Pair Writing: Towards Agile Participatory Design

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Abstract

Participatory Design practices are notorious for their drawbacks in empowering design stakeholders in the term of resources utilization. The issues of time, finance and engagement effort often hinder the practice of participatory design in a high-paced business-driven design environment. During our fieldwork in the adoption of radio frequency identification (RFID) technology in the Danish retail industry, we conducted our work within a framework of *Iterative Phase Model™ (IPM)*, a model that is developed to cope with any technology adoption cases. The model is domain and technology independent. In our case, we have applied the model to cope with the adoption of radio frequency identification (RFID) technology in the Danish retail industry that includes Pair Writing. The paper will introduce the IPM in relation to Pair Writing and demonstrate a case study of Agile Participatory Design.

1 Introduction

The Iterative Phase Model (IPM) is inspired by the needs to optimize resources utilization and improve stakeholder contribution for projects with short life cycle. The agility to move forward swiftly through phases in a process is the emphasis in the practice of the model. The model consists of four phases, i.e.: *Fieldwork*, *Reflection*, *Design and Development* and *Evaluation*. Within a process, each phase produces one or more process artifacts as an input for a subsequent phase in the process (see Figure 1). The artifacts can be refined, augmented or discarded depending on the context and progress of each phase.

One of the roles that plays a significant influence in IPM is *Facilitator*. Facilitator is a stakeholder that starts and ends the process, involves in each phase of the process, drives forward the process through phases and continuously makes decisions to start and end each phase. Depending on the needs and context of each project, a project manager can also play a role as a Facilitator. In our work, the second author is the project manager that plays the role of Facilitator. In this paper we will focus on the discussion of Reflection, Design and Development and Evaluation phases of IPM. The Fieldwork phase is discussed in details in (Tedjasaputra & Sari, 2005a).

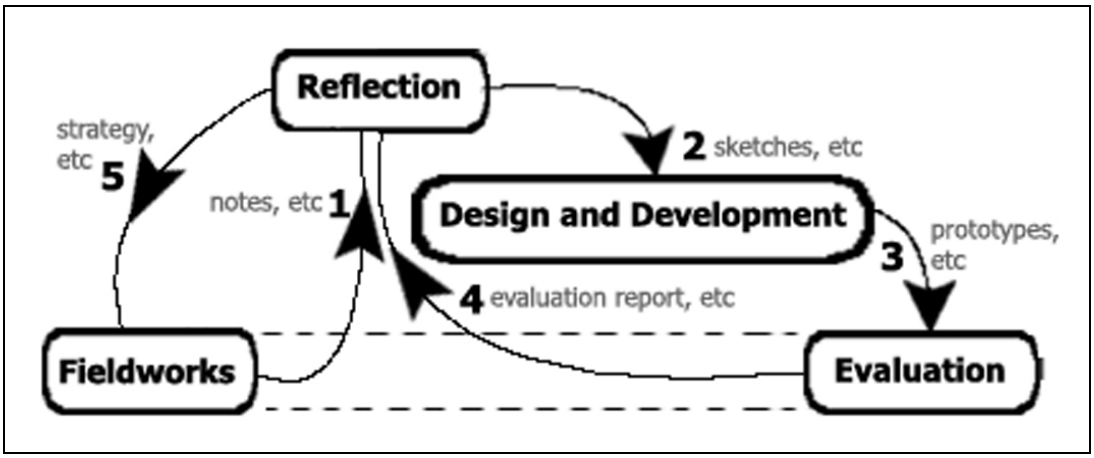

Figure 1: The model diagram of Iterative Phase Model

2 Reflection Phase

In our work, *Reflection Phase* consists of four activities, i.e.: *Pair Writing* (Tedjasaputra, Sari & Strom 2004, Tedjasaputra & Sari 2004), *Discussion*, *Literature Study* and *Analysis*. These activities happen in an arbitrary sequence. The sequence of the activities is not always the same in each iterative cycle. During the first iterative cycles, discussion, analysis and literature study dominated the reflection activities. Only after we finished with the first "prototype" of Pair Writing and evaluated it, we introduced Pair Writing (see Figure 3) in the subsequent Reflection phase.

Furthermore, we have categorized the Reflection phase into two different kind of activities based on the interaction among stakeholders, i.e. *Collective Reflection* and *Individual Reflection.* Pair Writing and Discussion are the reflexive activities that fall into the Collective Reflection category, while Literature study and Analysis fall into the Individual Reflection category (see Figure 4). The stakeholders can conduct these activities either synchronously or asynchronously in the framework of interaction among stakeholders.

The classification is important to "tune" the balance in the Reflection phase and maintain the synergy of interaction among the stakeholders. An example of tuning the balance of the Reflection phase is to allocate twenty percent of reflection activities for Collective Reflection and the other eighty percent for Individual Reflection in the first iterative cycle (see Figure 5). We have managed the first iterative cycle to be as short as possible, because we needed to move swiftly to the Design and Development phase and produce some low-fidelity prototypes that can be used as some tangible objects in subsequent phases. In the subsequent iterative cycles, we increased the allocation for the Collective Reflection and decreased the allocation for the Individual Reflection gradually. We kept tuning the allocation until we reached a "stable" stage in which more tuning would give no significant contribution to the Reflection phase. After this stable stage, we reversed the tuning with increasing allocation for Individual Reflection activities until the life span of the project ended.

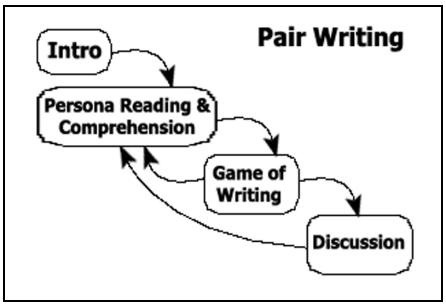

Figure 3: Pair Writing

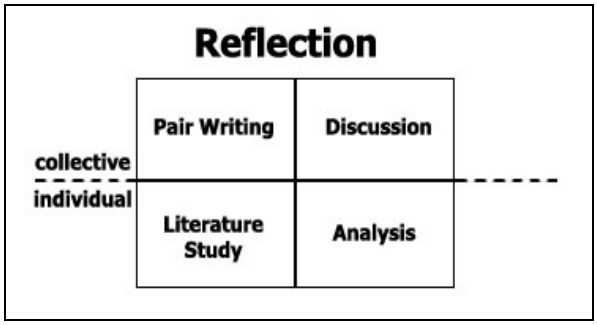

Figure 4: Individual and Collective Reflection Phase

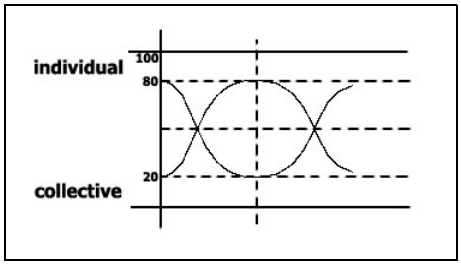

Figure 5: Tuning the balance of the Reflection phase

3 Design and Development Phase

The activities within the *Design and Development* phase concentrate on the design and development of tactical and strategic plans, personas and scenarios and prototypes. The design and development of prototypes in the Design and Development phase provides subsequent phases with tangible objects. Depending on the resources allocated and the maturity stage of the process for the design and development of prototypes, the produced prototypes can be in the forms of either low-fidelity prototypes or high-fidelity prototypes. In our case, we have produced low-fidelity prototypes in the forms of sketches, posters, a storyboard and devices (see Figure 6).

Tactical and strategic plans in the Design and Development phase provide short-term and long-term guidance in the process. There is no rigid guideline in defining tactical and strategic plans. This makes the role of Facilitator to be important in this phase. An example of a tactical plan for conducting a fieldwork is illustrated in Figure 7.

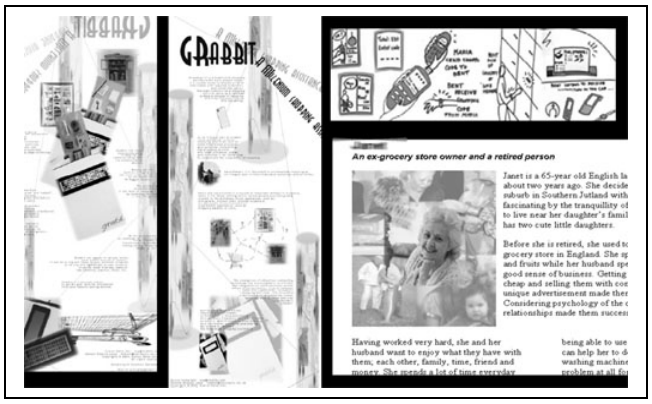

Figure 6: Poster, story board, and persona

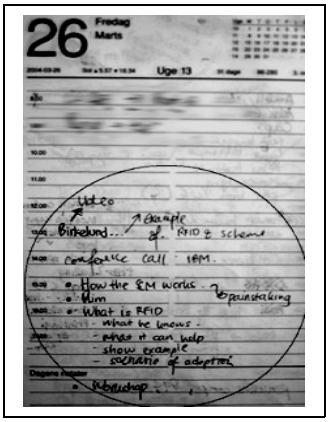

Figure 7: Daily Tactical Plans

In the Design and Development phase, we have used personas and scenarios extensively to support our design decisions. We developed our personas based on the results of previous Fieldwork and Reflection phases. Each time we reached the Design and Development phase, we iteratively refined our personas and occasionally added some new personas depending on the results of preceding Fieldwork and Reflection phases. In conjunction with personas, we created several context scenarios. In our case, we have employed Pair Writing to produce several context scenarios in our Design and Development phase (Tedjasaputra et. al., 2004, Tedjasaputra & Sari, 2004, 2005a, 2005b).

4 Evaluation Phase

The evaluation phase is the last phase before our activities cycle back to the Reflection phase. The purpose of the evaluation phase is to gain some feedbacks for the design artifacts produced in the Design and Development phase, such as shoppers' opinions on Lego prototype of RFID-based shopping appliance. Similar to the Reflection phase, we have classified the activities in the Evaluation phase into two categories, i.e. the Collective and Individual Evaluation (see Figure 8).

In the Evaluation phase, we define the following terms:

Individual Stakeholder can only consist of a stakeholder that produces a process artifact. If the stakeholder comprises of several individuals, the individuals have to be bound by a common interest and goal during their participation in the process, for example: representatives of an organization.

Collective Stakeholder refers to two or more stakeholders that produce a process artifact.

Contributor consists of *Individual Stakeholder, Collective Stakeholder, or Facilitator.*

Contribution Reference marks the contribution of *Contributor* in the creation of a process artifact.

Collective Evaluation means that the evaluation activities are conducted with Collective Stakeholder.

Individual Evaluation means that the evaluation activities are conducted only with Individual Stakeholder

The Evaluation phase utilizes Contribution Reference in each activity. Consequently, a process artifact should bear a contribution reference that refers to Facilitator, Individual Stakeholder or Collective Stakeholder (see Figure 8).

The main reason for the use of the Contribution Reference is the constant change of process artifacts' ownership during the transition from one phase to another. As an example, the transition from Reflection phase to Design and Development phase means that the ownership of Reflection artifacts held by the stakeholders in the Reflection phase has been transferred to the stakeholders in the Design and Development phase, because the stakeholders in the Reflection phase are usually different from the stakeholders in the Design and Development phase. In this case, the Contribution Reference can help distinguish the collective ownership of artifacts from individual ownership within the process. In addition, the Contribution Reference can be useful when the Facilitator needs to trace back the origin of an artifact, the changes applied during the process and the information of Contributor during a Reflection phase.

The main difference between the category of the Evaluation phase and the Reflection phase lies in the use of the terms “Individual” and “Collective”. In the Reflection phase, we use the term “Individual Reflection” to describe several individual activities conducted by a stakeholder isolated from any social interaction with the other stakeholders. In the Evaluation phase, we use the term “Individual” to refer to some evaluation activities conducted by a stakeholder regardless of social interaction issue. Likewise, the term “Collective Reflection” refers to collective activities in the Reflection phase, while the term “Collective Evaluation” refers to some evaluation activities conducted with collective stakeholders regardless of their social interaction.

5 Analysis and Discussion

Pair Writing as a sub-process within IPM has demonstrated its contribution in three phases, i.e. Reflection, Design and Development and Evaluation phases (see Figure 9). Nevertheless, we have not got a chance to employ Pair Writing in the Fieldwork phase, because we mainly used Pair Writing to support rapid ethnography for our HCI field research (Tedjasaputra & Sari 2005a). Even though it is theoretically viable to employ Pair Writing in the Fieldwork phase, it is still difficult to conclude whether Pair Writing is viable for any in-situ fieldwork.

After two Pair Writing sessions ended, we often synthesized context scenarios in a joint or collaborative writing to create a new context scenario in a Design and Development phase (see Figure 10). We have not had a chance to feed the new context scenario in another Pair Writing session in the Evaluation phase, even though it is theoretically viable to include a context scenario in the discussion of a Pair Writing session (see Figure 3) and compare the scenario to other context scenarios.

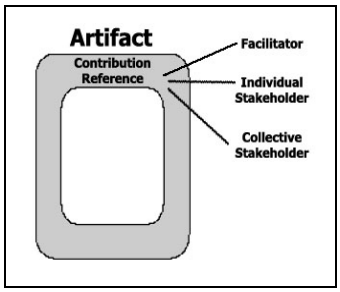

Figure 8: Collective and Individual Evaluation

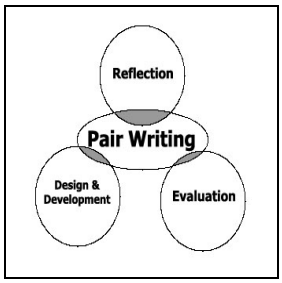

Figure 9: Pair Writing in Reflection, Design & Development & Evaluation phases.

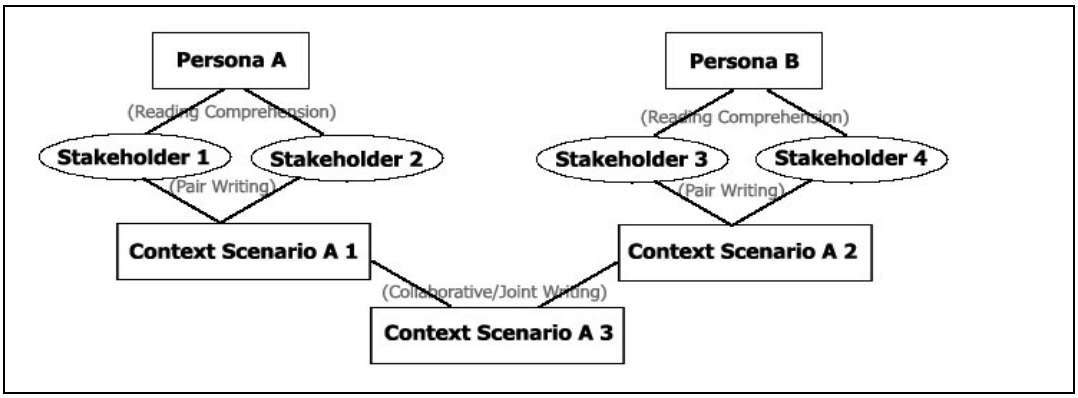

Figure 10: The creation of context scenarios

6 Conclusion

There are still many unexplored issues in the Iterative Phase Model (IPM) and Pair Writing, such as the application of Pair Writing in the Reflective phase, the recursive feeding of context scenario into Pair Writing, more empirical studies related to the "tuning" the balance of synergy in the reflection phase. Nevertheless, based on our preliminary work within the framework of IPM, we have illustrated how Pair Writing can support stakeholder participation and contribute to almost all the IPM's phases in an agile manner.

7 References

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