

Agile Software Quality Management: Do we need it?

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Abstract

By now more than a decade the agile movement enjoys a steadily increasing number of followers. Scrum is the project management practice of the day and to a bit lesser extent eXtreme Programming (XP) the current development practice. In many organisations the agile software projects are tolerated exotic islands yet. Some do struggle to adapt their organisation for hosting agile software projects and exploit their benefits. Few organisations adopted the agile principles and coexist naturally with their agile software projects and listen attentively to the agile movement protagonists who try to send the whole organisation, not only their projects, on the agile journey.

In the same period of time no major changes in software quality management practices can be observed. The documentation is still the basis for evaluating the 'quality' of processes in audits or assessments or appraisals (only the name changes, the principle stays the same). Measurement – metrics or key process indicators or process control characteristics – are on the agenda, but not really in real live. Few companies have such figures defined, some of them collect the figures even but very few evaluate them and a fraction of them uses the evaluations for process improvement purposes.

In this paper we revisit the agile values and principles and compare them with the perceived values and the actual principles of software quality management and we will try to answer the following three questions:

1. What is the impact of agile software project practices on software quality management?
2. How would software quality management look like if we would apply agile values and principles?
3. If we would apply the agile values and principles could software quality management cope with the impact agile software project practices have on it?

With other words, we'll investigate how would agile software quality management look like and whether it would be more suitable for an organisation with agile software projects.

1. Agile Values

Scrum and XP are value-based methods. Although they are both agile methods their sets of values are not identical. One reason could be that Scrum covers only the project management aspects of a project while XP covers both, project management and development activities. In our eyes a software development project is agile only if both, Scrum and XP (or another agile method covering development practices), are employed. Table 1 lists the Scrum and XP values and assesses the current traditional quality management (QM) practices in their light.

Table 1: QM in Light of Values in Scrum and XP

| Agile Values | Comment from QM Point of View | Conclusion for QM |
|---|--|-----------------------|
| Scrum [2] | | |
| Commitment Readiness for commitment to achieve the goals | QM is committed to quality goals that are derived from business strategy and business goals. | No change in mindset. |

| Agile Values | Comment from QM Point of View | Conclusion for QM |
|--|---|--|
| Focus Focus on the work needed to live-up to the commitment – everything else is irrelevant | This goal orientation, sincere commitment to common goals is not the rule in QM organisations. | Change in mindset is needed. |
| Transparency All information about the project is public and visible | Overall QM aim is to build trust in the development organisation by making its processes visible by documenting them. The degree to which the processes live-up to the requirements is made visible but not necessarily public. | Change in mindset and additional effort is needed. |
| Respect Despite different views esteem for each other in team | QM thrives for consensus about the processes and their implementation according to the project needs. | No change in mindset needed. |
| Courage To commit to goals, to work focussed, to be open, and to expect respect from colleagues | Courage in this sense is not a typical characteristic of QM organisations. | Change in mindset is needed. |
| XP [3] | | |
| Communication The most effective communication is face-to-face | Dominant communication channel in QM is in writing. | No change in mindset is needed. QM shall keep this mindset to the extent needed in the domain it is applied. |
| Simplicity Always thrive for the simplest solution that will do it | Is not a stated aim for QM. | Change in mindset is needed. |
| Feedback As quickly as possible | Closed feedback loops are an essential idea QM is based on, e.g. PDCA cycle. | No change in mindset is needed. |
| Courage To redo what is not sufficient | The idea of improvement is inherent to QM. | No change in mindset is needed. |

Focus, Transparency, Courage (Scrum), and Simplicity are the values traditional Quality Management needs to adopt to get more agile. Before we discuss what it could mean for QM to become more agile we visit also the agile principles.

2. Agile Principles

Agile Manifesto [1] defines not only the basic believes of the agile community but also the principles common to all agile approaches. In Table 1 we did investigate the values the two leading agile approaches apply to guide the course of action. In Table 2 we investigate the principles the major protagonists of the agile movement agreed upon to be common to all agile approaches. This intentional inconsistency explains why some principles in Table 2 overlap the values in Table 1.

Table 2: QM in Light of Agile Principles

| Agile Principles | Comment from QM Point of View | Conclusion for QM |
|---|--|--|
| Our highest priority is to satisfy the customer through early and continuous delivery of valuable software. | Customer satisfaction is the primary and only goal of QM. Whatever this requires is right from QM point of view. | No change in mindset is needed. |
| Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage. | Again, if it supports the achievement of customer satisfaction then it is right for QM. | No change in mindset is needed. |
| Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale. | It is not in scope of QM to decide about delivery frequency. That the processes needed for it are in place and working is in scope of QM like any other processes. | Not in scope. |
| Business people and developers must work together daily throughout the project. | It is in scope of QM to improve processes. If it is by better co-operation between business and developers then QM shall thrive for. | No change in mindset is needed but an additional effort needed to get business and development to work together. |
| Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done. | This is the real job of management. QM shall not preach or do anything that would be counterproductive. | Trust requires a certain change in mindset for QM. |
| The most efficient and effective method of conveying information to and within a development team is face-to-face conversation. | See value Communication in Table 1. | No change in mindset is needed. QM shall keep this mindset to the extent needed in the domain it is applied. |
| Working software is the primary measure of progress. | It is not in scope of QM to decide about progress measurement. | Not in scope. |
| Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely. | QM is about having processes controlled. | This principle does not require change in mindset |
| Continuous attention to technical excellence and good design enhances agility. | QM presumes qualification of the staff for the assigned task. Technical excellence is considered to be craftsmanship. | To turn the focus on the product quality is in some organisations change in the mindset. |

| Agile Principles | Comment from QM Point of View | Conclusion for QM |
|--|---|---------------------------------|
| Simplicity - the art of maximizing the amount of work not done - is essential. | See value Simplicity in Table 1. | Change in mindset is needed. |
| The best architectures, requirements, and designs emerge from self-organizing teams. | QM stands rather for clear assignment of responsibilities to individuals than to self-organising teams. | Change in mindset is needed |
| At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly. | See value Feedback in Table 1. | No change in mindset is needed. |

Trust and assignment of responsibility to teams rather than to individuals, focus shift from process to product quality and the co-operation between business / purchaser and development / supplier are the areas in which the traditional QM needs to change mindset and refocus its efforts.

3. How Shall QM Become Even More Agile

We saw that some fundamental QM concepts can be found in agile approaches as values or principles. I.e. it is definitely so that QM did significantly inspired the protagonists in the agile movement. The question we want to try to answer now is which agile values and/or principles can inspire QM so that it becomes more agile or more suitable for agile environments.

Table 3: Impact of Agile Values and Principles on QM

| Agile Value or Principle | Impact on QM |
|---------------------------------|---|
| Value: Focus | This requires from QM to accept that not all processes and even more not all artefacts are equally important to achieve customer satisfaction. QM has to get used to rely on customer's judgement of the value and priority of product characteristics as well as of the relevance of the artefacts other than working code. In this area less regulation by QM paired with a higher awareness of customers in quality issues would be a significant shift in the QM (and customer) mindset. |
| Value: Transparency | The shift here is from transparency of the intended / planned development process to the transparency of the executed process. The shift from documented intended process as flowcharts to visible executed processes as results and figures. This is a fundamental change in mindset and focus of the QM effort: Away from the paper tiger to result driven efforts. |

| Agile Value or Principle | Impact on QM |
|---|---|
| Value: Courage (Scrum) | Commit to something and do what you did commit to was always considered to be a true QM (and ethical) concept but, w.r.t. to certification audits and maturity assessments, too often violated and therefore lost its credit, it did get profaned. Nobody talks about it publicly, everybody knows it and talks about it behind the scenes. To get rid of this paranoia would be a major step towards real QM. But it has more to do with "back to the roots" than with "towards a bright new future". |
| Value: Simplicity | The inherent concept of improvement is implicitly thriving for simplicity. Complex processes are seldom efficient processes. Nevertheless, consciously seek for simplicity in all things we do, also in QM, would have certainly a significantly beneficial impact. |
| Principle: trust in team | Bluntly said: QM is trusting documented processes more than qualified teams. From the purchaser's point of view it is obvious. He is trying to gain trust by investigating how the supplier works. The question is whether a piece of paper evidenced by some samples asked for because of distrust can achieve this aim. It could be that trust can be only lost but not gained. The great power of trust is that most of the human beings want to live-up to it, they don't want to disappoint the partner. Of course there are also "criminals" .. but asking for paperwork will not prevent the crime. This is the same fundamental shift we recognised above for the transparency value. |
| Principle: assignment of responsibility to teams rather than to individuals | This must be based on trust, of course. Trust in the capabilities of the team to organise itself, trust that they are able to select and apply the processes most suitable for the task at hand and for the composition of the team and trust in the skills and knowledge in the team to master the given task. It goes hand-in-hand with management's commitment to create the needed environment, suitable general conditions and empowerment the team needs to be able to live-up to its commitment. What does it mean for QM? Help management to create the appropriate environment. And relax the requirement concerning assignment of responsibilities. |
| Principle: focus on product quality rather than on processes | There were times when QM's concern was actually product quality. At that time it wore the name quality assurance. With the label change the focus shifted to process quality. Now the time arrived when the pendulum should be moved back towards product quality but not loosing completely the processes from the sight. This means a repositioning of QM. It has again more to do with "moving back to the roots" than with "towards a bright new future". |

| Agile Value or Principle | Impact on QM |
|---|---|
| <p>Principle: Co-operation between business / purchaser / customer and development / supplier</p> | <p>QM did understand itself always as a lawyer of the purchaser. Not only in the purchaser's organisation but also in the supplier's organisation. "If you want to get customer's approval you need to do that and that" is the motto of this QM era. However, the 'customer is the king' era is over. In the agile world there is a clear division of responsibilities between the customer and the supplier and both share their part of responsibility for the success of the joint endeavour.</p> <p>For QM it is a change in mindset but not a significant shift in its results. It does not matter whether the responsibility for requirements, for the scope of the project is assigned to the customer or to the supplier. As long as it is clearly assigned.</p> |

4. Conclusions

Agile values commitment, respect, feedback and courage (XP) are basic ingredients of Quality Management like the agile principles customer satisfaction by early and frequent delivery and by embracing changes, sustainable development and regular reflection on teams performance. Agile flavours are not at all completely strange to QM.

However, there are certain agile values and principles that challenge traditional QM. I would underline two of them. Transparency and trust. Make the process state and performance visible is not new to QM, is still new to software QM in most of the organisations. To replace responsibilities assigned to individuals by assigning it to a self-organising team is also known in the automobile industry for long time but entered the software arena lately with the agile approaches. This is a challenge mainly in projects with contracted software development for external customers: How to trust to the unknown? This is an ideal field for QM to invent new approaches. Again, it is rather "back to the roots" than "towards a bright new future".

References

- [1] Manifesto (2001)
<http://agilemanifesto.org/>
- [2] Schwaber, Ken; Beedle, Mike: Agile Software Development with Scrum, Prentice Hall, 2001, ISBN 0-13-067634-9
- [3] Beck, Kent with Andres, Cynthia: Extreme Programming Explained – Embrace Change. Second Edition, Addison-Wesley, 2005, ISBN 90-321-27865-8