How to build an informative workspace?
An experience using data collection and feedback

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Abstract—Several works on agile methods discuss the use of team’s workspace for displaying relevant information. The management of an Informative Workspace (IW) is a challenging task as it can involve many different subjects such as team adaptability, continuous reflection, workspace layout, human cognition, usability, etc. Our paper explores the IW management and it is divided in two phases. The first phase describes a data collection performed on 8 agile teams in order to identify valuable aspects on managing an IW based on their experiences. We proposed a series of suggestions to the teams in order to improve their current context using their IW and we gathered the feedbacks. This process led to a set of seven heuristics for managing an IW. On the second phase, in order to reinforce the heuristics validity, a five point Likert scale survey was applied resulting mostly in positive evaluations. At the end of these two phases, we associate the seven proposed heuristics, when possible, to available considerations on other agile community references.

Keywords—informative workspace; agile metrics; agile tracking;

I. INTRODUCTION

Agile methods define a different approach in developing software compared with more traditional methods. This approach is usually related to a more adaptive way of handling such a situation. One of the most important aspects about agile methods’ approach is to emphasize communication during the software project life-cycle. Several agile methods present suggestions on using team’s workspace for displaying relevant information for team members and other stakeholders [1]–[4]. The use of Informative Workspaces (IW) has been typically considered only as a communication issue, but there are references relating its use with subjects such as team’s behavior [5] and self-directing work [4].

On this paper we give directions to answer the following question: “How to build an effective informative workspace?”. So, we present a study of a set of actions related to displaying information on team’s workspace based on our previous experience on agile methods. This study is focused on gathering and categorizing relevant information from these experiences identifying some valuable aspects related to IW management.

A. Experimentation

Several considerations about IW management are available on agile development references and papers. Despite all these approaches to address IW management problems, there is a lack of systematic data collection to provide evidences about the validity of most of these approaches on real agile projects. Besides, considering the amount of involved characteristics of this set of approaches, it would be difficult to address IW management on a regular agile project without any simplification about the main points to be considered.

The use of systematic data collection based on some IW management experiences could help in validating already established concepts on this subject and also identifying valuable aspects not yet addressed on the agile community. We propose performing such tasks as this research main goal.

II. DATA COLLECTION

In order to consider an aspect as valuable on an agile project, its concepts need to be applied on real environments and it should contribute for the welfare of the project.

To provide a better understanding, when performing the data collection the evaluation method should allow the categorization of the different actions performed. In addition, its use should provide the ability of grouping different actions into simplified categories, based on similar actions taken on different contexts. This approach is needed for simplifying a complex environment such as agile development projects.

Hartmann & Dymond [6] propose a set of suggestions for choosing appropriate metrics/diagnostics on agile projects based on heuristics. We chose to follow the same heuristics concept as a guideline model for our data collection. As it promotes adaptability to different contexts and can support different actions based on such contexts.

A. Environment

The chosen environment for this experiment was 8 open-source academic agile projects realized during the IME-USP’s “Laboratory of Extreme Programming” discipline -
The adopted approach for learning agile methods was to develop real software for real customers. Each project was assigned to a disjoint team. These teams had the capability of freely choosing their adopted techniques/practices/approaches in order to develop their software. In the discipline there was also a role called Metatracker - the researcher's role - responsible for helping all teams with their IW/Metrics management and collecting data of the team’s experiences on these areas.

**B. Approach**

In order to accomplish this research’s main goal, some IW management actions performed by the teams need to be monitored and the successful/failure ones should be identified based on its value to the related project. In addition, the successful actions’ related rationale should be considered as valuable by a large proportion of all teams, in order to prevent isolated successful experiences on a specific project environment. We restricted the number of evaluated aspects grouping them in a set of heuristics. These heuristics were based on some successful IW management experiences.

The data collection was separated in two phases. Phase one had a more exploratory action-research approach. This approach served to gather enough information to propose a restricted set of heuristics. On phase two, the value of the restricted set of heuristics is validated by all team members by applying a survey. With the survey results, it was possible to reinforce/refute phase one’s proposed heuristics.

**C. Phase One**

In phase one, we made a series of interviews on each agile team to understand their current context/problems. We also gave some suggestions following an action-research related approach. These suggestions were given thinking about how to use their IW to improve their team’s current context and also to improve the current IW situation itself. In addition, on each interview a statement about the effectiveness of each earlier made suggestions was requested for the team members.

The feedback of each collected suggestion on the interviews was latter classified in 5 categories regarding its usefulness/brought value on the team context/environment: 1. Positive; 2. Negative; 3. Undetermined (The feedback could not be determined as positive or negative); 4. Unperformed (The suggestion was not performed by the team (indicating non-acceptance); 5. Not collected (The suggestion feedback was not collected).

1) Results: In order to identify what really mattered in those teams IW management, the restricted set of heuristics was based on positive feedbacks considered as highly relevant on the teams by the Meta-tracker. All the complete list of suggestions, its rationale, feedback and classification are available on [7].

The relation between each proposed heuristic with positive feedbacks available on [7] is described on Table I.

**D. Phase Two**

Even though phase one’s proposed heuristics were based on some successful suggestion feedbacks, such proposals were made based only on a few of the IW management experiences the development teams had. Because of such restriction, phase one’s action-research approach is not considered as enough in validating each heuristic as valuable.

For obtaining better results in order to acclaim the proposed heuristics as valuable, this assertion should be evaluated by a large proportion of team members. To collect such data, we applied a survey to the teams.

1) Survey: The survey was applied in brazilian portuguese, it was made available on Internet and the team members were notified by an e-mail. Each proposed heuristic was related to a 5 point Likert scale evaluation question regarding its usefulness/importance in order to verify its value and reinforce/refute phase one’s results.

In order to filter less relevant data, only opinions of team members that performed related tasks to an heuristic were considered on the evaluation of such heuristic. Example: Only opinions of team members that performed theirIW management tasks in pairs should be valid for considering “Make your daily IW tasks made by a pair of team’s members” as valuable or not. In order to do such a filtering, we added a question for most of the heuristics, in the case of a negative answer the remaining related questions were not shown.

2) Results: The survey was made available to all 48 team members (including coaches) and we received 30 responses (62,5% of team members).

Most of heuristics were pointed out as valuable by the respondents. These results reinforces phase one’s suggestion feedbacks related results. ¹

¹The questions originally Portuguese were translated to English
Daily meeting’s proximity was considered important as high or very high by 86% of respondents, which definitely reinforces it as valuable. More details are available on Figure 1.

Tracking collectiveness usefulness was considered as high or very high by 70% of the respondents, which also reinforces it as valuable, as summarized on Figure 2.

“Specific issues handling” results were also positive, pointing the usefulness of using IW to handle specific problems with 70% high or very high responses, its results summary is available on Figure 3.

The importance of “Ease of assimilation” aspect was evaluated as high or very high by 80% of the responses, considering it as an important aspect and reinforcing the related heuristic. The summary of this aspect responses can be viewed on Figure 4.

“Tracking in pairs” responses show more divergence on its results, having being considered with low and very low usefulness by 17% of the respondents and high or very high usefulness by 44%. This data definitely does not invalidates the related heuristic, given that 83% of respondents consider it as at least regular. But, it’s applicability should be better evaluated on different environments compared to other heuristics. Figure 5 shows a summary of the related responses.

Practical manipulation aspect received the major “very high” number of responses (37%), denoting that for some environments practicality could be a very important matter when designing an IW, as shown in the results of Figure 6.

Low value informations removal aspect was evaluated as at least regular regarding its importance by all team members. But the respondent opinions between regular, high and very high were well divided resulting 23%, 33% and 30% respectively. These results, summarized on Figure 7,
denotes that this is considered as an important heuristic. We suppose that its importance could be strongly related to other environmental issues (such as visual pollution for example).

3) Results X Related Work: Several proposed heuristics based on phase one’s data and reinforced by phase two’s data are already directly or indirectly described on a few agile community references.

Using IW for handling specific problems encountered by the team can be found on Beck & Andres’ [3] statement of “if you have an issue that requires steady progress, begin charting it”. It can also be related to some metric management techniques such as Goal Question Metric which define metrics based on organization goals.

The importance of practical manipulation on IW management are related to Cockburn’s [1] information radiators desirable characteristic “Is easily kept up to date”, and also with Beck & Andres’ [2] tracker responsibility of measure important metrics without a large of overhead.

The value of ease of assimilation on IW artifacts is mentioned by Cockburn [1] by describing “Is understood at a glance” as a desirable characteristic of an information radiators. Blandford & Furniss [8] also consider several aspects related to human cognition which includes assimilation issues.

The importance of removing low value information can be denoted by Beck & Andres’ [3] “if the chart stops getting updated, take it down”.

The value of keeping the most important frames/boards near to daily meeting’s place was not found on agile community works, but it can be indirectly related to Hartmann & Dymond’s [6] principle for choosing appropriate metrics/diagnostic: “Provides fuel for meaningful conversation” - given the intrinsic goal of communicating along the daily meeting. The value of this aspect is also related to Poppendieck & Poppendieck [4] suggestion of making self directed work possible by the use of visual controls (such as kanban), taking in consideration the task planning purpose of the daily meeting.

Aspects such as pairing in IW tasks and making IW a collective responsibility could not be directly related to any known references by this paper authors. The study of reasons behind the value of such aspects could definitely provide additional contribution for the agile community and it should be addressed in future researches.

III. Conclusion

This work proposes a restricted set of heuristics for IW management. 5 of 7 of the proposed heuristics have direct or indirect related references already established on the agile community, making this data collection useful by reinforcing such references using real project experiences.

Phase two’s results provided more relevant data in order to evaluate this series of heuristics, but phase one’s action-research approach were extremely important by providing a simplified set of relevant aspects.

We realized that collectiveness/communication issues, such as “Pairing on IW”, “IW collectiveness” and “Daily Meeting Proximity”, could not be directly related to other agile references. Based on this fact we can denote that such matters should be better analyzed by the agile community on further researches on Informative Workspaces.

Given the primary goals of this data collection and based on its results and analysis, the set of proposed heuristics contributes to the agile community helping practitioners with hints and values to build an effective informative workspace.

REFERENCES