Serious Gaming: Helping Stakeholders Address Community Problems

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Citizens are increasingly coming together to solve problems that affect their communities. Participatory modeling is a method that helps them to share their implicit and explicit knowledge of these problems with each other and to plan and implement mutually acceptable and sustainable solutions.

While using this method, stakeholders need to understand large amounts of information relating to these problems. Various interactive visualization tools are being developed for this purpose. One such tool is 'serious gaming' which combines technologies from the video game industry – mystery, appealing graphics, etc., – with a purpose other than pure entertainment, a serious, problem driven, educational purpose.

Such gamification is an opportunity for participatory modeling approaches to embed models and simulations of complex processes into games and to attract the stakeholders. These game-like simulation tools help stakeholders to deal with uncertainties intrinsic to many models by trying out various scenarios. For example, they can choose different futures based on their desirability and not necessarily their likelihood and then work backwards to identify ways that might lead to them. This enhances their understanding of various dynamics and the trade-offs involved.

Games can also be used to bring together diverse groups of stakeholders who 'play out' their intentions and interact with each other promoting sharing of knowledge among them. They can also be used to incorporate indigenous knowledge into models and teach decision-making skills to the stakeholders.

Several advanced technologies, such as stereo glasses, 3D and immersive environments, models linked with virtual geographic environments, and mobile applications, are being incorporated in game development. Apart from use of such technologies, design and development of games requires creativity and involves several stages, such as conceptualizing characters, their visual design, linking models and testing prototypes, before eventually deploying.

Despite its immense potential as a visualization platform for stakeholders, especially for those who are 'ordinary' citizens, gaming is yet to become a mainstream tool in most participatory modeling exercises. For this to happen requires tools to simplify game development. Towards this goal, several gaming conferences, such as the 'serious games conference', are held every year.

Even simple games can be powerful. For example, we were able to successfully use a simple water

mining game to make high school children in villages understand that the main cause of their ground water crisis was not so much due to decrease in rainfall as to over-exploitation of ground water by the villagers. Before they started playing the game, the children mapped the wells and farms in their village using a mobile GIS (Geographic Information System) application and overlaid these maps on a satellite image of their village. As part of the game, each of them started ‘digging new wells’ or ‘deepening existing wells’ based on their perceptions and economic background. They quickly realized that they were all sharing a very limited ground water resource and that over-exploiting it in the short run meant they would have much less of it in the long run, especially when they needed it most eg., in summer for meeting even their drinking water needs.

If you have any such examples to share, we would be very pleased to learn from them and maybe use them in our setting.

Biography: *Nagesh Kolagani is a faculty member at the Indian Institute of Information Technology, Chittoor. He teaches IT systems and IT workshop courses and carries out research projects on participatory GIS, modeling & simulation, gamification and crowdsourcing. Prior to that, he was a Principal Scientist at the Indian Institute of Technology, Madras developing and demonstrating simplified open source mobile and web GIS software for use by school children and farmers in villages. He spent about eleven years in a village practicing and promoting organic farming, traditional medicine and afforestation, and exploring use of participatory GIS and modeling in these activities. He also worked for seven years in the software industry both in USA and India. He is a member of the Participatory Modeling Pursuit funded by the National Socio-Environmental Synthesis Center (SESYNC).*

Associated Project:
Participatory Modeling [2]

Links
[1] https://i2insights.org/2016/06/09/serious-gaming/
[2] https://www.sesync.org/project/enhancing-socio-environmental-research-education/participatory-modeling