

Engaging Local Community through Participatory Design to Achieve Sustainable Development.

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Abstract

Information and Communication Technologies (ICT's) in developing countries has played an essential role in economic growth and development in most low and middle income countries (R. Heeks, 2002). Heeks further discussed that the use of ICT increases efficiency, provides access to new markets or services and creates new opportunities for low and middle income countries. Thus ICT has been promoted as a major driver and facilitator of economic growth. Notwithstanding considerable ICT improvements achieved in low and middle income countries for instance; spread of mobile telecommunication, use of information management/decision systems, internet services and other ICT initiatives. However much improvements of ICT design and development approaches are needed to reap the benefits from its interventions in low and middle income countries (Gerster, 2008). The authors address these issues by presenting several tools and techniques that they feel are more suited to the developing world and essential components of a candidate participatory design methodology. These tools and techniques include the use of co-design, co-creation and participatory design tools and techniques such as 'role play, context mapping, collages, lego constructions, ethnography and constructive thinking to highlight pertinent developing countries issues, the importance of developing a motivated user group and the need for a progressive participatory design approach.

Participatory Design (PD)

Participatory Design (PD) draws from a long tradition which was born out of worker movements in Scandinavia in the eighties, empowering workers to co-create their working space. Since then, participatory design methods have been refined and adapted to ICT development among other disciplines, recognizing the end users as content experts and valuable participants in the design process itself. PD involves users from the onset into the development process (Diettrich, Eriksen and Wessels, 2014). Within PD the user or client's context, resources available, and needs are jointly explored and mapped. User participants uncover many opportunities and produce viable ideas that solve problems and create solutions that can be implemented. Often an iterative process, where ideas are tested, improved, and missed opportunities and refinements done within the development process are applied (Davies & Wilson, 2013). Davies and Wilson further added that PD uses prototyping to test results, plans, and process maps to implement the solutions, making tools and methods used in PD to guarantee a positive and consistent user

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experience. With this context we therefore postulate that PD is a most promising approach that can be used to engage the local communities in the developing countries to design effective and sustainable information communication technology (ICT) systems in order to attain economic development.

This paper will focus on and discuss the applicability of PD tools and techniques that can be employed to design sustainable ICT systems for developing countries hence economic growth and development. To aid in our analysis of PD for the developing world, we present three case studies which were implemented in Namibia and Botswana using different research participants. By using case studies, we aim to concretise the discussion within an understood framework.

Case one: Thamaga community pottery Botswana

Thamaga Pottery firm consists of sixteen (16) workers, and in our study only eight (8) participants were engaged in PD sessions, among them was firm manager, two supervisors and five workers. The purpose of study was to address communication, relationship and management grievances within Thamaga pottery firm to ensure smooth day to day management. In this regard communication is a very sensitive issue that needs to be handled with great care because it can either build or destroy relationships in a community. Engaging participants in PD session while applying different PD tools and techniques for example role play, co-design, co-creation, context mapping enabled us to identify community politics as major problem and challenge phased by the organization. In this regards community politics is the state of having people who share the same interests, values, norms or culture having differences resulting to formation of different camps within the same work environment. Some of these camps were spearheaded by supervisors and infiltrated with gossip, jealousy, hatred and reluctance. According to participant this poor cooperation led tremendously to the reduction in firm’s production and the firm’s was no longer able to sustain its operations. The graph below shows the summary of problems and challenges that were identified at Thamaga Pottery firm:



Workshop two was organized to design possible potential solutions to combat problems and challenge identified in first workshop, in this workshop we engaged

participants through role play, constructive thinking, co-design and co-creation to design effective and generally accepted remedy to problems and challenges identified in the first workshop. During PD design session the participants suggest to; organize regular departmental meetings, give workers time to ask and answer questions during meetings, interpret the conditions of service and code of conduct to native (local Setswana) language, organise a common tea room where workers in different department get acquainted to each other, including suggestions and challenges in work assessment form, elect a representative for the board meetings from the workers and finally recruit an assisting personnel to help manager. As potential solution to problems phased by the firm.

Given the short time frame, of two weeks only, we were not able to implement all the suggested solutions, however the participants and the research team agreed to implement departmental meetings as it would help alleviate multiple issues. For example. the lack of low-level communication within Thamaga pottery firm. Participants also lamented that as much as workers shared work related issues among their camps, there was no process and accountability or follow-ups. Participants believe that with properly held regular departmental meetings between the workers and supervisors many problems identified in workshop can be resolved. In addition to that workers will feel at liberty to express themselves during general meetings. Departmental meetings will also increase workers trust in delegates selected to represent them during board meetings. In our third joint workshop we designed simple and clear meeting templates in both English and Setswana languages. The template had instructions to guide the departmental meeting chair. The participants were very happy with the outcome. They believed that with a new structure and the lessons learnt from holding appropriate departmental meetings promoting constructive communication will increase workers trust in management henceforth increasing commitment and co-operation resulting in higher rates of productivity.

Case two: Stock market transaction system (Namibia)

In this study we engaged local community with interests of trading in stock markets in a PD session. The aim was to co-design appropriate applications that can be used to send updates of stock market prices to enable traders to make informed decisions. The participants were engaged through game playing, context mapping on trading strategies and preferences on the tradable stock. Thereafter an open discussion on open issues and general application development was held. Features and user interactions required were elaborated

The participants selected mining, agriculture, tourism, drugs and weapons as profitable organisation. Mining was considered most profitable because its products keep on appreciating over long period of time. When engaged in the context mapping on tradable items, diet and nutrition, cosmetics and therapy, construction and properties, retail and trade, Social media, Telecom and Gold and silver were pointed out as most traded items in the Namibian stock exchange markets. The participants suggested that in order to maximise profits on stock markets, a trader must buy more when many are selling as prices fall, then sell when the prices appreciate.

The participants determined mobile stock market transaction system as suitable application that can be used to update them and initiate transactions on stock markets, they added that the application must be user friendly, compatible with all mobile device platforms and easy to access placement orders. Furthermore the following features were suggested to be included in the application; Foreign trading exchange features, list of shares on demand, Access to an individual's account to commence transactions, Link the buyers and sellers physically, Précised platform, details of the shares, very clear buy and sell buttons, Clear trends and predictions of the shares (rising or falling), Attractive interface and less congested interfaces.

Case three: Self-actualisation of unemployed youth (Namibia)

Considering the high number of unemployed youth in Namibia and Africa as whole, this study investigated the prospective of PD as an approach to unleash the youths' potential to contribute towards viable solutions and services for unemployed youth in Namibia. We believed that inclusion of youth into participatory design activities can unleash their dormant potential of creativity, technological inclinations, as well as their energy to resolve youth related issues by themselves. We conducted the series of PD design workshops with thirteen (13) youth that fully attended and committed to a continuation of the joint initiative.

A first initial half day workshop was held with the youth to explore their context as well as skills and preferences while second workshop, distributed over two days, a common theme of action was decided and subsequent joint sessions contributed towards the implementation of a solution. The workshops involved game playing and exploration of different technologies such collages, role plays, legos, context mapping, constructive thinking, sticky papers and evaluations of a series of open discussions and brainstorming. Beyond these variations in content, we aimed for consistency in as many aspects of the workshops as possible. The youth were able to identify poor attitude towards life associated with lack of responsibility, colonised minds and lack of vision as the cause of problems faced by underserved youth, such as road accidents, insecurity, unemployment and domestics violence which in turn emanated to other sub categories of problems such as pregnancy and poverty. To solve these problem participants suggested that poor attitude must be addressed first. Creation of youth platforms, workshops with youth, career and dumpsite campaigns, youth forum conference, mobile applications were some of the suggested solutions that could be used to change youth attitude. According to the youth if these approaches were used, it would enable the youth to realise their potential therefore changing their attitude and mind set towards life. This led to the immergence of "self-actualisation for youth (SAY)" as the agreed project theme.

In the second instance a design session was held to identify all features of the platform/system to be implemented. To encompass the dumpsite campaigns and youth self-actualisation, the participants identified tasks to design a platform and suggested the following requirements to be implemented in the tool; online counselling and career guidance functionality, streaming option to keep records of television and radio shows or campaign sessions held by youth, implementation video, audio, and flash multimedia, download and upload photos, videos and articles system, online forum, crowd-funding campaign and short messages gateway systems, links to other social sites such Facebook, twitter, advertising page. They also argued that the platform must enable users to register as user or carrier guiders.

User needs specification and analysis (participatory design).

The researchers utilised PD tools and techniques successfully during the design process. The generation of various needs, problems, challenges and potential solutions are as results of PD tools that were found to be particularly useful in a developing world context. In most of these case studies the authors used PD essentially as a fusion of co-design, co-creation, and ethnographical principles, where the designer/researcher is an observer trying to gain an understanding of the user and their immediate context (environment). Typically a contextual design process consists of seven phases, namely a contextual inquiry, work modelling, consolidation, work redesign, user environment design, prototype and testing (Edwin Blake 2011). Thus it emphasises the development of an understanding of the users' daily goals, tasks and how the users respond to various prototyping techniques and artefacts. Parikh, Ghosh and Chavan (2010) demonstrated the need for contextual, ethnographic analysis techniques to be used. Ghosh and Chavan's results showed that such techniques are useful and thus a key component of any developing world design approach.

Whilst existing software development tools and techniques such as user centred design, agile and rapid application development have proven to be useful/applicable in developing world design initiatives. No guidelines or frameworks exist, within those techniques, that address developing world specific issues nor do they provide any guidelines regarding the application of that methodology within a developing world design context.

This problem manifests in during requirement analysis and specifications, where in most cases observations are translated into requirements. This works well in developed countries where new ICT system are often added to an already existing ICT ecology. As opposed to the developing world where in most cases any ICT system developed will be completely novel within the existing context. This means that it is hard to generate requirements upfront as the introduction of the system will massively impact the context in which it is being deployed. To help focus the requirements specification on pertinent developing world issues, we recommend to use of participatory design techniques that involve users in design of ICT products that include appropriate design process to new cultural contexts, this is meant to check on failures of some PD techniques which occur as results of not considering cultural boundaries(Winschiers, 2006). Therefore making the designed ICT systems suitable for the local community.

Conclusion

We presented PD with three individual case studies which make use of a community based PD approach to develop applications using, co-creation alongside co-design. The case studies demonstrate that community based PD can be successful in designing generally accepted service, application and ICT systems therefore ensuring the sustainable development as the local community will be in position to maintain services, applications and ICT systems after deployment. The collaborative

work done in both case studies helped the development of solutions required in respective workshops.

The results of designs showed that PD process involved clear communication, team work and cross-fertilisation. Whereas it is also important to conduct feedback via users, clients, and the community based design team. Part of PD process ensured that the team members had a shared understanding of the design method and tools used in design sessions this showed openness and knowledge sharing. We also observed that participant's choices were very inspiring and different from choices we would have made for them. In this contexts local users become increasingly familiar with technologies designed in other wards they are co-designers rather than subjects of investigations or solely evaluators of intended ICT systems (Winschiers-Theophilus, 2012). In brief PD serves as a reality check to keep designers grounded in the reality of the users, or else, designers may create too much change in an unsustainable manner as it has happens far too often with most of the ICT systems in most low and middle income countries including Namibia.

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