
Cumulus Secretariat
Aalto University
School of Arts, Design and Architecture
PO Box 31000, FI-00076 Aalto
Finland
E: cumulus@taik.fi
W: http://www.cumulusassociation.org

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Earthsploitation. Game Design Research and Experimentation for Food Sustainability

Maresa Bertolo, Assistant Professor - maresa.bertolo@polimi.it
Design Department
Politecnico di Milano, Italy

Ilaria Mariani, Ph.D. Candidate - ilaria2.mariani@polimi.it
Design Department
Politecnico di Milano, Italy

Giulia Ruffino, Teaching fellow - giulia.ruffino@mail.polimi.it
Design Department
Politecnico di Milano, Italy

The game is more and more recognised as an efficient vehicle for messages transmission – from commercial loyality to social communication. Game Design is today a young but mature discipline, belonging to the Communication Design field. Conceiving and designing games for social innovation requires specific theoretical and methodologial competencies.

In this paper we focus on food sustainability. We survey the background literature, and overview our design and research methodology; then, we describe *Earthsploitation*, a card game that addresses the food sustainability issue, offering information and insights to its players to encourage them to critically think about their daily food choices. We consider the food production a crucial topic, involving individuals, communities and States; its urgency is further confirmed by Expo2015's attention on nutrition and energy for the Planet and for Life.

The paper describes *Earthsploitation* in terms of components, game-mechanics and rules. It outlines the system – based on questionnaires and target questions – we designed to observe players, collect and analyse data. Finally, it presents the results emerged from several game sessions and our conclusions on how the game can achieve its two main objectives: (1) to be a pleasant and involving game, (2) to be a communication artefact conveying accurate information, nurturing and soliciting responsible reflections.

Keywords
Game studies, Game design, Food sustainability.

INTRODUCTION

In this ever-changing historical moment the Communication field becomes more and more complex and interdisciplinary. Communication Design includes several disciplines that make it broad and crossbreeded: it is rooted in a variety of research fields, from Psychology to Sociology, from Computer Science to Art. Aiming at researching and designing strategies, systems and communication

practices, the discipline is growing, increasing its conceptual tools, methods and dynamics that come from several fields, Game Studies amongst others. Along with its operative branch – Game Design – it has deeply evolved over the last decade, mainly as a result of the technological transformation and the significant crossbreeding with other branches of knowledge. The interest in the ludic paradigm as a communication system is widening, especially towards sensitive and problematic topics. Socio-cultural matters, social inclusion and education are nowadays issues and critical stimuli for reflection, analisys and applied experimentation. The ludic approach can play a key role in our communities thanks to games designed not with the sole purpose to entertain and elicit fun, but to foster mutual understanding and awareness, stimulating individual and collective reflections, looking at disseminating attitudes and behaviours for improving sustainability, resilience and quality of life, collaboration and dialogue, just to mention a few.

GAME, CULTURE, TRADITION

Play is a spontaneous, widespread activity acknowledged as a transversal practice in time, space, culture. Human beings are creatures who play at all ages, regardless of ethnicity or culture (Huizinga, 1938; Caillois, 1958). For long, however, adult players have been considered as childish or wasting-time people (Fink, 1957). Today, this depreciating attitude has changed: the ludic activity is more and more recognised as an important and precius practice, significant and necessary – as well as respectable – for everybody.

It is well-known that the connection between game and tradition is tight. From childhood, we play to experience the world and its nature; games help us to grow and learn, training us to face everyday situations (Winnicot, 1971; Piaget & Inhelder, 1971), often through activities passed down from generation to generation (Avedon & Sutton-Smith, 1971). History is rich of games aimed at educating and transmitting values; as an example, the *Game of the goose* in 1700 was used to teach geography, uses and habits (Milano, 2012).

The study of game origins remains important [...for the purpose of illustrating the continuity of human nature (Avedon & Sutton-Smith, 1971, p. 161)

Each game is developed in societal contexts that affect its traits. The game is a *representative system* (Huizinga, 1938; Salen & Zimmerman, 2004) reflecting the culture it was born in, showing a subtle but deep connection with the real world. The whole cultural production that influences design practice also affects Game Design. The physical and imaginative space where the play takes place, where players move and act, is called *magic circle*. It can be described as a porous membrane able to absorb and return some cultural elements of the environment within which the game was conceived, remaining in players' memory and eliciting a virtuous circle of mutual contamination (Bertolo & Mariani, 2013). Nowadays a growing number of games blurs the boundaries of the magic circle,

turning it into a two-way membrane (Zimmerman, 2012; Montola, Stenros & Waern, 2009; Walther, 2005). The game sprouts in socio-cultural elements of the society: its players symbolically interact with them, leading game elements to spread in every day life (fig. 1).

In our society an increasing number of people with different cultures, costumes, uses and habits lives side by side; dialogue and communication play a crucial role in helping coexistence and mutual understanding. Game Design can engage and involve players in experiences that can deliver and transmit meaningful concepts, bringing its specific contribution to prompt remarkable reflections and new cultural contents production (Bertolo & Mariani, 2014a; Salen, 2008; Bogost, 2007; Prensky, 2007). Immersing players in the ludic world, the play activity can elicit a state of openness to possibilities that consequently results in a potential change (of ideas and behaviours). To play a game is to move from the domain of everyday life into a special place of meaning (Salen & Zimmerman, 2004, p. 366) that allows a safe experience of reality or some of its aspects (Crawford, 1984; Suits, 1978; Juul, 2005). Thanks to this key feature, players may go through *meaningful experiences*, and participate in a system of semantic and cultural production. *Meaningful* because of the intensity of the experience, of its capability to convey knowledge and meaning, showing and sometime suggesting different ways to live/act/interact, activating potential critical reflection on our usual habits.

As such, games are cultural products that can be facilitators and activators of behaviour and attitude, as well as change. The issues addressed can indeed be various and they can relate to sensitive topics that require intervention. Environmental issues and food production systems are actual problems and the designer should confront them with its tools – conceptual, methodological and practical – games included.

FIGURE 1 - The magic circle as a porous membrane that allows a communication between the ludic context and the real world

SENSITIZE TO FOOD SUSTAINABILITY

In the second half of the twentieth century, the increase of the general welfare of the Western society combined with the increased productivity of industrialized goods have led to a radical change in daily habits and attitudes. Nowadays, too often we loose the perception of the ecosystem, experimenting a discrepancy between the way we think and act in relation to diet.

Time and again, the food production is the centre of attention. It is a complex, multifaceted and urgent issue – for human and Earth survival – that has to be managed to supply both the consumers' quality requirements and the needs of a growing population, taking into consideration the reduction of available resources and current regulations. According to INEA (2013), 44% of consumers takes daily decision on the ground of incomplete information. Over and over our tables are overflowing with food whose production led to an environmental depletion or to the suffering of living beings, making the consumer an (often unconscious) accomplice in a production system that is no longer sustainable (Rifkin, 1993; Singer & Mason, 2007). Earthlings need new dietary approaches and solutions, as well as the actual Expo 2015 debate states. Our purpose is to nurture a reflection on the different uses of planet resources and animals, from a traditional and cultural perspective.

We consider important to forward an in-depth knowledge on food production, but often the mere information is not enough to ensure that consumers critically reflect on their habits. We believe that an active participation in a ludic representation (Gee, 2007) of a food production chain can induce players to better perceive information, becoming aware of the connection between consumers' acts and the production itself, as we experienced with the case study presented in this paper. *Earthsploitation*, our project, submits practical information on environmental, economical and social issues, leaving to the players the task of reflecting on them and building up an ethical answer.

MATERIALS AND METHODS

Our research activity on Game Studies and Game Design takes place in Politecnico di Milano, Design Department. We focus on the connection among ludic artefacts and the experiences they elicit. International research shows how games can inspire people to look at their uses and habits with fresh eyes, and often to critically consider a genuine change in their daily lives. We design performable games, from board- to urban- and hybrid games (Bertolo & Mariani, 2013). Below we describe our game design process and the specific results we obtained dealing with food sustainability, presenting the methodology on the ground of the *Earthsploitation* case study, the analysis tools and the results.

OBJECTIVES OF THE STUDY

The aim of this study is to analyse, through a specific case study, how a game can encourage players to carefully and critically reflect on the food production system, obtaining information in an experiential and ludic way. We explain how *Earthsploitation* is able to make players aware of some urgent issues, increase the level of their awareness as food consumers, and convey scientific, scietal and ethical information.

The research questions are:

- *Do our players learn something and critically reflect by playing Earthsploitation?*
- *How effective can a game be in stimulating players to significally think on, and potentially revise, their food choices?*

GAME DESIGN PROCESS

We design games addressing sensitive topics that aptly tackle different issues, such as cohexistence in a multiethnic context, disability, mental desease, gender issues, and food sustainability. We know how important it is, in the design research and methodology, to designerly investigate the ludic potential and the resulting outcomes. Our approach is "through design" and it is structured around a case study prototyping and evaluation (Laurel, 2003; Cross, 2006). We indeed combine theoretical study with concrete application, aiming at complementing the more conceptual aspects of research with the emergences that come from playtests, namely game experimentations and trials. Considering that, we supervise thesis students who design games for social innovation, both in the theoretical and applied research process.

The game design process – being a process of design – consists of different steps and it is articulated as an *iterative replicable process* (fig. 2).

The first step includes the analysis of the issue, of the target and its needs, or of current problematics. The result is the design of a game aimed at addressing a specific topic: the (1) *planning* phase creatively originates a concept and then a prototype answering the purposes identified. During the (2) *action* phase, the game moves from the prototype to the playtest, with the intention to verify if it *works* and if it is correctly answering its purposes. The playtest represents a nodal aspect of the game design process, because it allows the (3) *observation* of players' behaviour. This activity requires a precise design and structure, as well as specific tools, to collect data that are useful for comparative analysis of different playtest sessions. The definition of methods of enquiry, such as assessment questionairres, is a crucial part of the design process. Then the (4) *reflection* phase conduces to the results analysis and comprehension, and, as a consequence, to the identification of possible changes and improvements. Once applied, a new cycle of planning, acting, observing and reflecting is required to check and verify the game consistency. In our opinion, a process that stops before this stage, can not be considered complete nor can claim to be an applied design research.

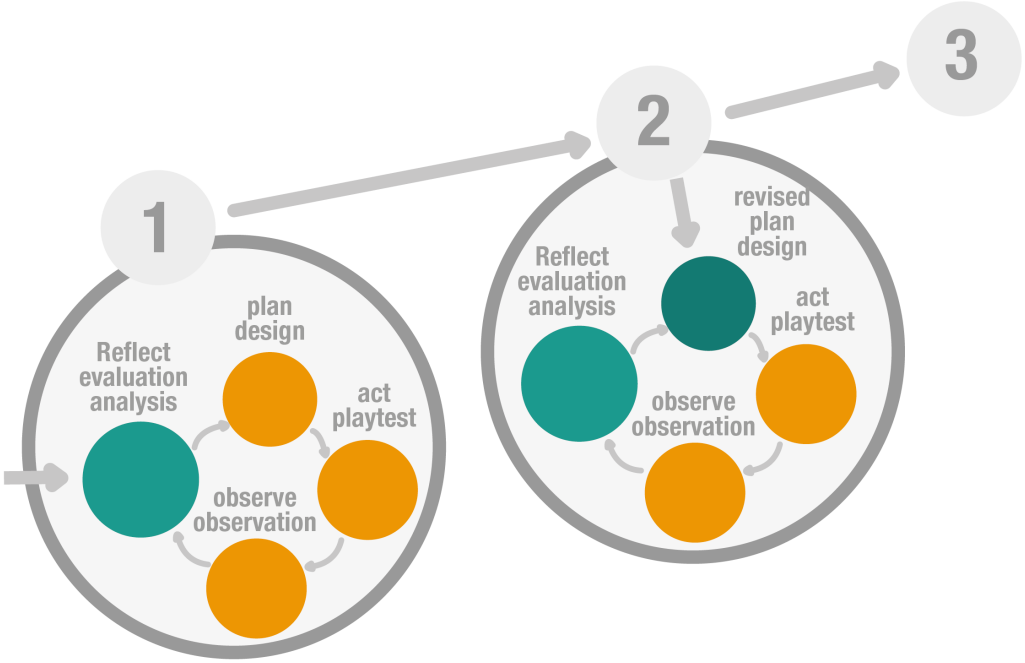

FIGURE 2 - The game design iterative replicable process

We brought to bear this process in *Earthsploitation* (Ruffino, 2013), a game developed by Giulia Ruffino as a result of her MSc thesis in Communication Design, supervised by Maresa Bertolo and Ilaria Mariani. The actual game, mainly because of the sensitive issue it addresses, required about 30 playtests and several graphics and mechanics adjustments. Then, the data collection process involved a sample of fourty people during ten game sessions.

EARTHSPLOITATION CASE STUDY

The project focuses on the system of animal and environmental exploitation for food supply, and on the cause-and-effect between it and the ecosystem, and it invites players to assume a different perspective.

Earthsploitation presents two different levels of objectives.

i. *Players' goal*: to put themselves in the shoes of food production entrepreneurs, aiming to increase their richness, because whoever is the richest wins.
ii. *Designers' goal*: a simplified representation of food production chains leds players to discover some economic, ecological and ethical background, to take decisions that harmfully affect the environment, and as a result to acknowledge the biological cost of each action.

GAME MATERIALS

The game material (fig. 3) is mainly composed of two Decks of cards:

i. *Resources Deck*: contains *Terrains* and *Resources*. Terrains (*Crops* or *Livestocks*) are permissions to start a production chains, and describe of them listing the Resources necessary for their production: *Water*, *Feed*, *Fertilizer*, *Structures* and so on. Each Resource shows information useful for the gameplay and also vehicle scientific information – unrelated to game mechanics – to inform players and raise their curiosity.
ii. *Events Deck*: contains cards that budge the production flow, striking one or more players.

On the table are placed twelve more cards, the *Earth-Time*, a landscape that get exhasusted, also visually, showing the planet's ability to sustain its inhabitants.

Then, players have *Coins*: the game value.

GAMEPLAY

Each gameplay is about 40 minutes and starts with four players equipped with a starting asset: a Terrain, Resources and Coins.

As entrepreneur, each player starts one or more Chains, whose potential value increases as the required Resources are added; when a Chain is complete, it can be sold and Coins capitalized. However, entrepreneurs have to carefully ponder their choices: look out for other competitors and assess how every Chain impacts on the game-ecosystem. Each sold Chain speeds up and exhausts the

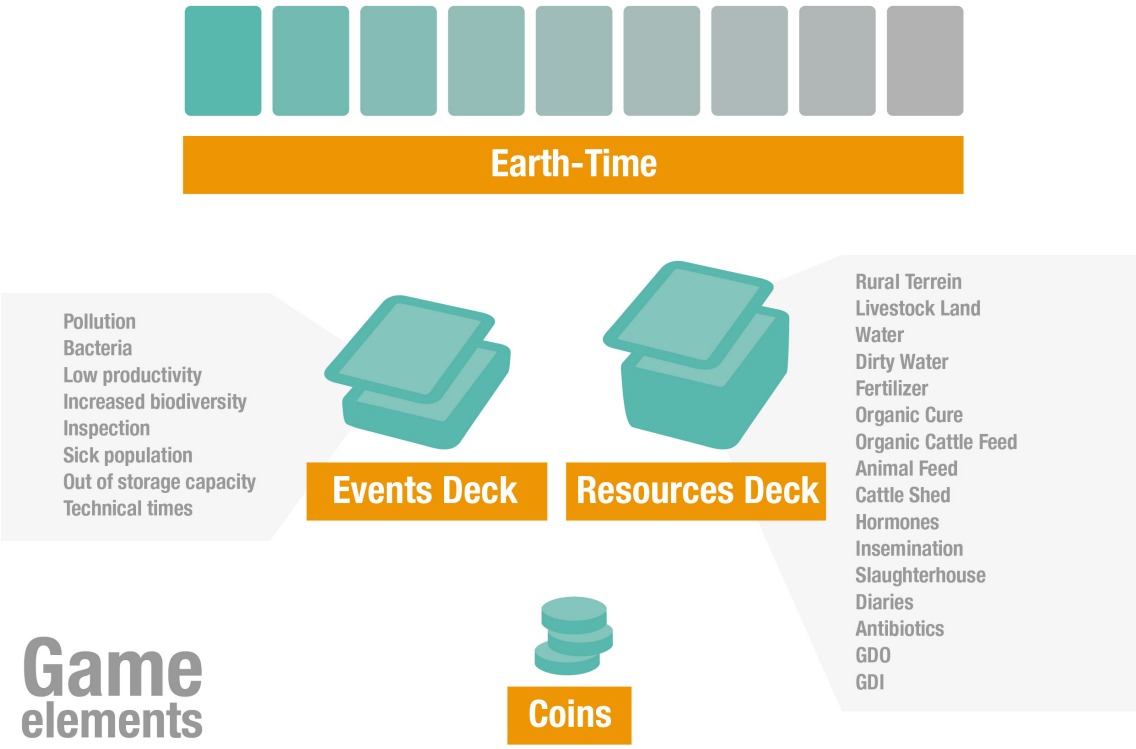

FIGURE 3 - Game material: the Earth-Time, Events and Resources Decks, and Coins

Earth-Time: the more demanding is a Chain, the more it consumes the world; nevertheless, Crops and organic chains are less deplating than Livestocks and industrial agriculture, often at the expense of production.

In turn, each player draws twice from the Resources Deck; these cards must be put on the market to be traded or barted, thrown away or kept. Then, the player can expand one of his Chains, adding Resources to his Terrains; if so, he/she draws and faces an Event. When a chain is closed and sold, the player earns Coins and consumes Earth-Time.

The game ends when the Earth-Time runs out, the richest wins.

DESIGN DECISION-MAKING PROCESS

This project aims to encourage revaluation of customs and points of view that usually come from cultural background leading us to consider everyday practices – such as our diet habits – as Natural, Normal and Necessary (Joy, 2010).

We worked on two fronts: *game mechanics* and *additional information*.

Game mechanics depict the relathionship between production strategies and environmental consequences: players' actions trigger results able to nurture a reflection on the mankind impact on the planet. For example, players discover that:

- Livestock-based chains yield more Coins than Crop-based ones, but they are more prone to diseases and contingencies related to animal exploitation and they exhaust more Earth-Time;
- *Dirty Water* allows to start a Chain without (clean) Water that – in the game such as on Earth – is insufficient to sustain all the current productions; consequently, Dirty Water lessens the chain productivity and makes the soil nonreusable.

Events Cards provide instant feedback, while Earth-Time metaphorically highlights that the world can supply limited resources: the more it is exploited, the more it approaches its breaking point. Additional information is provided in form of a short sentence on each Resource Card, explaining the resource role in the actual food production. Built by extrapolating scientific data from a variety of sources such as Global Footprint Network[1], FAO (2006, 2011; Chander at al., 2011), WHO/FAO (2007), ISPRA (2013), WorldWatch Institute[2], IFOAM (2009), these informative pills match with the game-material visual language. They can be ignored because they are not necessary for the gameplay.

Furthemore, each card is illustrated with an original drawing by Andrea Franzosi: the style is dramatic and intense, neither violent nor likely to induce the player to denial (fig. 4). We deliberately grounded *Earthsploitation* on the concept of *indirect reasons* (Manzoni, 2006; Sottofattori, 2010) that can drive people to think about their food choices – e.g. environmental impacts

[1]http://www.footprintnetwork.org/en/index.php/GFN/

[2]http:// www.worldwatch.org/

and production risks. The *direct reasons* – connected to ethic choices, i.e. on animal's exploitation – may emerge from the play experience. The tie-up among information and graphics aims to both emotionally and rationally affect the player's emotions as they are essential components of brain processes (De Bono, 1991, p. 59) contributing to decision-making.

ANALYSIS METHODOLOGY

We used a combination of qualitative – from group discussions to interviews – and quantitative research on a sample of fourty players, in 10 game sessions. To gather an in-depth comprehension of our players and of their play experience, we applied a participant observation research. During each game session, we took notes of the players behaviours/choices and of the game-system progression, both related to the game dynamics and to the player-information relationship. We used these observations to articulate 15-minute-interviews with groups of two to four players, and collect data on their experience. We listed specific questions to ask players to state their game experience, in a sort of short depth interview on particular items we consider meaningful, defining a synthetic questionnaire, structured as follows:

(1) general profiling;
(2) sensitivity to ecological and diet issues;
(3) relationship with additional information on cards;
(4) information that struck them the most.

Supported by game sessions' observations, we defined focused questions about the general impressions on the game mechanics and about the overall experience. This is a crucial activity because it can influence the analysis and interpretation of the data collected.

RESEARCH FINDINGS

SHAKING AWARENESS TO NURTURE CRITICAL REFLECTION

Data analysis shows different reactions in players, whom we observed considering age, ecological habit, being veg*an[3] and, finally, being usual gamers. Heterogeneous concerning most of these factors, our sample is rather homogeneous for age (fig. 5); ranging from 19 to 44, it is composed of 32,5% under 25; 67,5% over 25. We identified the 25-year-threshold because in Italy this is the age when firstly an economical independence meets the ecological attitude, allowing young people to actually take their own daily decisions. A first discriminating factor was the attention players paid to additional information. We therefore investigated

[3] *Veg*an* indicates both vegetarians and vegans.

(fig. 5) the game perception of who claimed to have read it, 82,5%, meaning that we succeeded in our intent to communicate sensitive issues through the game. Then, 75% of the total deemed the information was interesting. Among this 75%:

- 90% stated a general comprehension of the purpose behind the given information and its link with game mechanics;
- 70% already had an ecological attitude; players' interest in the information showed that often who is attentive to sensitive issues appreciates scientific detailed data and is stimulated to search for further knowledge;
- 60% declared to be bewildered by such information, and as a consequence was upset and "shocked"; nevertheless they stated they really enjoyed *Earthsploitation*. This is particularly remarkable because it shows once again how a game can invite players to have positive and pleasant experiences even in the presence of relevant information with an often strong emotional impact (Bertolo & Mariani, 2014b).

Returning to the overall sample, we asked "Does the information bewilder you?". Analysing answers, we notice that 45% declared to be bewildered and dismayed by the information learned (fig. 5). Among them:

- 94,4% was intrigued and encouraged to an in-depth analysis;
- 44,4% said they already knew the information on cards, but reading them on cards, with numerical data, caused additional awareness.

This result shows how we succeded in stimulating players to deepen their knowledge, even when they were already knowledgeable and informed. Collecting data immediately after each game session, we can not state that players have a general a posteriori and long-lasting will to change their behaviours as consumers, but certainly we can assert they have a more informed perspective on the issue and a set of relevant scientific data on which they can ground their choices.

We asked our players to answer the question "What game concept did strike you the most?". The responses identified two macro-areas, surprisingly mirrored (fig. 5):

- on one side the presence of limited resources: firstly, players were sensitive to lack of water (26%), secondly to the animal topic (21%). The scarcity of land (3%) is a very trenchant issue, perhaps due to the absence of additional information on Terrain Cards. On the contrary, the intense perception of water and animals could be the result of the information and the game-mechanics that make them indispensable. The gameplay often (and intentionally) get players into difficulties to coherently reflect real everyday dynamics, encouraging reflections in tune with the designer's aims. For example the limited presence of Water Cards – that are on the ground of each Chain – explains the dramatic issue that is the current lack of water. The Dirty Water emphasise the polluted water problem, urging the player to seriously think about it.
- on the other side the consequences of resources depletion: mainly because of its impact on the gameplay and the information it provides, Desertification (32%) highly strikes players. Pollution (12%) and Biodiversity (6%), also

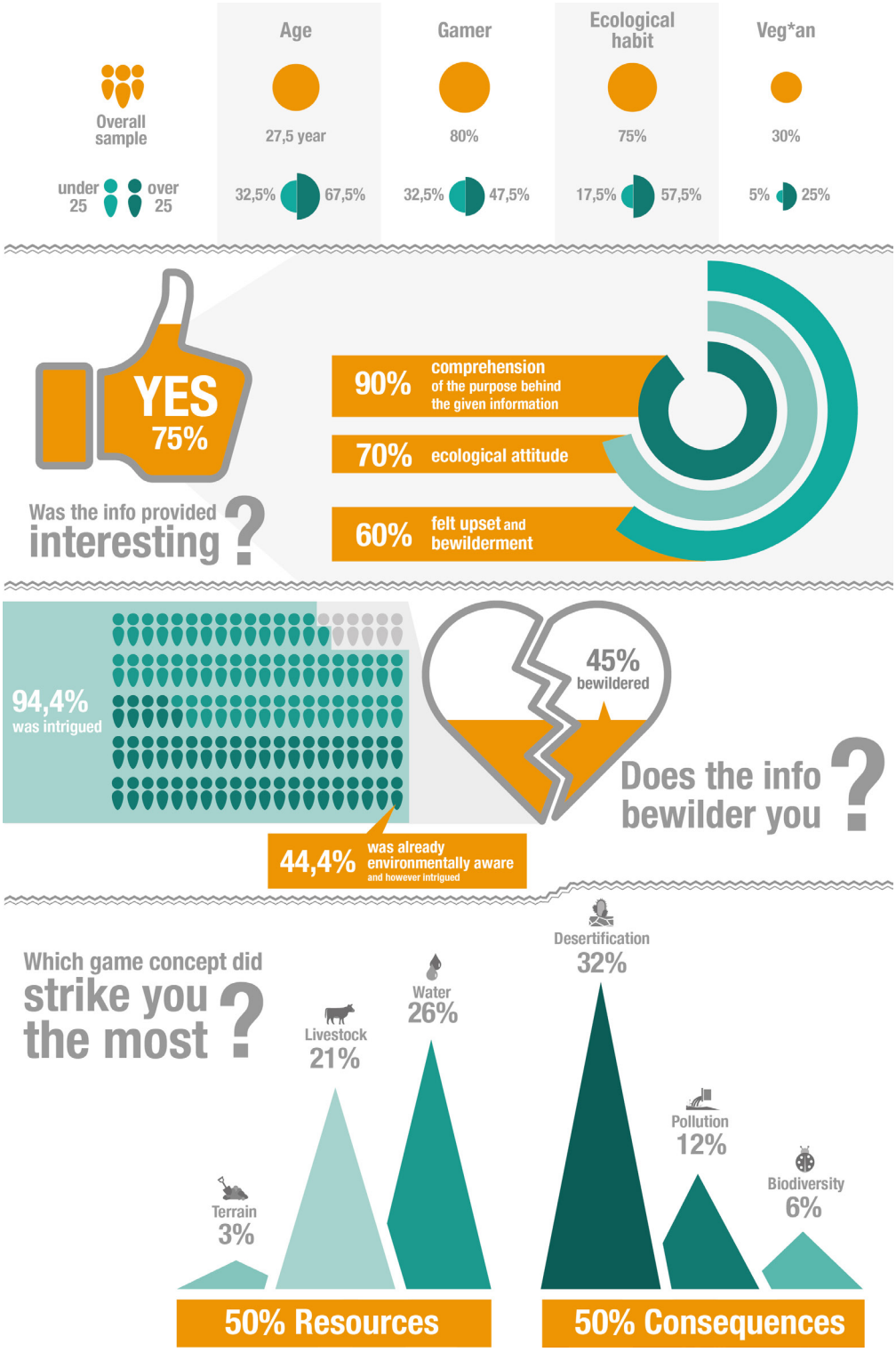

FIGURE 5 - Data visualization of inquiry results

present in the Events Deck, have a less impact on players. Probably due to their minor effect on the gameplay, they produce a modest emotional involvement.
- on the whole, observing the game sessions, we noticed that the additional information on cards frequently became the center of attention and discussion: they are an effective starting point for personal reflection and in-depth analysis, but also for collective debate.

DISCUSSION AND CONCLUSION

Earthsploitation addresses generally uncomfortable issues that in everyday life are often communicated in contradictory, ambiguous and fragmented forms and ways.

This project provides scientific and objective information, which is ludically tackled to be learned according to our own sensitivity; we don't aim to give players conduct guidelines, nor to *force* them to rethink their dietary habits; we *invite* them to critically and constructively reflect on the information encountered.

The results of the design process of analysis and evaluation show that *Earthsploitation* play experience is able to penetrate players' consciousness and awareness.The reading of the backstory of food production, planet exploitation and wastage – described referring to the scientific literature – has stimulated collective reflections and discussions in almost every gamesession. Especially through the players' observations and the debates the gameplay prompted, it emerged that issues felt as inconvenient/troublesome and complex were taken into careful consideration, allowing a knowledge transfer that otherwise would often not break through; they are able to overcome the perceptual barrier we often erect to protect us from potential pain.

Earthsploitation is a simplified representation of a production system, and as such it intends to suggest an overall view of the ecosystemic situation.

Results show that it can encourage players to draw a conscious parallel between the choices made during the game and the actual impact of their choices on food consumption.

Playing, we can learn through a non-constricting, creative and active process, which is ascribed to a mental state of openness (par. 1.1) and fun: playing we are into a psychological state that predisposes ourselves to greater receptivity (Koster, 2005).

Earthsploitation shows how it is more and more important to define and understand how deeply games can affect players and their awareness on specific issues. As a matter of fact, our observations and data confirmed that *Earthsploitation* is a *facilitator* for contents transmission and an *activator* of reflection and behaviors.

During the design process, as designers we had to be extremely conscious of our choices and their possible effects on players/users. We aim to inform consumers that the act of purchase is also ethical and not only a matter of liking

(Perullo, 2010). The understanding of what is consumed is the means whereby each of us can make the difference, prompting us to question our ways of life and cultural habits. Awareness leads to making choices; we can feed on technological food prepared according to unknown processes, using doubtful raw or adulterate materials; or we can ask ourselves what we really put on our plates.

To change we need to know. To know different ways of thinking and acting; to know information to reconsider the sustainability of our behaviours; to know the hidden or less obvious side of things.

The experience on the ground of this design-process allowed us to experiment how a process of cultural production, in a virtuous and transformative cicle, from reflection to experimentation, can be activated and integrated into design practice. The food production is indeed a crucial matter, not only at local or national level: it involves individuals, communities and States. Expo2015's attention on nutrition and energy further confirms the urgency of the issue.

FUTURE DEVELOPMENTS

Earthsploitation is clearly a proactive system of communication, but it is also able to engage players into an activity that involves real fun. Our purpose is to publish the game adressing gamers, as well as schools, libraries, museums, cultural associations. This will allow us to proceed in the observation and analysis process, expanding it to a larger and varied target (encreasing our sample). In addition, we intend to involve further researchers from different fields of study into a long time observation process that looks at the game effects on players after weeks and months.

REFERENCES

Avedon, E., & Sutton-Smith, B. (1971). *The Study of Games*. New York: John Wiley & Sons.

Bertolo & Mariani. (2013). "Meaningful play: learning, best practices, reflections through games", in K. Mitgutsch, S. Huber, J. Rosenstingl, M. Wagner, J. Wimmer, *Context Matters! Exploring and Reframing Games in Context*. Proceedings of the 7th Vienna Games Conference FROG13. Vienna: New Academic Press, pp. 222-234.

Bertolo & Mariani. (2014a). *Game Design. Gioco e giocare tra teoria e progetto*. Milano: Pearson.

Bertolo & Mariani. (2014b). "A Hostile World. A Pervasive Urban Game to Sensitise and Foster a Cross-Cultural Reflection", in D. Ruggiero, *Cases on the Societal Effects of Persuasive Games*, Hershey: IGI Global.

Bogost, I. (2007). *Persuasive Games: The Expressive Power of Videogames*. Cambridge/London: The MIT Press.

Caillois, R. (1958). *Les Jeux et les Hommes*. Paris: Gallimard. Trad. eng. Man, play, and games. New York: The Free Press, 1961.

Chander, M., Bodapati, S., Mukherjee, R., & Kumar, S. (2011). *Organic livestock production: an emerging opportunity with new challenges for producers in tropical countries*. Rev. sci. tech. Off. int. Epiz., 30(3), 569-583.

Crawford, C. (1984). *The Art of Computer Game Design.* New York: Osborne/ McGraw Hill.

Cross, N. (2006). *Designerly ways of knowing. London*: Springer.

De Bono, E. (1991). *Sei cappelli per pensare*. Milano: Rizzoli.

FAO (2006). *Livestock's Long Shadow. Environmental Issues and Options. Rome*: FAO.

FAO (2011). *Antibiotic in farm animal production. Public health and animal welfare*. Rome: FAO.

Fink, E. (1957). *Oase des Glücks. Gedanken zu einer Ontologie des Spiels*. Freiburg: Alber. Trad. it., L'oasi del gioco, Milano: Raffaello Cortina, 2008.

Gee, J. P. (2007). *What Video Games Have to Teach Us About Learning and Literacy*. New York: Palgrave Macmillan.

Huizinga, J. (1938). *Homo ludens. Trad. eng. Homo Ludens. Boston*: Beacon, 1972.

IFOAM (2009). *Water: organic farming makes every drop count*. Available at: *http://eu.ifoam.org/sites/default/ files/page/files/ifoameu_policy_water_ factsheet_2009.pdf*

INEA (2013). *Il benessere degli animale da produzione*. Available at: *http:// dspace.inea.it/bitstream/inea/389/1/ilbenessereanimaleweb.pdf*

ISPRA (2013). *Rapporto Nazionale pesticidi nelle acque.* Roma: ISPRA. Available at: *http://www.isprambiente.gov.it/files/pubblicazioni/rapporti/R_175_2013_rev_finale.pdf*

Joy, M. (2010). *Why We Love Dogs, Eat Pigs, and Wear Cows: An Introduction to Carnism*. San Francisco: Red Wheel/Weiser.

Juul, J. (2005). *Half-real: Video Games between Real Rules and Fictional Worlds*. Cambridge/London: The MIT Press.

Koster, R. (2005). *A Theory of Fun for Game Design. Scottsdale*: Paraglyph Press.

Laurel, B. (2003). D*esign Research: Methods and Perspectives*. Cambridge/London: The MIT press.

Manzoni, A. (2006). *Noi abbiamo un sogno. Riflessioni ed emozioni nel rispetto degli animali*. Milano: Bompiani.

Milano, A. (2012), *Giochi da salotto, giochi da osteria nella vita milanese dal Cinquecento all'Ottocento*, Milano: Mazzotta.

Montola, M., Stenros, J., & Waern, A. (2009). *Pervasive Games: Theory and Design. Burlington*: Morgan Kaufmann.

Perullo, N. (2010). *Filosofia della gastronomia laica: il gusto come esperienza. Roma*: Meltemi.

Piaget, J., & Inhelder, B. (1971). *Mental Imagery in the Child: A Study of the Development of Imaginal Representation*. New York: Routledge.

Prensky, M. (2007). *Digital Game-Based Learning*. New York: Paragon House.

Rifkin, J. (1993). *Beyond Beef. The Rise and Fall of the Cattle Culture*. New York: Plume.

Ruffino, G. (2013). *L'ambiente in gioco. Il game design per lo sviluppo dell'empatia ecosistemic*a (Unpublished MSc thesis). School of Design, Politecnico di Milano, Milano, Italy. Available at: *https://www.politesi.polimi.it/handle/10589/89145*

Salen, K., & Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals*. Cambridge/London: The MIT Press.

Salen, K. (2008). *The Ecology of Games: Connecting Youth, Games, and Learning*. London/Cambridge: The MIT Press.

Singer, P., & Mason, J. (2007). *The Ethics of What We Eat: Why Our Food Choices Matter*. Emmaus: Rodale.

Sottofattori, A. (2010). *Sugli argomenti indiretti e su quelli diretti. Liberazioni* (3).

Suits, B. (1978). *The Grasshopper: Games, Life and Utopia*. Peterborough: Broadview Press.

Walther, B. K. (2005). *Reflections on the methodology of pervasive gaming*. Proceedings of the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology, pp. 176-179.

WHO/FAO (2007). *Codex alimentarius* – third edition. Food and Agriculture Organization of the United Nations. Rome: FAO.

Winnicott, D.W. (1971). *Playing and Reality*. New York: Routledge.

Zimmerman, E. (2012). "Jerked around by the magic circle: Clearing the air ten years later", in *Gamasutra*. Available at: *http://www.gamasutra.com/view/feature/135063/jerked_around_by_the_magic_circle_.php*

THE VIRTUOUS CIRCLE

CUMULUS CONFERENCE 2015

DESIGN CULTURE AND EXPERIMENTATION

Design comes out of the interaction between a practice, which seeks to change the state of things, and a culture, which makes sense of this change. The way this happens evolves with time: practices and cultures evolve and so do the ways they interact; and the attention that is paid at different moments to one or other of these interacting polarities also evolves. In the current period of turbulent transformation of society and the economy, it is important to go back and reflect on the cultural dimension of design, its capacity to produce not only solutions but also meanings, and its relations with pragmatic aspects. Good design does not limit itself to tackling functional and technological questions, but it also always adopts a specific cultural approach that emerges, takes shape and changes direction through a continuous circle of experimenting and reflecting. Because the dimension and complexity of the problems is growing, it is becoming evident that to overcome them it is, above all, necessary to bring new sense systems into play. This is ground on which design, by its very nature, can do much. Indeed, the ability to create a virtuous circle between culture and practical experimentation is, or should be, its main and distinctive characteristic. However, for this really to happen it is necessary to trigger new discussion and reflection about the nature and purpose of design practice and culture.