

I Wish for an Animal:
A Multi-Player Mixed-Reality Game about Wildlife Conservation

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Program Authorized to Offer Degree:
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Abstract

I Wish for an Animal:
A Pervasive Game to Raise Awareness about Wildlife Conservation

Shaghayegh Ghassemlan

Chair of the Supervisory Committee:
Tad Hirsch, Associate Professor
Dominic Muren, Lecturer
Karen Cheng, Professor

-Last night the Sheikh went all around the city, lamp in hand,
crying, "I am weary of beast and devil, I wish for a man."-

This verse is part of a long poem by Rumi, the Persian Sufi poet of 13th century. As a name for this project the last part of this verse is picked and slightly modified, to show that as he was looking for an uberman in the dark, we soon will be wishing for animals*.

"I Wish for an Animal" is a pervasive game designed to educate about the matter of wildlife conservation. Urbanites live in the concrete jumble they have built over centuries around a society in which the only species who have a say, are Homo sapiens. Lifestyle of city dwellers has made it so that their only daily exposure to nature would be interacting with their apartment plants and pets. This removes them from realities of the natural environment and creates this belief for the majority that preserving the environment is a job of environmentalists rather than that of each of them.

"I Wish for an Animal" tries to raise awareness about the impact of everyday city life on wildlife extinction and conservation. The game was experienced for four days in Tehran with 85 players, in April 2015.

* In Persian "I wish for an animal" rhymes with "I wish for a man".

I WISH FOR AN ANIMAL

A MIXED-REALITY GAME ABOUT
WILDLIFE CONSERVATION

MDES THESIS 2015 | SHAGHAYEGH GHASSEMIAN



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A multi-player mixed-reality game about wildlife conservation

I Wish for an animal is a game played in three days by a group of players and the goal is saving animals in the fictional city of the game. I describe the design and realization of the game showing how it is driven by a strong narrative that is crafted from destinations, times and events and yet supports interactivity through chat, the use of objects, health and dilemmas, all of which can be combined into more complex missions.

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Wildlife conservation in Iran

Iran is a developing country with a large population, which has increased by eighty percent in the past thirty-five years. The country is now facing the imminent extinction of many native flora and fauna species because of rapid alteration of their natural environment, coupled with poor management and over-exploitation. The IUCN contends that from the 1127 vertebrates living in the boundaries of Iran, 74 species are listed as vulnerable, endangered or critically endangered. Moreover, five species (Asiatic cheetah, leopard, Asian black bear, Persian fallow deer and onager) of this portion only live in Iran, which means if they become extinct they are gone forever, as did Persian lion and Caspian tiger more than sixty years ago.

More than three decades of exploitation have destroyed much of the country's natural resources. The estimated rate of desertification is about two million ha per year. National parks and other protected areas have been the most hard-hit areas with the maximum destruction occurring between 1978 and 1990. The major cause of the rapid decline in the wildlife resources of Iran has been habitat disturbance. Overgrazing, defragmentation, droughts, industrial pollutants and deforestation have now altered about 96% of the natural habitat of the country. In addition to all of these causes direct killing and shooting of wildlife are a very straightforward reason of extinction for endangered species.

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DISPERSION AND CAUSES

1127 SPECIES

- 194 Mammals
- 521 Birds
- 212 Reptiles
- 20 Amphibians
- 180 Fish

CAUSES:

- Land-use change
- Defragmentation
- Droughts
- Poaching
- Industrial pollution
- Agricultural pollutions
- Overgrazing
- Animal Trading
- Deforestation
- Food shortage
- Car accidents

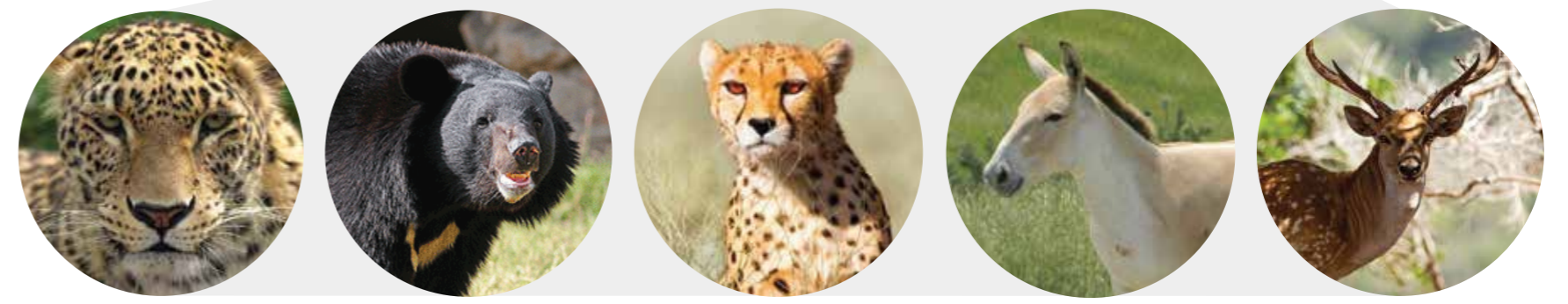
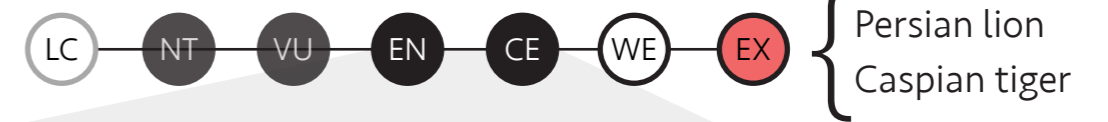
Wildlife conservation in Iran

IUCN RED-LIST 2013

[67 species]

IUCN RED-LIST 2014

[74 species]





Starting the project in Iran Summer 2014

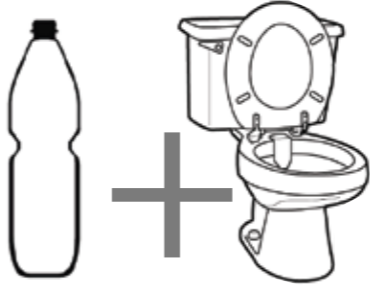
COLLABORATION OPPORTUNITY

I had a chance to meet Amir, a wildlife conservationist and get in touch with a well-known NGO, Persian Wildlife Heritage Foundation. They supported the research phase through the design process.

1

On average a person flushes the toilet 4.5 times a day. By putting a heavy water bottle in the toilet tank, about 5 liters of water can be saved every day per person. This has been a common method dating back to wartime rationing, when many people used bricks in the toilet to decrease their water usage.

To see how people would respond to this idea, I designed a label for empty water bottles and provided it online for download and at the same time printed a bunch of them and put them on the shelves of two supermarkets and asked the salesmen to hand them out to anyone who buys a bottle of water.



EXPERIMENTING WITH THE POTENTIAL AUDIENCE

2

An experiment on facebook, asking people to take pictures of a list of 26 items. The collaboration was not as expected, only 13 people participated.



این پستک هفته آینده با ۲۶ وسیله روزی که از این استفاده می‌کنی
 از یاد تو می‌ماند که آن عکس‌ها را هر چه می‌خواهی
 مگس را می‌توانی از آنجا و به آنجا که می‌خواهی
 http://www.persianwildlife.com

عکاسی برای پروژ دتیز این

۱. این پستک هفته آینده با ۲۶ وسیله روزی که از این استفاده می‌کنی
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There are many direct and indirect stakeholders in wildlife conservation; almost every living creature is reliant on wildlife. From this wide range, I focus on connection between city dwellers and villagers in Iran and the importance of this correlation in protecting the wildlife. Villagers are directly dealing with the wildlife and at the same time they consist ninety percent of the poachers in Iran. This paradoxical situation arises from many environmental injustice issues combined with the demands from urbanites. Urbanites have the three main criteria of environmental justice by being provided with infrastructure (distribution), considered in the process of decision-making (recognition) and having a direct political impact (participation), while rural communities are disregarded in all three of them. At the same time because of their direct interaction with wildlife, rural communities are blamed for most of the problems that stem from this interaction, one of them being poaching.

Iran is a society in transition. It has been moving from traditions to modernism since 1900 with the emergence of Persian constitutional revolution.

Because of many socio-political situations governing the society and culture of Iran, this progress has been very slow. This is creating a great gap between city dwellers and rural communities: city dwellers do not recognize a social status for those who are not "modern", which means anyone living out of cities having non-modern jobs such as farming and ranching. And villagers feel a deep resentment towards urbanites who, they believe, benefit most from all the money gained from oil sold by the government. These perceptions drive these communities apart and take away the chance of collaboration for big problems of the country such as wildlife preservation. Along with the problem of false judgments and recognizing each other as the cause of the problem, which is shifting the burden of wildlife extinction only to the shoulders of the rural community; these groups have no access to actively engage in helping each other or knowing the living situations of the other group. So this conflict shows one social aspect of the problem of wildlife conservation, which this project will address. It will initially explore both ecological and cultural pieces of the problem in that region.

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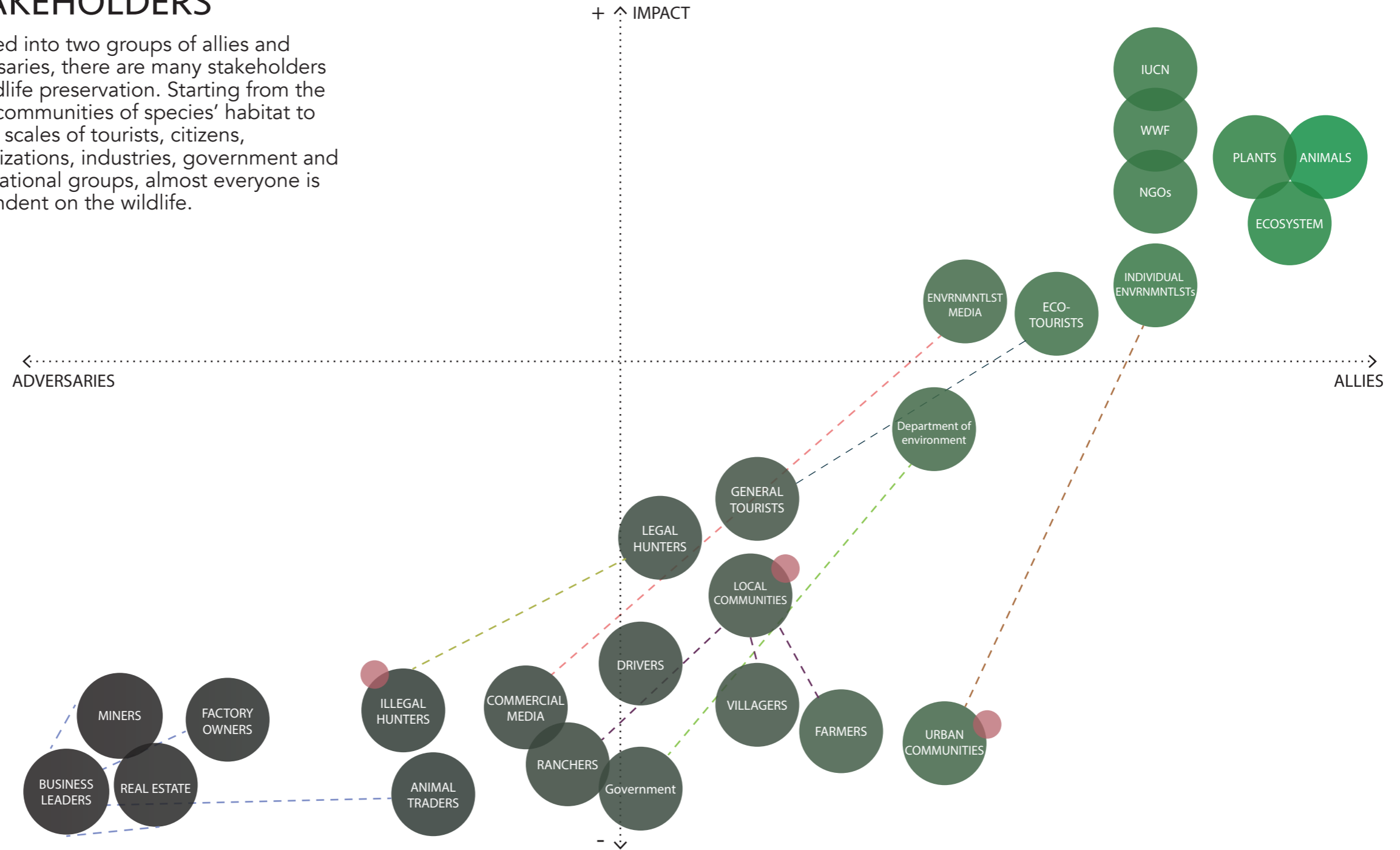
GAMEPLAY

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STAKEHOLDERS

Divided into two groups of allies and adversaries, there are many stakeholders in wildlife preservation. Starting from the local communities of species' habitat to larger scales of tourists, citizens, organizations, industries, government and international groups, almost everyone is dependent on the wildlife.



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**A multi-player
mixed-reality
game
about wildlife
conservation**

Among the three chosen stakeholders: Illegal hunters, local communities and urban communities; I found urbanites more promising for a design project considering the thesis project limitations. An audience who I had more accessibility to and used to be part of them: Youth from Tehran.

Ethnographic research and expert interviews led to nine important insights and I chose five of them that resulted in a design statement.

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Disconnection
Between Urban and
Rural Communities

Wrong Beliefs
about
Environmental Issues

Poaching: Poverty,
Pleasure and Revenge

Poaching: A Market
Demand from Cities

Modernity
vs. Tradition

Tech-Savvy Youth

Antagonism
towards Government

Disconnected
Consumption-Oriented
Urban Lifestyle

Emotional Response
to Environmental Issues

— INTRO

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— INSIGHTS

■ **IDEA**

— DESIGN

— FABRICATION

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— GAMEPLAY

— FEEDBACK

— FUTURE

EDUCATING
THE URBANITES
ABOUT THE
IMPACT OF THEIR
LIFESTYLE ON
WILDLIFE
CONSERVATION

INTRO

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INSIGHTS

I needed to find a tool that would comprise two aspects of raising awareness and educating, regarding the audience and the subject:

IDEA

DESIGN

"I mean, that, you know, ought to be the ideal of teaching, anyway, whether it's children or graduate students. They should be taught to challenge and to question. Images that come from the enlightenment about this say that teaching should not be like pouring water into a vessel. It should be like laying out a string along which the student travels in his or her own way, and maybe even questioning whether the string's in the right place."

-Noam Chomsky

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"Volunteers will commit more to volunteering for conservation activities if such activities meet their more pertinent personal and social goals of connecting with and giving back to their communities, social interacting with other volunteers and defending and enhancing their egos."

-Stanley Asah, et. al

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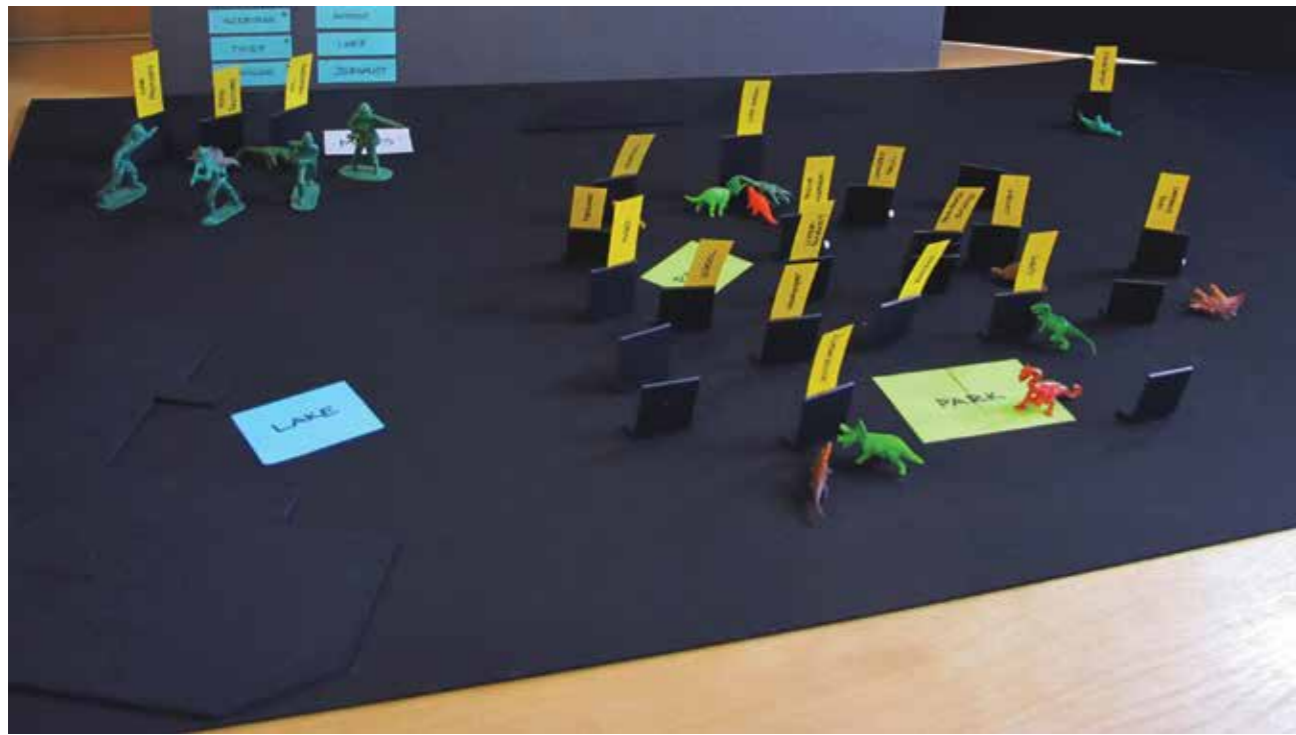
EXHIBITION

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FEEDBACK

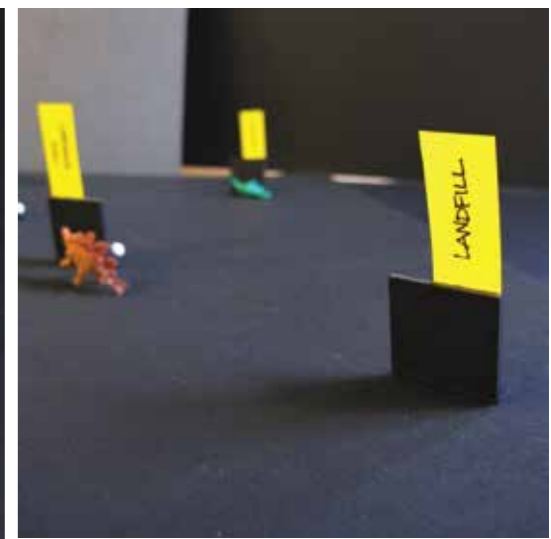
FUTURE

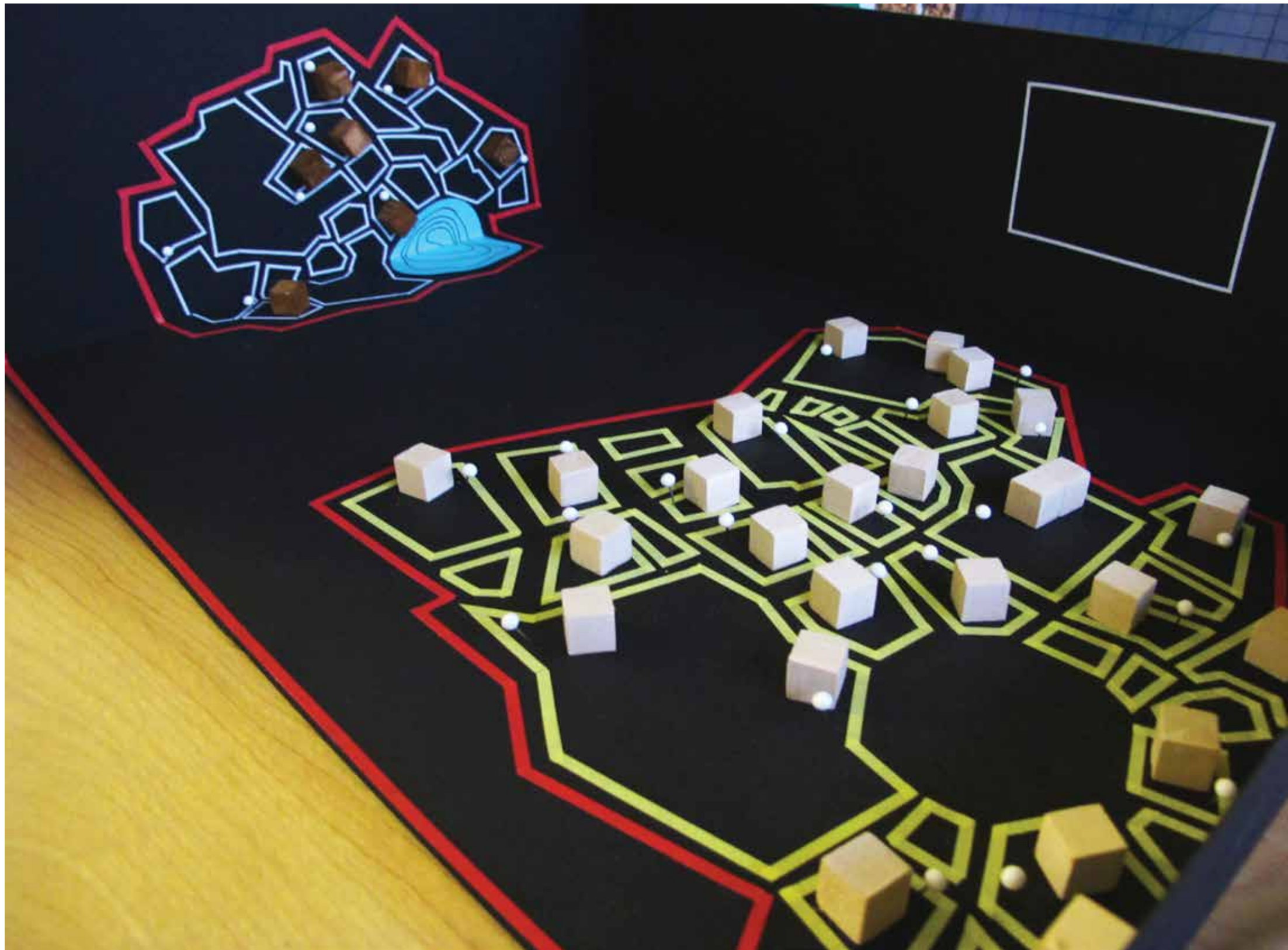
A game that
would start a
conversation
about wildlife
conservation



Phase one
**Experiments
to design a
boardgame**







Phase 2
**Combining
interactive
fiction with
the game**



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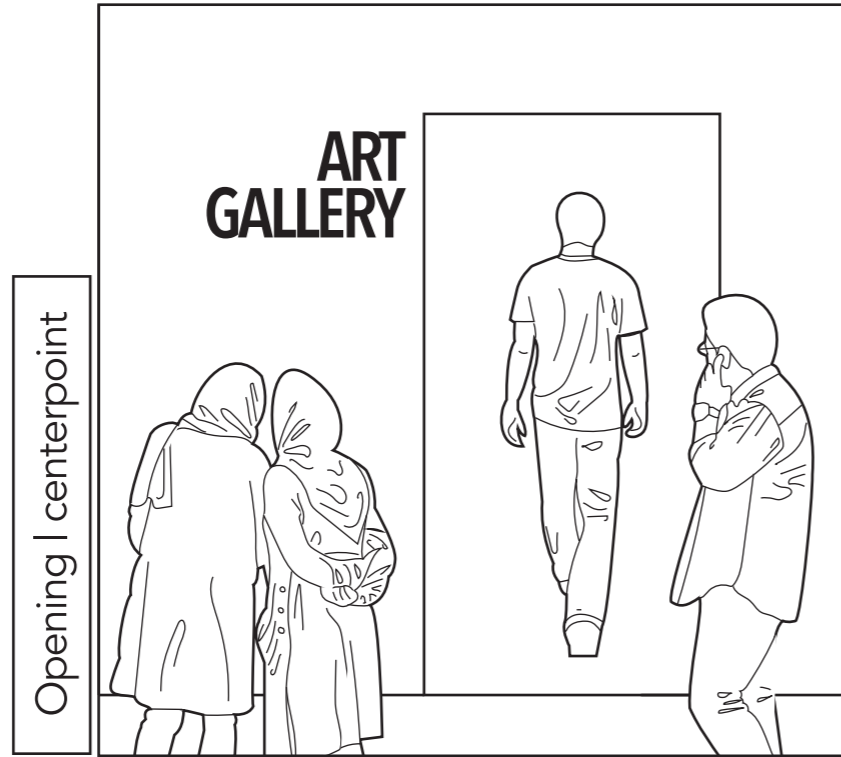
FEEDBACK

FUTURE

After experimentions and designing different boardgames and looking into existing games such as Day of the Figurines by Blast Theory, the game was born:

I WISH FOR AN ANIMAL

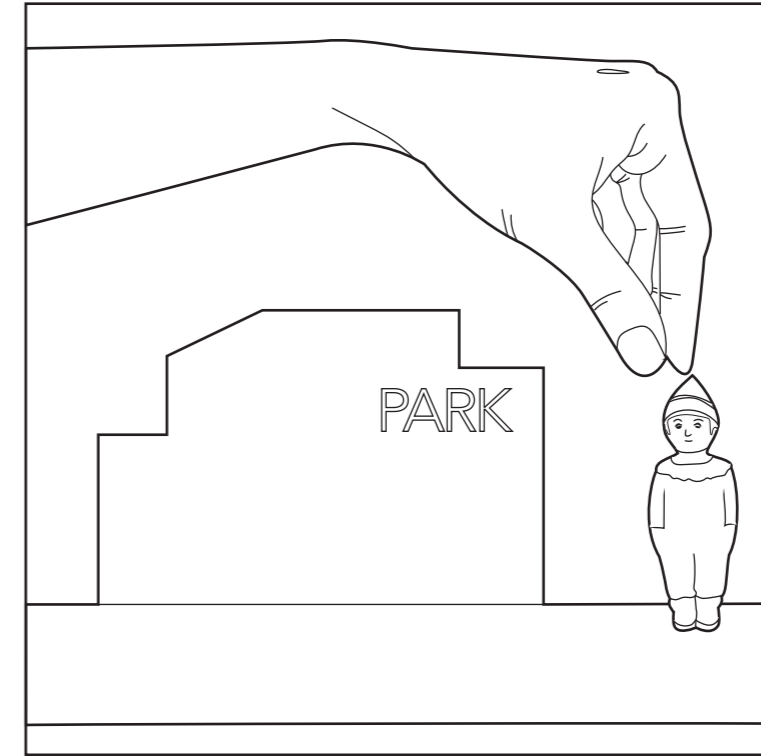
In any social activity in order for change to happen there should be physical interaction. Although I wish for an animal is played via text messaging and from anywhere in the city, it has a centerpoint where players can meet.



REGISTER

Create your statuette that represents you in the game

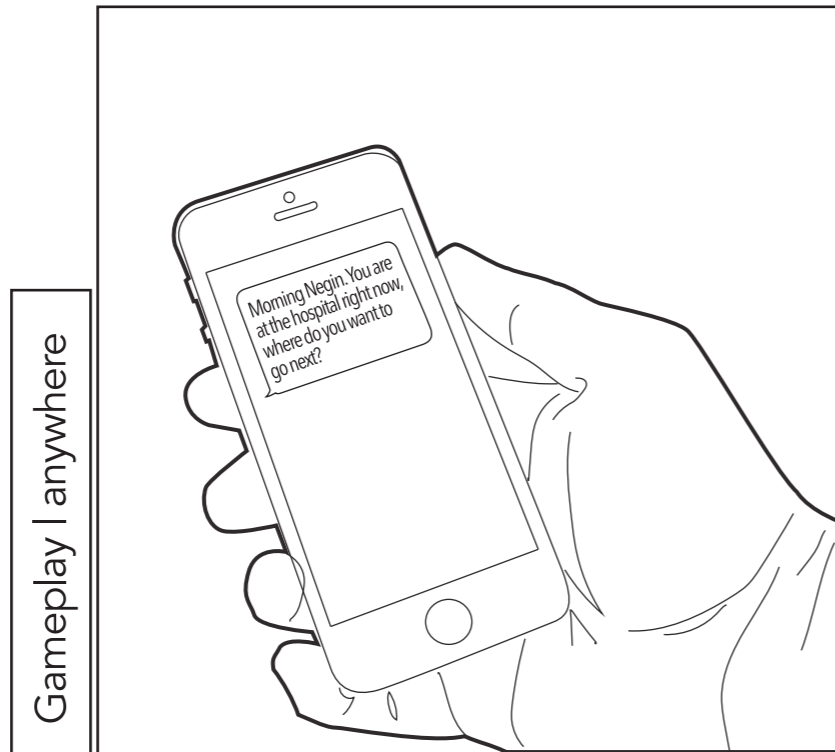
Provide your ID and phone number to receive messages



LEARN

Visit the centerpoint of the game where the maquette of the city and the protected area is set.

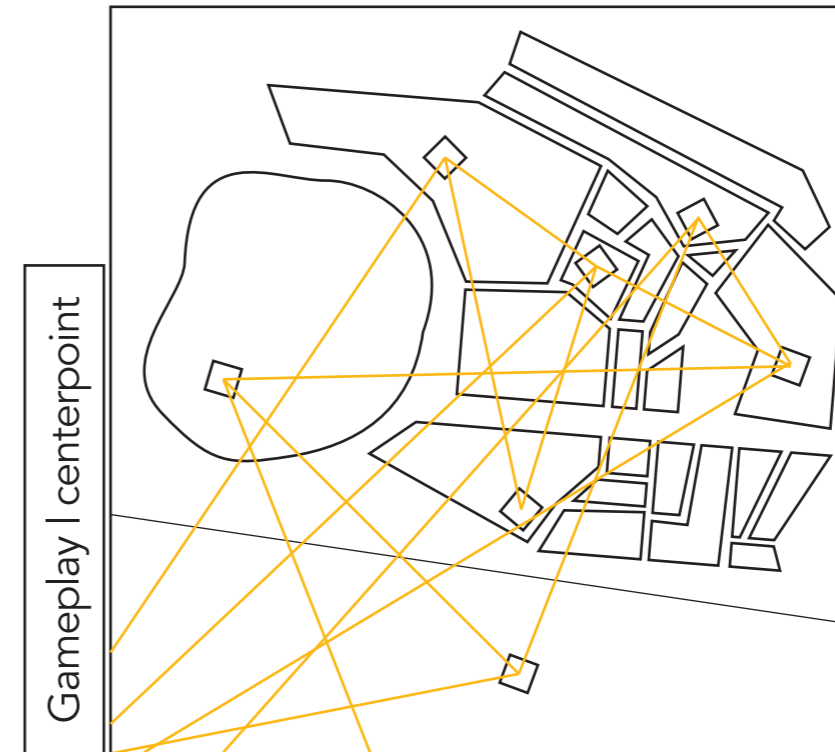
Get instructions on how to play the game.



PLAY

From the day after you'll receive messages from the game on your phone. You can answer by a set of commands:

- Go
- Find
- Pick
- Use
- Drop
- Say
- Shout
- Update
- Leave Heemand



TRANSFORM

As you move through the city and make decisions; the city, the village and the protected area change.

The artist is transforming the model simultaneously.

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UNDERSTAND

The last day is when all players can see the changes they have caused in the city and its environment: the wildlife and their own habitat.

Plus there are conservationists from an NGO [Persian Wildlife Heritage Foundation] who will answer questions and invite players to volunteer for conservation activities.

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In the process of implementation three elements of the game where fabricated:

Platform

Content

Space

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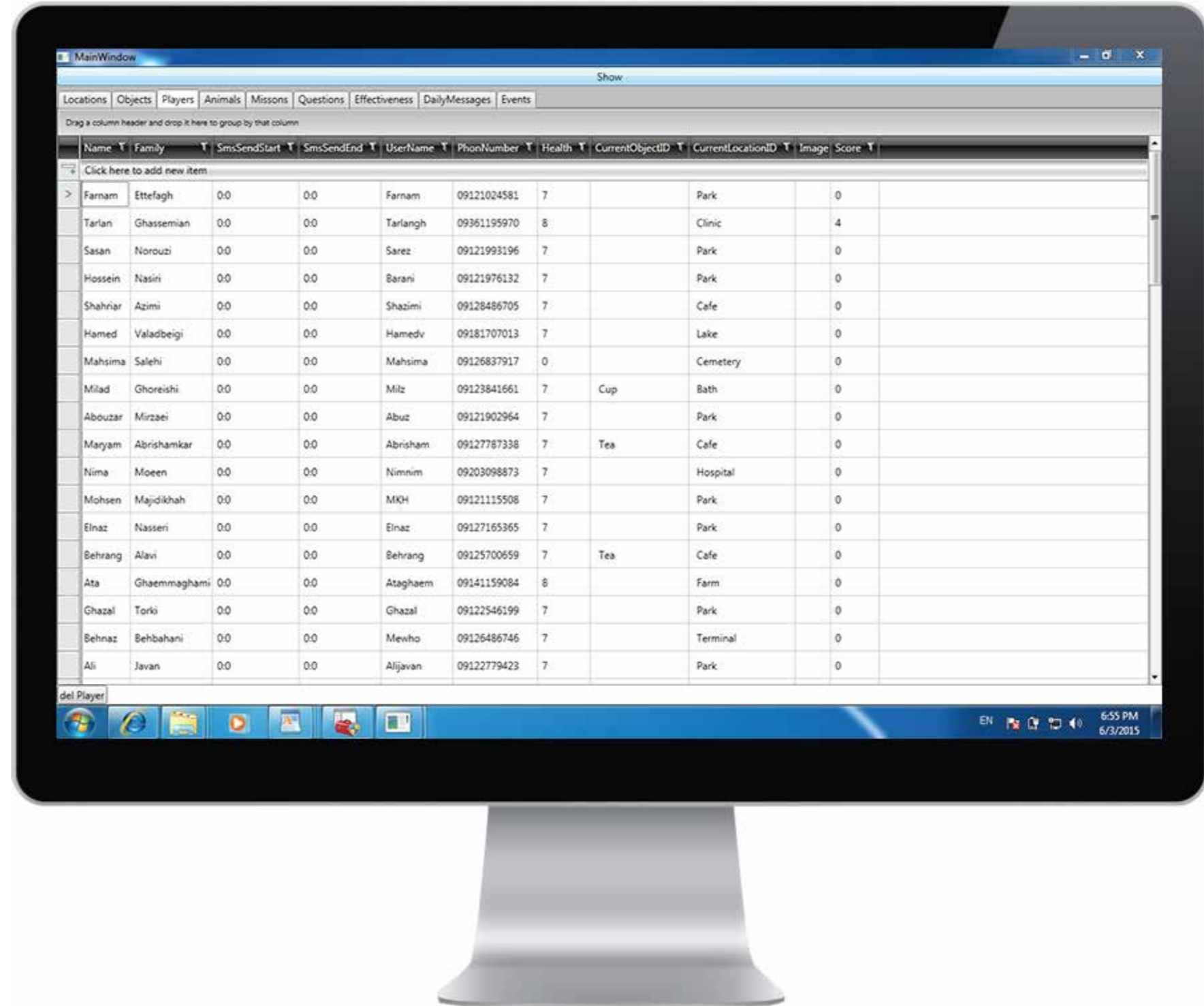
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Platform

The platform I created with the help of a developer, is a windows-based software and I had to work with it on a Mac computer. It consisted of 9 different data sections and after connecting to a server, would automatically reply to players based on their responses.



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Platform

- Locations
- Object
- Players
- Animals
- Missions
- Questions
- Effects
- Daily messages
- Events

Name	Capacity	LocuStart	LocuEnd	Top	Left	Image	Dangerous	Active	Description
Lake	15	00	00	17	15		OnHelp	<input checked="" type="checkbox"/>	بعض وقتا از توکی که حاضران به سطح آب میزنن صبح‌ها گره درست میزنه. از جغذا شبیه همین روزا وقتشه که برنده های مهاجر از شمال بیان اینجا خونه کنهها جل باین فونه های پنج بره. کاشکیه جلوی درش رو آب بازمین که از این فونه رفت و آمد خاک بند منه
Kadkhoda	5	90	210	17	1			<input checked="" type="checkbox"/>	این ساختمونایی که آرزوهای اینجا ساختن به دهمه شدن آب نوبی شهر تکمیل می کنه. هر 100 بارگی که اینجا مستطوی کنین به تاکنر آب بر می منه
No 2	50	00	00	3	7			<input checked="" type="checkbox"/>	ARM به کمک بزرگ گنج که هیچ ترازق ندارد در ساختمون سنگس و شجاع جل به جصفه بانک که صاف از رده تو چشمت اینجا نیست. اینجا می توانی با
NGO	5	90	220	9	11			<input checked="" type="checkbox"/>	همه وقت که دنبال به زن خودتک میگردی که برایش به چه اثر عمل بیاری. با همه دندونک کنونکونش رو نشونت میدی و سلام میدکنه. باکونش جصابی برویوهونه
Market	15	80	220	7	13			<input checked="" type="checkbox"/>	اینجا از توکنسیرنی و غیرتیرنی ساختمون خایه که تا حالا بیگ شدهچ برقی میزنه و آنجایی که تویش رفتوآمد می کنی همه بزرگ خوب میس
Mall	40	90	220	9	5			<input checked="" type="checkbox"/>	دن و به شمن حاضر دراز قلعه و نعتونون برقی تویش باید از خودتکن روزانه (توکی زیرزمین) همرازه رو بگورگ اقا بعضی روزها به سرگ خبر درز می کنه
News	20	80	230	5	13			<input checked="" type="checkbox"/>	تایخ میزنه. همه جا بر از خاک و خنه. از جمله های بیهنگاره بالاین صدای بازی و چپ و داد بچفا میاد. بهور به آخر میله درست کنار پاندا موکلب باسی
Construct	18	00	00	3	1		OnHelp	<input checked="" type="checkbox"/>	خرای بارک به خاطر ترختکات اطرافش شبیه چند درجه از جاشک بیگه جکسندرا
Park	50	00	00	1	8		OnHelp	<input checked="" type="checkbox"/>	همه حونهها رو به این مسئله منتقل کنه تا همم قلعه برای کار و رفتوآمدهای بیگه جایه. بنن این ساختمونها به اندرک منن که ساختمون تمام توچه رو گرفته
House	10	00	00	1	1		OnHelp	<input checked="" type="checkbox"/>	بره بیس آزاد است. داخل ساختمون میاد به هم ریختهس و به تمام برنده بازی بوره روی هر میز تا سلف جیده شدن. صدای دهنوا و گنجش و گنجشکاری میاد
Police	20	00	00	5	5		OnHelp	<input checked="" type="checkbox"/>	جمعیتشه کارخونههای اطراف شهر هرروز به چیز تولید می کنن. مشکهاک بزرگ بند که قبضی از توکون پیدا نیست
Factory	15	50	210	15	4			<input checked="" type="checkbox"/>	کنه های آفرو و شوکا و همای بیس. توچه ها بالای توکها ازمنن می کنن. خرس ها از هر طرف میفته بین بیرون و بانک ها هم سمن می کنن. زیاد آتایی شدن
Jungle	30	00	00	17	17		OnHelp	<input checked="" type="checkbox"/>	بره گله های داخلون رو میارن این اطراف برای چرا. میکن اینجا باید چارچشمه همراق باشن که ضمن چندتا گرگی که باکون میارن هم لندن رو گله ن تا فاکور
Lea	25	00	00	17	11			<input checked="" type="checkbox"/>	مکعب جایی بوده که از قبیمه آنجایی توکی جنگل اطراف می گزمن. برهضفا دور این تیکه رو گرفتارن. به سرگ جاک آتیی روی راهی از بیس میاد فضا
Camp	15	00	00	17	13			<input checked="" type="checkbox"/>	به سایت بزرگ نمایی از فضاچن. نه ترخان اینجا هست نه ساختمون. بهچر صدای باد که توکی فضا میروچه و خاشاک رو بند می کنه. هیچ صدایی نهنشونوکی
Empty	12	00	00	3	7		OnHelp	<input checked="" type="checkbox"/>	دنگر و برستار بودنی. اینجا بیشتر شبیه داروخانهس تا بیمارستان. فضا رنگن و بیمارستان بره از اندک همرس و بکن تو تا برستار که باید به کار فضا برس
Hospital	9	00	00	1	5		OnHelp	<input checked="" type="checkbox"/>	لایق بند هر دانشکده روی همس. اجناس بیایه انداختن و دانشجوها با فضا از کتارت رد میارن. اینجا هم جل بارک به جایی برهضفاش از فضا شهر جکسندرا
University	20	60	210	11	13			<input checked="" type="checkbox"/>	

CONTENT

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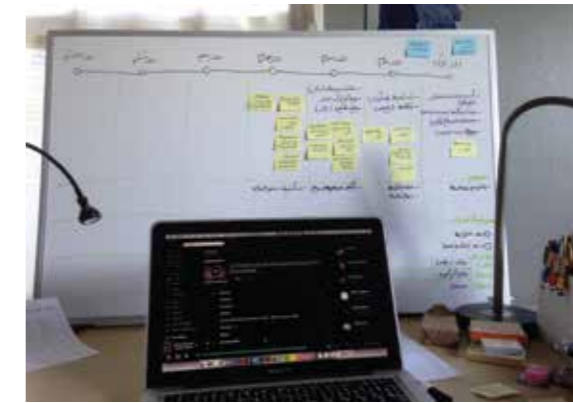
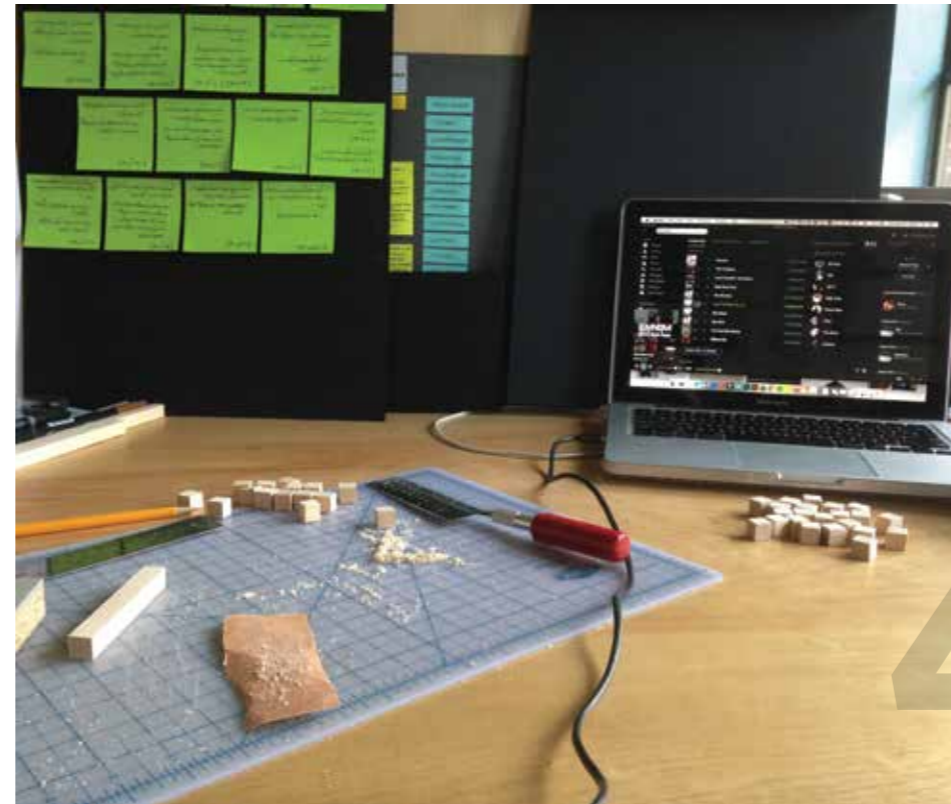
GAMEPLAY

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Content

Creating the content, which were the scenarios and missions that happened in the city, was a 2-month process of reading, writing, test plays, feedback and rewriting. In the end the game held 47 different missions based on locations and time of the day. They varied from very easy to tough as game proceeded. Because it turned out that becoming familiar with the commands and ruleset of the game took some time and easy scenarios helped players get used to the logic of gameplay.



47 SCENARIOS

Very easy
Easy
Challenging
Tough

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Space

RENT A SPACE
PREPARE THE TEAM
MAKE THE MATERIALS

- 2097 animals made from cardboard in 7 different species.
- 24 locations
- 500 buttons
- Booklets
- Posters



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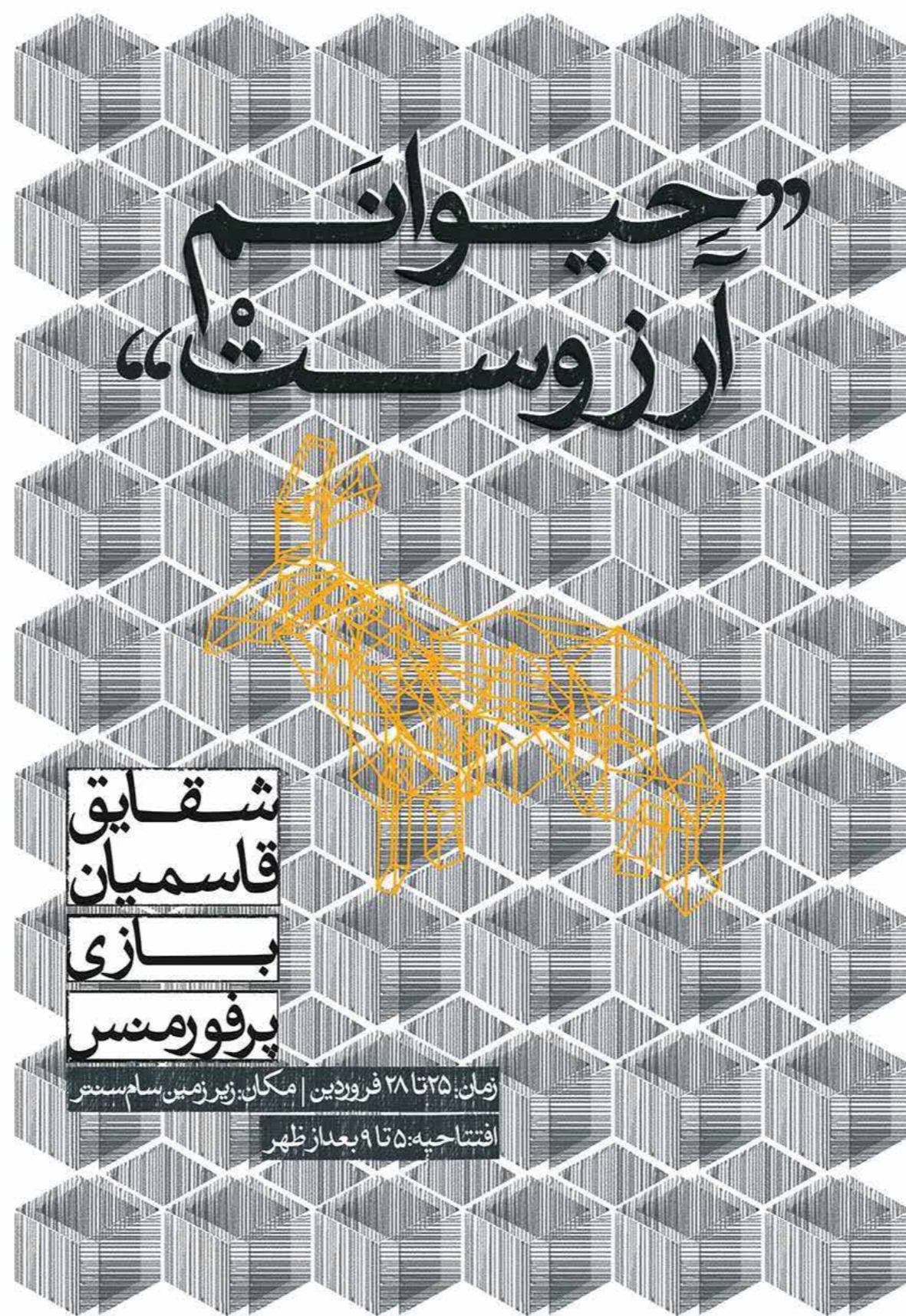
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TEHRAN

APRIL 14-17

SAM CENTER BASEMENT

I travelled back to Tehran in early-April to test the game. I rented a space at a shopping mall and advertised a week prior to the game using this poster and also uploading a short video on Facebook and Instagram.

* Watch the video in supplementary materials

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INSTRUCTIONS



TEHRAN
 April 14
 Sam Center
 Basement

REGISTRATION

About 300 people visited the centerpoint in the opening. 85 of the registered to play. They gave us their phone numbers, customized their figure and put it in the "park", where the game started.

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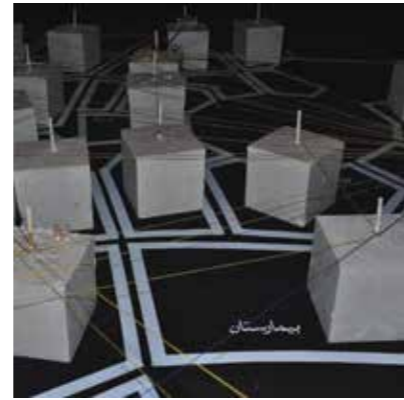
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FEEDBACK

FUTURE

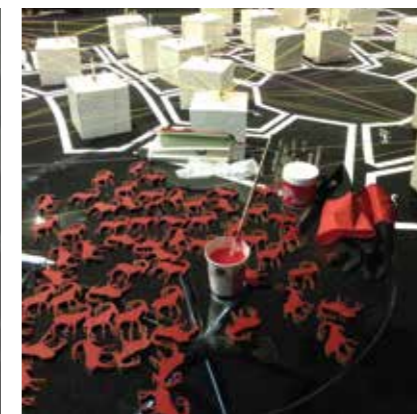


TRANSFORMING
THE MODEL



TEHRAN
April 15-16
Sam Center
Basement

As the game proceeds in the following days I am at the centerpoint changing the model based on the messages I receive from players: Tracking them in the city, destructing locations and killing players an animals.



INTRO

GOAL

INSIGHTS

IDEA

DESIGN

FABRICATION

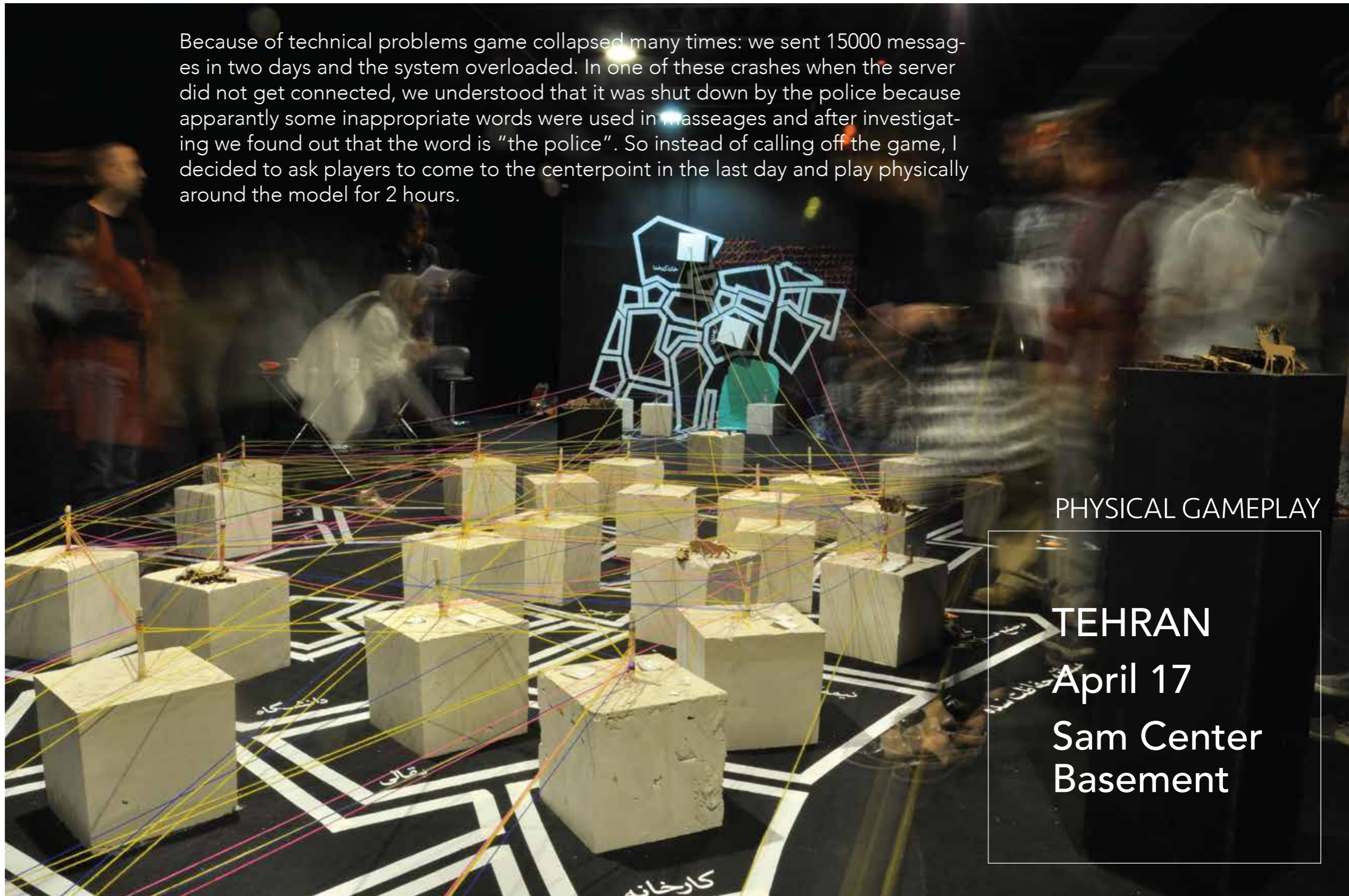
EXHIBITION

GAMEPLAY

FEEDBACK

FUTURE

Because of technical problems game collapsed many times: we sent 15000 messages in two days and the system overloaded. In one of these crashes when the server did not get connected, we understood that it was shut down by the police because apparently some inappropriate words were used in messages and after investigating we found out that the word is "the police". So instead of calling off the game, I decided to ask players to come to the centerpoint in the last day and play physically around the model for 2 hours.



PHYSICAL GAMEPLAY

TEHRAN

April 17

Sam Center
Basement

INTRO

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GAMEPLAY

FEEDBACK

FUTURE

7.95
Average care for saving animals

72%
Make an app

Average interest in the subject of wildlife conservation
8.34

What I liked about it:

- Idea and concept
- Imagination
- Collaboration
- Physical model and animals
- Connecting technology, environment and daily life
- URLs referencing to real-life news
- Caring for wildlife
- Interactive nature
- Relitivity of actions/decisions
- The story

TEHRAN
April 17
Sam Center Basement



I also wrote a questionnaire on the wall to get feedback about the experience of gameplay from players.

What I didn't like about it:

- Difficult and Complicated set of rules
- Short length of the game
- Too many messages
- Ambiguity
- Not deep enough
- Lack of visual content

Average joy of the game
7.68

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FUTURE

Write a paper
based on
the experience

/ debug
/ test
/ run
/ publish

Conclusion

Environmental issues are an unspoken matter in Iran's society. Although there are different NGOs and people actively engaged in the field, majority of population are uneducated and naive about it. Like almost every other society, people believe that dealing with environmental issues is a job of environmentalists. After the physical gameplay (watch the video), Amir and I had a 30-minutes conversation with players and answered their questions about the game and also wildlife conservations. Surprisingly the questions, were those I wished would be raised by playing this game and it showed that part of the goals of the game were met: starting the conversation in players' minds and putting them in the place of decision makers.

The test-play revealed many problems of the game that need to be solved in the future before another test-play or launching the game. Players said that the scenarios could be deeper and at the same time wanted the game to be longer because they needed more time to get used to the rulesets and the mentality of the game.

The NGO that I worked with, Persian Wildlife Heritage Foundation, were amazed by the response that they received from visitors and players. They proposed to support the game in its future attempts.

Bibliography and related resources

Books

Bell, Michael M. "An Invitation to Environmental Sociology". SAGE Publications. 2011. Print.

"Sources of Power: How People Make Decisions". The MIT Press. 1999. Print.

Orr, David W. "The Nature of Design: Ecology, Culture and Human Intention". New York: Oxford University Press. 2002. Print.

Dobson, Andrew, and Bell, Derek. "Environmental Citizenship". The MIT Press, 2005. Print.

McGonigal, Jane. "Reality is broken: Why games make us better and how they can change the world". Penguin, 2011.

Salen, Katie, and Eric Zimmerman. Rules of play: Game design fundamentals. MIT press, 2004.

Papanek, Victor. "Design for the Real World: Human Ecology and Social Change". Academy Chicago Publishers. 1985. Print.

Debord, Guy. "Society of the Spectacle". AKPress. 2006. Print.

Thaler, Richard, and Cass Sunstein. "Nudge: Improving Decisions About Health, Wealth and Happiness". Penguin Books. 2008. Print.

Agar, Michael H. "The Professional Stranger: An Informal Introduction to Ethnography". Academic Press. 1996. Print.

Gibson, James J. "The Ecological Approach to Visual Perception". Boston: Houghton Mifflin. 1986.

Buxton, Bill. "Sketching User Experiences: Getting the Design Right and the Right Design". Massachusetts: Morgan Kaufmann. 2007. Print.

Stickdorn, Marc, and Jacob Schneider. "This is Service Design Thinking". New Jersey: John Wiley & Sons, Inc. 2011. Print.

Winnicott, D. W. "Playing and Reality". Routledge Classics. 2005. Print.

Papers

Ashayeri, Sheyda and Helen Newing. "Meat, Market, Pleasure and Revenge: Multiple motivations for Hunting in Bamu National Park, Fars Province, Iran". IUCN Parks. 2014. Print.

McGonigal, Jane. "Why I love bees: A case study in collective intelligence gaming." The ecology of games: Connecting youth, games, and learning (2008): 199-228.

Nieusma, Dean. "Alternative Design Scholarship: Working Towards Appropriate Design". The MIT Press. 2004. Print.

Healy, Tim. "The Unanticipated Consequences of Technology". SCU Publications. Print.

Buchanan, Richard. "Wicked Problems in Design Thinking". The MIT Press. 1992. Print.

MacGregor, Sherilyn. "No Sustainability without Justice: A Feminist Critique of Environmental Citizenship". Keele University, 2007

Thackara, John. "In the Bubble: Designing in a Complex World". The MIT Press. 2005. Print.

Courses [Online]

Harari, Yuval Noah. "A Brief history of Human kind". Coursera.org

Sachs, Jeffrey. "The Age of Sustainable Development". Coursera.org