
Enabling 'New' Practices of Renewable Energy Sharing: A Cross-Cultural Approach

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Abstract

Local generation, distribution and consumption of renewable energy within neighborhood is an emerging application context for the concept of 'sharing'. This position paper introduces a cross-cultural approach to enable 'new' social practices of renewable energy sharing in neighborhoods. The approach is being developed based on ongoing field-research on Energy Cooperative in The Netherlands and solar-lamp sharing service in rural India. The approach is theoretically grounded in Social Practice Theory. In this paper, we briefly discuss the role of digital interactive technology to support the cross-cultural approach to enable 'new' energy sharing practices.

Author Keywords

Sharing; Renewable Energy; Social Practice Theory; Rural India; The Netherlands

ACM Classification Keywords

H.5.m [Information interfaces and presentation]: Miscellaneous; J.4 [Social and Behavioral Sciences]: Sociology.

Introduction

Across the globe, emerging Smart Energy Systems, Energy Cooperatives and Community Energy initiatives are offering possibilities for 'new' practices of renewable

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Figure 1: Rural Spark's energy-supplier in village of Gaya district, Bihar State, India



Figure 2: Solar lamps that are part of lamp-sharing service



Figure 3: Neighbourhood of Achter De Hoven, Leeuwarden, The Netherlands

energy sharing within neighborhoods. According to Shove et al. [5], 'new' practices are formed by innovative integration of three elements (materials, meanings and competences) of practices. Materials include technology, things, hardware, software and infrastructure. Meanings include values, norms, ideas, desires and reasons. Competences include know-how, knowledge and skills. All three elements are required for practices to be performed and to become active in real world. These elements are dynamically inter-linked and mutually shape each other. 'New' practices for this research are practices that are not yet active in real world due to missing elements of practices but are envisioned to become part of everyday reality in near future. For instance, infrastructure for renewable energy sharing within neighborhoods in The Netherlands is not available yet and hence practices of renewable energy sharing cannot be performed. We argue that even though these 'new' practices may not be yet active in real world they are important for design and research inquiry as they offer unique possibilities in near future. This poses the following design questions: How to design for 'new' practices of renewable energy sharing? How can digital technology support the emergence of 'new' sharing practices till the necessary elements of practices become widely available?

This position paper introduces a cross-cultural approach that aims to enable 'new' practices of renewable energy sharing in neighborhoods. The approach is targeted to designers that strive to support the emergence of 'new' practices in this regard. The approach is an outcome of field-research on an Energy Cooperative ¹ in The Netherlands and Rural Spark's ² solar-lamp sharing services in rural India (see Figure 1, Figure 2 and Figure

3). During the field-research, we realized that due to variety of reasons, such as, non-availability of technological infrastructure (material) and dominant view of 'abundance' of electrical energy (meaning), renewable energy sharing practices are not active in neighborhoods of The Netherlands. In contrast, practices of solar-lamp sharing service are emerging in rural India and incorporate many interesting aspects, such as, convergence of monetary and non-monetary forms of energy sharing and use of social relationship for energy sharing. We realized that some elements of energy sharing practices in rural India are relevant in context of Energy Cooperative in The Netherlands. Hence, we propose a cross-cultural approach that utilizes the theoretical view of Social Practice Theory [5] on movement, travel and circulation of elements of practices and integration of diverse elements to enable 'new' practices. This approach connects with the theme of 'creating new sharing practices' of 'design for sharing in local communities' workshop. In this paper, we briefly discuss the role of digital interactive technology to support the cross-cultural approach to enable 'new' energy sharing practices.

Framing 'Energy Sharing'

The ongoing debates on commercial and non-commercial sharing systems have not sufficiently focused on sharing of renewable energy within neighborhoods. The sharing of renewable energy remains an understudied subject. This research focuses on application of 'sharing' and related concepts (such as pooling, gifting, renting) to the domain of renewable energy. Based on work of [1, 6, 8], the research defines 'Energy Sharing' as 'people-centered distribution, re-distribution and circulation of renewable energy within neighborhoods'. The research explores theoretical and conceptual insights on 'sharing' originating from literature on economic anthropology and sharing

¹<http://www.ecachterdehoven.nl/>

²<http://www.ruralspark.in/>

economy. The research is related to emerging discussions about application of sharing concepts to local distribution of renewable energy [2, 4]. The research connects with the initiatives (e.g., GridMates³, Shifft⁴, Buurkracht⁵) that combines local distribution of renewable energy with interactive technology.

Related Works

The research fits within the ongoing debates in HCI and Sustainable Interaction Design (SID) where social practices are taken as an unit of analysis and design [3, 7].

Cross-Cultural Approach for Energy Sharing

Our Cross-Cultural approach argues that 'new' practices of renewable energy sharing (Focus Domain) in a particular sociocultural context (Focus Context) can be enabled by utilizing:

1. energy sharing practices from another sociocultural context (Reference Context) and
2. other existing sharing practices in the Focus Context but from different domains (Stimulating Domain). See Figure 4.

The Focus Domain for this research is renewable energy. The Focus Context is the sociocultural context for which 'new' energy sharing practices are to be enabled. In this research, neighborhoods in The Netherlands where practices of energy sharing are not existing at the moment represent the Focus Context. The Reference Context is the sociocultural context where the desired practice of energy sharing is existing or emerging. In this research, rural India where practices of energy sharing are emerging

³<http://www.gridmates.com/>

⁴<http://shifft.com/>

⁵<https://www.buurkracht.nl/>

represents a Reference Context. The Stimulating Domain refers to other exiting sharing practices in everyday life. Some Stimulating Domains for this research are meal sharing, urban-garden sharing, water and land.

Social Practices, 'Migration' and 'Extension'

This cross-cultural approach is grounded in Social Practice Theory's view on movement, travel and circulation of elements of practices (materials, meanings and competences) and integration of diverse elements to enable 'new' practices [5]. According to Shove et al. [5] the elements of a practice can circulate and travel between practices, places and diverse sociocultural contexts. We define 'Migration' as transfer and circulation of elements of practice from one sociocultural context to another. Similarly, 'Extension' refers to transfer and circulation of elements of practice from one domain to another.

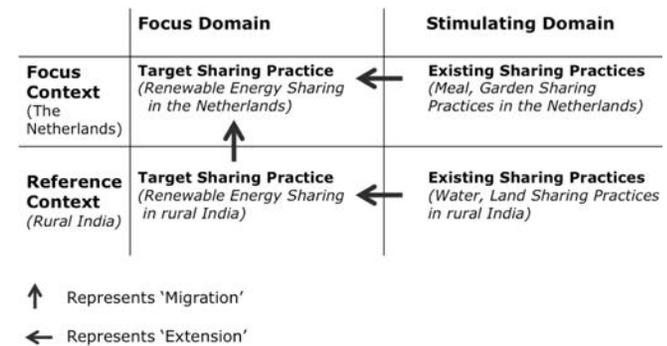


Figure 4: Model representing our cross-cultural approach

Digital Technology to Support this Approach

We regard that digital interactive technology can play a crucial role in supporting 'migration' and 'extension' of elements of energy sharing practices and so enable 'new'

practices of renewable energy sharing in neighborhoods. Following design considerations can facilitate this:

- Design for 'Extension' of sharing practices: Concepts of gamification and mechanisms of serious games can play an important role in transfer of 'meanings', 'material' and 'competences' of sharing practices from one domain to another. Social media based awareness campaigns can help in circulation of 'meaning', creation of a sharing community and in recruitment of people as practitioners of 'new' energy sharing practices.
- Design for 'Migration' of energy sharing practices: Techniques of simulation games can help in virtually creating 'material' component (infrastructure) of energy sharing practices that are not yet readily available in real world. This would allow people to experience energy sharing practices. Serious Games can help in building 'competence' for energy sharing. Video interfaces and social media can help in transfer of 'meanings' as these can facilitate interaction between practitioners from different sociocultural contexts.

Discussion and Conclusion

The cross-cultural approach brings attention to elements of sharing practices. Often the focus of sharing initiatives are limited to installation of 'material' (infrastructure) but ignores 'meaning' and 'competence' components of sharing practices. This limitation is also observed in existing pilots of Smart Energy Systems in The Netherlands. Digital interactive technology can enable 'new' renewable energy sharing practices in neighborhoods by facilitating transfer and circulation of elements of practices (meanings, materials and competences). Digital

technology can help people in experiencing elements of energy sharing practices even before all the elements are readily available in their sociocultural contexts.

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References

- [1] Belk, R. Sharing. *Journal of Consumer Research* 36, 5 (Feb. 2010), 715–734.
- [2] Crosby, M. An Airbnb or Uber for the Electricity Grid? http://blog.rmi.org/blog_2014_09_02_an_airbnb_or_uber_for_the_electricity_grid, 2014.
- [3] Pierce, J., Strengers, Y., Sengers, P., and Bødker, S. Introduction to the special issue on practice-oriented approaches to sustainable HCI. *ACM Transactions on Computer-Human Interaction* 20, 4 (Sept. 2013), 1–8.
- [4] Rifkin, J. Energy-sharing is the new internet. <http://www.wired.co.uk/magazine/archive/2012/02/ideas-bank/energy-sharing>, 2012.
- [5] Shove, E., Pantzar, M., and Watson, M. *The dynamics of social practice: everyday life and how it changes*. SAGE, Los Angeles, 2012.
- [6] Strengers, Y. *Smart Energy Technologies in Everyday Life : Smart Utopia?* 2013.
- [7] Wakkary, R. O. N., Desjardins, A., Hauser, S., and Maestri, L. A Sustainable Design Fiction : Green Practices. *ACM Transactions on Computer-Human Interaction* 20, 4 (2013), 1–34.
- [8] Widlok, T. *Property and Equality-Ritualisation, Sharing, Egalitarianism*. Berghahn Books, New York, 2005.