Distributed Product Owner Team for an Agile Medical Development

Strategies for growth, communication, and customer collaboration

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Abstract

This case study is based on SYNGO's Transition to Agile Project Management with elements of lean for a software organization that is distributed to 7 sites in 5 countries on 3 continents. The main focus is on the ramping up of a distributed Product Owner team, skills, knowledge, communication structure and communication support.

Background – Siemens AG Healthcare and the SYNGO product portfolio

Siemens AG Healthcare

The Healthcare Sektor of Siemens AG is one of the globally leading companies in medical solutions and devices (www.siemens.com/healthcare).

The *syngo* Software plays a central role as a common base for scanners, medical imaging and workflow. The *syngo*.via 3D routine and advanced reading solution helps to accelerate workflows across all modalities, and is suitable for both day-to-day and more challenging cases (http://www.healthcare.siemens.com/medical-imaging-it). More about *syngo.*via:

- It is efficient: by helping save valuable time, it allows physicians to focus on their core tasks.
- It is flexible: users can customize applications, layouts and workflows.
- And it is intelligent: it delivers powerful image reading, and guides users through the entire workflow.

The market is very dynamic, at the same time there are highest quality requirements, and there are many different country-specific regulations to follow in the creation and distribution of the software.

Medical Software Development

It is special – in the way that many national and international regulations need to be considered.

For our topic it is most important that the problem domain is different from what developers have experience in.

"My developers keep telling me: but our users must understand our logic! – It is very hard for them to understand the doctors have a different work context, and a totally different way of thinking." (a Product Owner)

Inside *syngo*.via product and modules

- Our product consists of
- Modules that represent certain feature areas, and can be re-used in different products
- Apps using the modules that are created especially for *syngo*.via

Large-scale distributed agile transition

We have done the transition to agile of a large-scale distributed development organization following the three steps that are often needed for transition of big organizations:

- **Learning and piloting**: the first agile transition team started in 2008 bottom-up driven by project participants, and learning from other big companies, books, conferences, and consultants. Management support was asked for and given. First pilot Scrum teams were set up, accompanied and coached, and their feedback was evaluated and communicated to all employees.
- **The big transition**: long preparation phase with budget, external consulting, planning of all areas and waiting for the end of the current release. The role of suppliers changed gradually from an extended workbench model to a true partnership. Scrum teams were started whenever they got available for the new release, or even earlier if their managers allowed their early conversion. The Product Owner team was also ramped up gradually. Some things changed mid of 2010 with one large roll-out: the prepared changes of processes, line organization and project organization. Most component teams were converted into feature teams. A big product release with more than 20 Scrum teams was started. The way of working of the teams was continuously improved by the teams themselves as well as by coaching.
- **Continuous Improvement**: more investment into technical excellence. Results of the retrospectives of the Scrum teams are used to work more efficiently. Processes are cut down into small slices and filled into the iterations. We do benchmarking with similar organizations inside and outside of Siemens. We are learning from concepts of Lean Product Development.

Agile Transition Goals

- Improve time to market – getting new feature ideas much quicker to the customers than before
- Improve quality of delivered products
- Customer centered development – involve customers in prioritization and concepts, so that products are even closer to customer needs
- Increase team productivity and motivation

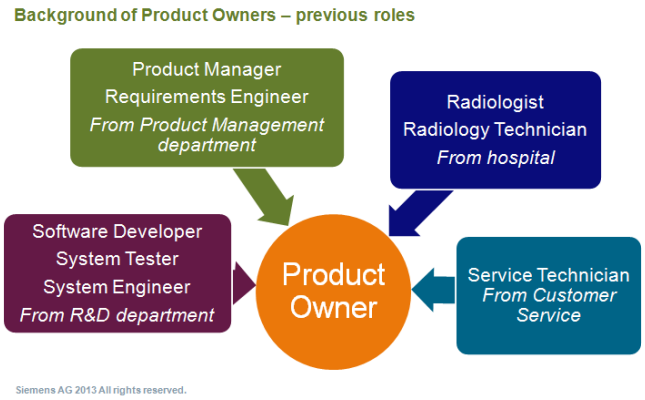
Our mid-term to long-term target structure is

- Co-located feature teams with their Product Owner
- Distributed to multiple sites in several countries – all within Siemens, and all able to communicate with each others in English
- Suppliers as partners feeling responsible for their features

That means for the Product Owner team that it needs to travel from the beginning, and get distributed after an initial ramp-up period.

Growing a Distributed Product Owner team

Background of Product Owners



Product Owners have different background from their previous roles. This means that they have a good base in some of the knowledge and skills they require, and some lacks in other areas. People have been selected who have a good subset of needed skills and knowledge. A gap analysis is needed not only at suppliers, but as well in the headquarters, and set up of a plan to close these gaps.

At the beginning of such a transition it is challenging to allow for sufficient time to analyze and address these gaps.

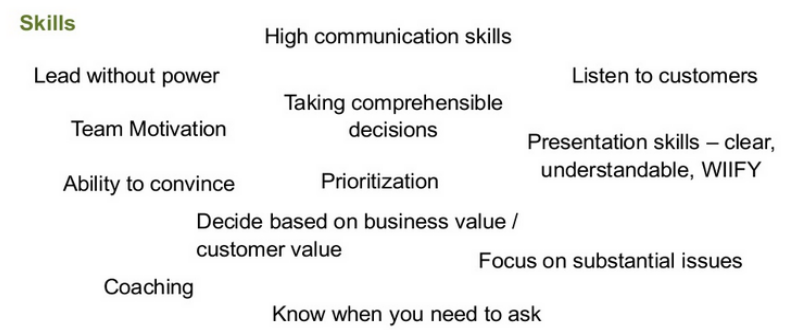
We focused initially on process and QM trainings which were provided to all Product Owners, as well as on the job training by experienced product owners and Scrum trainers.

Further down the road in our transition we started to systematically analyze with the PO team and their line managers the remaining training needs, and offered them in form of classroom trainings, coaching, customer visits, and additional trainings on the job for the Product Owners. Coaching by experienced PO helps a lot! This is a key learning.

Knowledge

The needed knowledge is grouped here by the area of application: left side is with the Scrum team, right side with the customers, and in the middle topics that are related to both and to the whole organization. We should also not under-estimate stakeholders and interfaces within the organization – both can be very complex in big organizations.

Skills



The skills are ordered here in the same left to right distribution as the knowledge above.

The skills are often even more critical than the knowledge. Also the personality must be considered. The best adept of the customer workflows, of software development teams and the product can be a terrible Product

Owner if he or she is not able to say “NO” to any single requirement proposed by one of the many stakeholders. The same applies if a PO is not able to communicate a clear vision to the team, and to prioritize features according to this vision.

Choose POs according to skills they have! Existing skills can be improved, but they will not build up from zero. A new PO must be able to do in principle a trade-off decision between effort and value.

Imagine a person who is very knowledgeable about the product and the customers, but she cannot abandon any single feature idea, and she cannot convince anybody to concentrate on the 5 most important features for the next release!

You certainly remember what Dan Pink[3] investigated about motivation for knowledge workers: they are driven by the degree of autonomy, mastery and purpose they can reach in their daily work. What is the PO responsible for in relation to the Scrum team? - He or she is giving **purpose** to the team. On the customer side, being able to listen to and understand the customer is even more crucial than the presentation skills. In presenting, the main focus of the PO needs to be the WIIFY – “What is in for you”[4].

Investing into Product Owners at partner organizations

We have three successful models for Product Owners at partner sites:

- Employ a Product Owner from external with excellent problem domain knowledge – in our case, a radiologist, and teach SW development, agile, and our product
- Take a long years experienced person from a leading software development role, and teach Product Owner role, customer and business topics
- Ask an experienced Product Owner from headquarters to move (temporarily) to a site

You may still ask yourself: Should we do this at all?

Our main question was, can our partner ramp-up the competency and skill-set in a reasonable timeframe? Because it is so broad, it was most probable that the partner had to hire a radiologist or radiology technician with several years of hospital experience, in best case in more than one country.

Then it was clear that in many cases we had to teach the team side and the software side of the knowledge, and provide the coaching by experienced POs, including the interfaces and processes at Siemens.

Other companies who are outsourcing to a general software supplier may hesitate more to hand over part of their innovative knowledge to them. On the other hand, the outcome of a Scrum team that frequently can ask questions to their PO is so much better than one that has a thin interface to the PO, that it returns much more than the investment.

Product Owner team communication

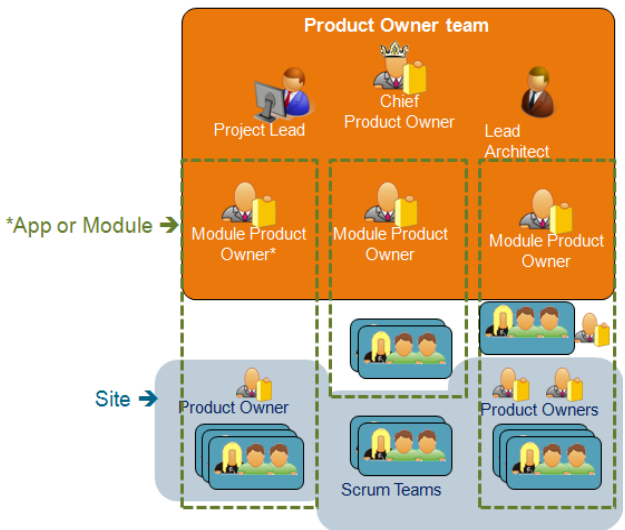
Whole PO team

In the whole Product Owner team:

Workshops - one to two times per year: roadmap, big features next release, process improvement

Weekly sync: virtual status meeting. There, the project status is discussed: any changes in feasibility of the backlog of the teams or modules? Any major obstacles that cannot be solved by the teams?

Results of regular or special testing is presented.



Any process changes need to be introduced? Any special activities that teams or Product Owners have to take care fore, based on project milestones?

Each sprint there is also a common demo of the software across all modules by the Product Owners, after each team has done their demo.

Core PO team

In the Product Owner Core Team there are the following sync meetings:

- Daily sync across modules. Important content topics are discussed.
- Weekly sync including module architects. Discuss features that concern other modules.
- Face to face personal meetings between Module POs or with the Chief PO –very helpful.

First these sync meeting all took place face to face in the headquarters. Then there was the new fact that one Module PO is at a different site. Now we need virtual meetings even within the core PO team. There clearly a part of the communication bandwidth is lost, and now we have to invest into improving the virtual communication (see below).

Roles in Scrum Team supporting PO

We have a few specific roles in the teams that support the PO especially in certain aspects:

System Analyst – supports Product Owner in detailed research and requirements engineering. Documents backlog grooming results in backlog and specification document.

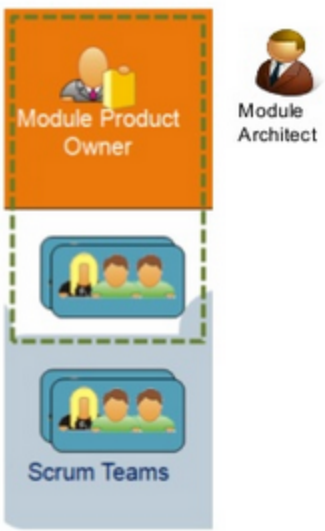
Team-Architect – coordinates technical features, redesigns, takes care of technical debt, protects architecture. For the technical features, often replaces the PO in accepting results. However, the PO still must take the lead in prioritization and must understand the value and benefits of technical features.

Scrum Master – takes care for organization, improvement, process. Supports the PO demanding a clear prioritized backlog, and reminding him or her of the important dates and meetings, especially iteration changes.

Communication of the Product Owners and Teams Within the Module – four different models

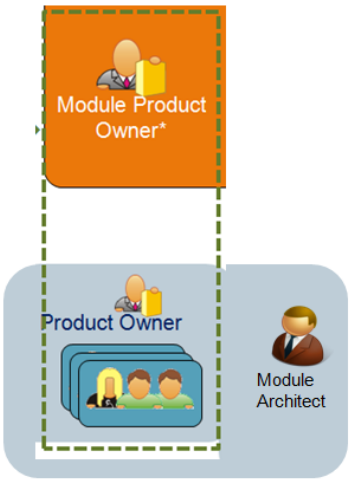
1) Module Product Owner and module architect in HQ, a few teams - onsite and offsite.

- Module PO prioritizes the backlog mostly alone.
- Backlog grooming with teams is supported by system analyst, module architect and team architects.
- Module PO participates in the sprint reviews with each team and accepts the results.



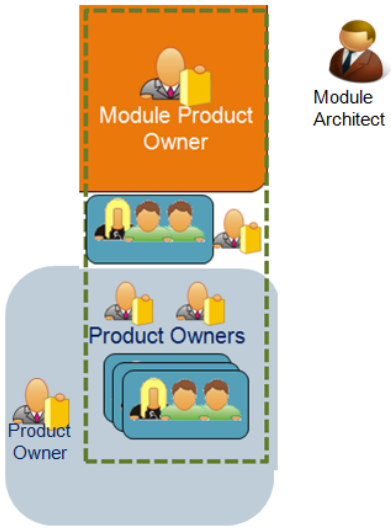
2) Module Product Owner in HQ, a local Product Owner and a module architect, a few teams – all offsite but on the same site.

- Module PO prioritizes with local PO
- Intense communication M-PO and local PO by virtual sync meetings and visits
- Backlog grooming with teams mainly by local PO
- Local PO participates in the sprint reviews with each team and accepts the results



3) Module Product Owner and module architect in HQ, each team with a team Product Owner - onsite and offsite teams.

- Module PO prioritizes top level
- Top level backlog grooming with team POs, and module architect
- Weekly virtual sync meetings of module PO, module AR, team POs
- Team PO accepts the results of each sprint for his/her team
- Module PO participates in selected sprint reviews



4) Meanwhile we have a fourth model – all roles are co-located at the supplier site regarding the whole module. Of course there the challenge is to keep the module PO in sync with his colleagues in the HQ. But the communication with his Scrum teams is very intense.

All models have their advantages and disadvantages: as the virtual communication is never perfect, some interfaces are broader or narrower than the others. In addition to the (Module) Product Owner's personal skills, how close they are to the rest of the PO team and how deeply they are involved in all necessary discussions depends on how much and how directly they communicate with their counterparts.

Travel needs for the Product Owners

Many team or Module Product Owners travel every sprint (4 weeks) to spend a few days with their remote teams. This may change after the first year of collaboration: as soon as the knowledge of the local PO has grown, and they and the teams know better what the goals and vision of the Module Product Owners are, the travel can be less frequent.

Local Product owners from sites travel to HQ to stay in contact with the rest of PO team, and with other stakeholders (5 to 10 times per year). Some modules have many stakeholders also outside the PO team, e.g. Customer Service department.

The yearly workshops of the PO team itself and with the end customers (radiologists, administrators) are held in different sites where we have development teams.

Communication infrastructure for teams and POs

Also a good communication structure is needed, for POs as well as for teams. This includes:

- **Conferencing tool** including sharing of desktops, collaborative working, chat, voice and video. This is used for all kinds of Scrum meetings, especially if the remote PO has to be involved with the team. The experience needs to be as natural as possible. Here we are improving, but still experimenting much more difficulties with the infrastructure in India than in the European countries. This is something we need to improve quite a bit, balancing data security needs and usability.
- **Backlog management tool** with different views. Here we are using Microsoft TFS in order to integrate all views into one tool – Backlog, Project Progress, development, build, integration, test execution and bug-tracking. Product Owners and teams are using different views that help them see exactly what they need to see on a daily basis. The teams, but also the PO team must be able to see daily metrics about the feasibility of the teams and the whole release.
  We are using team dashboards which have the most important team metrics visible. For the daily standup, we have task boards based on TFS which show the backlog items and tasks with the owner. Teams have selected one of three different types of task boards.
- **SharePoint sites**, with documents, blogs and wikis. This supports the sharing of concepts, checklists, or process tips and tools information, between the Scrum teams of a module or all Scrum teams.
- **Communities of Practice** for sharing role-specific content across the sites provide meetings and learning materials for all roles across the project. They rely on the conferencing tool and customized SharePoint sites. E.g. Product Owners will exchange there on their particular needs: tools, practices, trainings that are provided, and problems they need to solve. They exchange best practices among each others, and give helpful hints to their colleagues at different sites.

Travel versus online collaboration

Initially, travel is required to build up trust between a PO and his or her team, or between a local PO and the PO team and the stakeholders in the headquarter. The personal meetings also set a common background for understanding what each side means when they talk or write, their sense of humor, their personal backgrounds, and other soft factors that are crucial but often underestimated. Communication that starts only virtually is failing more often. - After the initial phase, there is much more often a successful online communication possible. There are also complex discussion topics at which also POs and teams who are in a long-term trustful contact get frustrated as long as only virtual communication is possible. But this will probably improve with better tooling. Therefore, I want to pilot the usage of a telepresence solution together with real-time collaboration whiteboards, which can provide nearly the same bandwidth of collaboration as the face-to-face usage of a whiteboard together.

Customer collaboration

The challenge: many different customer types

All Product Owners need to have access to different types of customers, reflecting different market segments In our case

- Big and small hospitals

- distributed hospitals with common infrastructure
- Less and more tendency to automation of workflows
- Country, culture, tradition…

Therefore we have a lot of different kinds of Product Owner - customer collaboration.

Congresses

Product Owners need to travel to important congresses which our customers visit as well, in our case e.g. the ECR in Vienna, the RSNA in Chicago, and Arab Health in Dubai. Here they are looking for

- Personal customer contacts
- Learning from customers
- Organizing user meetings

Local collaboration sites

We have collaboration contracts with hospitals at the cities where our development teams are

- Hospital visits for team members
- Product Owners have a local contact
- Sometimes local contact can be used for showing intermediate state of features

Customer Use Evaluation sites

We do a Customer Use Evaluation before each product release at 15 to 20 sites around the globe

- Each Product Owner is responsible for one site as main contact for all topics
- All Product Owners get summarized feedback from customer sites
- All Product Owners can ask selected customer sites about their specific topics

Product Owners travel to special sites

Some Product Owners still need quite specific customers for their topics:

- Who is advanced enough or thinks abstract enough about future needs to talk about this particular topic?
- With whom can we talk about a topic that is still totally confidential?

Involving customers into new features in the radiology workshop

Once per year, 10 -15 radiologists from customers are invited to one site for 3 days

- Good mixture of customer types and countries
- All Product Owners can present and participate
- They present the features of the current release for early feedback
- They give a preview on concepts for next release:
  a) useful feature?
  b) useable concept?

Involving customers into new features in the administrators workshop

Once per year, 10 IT admins and clinical admins from customers are invited to one site for 3 days

- Selection criteria: long term installed site and intense usage of admin tools and features
- Mainly for Product Owners from the admin related module, others can participate
- Excellent feedback from users
- The Module PO gives the admins virtual money to spend on different future features and wishes => they learn how we prioritize

Conclusions

Distributed Product Owner Team

Yes, it is possible and has lots of advantages to distribute the Product Owner team with the co-located Scrum teams to the sites.
However, it requires

- A lot of travel for the POs in the headquarters as well as the POs at supplier sites
- Careful, background and skill oriented selection of persons for the PO role.
- Investment into closing the knowledge gaps and improving skills of each single PO.
- Set up of communications means and structures for the PO team itself, as well as for PO and their Scrum teams, and for all roles in the organization for sharing best practices and continuous improvement across sites.

Agile Transition Goals

Regarding the goals of our agile transition, we can look back to the fast three years and three agile feature releases of syngo.via and reconsider our goals:

- Improve time to market – Many important features now get delivered within a year: a big improvement compared with previously several years of backlog.
- Improve quality of delivered products - bug metrics and feedback from collaboration sites show a steady improvement of quality with each new feature version.
- Customer centered development – most of the above described end customer involvement has been introduced during the three agile projects. Customer Use Evaluation is of course a standard part of medical software development, but also here the involvement of individual Module and Team Product Owners is now much deeper than before. Need to improve: direct involvement of customers with more teams.
- Increase team productivity and motivation - the motivation of team members has been increased based on surveys and interviews in many cases by more interesting work, more variety of topics, and especially previous testers are much happier now as members of a cross-functional team. On the other hand, working from a backlog also increased pressure on team members. Motivation of developers is also increased due to knowing more about the end customers and about the needs that the product and the features address.

Sources of information and references

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Andrea Heck has a university degree in computer science and has been working for more than 20 years in the Software industry. She is CSM, CSPO, and CSP, and currently responsible for the Agile Transition of SYNGO.

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