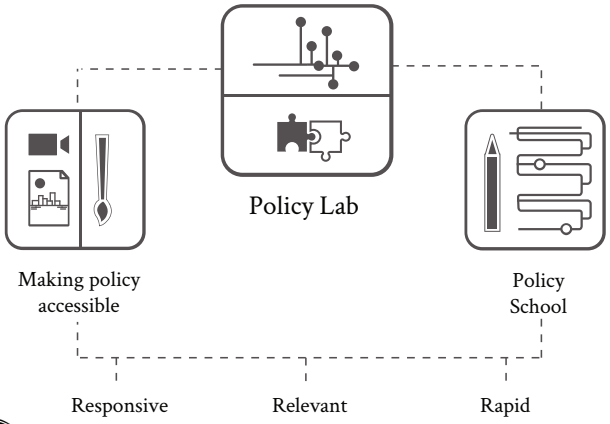
FIELDS of VIEW

OUR GOAL

Can policymaking be made more relevant to the lives of people affected by it? Can policymaking be more responsive to the constantly changing social-economic-environmental context? Can we reduce the time taken for a policy to go from the drawing board to implementation? The answer to all these questions is yes, provided we have the right set of tools. Our goal thus at Fields of View is to undertake research at the intersection of technology, social sciences, and art to design these tools for policymakers and people. We are a not-for-profit group based in Bangalore.



HOW DO WE GO ABOUT IT?

Our work involves three inter-related threads in order to make better policy:

Policy Lab
In the Policy Lab, we undertake research at the intersection of technology, social sciences, and arts. We work in the areas of urban poverty, energy, disaster management, transportation, and water. Our research involves creating and designing new methods and tools in the areas of simulations and games.

School of Policy
Training programmes and workshops for government agencies and civil society organisations across South Asia on these new tools and methods.

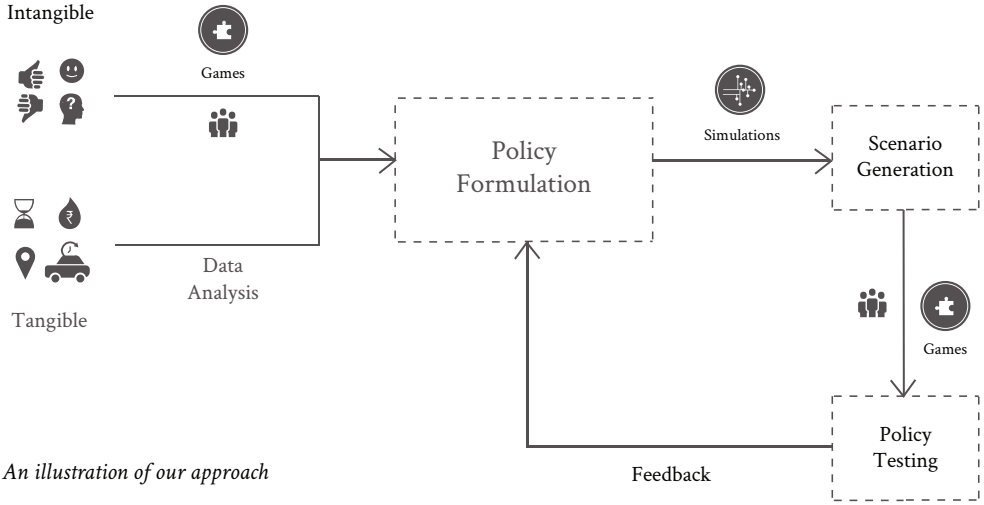
Making policy accessible
Artifacts, which include graphic novels, games, and videos to make policy more accessible and actionable.

APPROACH

The Policy Lab approach

Games allow us to model complex issues without losing nuance, and are accessible to people with different levels of literacies. We use games as data collection mechanisms to elicit needs and preferences of people, which becomes an input for our simulations. The simulations at FoV allow us to meld data at both micro and macro-levels. These simulations are exploratory, which allow policymakers to explore different scenarios and experience consequences of their choices in an immersive fashion. The scenarios chosen by the policymakers can be tested using games, before implementation. Thus using a combination of games and simulations allows us to make policymaking more rapid, relevant, and responsive.

We seek partners from the government, academia, civil society, and industry to further our goal of understanding cities better.



An illustration of our approach

GAMES

Be it 'Go' with its deceptively simple rules governing smooth ovals across a chequered board or hopscotch that enlivens school yards and streets, games are integral to any community's cultural heritage. Game play involves and invokes memories of fun, friendship, and sometimes failure too.

It is but natural that the immersive power of games has been harnessed to address real-life issues. Not only do games provide an inexpensive way of mimicking real-life situations, but they also allow us to learn and experience in a safe space, and the learning stays with us.

In the area of policymaking, games can be used in the following ways:

1. Games for policy research
- *Games for preference elicitation*
- *Games for policy testing*

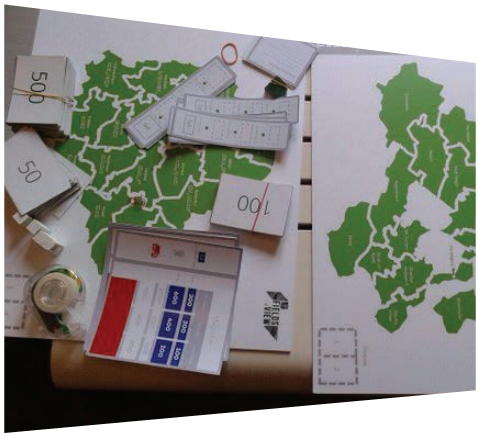
2. Games for capacity building

3. Games to make policy accessible

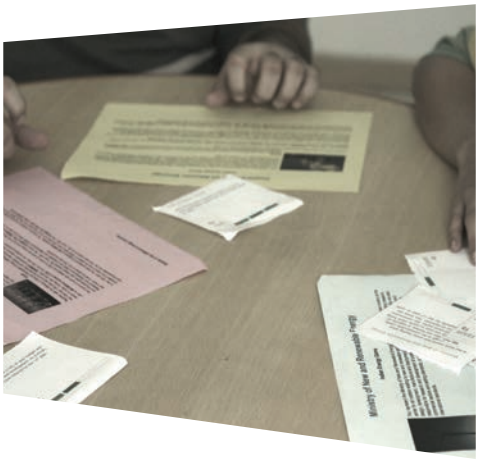
Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

Games for preference elicitation:
For policymaking that is responsive to the needs of people, it is critical to include the needs and preferences of the people to design the policy. Games are a powerful medium to collect this intangible, unquantifiable data. Games can model complex systems without losing nuance. As the players interact with the system in the game and decide on their choices, these choices are the data required to understand the players' preferences and biases. At Fields of View, the preferences elicited through games are fed into our simulations to generate different options for policymakers to choose from. Example: City game, Namma Khate Namma Kathe, Joint Road Forward etc.

Games for policy testing:
In pluralistic societies, there are different policy scenarios that policymakers can potentially opt for. Once policymakers short-list certain choices, they can be tested through games with the target audience. The outcomes of such policy-testing game sessions provide insights for the policymakers to make the most appropriate policy choice. Examples: Map my city, City game, **Games for policy testing:**PIEMAC, Electricity market game etc.



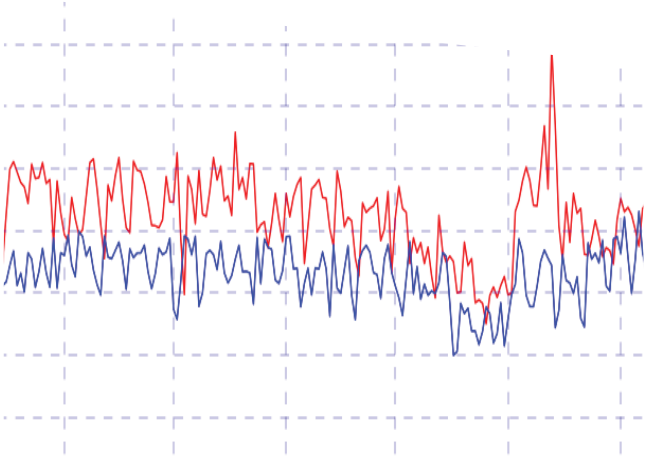
Games for capacity building
As games can model complex systems without losing nuance, games can be used by policymakers and civil society to learn about the policymaking process, and the challenges in different domains of policy-making. Example: Indian energy game, Rubbish!, Cantor's world.



Games to make policy accessible:
As we can leverage the visual space in games, they provide a powerful tool to communicate with audiences with different literacy-levels and languages. Example: ₹ubbish!

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

SIMULATIONS



"Remember that all models are wrong; the practical question is how wrong do they have to be to not be useful."

- George Box

Simulations for policy

At Fields of View, we design bottom-up, exploratory simulations to make better policy.

Introduction

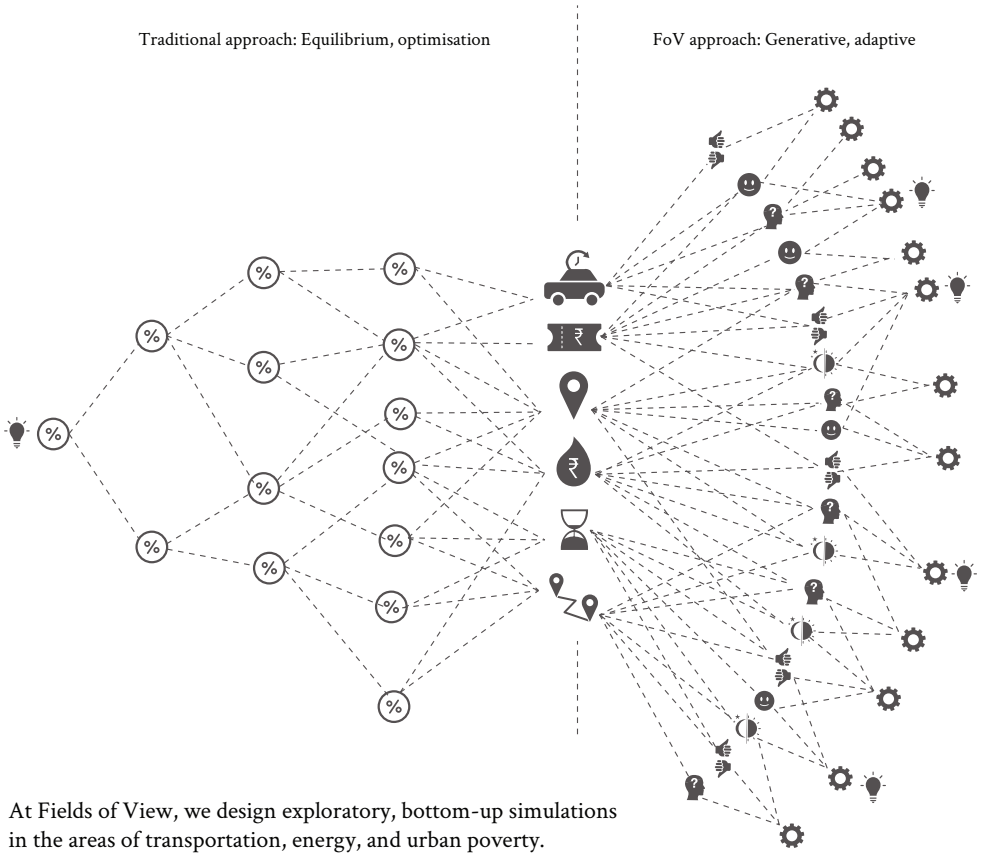
Models are representations of the real world. A simulation can be understood as a model in action over time. With advanced computing power at our disposal, simulations nowadays can crunch large quantities of different kinds of data, and therefore are a powerful tool to aid policymakers in decision-making.

Simulations at FoV

Traditionally, simulations model either the micro-level or the macro-level. For instance, transportation simulations usually model either bus stops, roads, etc (micro-level) or at the scale of national highways (macro-level). What is required are simulations that operate in between these two levels, at the meso-level. Such meso-level simulations meld both macro and micro-level data. At FoV, we build meso-level simulations.

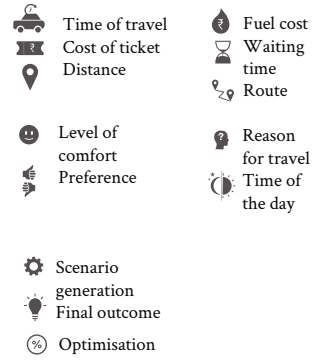
Moreover, the simulations at FoV are bottom-up, unlike traditional simulations. We model individual actors and their preferences. We elicit these preferences using our games. These preferences are intangible, unquantifiable data, which other simulations do not handle. Thus, in our simulations these individual actors or agents interact with each other and different scenarios emerge. Using these bottom-up simulations, which combine both tangible and intangible data, we generate multiple scenarios, which the policymakers can explore and choose from.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



At Fields of View, we design exploratory, bottom-up simulations in the areas of transportation, energy, and urban poverty.

As an example, consider route planning for a public transportation systems in cities. Public transportation affects people from all walks of life. Presence of public transportation routes may spur growth in different parts of the city, adding to economic growth. It may also affect housing demand and prices. It may even spur people to service last mile passengers, thus creating a whole new market. The relationship between the passengers, the administrative institutions, the available resources and their delivey mechanisms has to be taken into account to plan a public transportation route. Through modelling and simulation, we explore the dyamics of interactions between the various sub-systems.



Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

FoV WORKSHOP

The Fields of View workshop creates a space for participants from diverse backgrounds to design together.

OBJECTIVE

Social problems are complex, involving multiple dimensions. We need people from diverse disciplines, backgrounds, and perspectives to come together to design for these problems.

Though bringing together people from different backgrounds is acknowledged as a first-step to a more participatory, bottom-up approach to design, often such sessions become difficult to manage, and leave participants frustrated at the lack of productive outcomes.

The Fields of View workshop involves a guided process that creates a space for participants from diverse backgrounds to design together.

Intended Audience

The FoV workshop can be adapted to different contexts. We have conducted the workshop with diverse groups that include designers, government officials, civil society groups, and academia.

Keywords

Design, interdisciplinary, participatory processes.

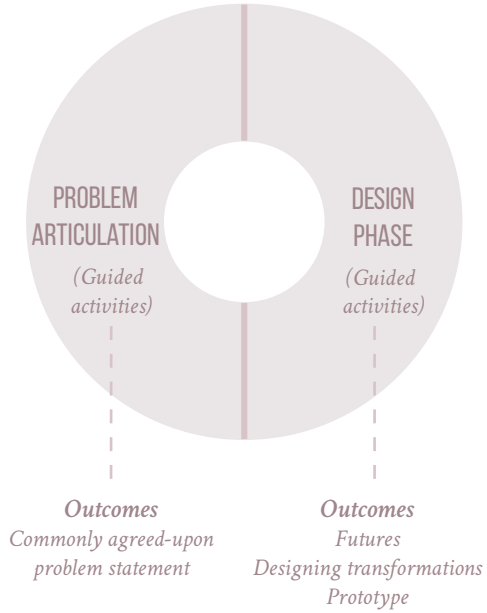
Photo Courtesy - UNDP Sri Lanka

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

APPROACH

In game terminology, a field of view refers to what is visible to the player. Fields of View thus refers to the common ground, where different people with different perspectives can come together and have a dialogue. Drawing upon our in-house interdisciplinary methodology, the Fields of View workshop involves a guided process involving two phases — the Problem Articulation and the Design phase.

The first phase of the workshop involves participants working through different activities that lets them come up with a commonly agreed upon problem statement. In the design phase, participants work together to imagine futures and figure out how to design for these transformations.



OUTCOMES

Commonly agreed upon problem statement, visions for the future, prototype of interventions.

Photo Courtesy - UNDP Sri Lanka

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

FoV GAME DESIGN COURSE

Short-term and semester long courses covering the fundamentals of game design.

OBJECTIVE

At Fields of View, we design games to make better policy, by improving processes such as learning, decision-making, and participatory planning. Such games require us to model the real world, and systems such as transport, waste management, city planning, disaster management, energy planning, and climate change, which involve multiple stakeholders, and complex trade-offs.

A good game should model the real world in just the necessary amount of detail; simplify it too much and the game loses touch with reality; complicate it with various rules, and information, and the game becomes hard to play. Game design is all about the subtle art of balance. We have developed an in-house methodology to develop such games, and based on this methodology, we offer different courses on game design, from short-term courses to a semester-long course.

Intended Audience
Tool builders, Domain experts in transport, climate change, planning etc., Masters-level students in Engineering, Design, Urban Planning and Architecture.

Keywords
Game Design, Short-term course, Semester-long Course.

Photo Courtesy - Khoj International Artists' Association, 2015

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

UNPACK PLAY

This is the short-term game design course offered over 10 weeks in-house at Fields of View. This is useful for people working in different domains (transport, climate change, city planning, etc) and for tool builders.

FULL-SEMESTER GAME DESIGN COURSE

We offer game design courses for Masters-level students. This is of interest to students of engineering, design, social sciences urban planning, and architecture.

Photo Courtesy - Khoj International Artists' Association, 2015

OUTCOMES

In the Fields of View game design course, we take participants through the process of problem formulation, elements of game design, and creation of a prototype. You will learn how to decide when and where a game is useful, and how to facilitate and conduct such games. The course is comprehensive, with well-defined modules, readings, and exercises.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

CANTOR'S WORLD

A journey towards sustainability.

OBJECTIVE

At the Rio+20 Summit in 2012, a trio of organizations under the UN umbrella released an Inclusive Wealth Report. The report spoke about an 'Inclusive Wealth Index' (IWI) to measure a nation's development. Indicators already in use to understand development and progress such as GDP (Gross Domestic Product) and HDI (Human Development Index) do not consider environmental issues and its subsequent impact on our future.

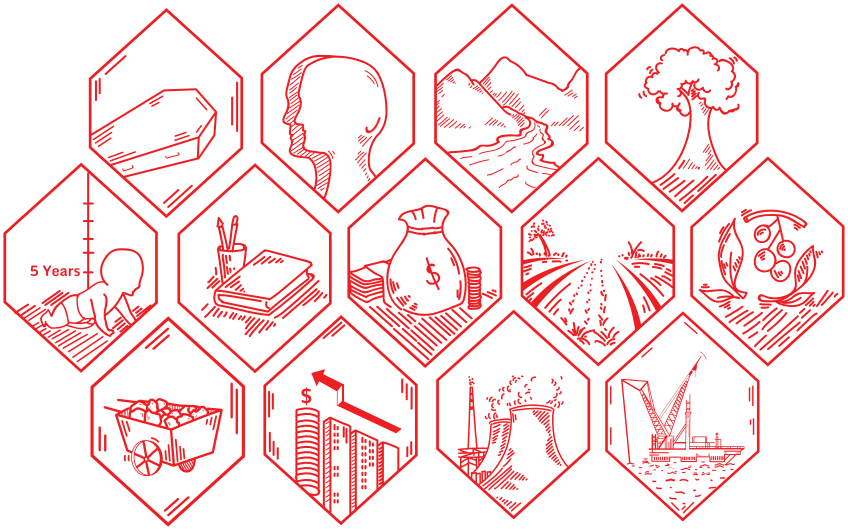
The IWI is a way to acknowledge and articulate the interconnectedness of the economy, environment, and human well-being. The game Cantor's World has been designed for students and policy makers to learn how the IWI complements other indices. In the game players can experiment with different policy choices and experience first hand the tug-of-war between short-term results and long-term sustainability.

Intended Audience
Students, educators, economists.

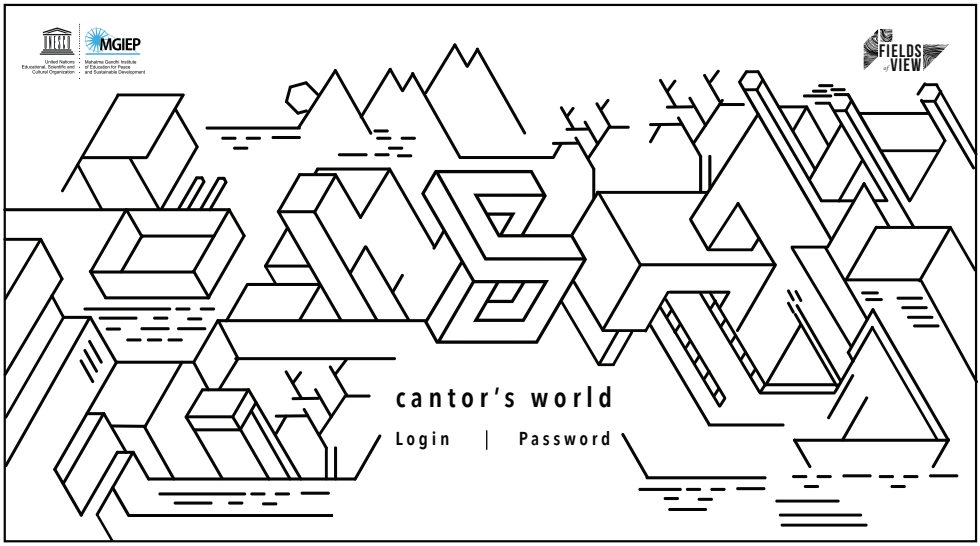
Keywords
Inclusive wealth, computer supported game, GDP, HDI, learning, economics

Type
Computer-supported game

No. of people
5 -25 players

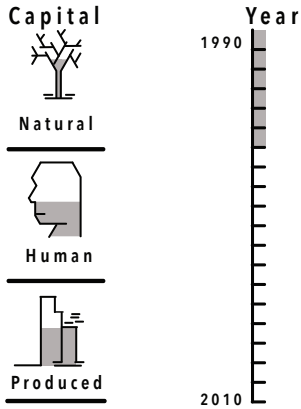


Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



GAME PLAY

Players prepare budgets using their judgements based on the national economic indices that are provided. This would include the IWI as well along with some of standard development indicators. The players will determine a course fiscal budget plan along with basic monetary policy based on the information provided to them by the indicators. The players will be free to follow the information afforded to them by any of the economic indicators to determine their policies.



LEARNING OBJECTIVES

The game is designed to encourage players to develop a futures orientation and apply the same to shape real life sustainable economic policies. Specifically, players learn the following:

- Players learn the components that are used to calculate the IWI and how it compares with other development indices such as GDP, HDI, etc.

- Players learn how changes in national policies can alter different indices and what advantages does the IWI offer in understanding these changes.

Acknowledgement
This research is funded and being carried out in collaboration with UNESCO - MGIEP.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

CITY GAME

A turn-based multi-player game to explore urban form and preferences.

OBJECTIVE

The City Game is designed to explore urban form and elicit a group/individual's preferences about their city. Participants play in turns and react to each others' actions, and in doing so create a dynamic that is absent in traditional participation/feedback processes. The game allows for experiments with various design alternatives. Players can experiment with different policies and rules, observe various patterns that emerge and contrast different emerging scenarios.

GAME PLAY

It is played in small groups where participants take turns to play and design an urban space in a mock setting. They can witness the evolution of the city and negotiate with each other to resolve conflicts.

Participants build structures in turns and witness the evolution of the city visually in real-time. We have multiple variants of the City Game.

Intended Audience
General Public, Urban Planners, Architects, Real estate developers

Keywords
Urban systems, Games, Visualisation, Self-Organisation

Type
table-top

Duration
45min -1.5hour

No. of people
10 -30 players

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

RESULTS FROM A GAME SESSION

ROUND 1

ROUND 2

ROUND 3

ROUND 4

ROUND 5

FINAL ROUND

Acknowledgement

City Game was conceptualised and designed by Dr. Juval Portugali, Tel Aviv University. We wish to acknowledge that a portion of this work was carried out by members of the Next Generation Infrastructures Laboratory at the Center for Study of Science, Technology and Policy. This work was funded by Jamsetji Tata Trust and the Next Generation Infrastructure Foundation.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

ELECTRICITY MARKET SIMULATION GAME

A game developed to help the audience understand the short-term and long-term dynamics of electricity and carbon markets.

OBJECTIVE

Electricity markets are influenced by transactions in the market, policy decisions, evolving institutions, unstable fuel prices, availability of fuel and advances in technology.

The limited options for storing electricity contributes to the market volatility.
These varying characteristics make it difficult to analyse and understand the behaviour of electricity markets.
The primary objectives of the game are:

1. To teach the dynamics of electricity markets.
2. To analyse and understand the impact of various policies in such a system.

GAME-PLAY

In the game, players represent a company with different power generation technologies. Players decide on investing in a new power plant, dismantling or trading of an existing power plant, and bid in a power exchange. An electricity board regulator has the power to introduce and modify market policies.

The game proceeds in rounds, where a round simulates a full business cycle. In these rounds, we can introduce or modify various policies (such as turning on carbon market etc.). This allows players to understand and analyse the impact of their decisions, the effects of various policies, etc.

Intended Audience
Students, Market Analysts, Policy makers, Researchers and Companies in the Power Sector

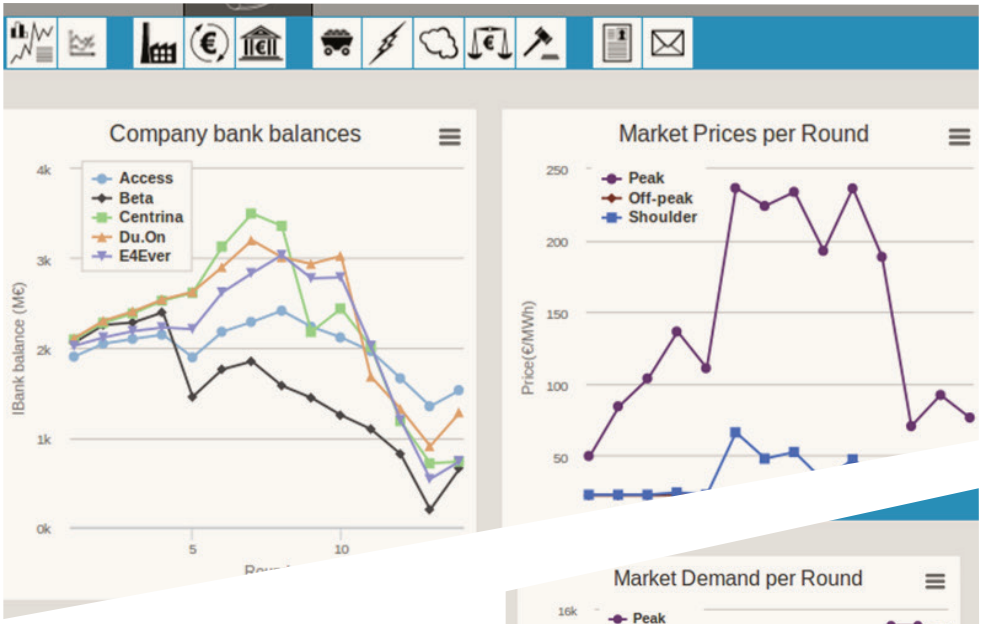
Keywords
Complexity, Bidding

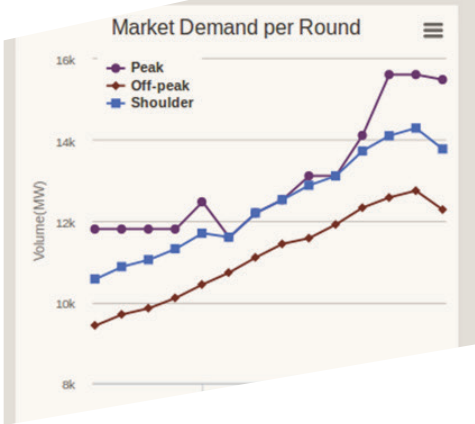
Type
Web-based

Duration
1-2 hours

No. of people
Minimum of two teams with any number of players. No limit on maximum number of players

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in





OBSERVATION

Throughout multiple sessions, we observe that the gaming simulations help players understand the consequences (market response) of their investment strategies. They can test and observe effects of simple strategies such as marginal cost bidding, etc.

The players also experience the effects of incomplete information on future developments and the flux in the global fuel market. The players learn how to make trade-offs between short-term profits and long term market share.

OUTPUT

- Gaming-simulation platform.
- Implications of changes in the regulatory framework on the investment strategies.

Acknowledgements

This work was carried out in collaboration with Dr.ir. L.J. de Vries, and Dr. ir. Emile J.L. Chappin from Technology and Policy Management, TU Delft, Netherlands .

Collaborations

Technology and Policy Management, TU Delft, Netherlands.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

INDIAN ENERGY GAME

A multi-player game designed as an educational tool to help participants understand the complexity of designing energy policy in India.

OBJECTIVE

India needs an energy policy that addresses the decreasing coal reserves, increasing demand, technological challenges and environmental issues. Comprehending problems which arise in such complex socio-technical systems is non-trivial. The Indian Energy Game has been designed to understand the following:
a) The challenges faced by different agencies in meeting targets.
b) The decision making process and negotiations between the agencies.

GAME PLAY

The participants are allowed to experience the consequences of environmental, social, technological, and geopolitical factors.

They assume roles of different ministries in the Indian Government that build energy capacity in the country. These Ministries are responsible for controlling the fuel sources that different generation techniques use.

The game is played in two rounds: in the first round the participants need to design an energy mixture for India's 12th Five-Year plan and in the second round they design an energy mixture for India's 13th Five-Year plan. Constraints such as social costs, environmental costs, fuel shortages, national security and technology barriers to name a few, shape the players' decisions.

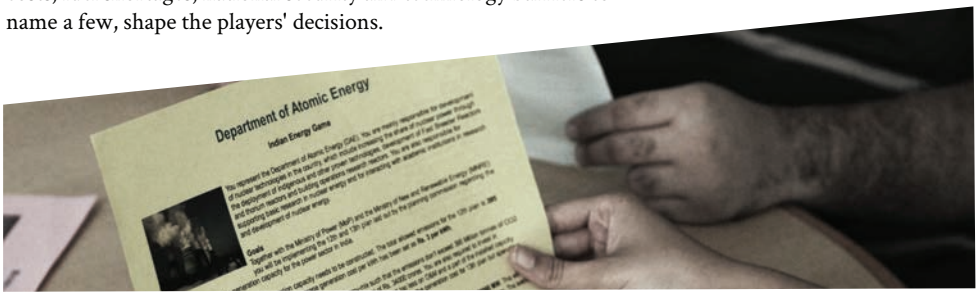
Intended Audience
General Public, Energy Policy Planners.

Keywords
Multi-party negotiation, Conflict resolution, Energy Policy, Planning.

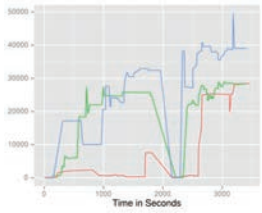
Type
Paper-based/ table-top

Duration
1hour - 1.5hour

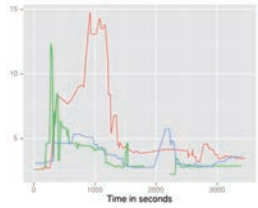
No. of people
6 -12 players



Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



CO_2 emissions in million tonnes



Cost of Generation on Rs/kWh

OBSERVATION

During the course of the game, the participants experience the various environmental, societal, geopolitical, and economic constraints faced by the decision makers while planning for energy policy in India.

This helps players understand the constraints faced by policy makers, the importance of cooperation and the dynamics of negotiation & information sharing. We observed in multiple sessions of the game that the teams do not share information in the first round of the game and face the consequences of the same. This eventually results in the teams sharing amongst themselves in the second round.

To give another example, we observed in multiple sessions of the game that the participants seem to understand that large hydroelectric projects, although inexpensive, displace a lot of people and have severe environmental costs.

Acknowledgement

We wish to acknowledge that a portion of this work was carried out by members of the Next Generation Infrastructures Laboratory at the Center for Study of Science, Technology and Policy. This work was funded by Jamsetji Tata Trust and the Next Generation Infrastructure Foundation.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

GAMING SIMULATION BASED TRAINING FOR SST

A simulation developed to train the users of a tokamak in its remote operation,using a robotic arm.

INTRODUCTION

Researchers at Institute for Plasma Research (IPR) are developing the Steady State Superconducting Tokamak (SST) to conduct various experiments on plasma matter. In order to perform maintenance operations for the tokamak, the machine has to be brought to a state where it can be operated on by personnel safely.

This involves shutting down the entire machine for it to cool to a manageable temperature, breaking the vacuum of the plasma chamber and (sometimes) waiting for radiation to reduce. This lengthy procedure is followed by an equally time-consuming process to bring it back into an operating state.

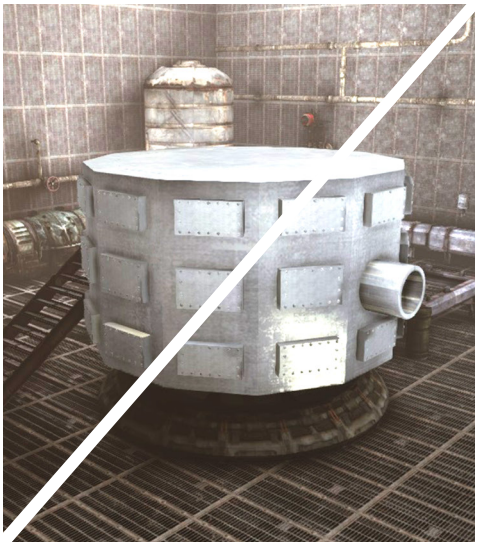
Remote operations for maintenance will reduce the maintenance delays, and allow for longer experiments.

Intended Audience
Operators of the tokamaks

Keywords
SST, training

Type
Virtual Game

Number of players
Single player/ operator



OBJECTIVE

A robotic arm is being designed for performing such remote maintenance operations for SST. We have developed a gaming simulation in order to aid the designers in eliciting requirements for their design, as well as helping train operators to perform maintenance operations.We have done this using an immersive virtual environment completely modelled after the SST.

Equipment and processes in hazardous and highly specialised environments, which require human input, can be designed, developed and tested using such immersive gaming simulations.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

GAME PLAY

The interior of the SST is lined with graphite tiles. The player can either be a maintenance operator or a supervisor involved in the design and specifications of the real robotic arm.

The player assumes the role of an SST operator performing maintenance operations through the course of the game, and learns to use the robotic arm to identify and replace damaged tiles. The game is designed in accordance with 4 Component Instructional Design (4C/ID) approach to developing training systems.

It incorporates various levels of difficulty to train operators and monitor their progress as they develop their skill. It also helps supervisors to identify key specifications for the real robotic arm based on the progress of their operators, and on their own experience with the system.

Acknowledgements:
This work is funded by the Board of Research in Fusion Science and Technology (BRFST) and the work is being carried out in collaboration with the Institute for Plasma Research, Gandhinagar.

Collaboration:
Institute for Plasma Research

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

JOINT ROAD FORWARD

A project that uses gaming and computerized simulations to study planning for mobility infrastructure and policy.

INTRODUCTION

The Joint Road Forward is a multi-year project aimed at developing gaming and simulation methods to better design mobility infrastructure and policies, leveraging different forms of relevant data, and participatory methods.

The research project is a collaboration between academia and industry in India and the Netherlands, with a goal to learn from both contexts. We will use mobility data mining methods to build specific mobility models, which form the base for the gaming and simulation platform.

Intended Audience
Policy makers, Transportation Industry, Academia

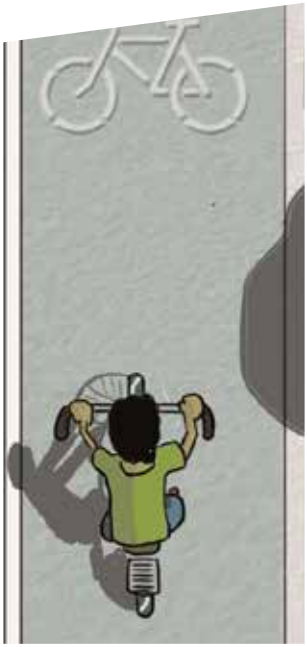
Keywords
Mobility, infrastructure, policy.

Collaborations
IIIT-B, TU Delft, KTH Royal Institute of Technology

APPROACH

Our approach leverages both gaming and computerized simulations, built and validated using data from Indian and Dutch contexts. Computerized simulations offer a space for experimentation at scales of cities, and gaming simulations provide the ability to use participatory approaches enabling multiple stakeholder engagement.

The goal of the project is to explore the role of transport infrastructure and mobility on the daily lives of people. Using gaming and simulations we intend to explore this in local cultural contexts of India and the Netherlands.



OUTPUT

Gaming and computerized simulations.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

MAP MY CITY

A participatory exercise developed as part of the ACCCRN initiative to help cities identify and define climate challenges they face.

OBJECTIVE

The excercise was developed to help cities identify and define climate challenges they face in the course of their daily operations in their respective geographic areas and to identify possible resilient strategies for future weather extremes.

It allows participants to learn about risks of climate extremes on routine operations in their local urban context. It is also designed to impress upon them the need to identify strategies to build resilience in their local municipalities. Participants also get an overview of the operations of different departments and identify gaps, similarities, and possible avenues for cooperation.

Intended Audience
Civil engineers, Urban practitioners who work with utilities infrastructure such as water supply distribution, sanitation, and solid waste management.

Keywords
Extreme climate event, resilience, civic infrastructure, basic utilities, cities, municipalities

Type
Table-top game in a workshop format

Number of people
3 groups

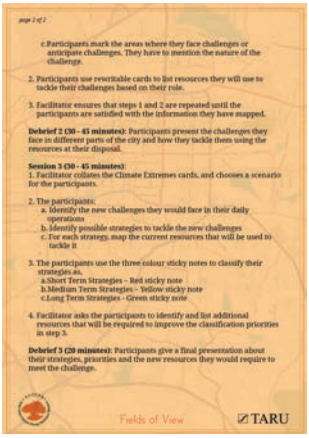
GAME PLAY

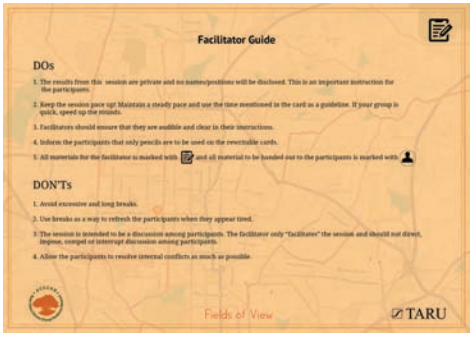
The session is conducted with participants who have experience in urban planning and management, municipal operations, urban services or have operational knowledge of the domain. Participants fulfil the role of their chosen city agency (at municipality level) and are required to identify routine problems the agency faces.

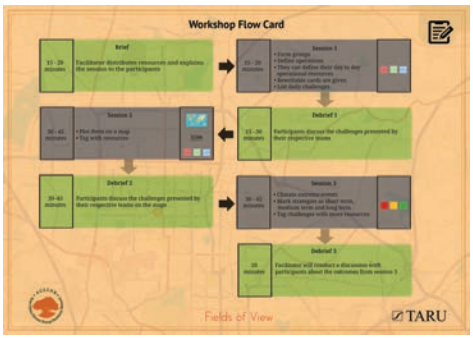
Participants are then provided a mock scenario of problems they would face due to extreme weather, based on their geographical context. They are then required to define a strategy to tackle the problem using their current resources.

Participants map strengths and weaknesses of their departments and discuss it with others. The exercise concludes with the participants identifying short, medium and long term goals for their individual departments and identifying possible avenues for collaborations among different departments for implementing their plans.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in







OUTPUT

At the end of each exercise the participants collectively:

- Generate the list of challenges that each of them face during their daily operations,
- Generate the list of all the resources that are at their disposal,
- Collectively prioritise the order in which they will tackle the challenges which allows them to leverage each other's capabilities and resources.
- Identify resources that they would like to have.

Collaborations

This work was funded by and carried out in collaboration with TARU Leading Edge, Gurgaon.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

PIEMAC

A gaming simulation designed to understand information flow, identify loopholes, and understand the evolution of communication protocols within organisations.

OBJECTIVE

Information flow in organisations shapes the way an organisation functions, the efficiency with which individuals can act, and the way the organisation plans its future. However, providing relevant information at the right time to the right people is often a challenge. Personal and informal networks play a vital role in shaping the flow of information. Such information flow is usually based on organisational standard operating protocols (SOPs). The primary objectives of this game are:
a) To identify loopholes and bottlenecks in these protocols, especially when such protocols have been adopted from elsewhere.
b) To study how protocols evolve within an organisation.

GAME-PLAY

The roles in the game are based on the various roles in the organisation under investigation. The game begins with the game facilitator handing out to the participants, the game scenario, role description, responsibilities and the set of actions available to them during the game. The participants communicate with each other using hand-written messages to address the issue presented in the game scenario. The players are informed about the various constraints during the course of the game through real-time feedback from the facilitator.

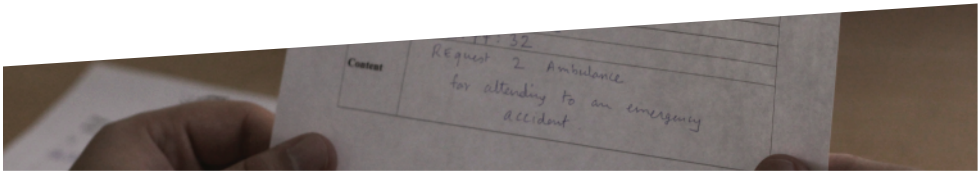
Intended Audience
Agencies involved in Disaster Management, HR Groups, policy-making bodies and other such organisations where information flow involves multi-party coordination and collaboration.

Keywords
Multi-party co-ordination and collaboration, Information Flow, Protocols, SOPs

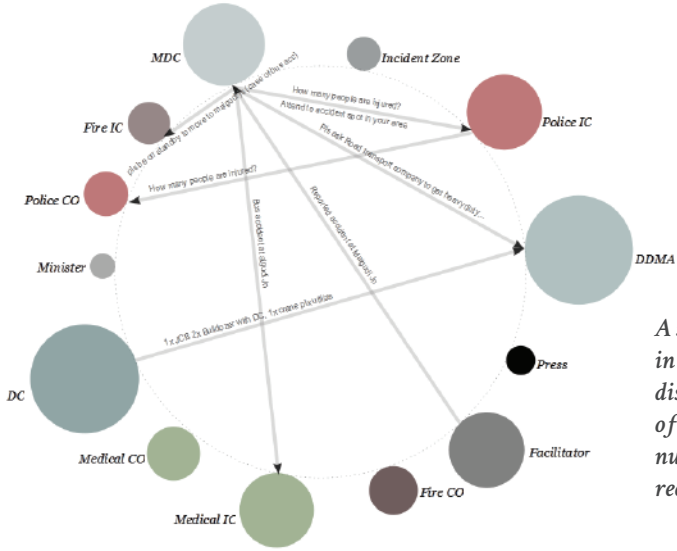
Type
Paper-based, table-top

Duration
45min -1hour

No. of people
Depending on the target organisation

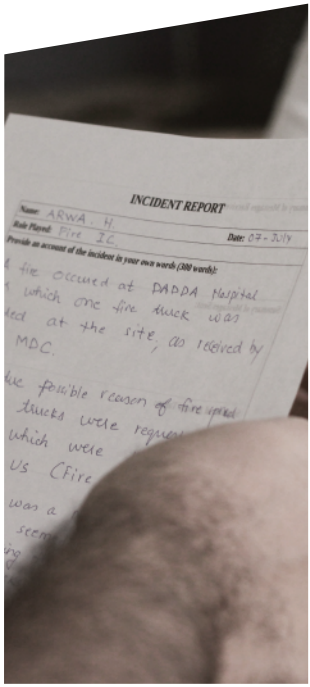


Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



A snapshot of message exchange in an instance of PIEMAC for disaster management. The size of the bubble indicates the number of messages sent and received during the game.

OBSERVATION



Questions such as how the content of a message changes as it "flows" through an organisation (Chinese whispers), or the effect of spurious messages on information flow etc. can be answered using this game. In one instance of the game, it was seen that the protocol proved stable even when multiple spurious and misleading messages were introduced into the system.

Organisations inevitably evolve methods of communication to suit the people in the organisation. Such methods, when formalised, can become (secondary) protocols of information flow within the organisation. Through multiple runs of the game, it is possible to evolve such protocols, formalise and test them.

Acknowledgements

We wish to acknowledge that a portion of this work was carried out by members of the Next Generation Infrastructures Laboratory at the Center for Study of Science, Technology and Policy. This work was funded by the Center for Artificial Intelligence and Robitics, Jamsetji Tata Trust and the Next Generation Infrastructure Foundation.

Collaborations

Department of Science and Technology

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

₹UBBISH! / KAASU KASA / KAASU-KUPPAI

A game to address some of the challenges faced by Dry Waste Collection Centres DWCCs and help strengthen the infrastructure for waste management in the city

INTRODUCTION

Recently, Bangalore adopted a decentralized approach to address its waste crisis with Dry Waste Collection Centers (DWCCs) being setup in every ward. How can we address some of the challenges faced by DWCCs and help strengthen the infrastructure for waste management in the city? It is this question we explored in ₹ubbish!, a cross-cultural design collaboration between Bangalore and Amsterdam.

Intended Audience
Residential Welfare Associations, Bulk generators of waste, Policymakers, Students.

Keywords
Solid Waste Management

Type
Tri-lingual board game

Duration
1.5 -2 hours

No. of people
4 -12 players

OBJECTIVE

Some of the challenges faced by DWCCs include apathy of citizens toward dealing with waste and a lack of knowledge about the new decentralised system for waste management. Our objective was to address knowledge gaps and questions of attitude and behavior to promote understanding of the waste management system at both the micro and macro levels.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

APPROACH

A combination of the methodology followed at Fields of View and MediaLAB Amsterdam, involving framing the problem in consultation with stakeholders, field visits, discussions and interviews with experts, game design, and user tests.

Acknowledgements
Nalini Shekar and the team at Hasirudala

Collaborations
The project was a collaboration between mediaLAB Amsterdam, IIIT-B, and Fields of View.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

STAKE

An exhibition game on pastoralists in India

INTRODUCTION

Given that India has 34 million pastoralists managing a livestock of more than 50 million, it is imperative to understand and respond to the needs and aspirations of pastoralists both through informed policy-making and involvement of different stakeholders. The game 'Stake' is designed with the objective of learning the relationship pastoralists share with the commons in the context of sustainability.

OBJECTIVE

Stake was developed as part of a curated traveling exhibition of the life and livelihood of pastoralists in India titled 'Living Lightly: Journeys with Pastoralists' organised by Sahjeevan and Foundation for Ecological Security (FES) at Indira Gandhi National Centre for the Arts (IGNCA), New Delhi from 2nd to 18th December 2016.

Intended Audience
General public

Keywords
Sustainability, pastoralism, commons

Type
Exhibition game with life-size assets

Duration
About 50 minutes
•10 minutes Briefing time
•30 minutes of game play (less when the players fail to achieve a sustainable future)
•10 minutes debriefing time

No. of people
6 players

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

GAME PLAY

In Stake, players play the role of either pastoralists, industrialists, or farmers and chart their course on a common landmass called 'Mitti'. Pastoralists need land for their livestock, farmers need land for agriculture, and industrialists need land for their plants. Their actions involve trade-offs between how they use parcels of land, how much resources they consume, and how sustainable is their consumption. The players need to ensure that their consumption does not tip over the sustainability scale.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

THRIFT

A turn-based multi-player tabletop game to understand the complexities of Indian Smart Cities Challenge.

INTRODUCTION

Given that India dreams of creating a 100 smart cities in the near future, the question of how city councils can fund this transformation becomes an urgent question for policymakers. The Central Government has proposed to provide financial support to the Smart City Mission to the tune of Rs. 48,000 crore over five years, which works out to an average of Rs. 100 crore per city per year. An equal amount, on a matching basis, will have to be contributed by the State/ULB (Urban Local Body); therefore, nearly one lakh crores of Central/State funds will be available for Smart Cities development.

How can city councils work with this hybrid funding model? How do different interest groups influence their decisions? How can they retain flexibility, while facing the twin challenges of improving capabilities as well as increasing accountability?

Thrift is a game designed by Fields of View that allows you to immerse yourself in these questions.

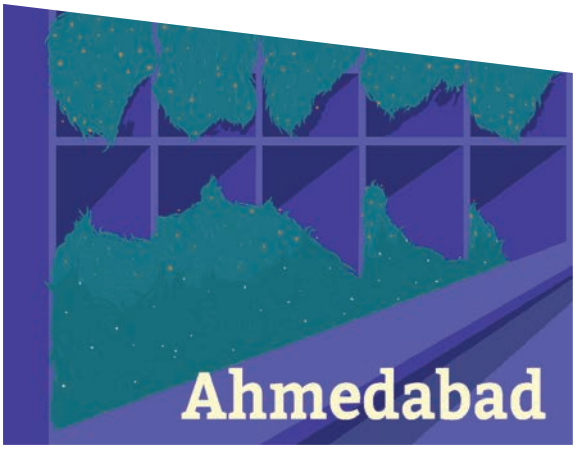
Intended Audience
ULBs, Policy Makers, City Planners, Government Bodies, General Public.

Keywords
Decision-making, Urban Planning, Policymaking.

Type
Turn-based table-top game

Duration
1.5 Hours

No. of Players
6 -10 players



Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

GAME-PLAY

In the game, participants play the role of a city council. Participants need to make different decisions on what they would invest in toward making their city smart, and they have to contend with the priorities and constraints faced by their cities.

Mirroring the Smart City Challenge, the game 'Thrift' too requires the city council to ensure citizen participation and grapple with how that influences their decisions. Given these different dynamics, the goal of the city councils is to ensure financial sustainability for their cities.

OUTCOME

Budget training for Smart City proposals.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

SMART CAMPUS SIMULATION

A simulation based tool to understand energy consumption patterns and behaviour cost reduction in large campuses.

OBJECTIVE

We conceptualised and campus as a socio-technical system and use design theory to look at adaptive approaches to improve energy utilisation. This work also explored approaches to convey the need to change energy usage patterns to address the issue of the campus's carbon footprint. Just as energy usage behaviour assumes energy to be ubiquitous, we planned to understand the use of technology to achieve responsible energy consumption ubiquitously as well.

Intended Audience
Campus administration, Energy researchers, Architects

Keywords
Energy-consumption, Adaptive, agent-based simulations, Socio-technical system, Sensor Deployment

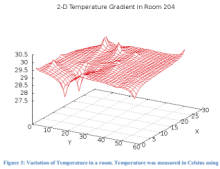
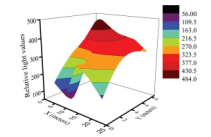


Figure 3: Variation of Temperature in a room. Temperature was measured in Celsius using TMP36 sensor



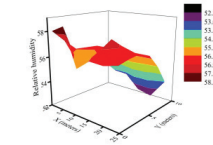


Figure 5: Plot of Relative Humidity (values vary from 0-100) in a room. Humidity was measured using the DHT22 sensor.

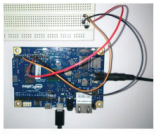


Figure 6: Photograph showing temperature sensor interfaced with Intel Galileo board.

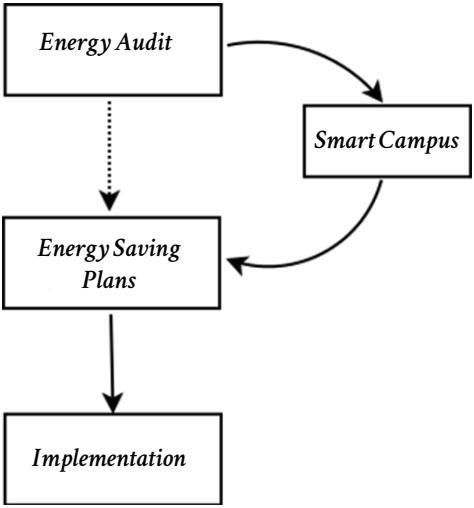
APPROACH

In order to model the socio-technical aspects of the campus, we collected data about the physical dimensions, the energy meter readings from its buildings, a catalogue of all the devices with their locations, campus operational policy, user behaviour and their preferences. We used IIIT - Bangalore as a case study.

We used FoV's Phoenix simulation platform to implement an agent based model for the campus along with additional information such as population, the current billing and tariffs, etc,. Using this model we create different scenarios of operations for the campus such as:

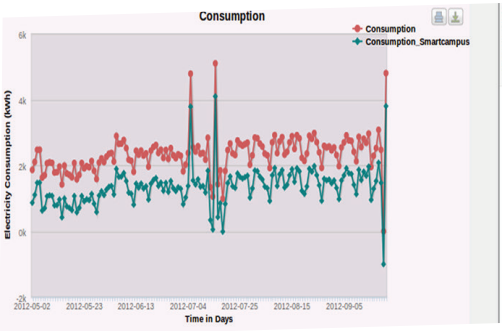
- How does the energy usage behaviour change with staggered work hours and changing course structures?
- What is the cost-benefit of deploying a new technology, for example, an adaptive sensor based device control, on the campus?
- How can we raise awareness about issues of climate change and energy responsible consumption with a dynamic campus population?

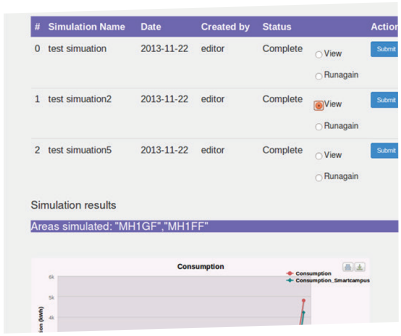
Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



OUTPUT

- A multi-agent simulation tool for a smart energy campus.
- A specification for the sensors for long term deployment.
- A range of possible energy saving options based on different policies and scenarios.
- Research articles.





Acknowledgements

This research was funded and carried out in collaboration with CEEMS Lab, International Institute of Information Technology, Bangalore.

Publications

Harsha Krishna, Onkar Hoysala, Murali Krishna G., Bharath M. Palavalli and Eswaran Subrahmanian. (2014). Modelling technology, policy and behaviour to manage electricity consumption. Proceedings of the IEEE Region 10 Humanitarian Technology Conference, Chennai.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

MULTIAGENT SIMULATIONS FOR INTEROPERABILITY DURING DISASTER MANAGEMENT

A gaming and simulation framework for designing, testing and validating SOPs for disaster management.

OBJECTIVE

This project uses a gaming and simulation framework for designing, testing and validating Standard Operating Procedures (SOPs) for disaster management which adhere to the local institutional support frameworks, and are process and semantically inter-operable.

We use a gaming and computerized simulation methods in conjunction with each other for participatory design of interoperable standards for disaster management. Gaming methods provide a platform for experiential learning for the participants, and for validation of SOPs through what-if scenarios. Computerized simulations help test the efficacy of the shared vocabularies which is used by agencies involved in disaster management.

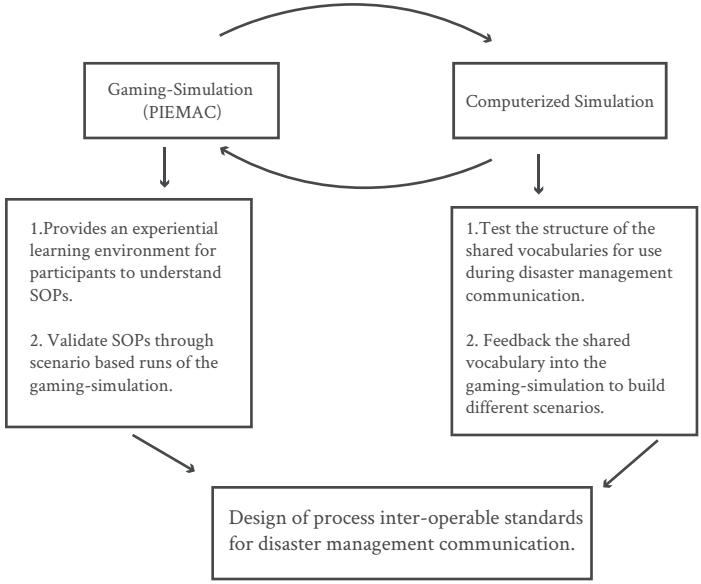
Intended Audience
Policy Makers

Keywords
SOP, policy, PIEMAC, shared vocabulary

APPROACH

To test Standard Operating Protocols and their operation during disaster management, we use games to collect data about messaging constructs – how do agencies communicate with each other? We then build a shared vocabulary for communication that the agencies can use for semantic interoperability. A shared vocabulary informs participants about whom they can communicate with, what their message constructs ought to be, and what file format of communication they could use, among other things. Using the computerized simulations, we test the shared vocabularies under different disaster scenarios.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



CASE STUDY

We developed a simulation tool to test the effect of use of shared vocabularies on communication during disaster management. The shared vocabularies were built using messages from sessions of the PIEMAC game. The computerized simulation developed was used to test the efficacy of this shared vocabulary under different disaster scenarios, and the simulation results were analysed to provide recommendations for effectively designing the shared vocabularies.

OUTPUT

This effort utilises PIEMAC as a crucial component in the framework, as a game for data collection. Two key outputs are the simulation itself, and recommendations for the Standard Operating Procedures.

Acknowledgements
This project was funded by the Natural Resources Data Management System, Department of Science and Technology.

Collaborations
DST, IIIT-B

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

URBAN POVERTY

A study to understand the contribution of the urban poor to the economy and functioning of the city.

OBJECTIVE

In recent times, there has been a shift in conceptualising poverty in an interconnected manner, rather than in a reductive way. If poverty is a multidimensional phenomenon, what then is the nature of the relationship between poverty, income/wages, and well-being? What are the implications of such a conception of poverty, income/wages, and well-being for programmes addressing poverty?

Intended Audience
Slum residents, activists and civil society, policy makers, and academia

Keywords
Urban poverty, slums, livelihoods, mobility, shelter, social mobility, living wages

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

Research on urban poverty

There are four challenges in understanding poverty for policymaking: First, traditional approaches to understanding poverty either focus on the micro-level or on the macro-level, and there is a disjunction between these two approaches. Second, capturing the consequences of policies that reflect in the long-term and understanding their impact on individuals' lives is not easy to model. Third, the interlinkages between various dimensions of poverty and how it changes with time is again not easy to model. Fourth, the needs and preferences of people are not included in the policymaking process.

In order to address these challenges, at Fields of View, we use a computational modelling approach, which combines both simulations and games. We use agent-based modeling that allows us to model micro-level behaviour and integrate it with macro-level data. In addition, the computing power available today allows us to model interlinkages between different dimensions and examine change over a period of time. As the simulation can be run for an extended period of time, it is possible to examine long-term consequences of policies at both micro-level (individuals' lives) and macro-levels (level of inequality).

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

CONVERS*(T)*ATION

To increase reporting of sexual harassment of women in public spaces

OBJECTIVE

While newspapers debate over women's safety, can we think of designing options to enhance a sense of safety of women in public spaces, without compromising their freedom?

It is this question we explored in a cross-cultural design collaboration between two teams, one in Bangalore and the other in Amsterdam, comprising students of both Indian and Dutch nationalities. The focus of the team in Bangalore was to address under-reporting of sexual harassment of women in public spaces.

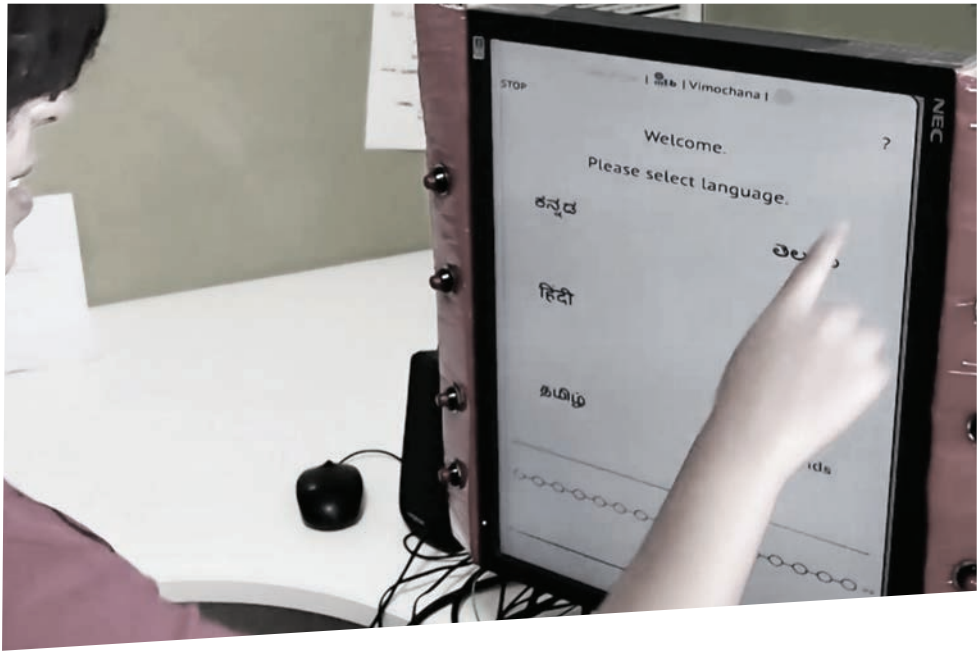
Intended Audience
Women's rights organisations, public service providers, and the public at large

Keywords
Women's safety, design

APPROACH

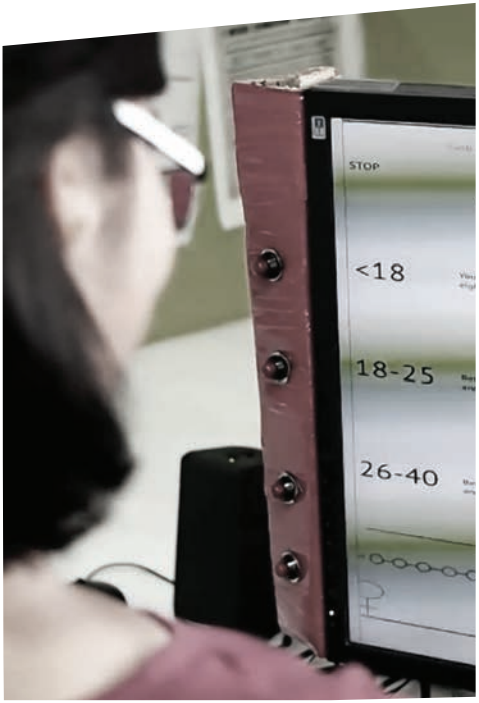
A combination of the methodology followed at mediaLAB Amsterdam and Fields of View, involving framing the problem, field visits, discussions and interviews with experts, designing the device, and user tests.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in



OUTPUT

- Prototype of an electronic panel,
- Convers[t]ation, for informally reporting cases of sexual harassment.
- A white paper on the institutional support required for the panel.



Acknowledgements
Shakun Mohini, Vimochana; Sandhya Rao, Hengasara Hakkina Sangha; Laxmi Murthy, journalist

Collaborations
The project was a collaboration between mediaLAB Amsterdam, IIIT-B, and Fields of View.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in