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The Pomodoro Technique for Sustainable Pace in Extreme Programming Teams

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Abstract. One of the common challenges of an Extreme Programming (XP) team is to find strategies so to reinforce practices and increase velocity. Most practices have found at least one optimal strategy tested and approved practically by the community, while 'sustainable pace' is core tenet missing a clear strategy. The aim of the Pomodoro Technique (PT) is exactly to fill this gap. The PT is a timeboxing strategy originally meant for optimizing personal work and study and then applied to XP. The PT is widely applied by Italian Agile teams, but is still little known elsewhere. This paper examines how the PT is applied by them and how it integrates with XP.

1 Introduction

Starting an Extreme Programming (XP) team from scratch is always a challenge, just as it is to transform an "ordinary" software team in a genuinely XP one. One of the key point in enhancing an XP team is promoting team velocity, i.e. its productivity measured in story points completed in a given iteration. Team pressure in individual programmers' experience is well-known in XP literature and the use of Yesterday's Weather is the suggested practice so to manage the fear of censure and the risk of overwhelming [2]. Nevertheless, one of the known common errors in mentoring an XP team is to put too much attention to velocity too early, with unuseful stress. In other words, the risk in focusing on velocity is to reduce enthusiasm among team members: this risk should be addressed more clearly – after all, agile software developers' main mantra is 'coding as fun', and if this becomes untrue the whole process collapses. In our experience, achieving an equilibrium between team velocity and individual satisfaction is much more difficult for XP teams than "ordinary" ones, because of the very characteristics of this lightweight methodology. Usually the impact of (un)sustainable pace in a XP team's daily work so to achieve this equilibrium is underestimated. We found out that an unstressful – as well as efficient – way to help teams find their 'natural' rythm in daily work, in other words a sustainable pace, is the most direct way to achieve the necessary equilibrium between team and individual needs. The Pomodoro Technique (PT) can be used fruitfully in this sense.

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2 Pomodori for Time Boxing

The PT is a time boxing strategy people can apply in any situation, e.g., homework, study, cleaning house, and indeed software development, spread out from the psychological notions of time elaborated by Bergson and Minkowski [3]. It was invented initially for individual work, but it was then applied especially by XP teams. This paper covers only this last case. The goal of the technique is to perceive time as a value ("I'm doing my best at a right rythm"), instead of an enemy ("I have not enough time; I'm late"). When the PT is applied, we observe that wasted time and overwork are drastically reduced, while the distinction between free time and work time becomes clearer. The individual comes to respect the value of time more, both free time and work time. The heart of the PT is to start a 25-minutes timer and then focus completely on one task until it rings; no email, instant messaging or any other distraction is allowed. When the timer rings, people relax, push away the keyboard and rest for five minutes. This is a 'pomodoro': 25 minutes of focused, uninterrupted work on one task. The "pomodoro" name comes from the use of a common kitchen timer in the shape of a tomato (*pomodoro* in Italian). The 5 minutes break permits the performer to keep his or her own attention curve at its best, enhancing the rising points and at the same time minimizing the lowest ones. To improve this effect, every four subsequent successful pomodori a longer pause is recommended, usually 15 minutes long. This combination of breaks and pauses permit people not to work in overtime, being less efficient because of overtime work. This alternance of working time and breaks and pauses give the pace to the day, both to individuals and teams, and hopefully helps people adjust the rythm in order to reach a real sustainable pace.

There are two important rules in the PT: the Zero Pomodoro Rule and the Fundamental Rule. The Zero Pomodoro Rule states that if the pomodoro is interrupted, that pomodoro counts for nothing. This is a corollary of the Fundamental Rule: a pomodoro is indivisible. Practitioners become soon aware that there are two kinds of interruptions: the internal ones ("I should check email; I'll get me a coffee"), due to fear of being unsuccessful or to the difficulty of focusing on a single task for even as little as 25 minutes; and the external ones (a phone call, a request from a collegue), which are more difficult to manage. In fact, giving in to all sorts of unplanned and apparently urgent tasks can literally destroy all planning activity. This is made more visible in XP team, as the velocity is drastically reduced: "protecting the pomodoro" leads to fewer interruptions. The PT is also a valid tool for XP coaches, who want to protect the team members from external influences during their daily iterations. An Italian coach even introduces XP at the first glance by only retrospectives and the PT as the practices: the first practice tells which other practices are needed, while the PT get the team aware how much their daily work is really focused [7].

3 Applying the Pomodoro Technique in XP

During development, for every pair of developers there is a timer. The owner of the card is responsible for loading the timer, while recording is made on the card itself. During a meeting with people external to the team, the pomodoro may also be used to

help people focus and reduce wasted time, and also to record precisely how much team effort was invested.

In XP teams, internal interruptions are easier to reduce, as no one is working really alone, so there is an implicit control so that everybody avoids at least explicit distractions. Different people deal with external interruptions differently, but some common patterns can be found. The most used pattern is called *inform. negotiate, callback* [3]. When someone interrupts, for instance a colleague, the developer *informs* that they are in working time, usually by saying "I'm in the middle of my pomodoro". Then they *negotiate* how urgent the request really is. In most cases the new task is delayed until the end of the pomodoro (e.g. "I'll finish my pomodoro in about 7 minutes, then I'll come"). In fact, there are few urgencies that can't be delayed for a few minutes, so people accept this *callback* strategy. Surprisingly, one of the most difficult aspects of the PT is the art of having a break. A break is *really* a break: people should relax during breaks, have a cup of tea or maybe just stand up and take a deep breath. One important thing is that you shouldn't actively think about the activity performed in the last pomodoro or what you expect to do in the next one. Thinking about something else relieves the mind, often leading to creative solutions, exactly because of the change of the attention focus. In spite of this it is not rare, while pair programming, to see the navigator calling the driver who is still juggling eggs in his mind, even after the ring of the timer.

It is worth to notice, that the ideal engineering days are different from the actual days: typically teams estimate eight pomodori for a project while half of them are actually spent in meeting, presales or support. In other words, there is no formula to convert pomodori to calendar time, because of interruptions on one side and of shorter successful pomodori on the other one (this is the No Formula Rule [3]). In our experience, teams learn to estimate every type of working activity, not only design and development.

There is a danger of viewing the pomodoro as a taylorist method for regulating the workers' day. It is not so, because the timer is used and regulated by the individual or pair. One might expect that, in a normal eight-hours work day, we should be able to do 15 or 16 pomodori. In practice, in a perfect day with no interruptions, it is rare to be able to do more than 12 pomodori. In a healthy, well-rested team it is reasonable to expect everyone to do about 10 pomodori per day. Where is the rest of the time going? For the most part in pauses or non-recorded activities, such as reading personal email. It might seem that this is quite unfortunate for the employer, as he's only getting 5 hours of concentrated work per day. But in fact, it is very advantageous to be able to see with this degree of precision how much *real* work he's getting and exactly *on what* it is spent.

How much does the technique cost? In the PT the first pomodoro is spent planning the rest of the day, and the last pomodoro is for recording of what was done. The overhead of two pomodori seems large; but there is much value in planning and in retrospecting. The first pomodoro can coincide with the daily stand-up meeting.

4 Case Study: XP User Groups and Teams

XP user groups collect people who are interested in exploring XP both in theory and practice. It is a good environment to share ideas, experience, and to experiment new techniques. In Milan the XP user group is highly business oriented, while in Varese it is more linked to the local University [5].

Pomodori came into user stories as an auxiliary tool for difficult estimation. In fact, as each pomodoro is dedicated to a single task, activites are planned along clearly defined subactivities estimated in pomodori: this is coverd by the More Than Five Pomodori and Less Than One Pomodoro rules. The first rule says that if you estimate an activity more than five pomodori, this should be split up. The complementary rule says that if several activities are estimated at less than one pomodoro, they should be joined together. The only exception is during the *last* pomodoro of a given activity: if the estimation of a given activity was of three pomodori and that activity is finished during the first 10-15 minutes of the third pomodoro, that pomodoro can be considered completed. Of course, if the activity is completed in the first 5-10 minutes, an overestimation occured, and that pomodoro shouldn't be counted.

Unlike XP user groups, XP teams should deal with the pressure of business needs and different work contexts. For instance, a team has chosen to deal with multiple simultaneous projects with pomodori. The relative priority of the customers were given by management, and the available weekly pomodori were assigned according to proportions: if the most important customer is as important as all the others put together, then the team will dedicate 50% of the available pomodori to them [7].

There are different PT recording strategies among teams. For instance, the Wallabiez team in Sinapsi (Milan) a big visible chart is used, where every day a different person is nominated the "Frodo of the Pomodoro", i.e. the bearer of the timer who is responsible for loading it and tracking: this allowed to the team to realize they were much less productive after lunch, so they started to colour the morning pomodori differently, so to make the problem visible [6]. In the Moonring team (Databtech, Milan), as well as in the Varese XP-UG, the pomodori are recorded in a wiki [5,8], while in other teams – e.g. in Sourcesense (Milan), Quinary (Milan) and XP Labs (Rome) custom applications were built for this purpose.

Sometimes people use the PT in open spaces where other people do not; in that case the ticking of the kitchen timer can cause problems. In those cases a software pomodoro can be used, but its use is highly controversial, as experience says that it is most difficult to have a break. In alternative, different hardwares seem to be more effective, e.g. hourglasses or countdowns on mobile phones, whose ringing is socially accepted. Furthermore, people invented strategies also for unnoticed breaks, i.e. to relax in front of their monitors, for example throughout unobtrusive qi gong exercises for the eyes [4].

5 Concluding Remarks

Sustainable pace is a practice of XP directly connected to the inner cycle of an XP team (e.g. where pair programming, simple design and refactoring are performed) and to retrospectives. Even if the PT doesn't improve velocity directly, so that it is difficult to find precise measures of its effect, in our experience it get people more aware on velocity so to improve it during the next iteration. Moreover, the PT is a lightweight measure of the effort easily understood: in our experience, retrospectives held after the introduction of the PT are more focused on work and on real working data, and creative solution about avoiding external interruptions are found. People learn to give priorities more explicitly, and, most importantly, they start feeling time as an ally.

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