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The Marriage of Two Process Worlds

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This article describes the approach of two big companies to combine their different process worlds and the experiences the author made. The purpose is to give the reader an understanding of the factors that have an influence in creating a global process definition. Cultural differences are playing an important role, also the different languages. Before talking about the content, the parties have to clarify the framework such as the process architecture or the process design methods. Furthermore, it is important to define tailoring conditions to be flexible enough to use the new process on different project areas. And finally the new process has to prove that it can be lived in real life. Copyright © 2009 John Wiley & Sons, Ltd.

KEY WORDS: process definition; process architecture; tailoring; pilot projects; process elements; process improvement

1. MOTIVATION

The life of a process engineer is never boring, even if he or she is working in a company that grows continuously. Besides the always running improvement initiatives, the organizational situation has a significant influence on the construction of processes.

In 2007, Continental acquires Siemens VDO Automotive AG and advances towards among the top five suppliers in the automotive industry worldwide, at the same time boosting its market position in Europe, North America and Asia. With sales of €16.6 billion and more than 150,000 employees, the company develops systems for chassis and safety, engine and transmission, multimedia and body and, of course, tires. The vision is to shape the megatrends in the automotive industry:

- Increase in safety systems in the vehicle
- Conservation of natural resources
- Sophisticated information management in the vehicle
- Growing demand for individual mobility in future markets.

To utilize these opportunities as fast as possible, the management impelled the definition and integration of common processes and IT applications. Within half a year, a common engineering process including system, software, electronics and mechanics disciplines should be established. Furthermore, all supporting and management processes such as project, configuration or quality management should be included. A great and nearly unreachable goal considering the size of the new company and the different ways of approaches in handling projects. On one hand, a fully standardized system with detailed descriptions, on the other hand a flexible set of methods and components that can be adapted easily. Both approaches have advantages and the goal was to combine them and make the most of them.

It was not the first time for the process engineers on both sides to merge processes and create the best combination. The dimension was bigger now than ever before, but the people have obtained a lot of

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Figure 1. The motto of the new company

experience in the last years, so the starting point was a good one. The management knew that only with a common proceeding all the synergies can be used. And they motivated the colleagues not only by telling a few nice words, but also by collaborating on all levels of management and development. And they established a common motto to communicate the great goal (see Figure 1).

2. HOW TO GET TOGETHER – THE DIFFERENCES IN CULTURE

Taking a closer look at the two process worlds, you will see that in reality not only two process descriptions are combined. In proccess of time the different organizational areas in each of the two companies have 'improved' their specific processes in a way that the core process of the company was sometimes not visible any more, and therefore not only two processes have to be considered. The risk was high that the number of people involved in the integration meetings grows up to an amount, where discussions never seem to come to an end instead of agreeing compromises. So the number of participants must be decreased to the relevant stakeholders. But who are these stakeholders?

To identify these persons is difficult, even when the new organizational structure is unclear short time after the merge. But on both sides so-called 'expert groups' exist, who already worked on a common approach earlier. The members of these groups consist of experienced engineers who have worked in their specific areas for years and know as well the needs of the developers as the requirements of demanded standards. Out of both groups, three to four experts for each new integration team were nominated, assuming that they can speak for the whole group. Each team should work on a different topic of the new big process map, e.g. on the Software Development process or the Project Management area.

It seems that everything is prepared now to start working. But what is the working material the integration team has to deal with? There is the process content, described in different details and maintained in different process tools. The tool ... seems that this is not a topic for a process integration team, but far wrong. The tool influenced in a strong way the kind of modelling processes because different methods and techniques are supported, and therefore also the way to come to a common description was influenced.

Two tools were used in the past:

- ARIS
- Project Kit (new name: stages[k])

ARIS provides a large scale of modelling possibilities, allowing the process managers to design any kind of process elements at different levels and in different details. The 'brick' concept allows the reuse of predefined process modules in different process areas. It is a tool the process designers are mainly working with.

Project Kit is simple to use and provides not so much modelling possibilities. But it is able to tailor a predefined process to the needs of different product areas. And it has the great advantage that it can be used and adapted for each project, means the project can really 'live' with it. The user group here is more the development team, not the process designers.

Another difference was the way how process management was handled in these two companies. On one side, a big organization with process executives and process owners were defined taking care, that everything was documented and detailed in a solid way. On the other side, the process experts were nominated out of the development team, describing the necessary content with enough flexibility to adapt it to the project's needs. Both approaches have their advantages and disadvantages, but it is not easy to commit to a common detailing level with the uncertainness how the future organization will look like.

3. THE CHILD IS BORN – A COMMON LANGUAGE IS NECESSARY

A child is able to learn any language. Even if the parents are speaking different ones, he or she can assign different words to one of his or her parents. But what if the parents do not understand each other?

So first they have to establish a common glossary of terms where they describe the meanings of all

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expressions both parties are using. And hopefully they can agree in each case to a common expression. For further activities, it will be much easier then to discuss and decide about details of the new process.

Do not think that this topic is an easy one. A lot of time in such integration meetings is spent with discussions about simple names like 'Software Designer':

> We do not have Software Designers; we only have Software Engineers that are also doing the software design!

Is this really a problem? It should not be! In most cases, it is an organizational problem. To understand that a common process at an abstract level cannot reflect all organizational roles is an essential part. Such details can be brought into the process later by adapting it to the business units needs.

Another classical discussion is the definition of components, modules, functions, units and so on. Which one is bigger? What is the smallest possible unit? Who is responsible for them? Which ones must be integrated and which ones can be implemented easily? Although there are default definitions in different standards, it is always a hot topic for all parties.

Finally, they decided to call each important thing by the same name. But where should they put now these important things – the children's toys?

4. PLANNING THE CHILDREN'S ROOM – THE PROCESS ARCHITECTURE

Often it happens that the child is in the world but nobody takes care of the children's room. How shall it look like? How shall it be structured? This does not mean to have a detailed plan which toy comes on which place, but to define the 'places' where the toys can be put on before buying them.

In our process language, we talk about the process elements of which the process shall consist, and the associations between them. In the beginning, it should not be too detailed but the main elements should be mentioned (see Figure 2):

- Phases and milestones: The frame for a process landscape can be described with a series of phases, finalized by a milestone or gate. In each of these phases, a set of activities are performed that not necessarily belong to one process area, e.g. 'Planning software tests' can be in the same phase as 'Designing the software architecture'.
- Process elements and activities: A group of single activities that belong together in any

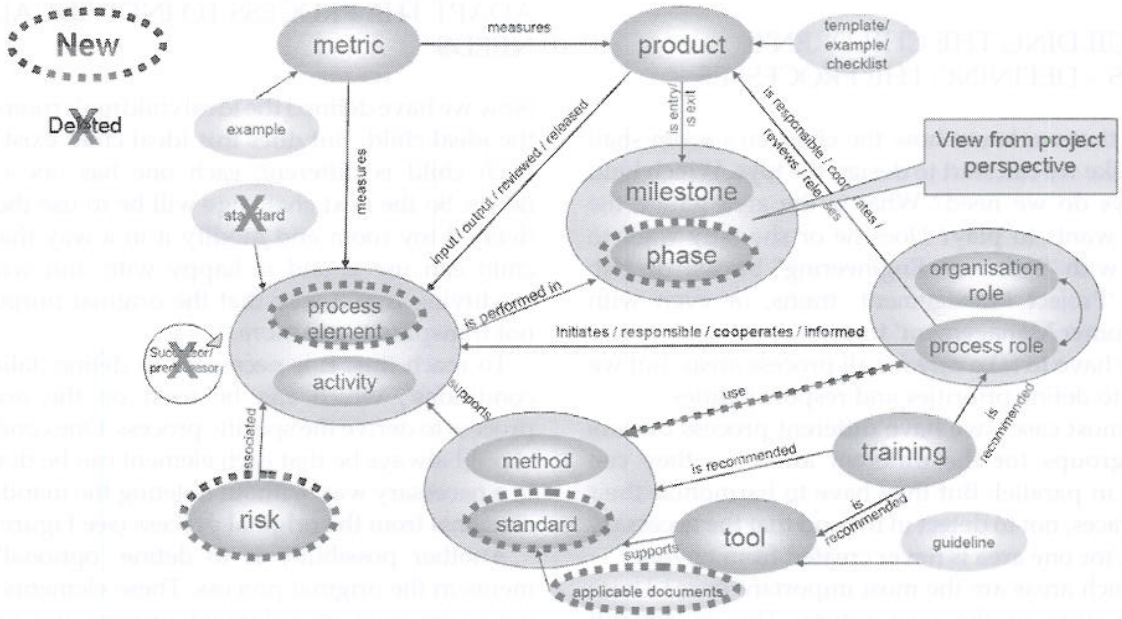

Figure 2. Working draft of a common meta model

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way can be described as process elements, e.g. 'Identify Software Requirements' as part of the process element 'Software Requirements Analysis'. Each activity should be assigned to a phase where it will be performed.

- Products: The result of each activity should be reflected in an outcome. This needs not to be a document, can also be a database entry, a tool setup, a binary file, some kind of hardware part, ... These outcomes can also be used as inputs for other activites. In the end you might perhaps be able to establish an activity-product flow.
- Roles: Someone needs to perform all the defined activities. Therefore, roles are necessary. They are associated with the activities as well as with the products. But take care that no inconsistencies occur in the triangle Role <-> Activity <-> Product <-> Role. With the right tool, you are able to avoid these inconsistencies automatically.

With these four elements, a first version of a common process description should be possible:

- The role 'Mother' says to role 'Child': Do the activity 'Clean up your room.'
- The role 'Child' puts his or her input products 'toys' onto the product 'Shelf'.
- The outcome is a tidy product 'Children's Room'.

5. BUILDING THE CHILDREN'S TOYS – DEFINING THE PROCESSES

Now that we know how the children's room shall look like we can start to design the toys. Which kind of toys do we need? What is the area where the child wants to play? Does he or she only want to play with 'Software Engineering' bricks, or also with 'Project Management' trains, or even with 'Customer Management' towers?

We have to take care for all process areas, but we need to define priorities and responsibilities.

In most cases, we have different process owners and groups for the different areas, so they can work in parallel. But they have to harmonize their interfaces, not to detect in the end that the necessary input for one area is never created from anyone.

Which areas are the most important ones? Those to be used in the next future. This is difficult to decide and it depends on the way of future collaboration. Leaving this answer open, we will concentrate on the software engineering process.

It is useful to define a structured approach for working on the different process elements. One example for an order could be the following:

- Phase names and descriptions per process
- Milestone names and descriptions per process
- Deliverables per milestone (part of output products)
- Deliverable descriptions
- Role names and descriptions per process
- Activity names and descriptions per phase
- Input/output product names and descriptions
- Association of activities, input/output products and roles

Keeping this order in mind it should be possible to put more and more details into the process without running the risk of discussing details that are not necessary at this time. In the end, we should have a first version of a process description that can be used and adapted by each project type or business area.

For our child this means that it is not so important if the train defined as a toy is red or green. He or she can use it and play with it. And if he or she wants to have it in blue, it can take a crayon and paint it.

6. 'CLONING' THE TOYS – HOW TO ADAPT THE PROCESS TO INDIVIDUAL NEEDS

Now we have defined the ideal children's room – for the ideal child. But does this ideal child exist? No! Each child is different; each one has one's own needs. So the next challenge will be to use the predefined toy room and modify it in a way that our child can use it and is happy with, but without modifying it in a way that the original purpose is not transparent any more.

To reach this, it is necessary to define 'tailoring conditions', which can be used on the original process to derive the specific process. One condition should always be that each element can be detailed in a necessary way without deleting the mandatory elements from the original process (see Figure 3).

Another possibility is to define 'optional' elements in the original process. These elements need not to be used in a derived process and can be replaced by individual ones (see Figure 4).

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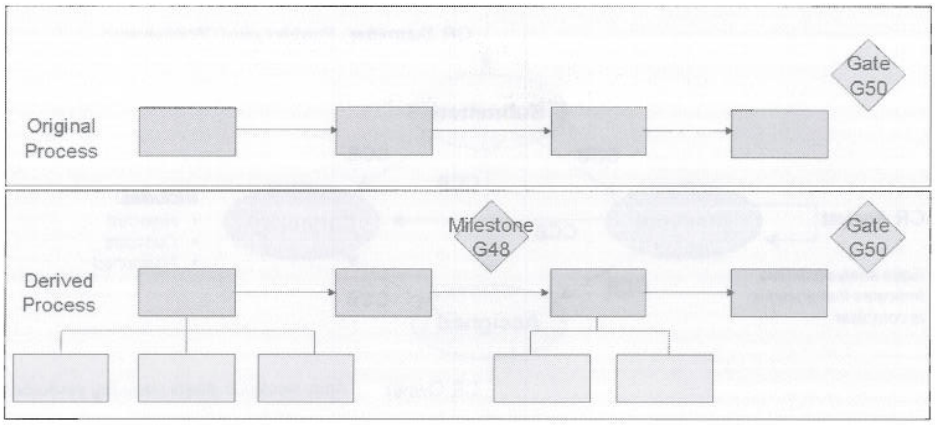

Figure 3. Detailing of process elements

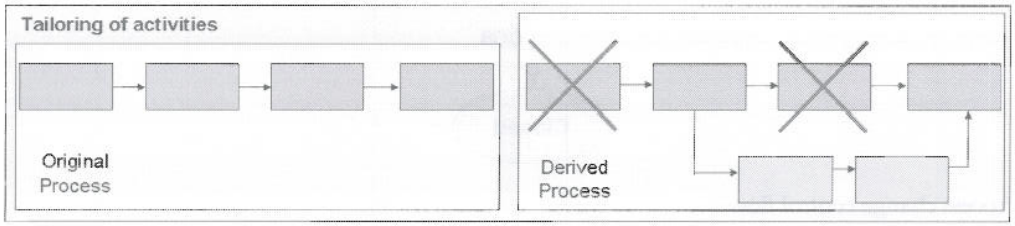

Figure 4. Deletion of optional elements and definition of additional elements

In the end, we should have a process definition that fulfils the needs of the project and the demands from the original process.

7. THE CHILD IS PLAYING – THE PROCESSES ARE LIVING

And now child . . . close your eyes . . . open the door to the children's room . . . open your eyes and . . . let us play! Let us see whether the toys we designed for our child are really making fun, or whether he or she is unhappy with one or all of the toys.

The setup of pilot projects is a useful way to find out, if the processes defined on the 'green table' are really able to be used. In fact, the process was not only defined by theoretical experts but also by practitioners, so the risk of having completely wrong processes is very low. But details in handling different process areas might not be defined well enough, or a template does not match with the demands of an activity, or a role description misses an essential part . . .

Process improvement is the task that is in the main focus now. Feedback from the pilot projects and from the other ones must be collected, analyzed and implemented. A change control board decides about each change request submitted by any of the process users. In the place of the process definition teams from the integration phase are now the process managers who have to take care about every change in their process area (Figure 5).

The opportunities for improving the processes are big . . . as they were before . . . before the merge. But the processes are living, the child is playing, and that was the goal.

8. CONCLUSION

You have seen that combining two process worlds into one is not an easy task. You have to take care of different situations like cultural background, different languages, process modelling tools, individual needs and last but not least the users of the process. People from both prior companies are now working together with the new process within common projects. They are not absolutely familiar with it, but they have the support from the process experts

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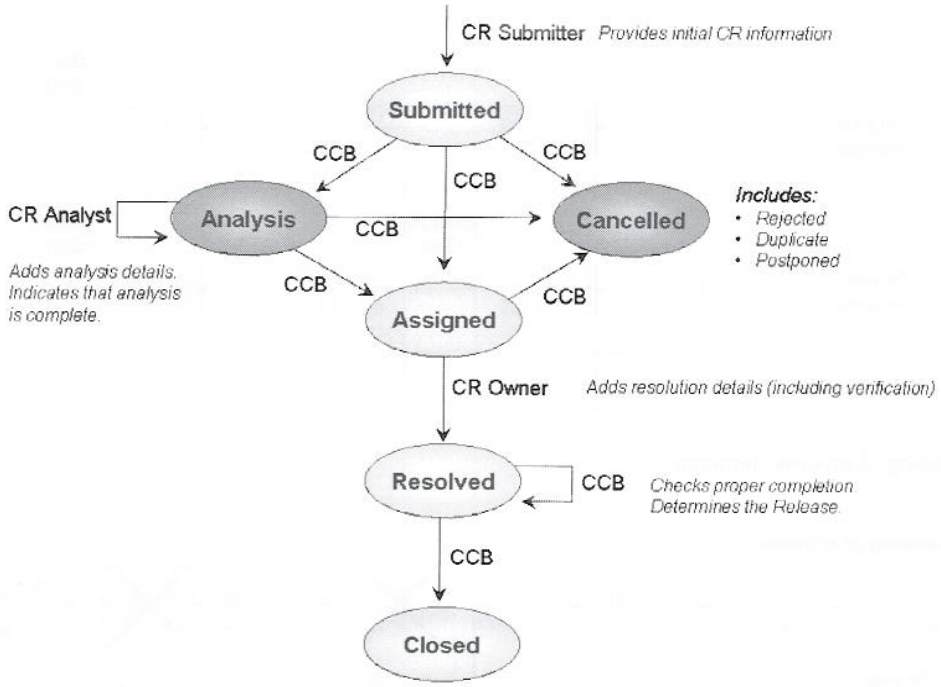

Figure 5. Process change control flow

in their organization and can deliver as many feedbacks as they have.

Doing this integration in such a short timeframe is possible if you focus on the main parts and not lose yourself in details. And there will be enough time to add as many loops of process improvement as you need after you have established a first working version.

Because the best child is not good enough if he or she was never born.

REFERENCES

Balzert H. 1998. *Lehrbuch der Software-Technik – Software Management, Software Qualitätssicherung, Unternehmensmodellierung*, Spektrum-Verlag.

Höhn H, Sechser B, Dussa-Zieger K, Messnarz R, Hindel B. 2009. Software Engineering nach Automotive SPICE: EntwicklungSprozesse in der Praxis – Ein continental – Projekt auf dem Weg Zu Level 3. dpunkt Verlag.

Hass AM. 2003. *Configuration Management Principles and Practice*. Addison Wesley: Reading, MA.

Hindel B, Hörmann K, Müller M, Schmied J. 2006. *Basiswissen Software-Projektmanagement*. 2. Auflage. dpunkt.verlag.

Hörmann K, Dittmann L, Hindel B, Müller M. 2006. *Spice in der Praxis*, dpunkt.verlag.

Ludewig J, Lichter H. 2007. *Software Engineering – Grundlagen, Menschen, Prozesse, Techniken*, dpunkt. verlag.

Mantel S, Meredith J, Shafer S, Sutton M. 2001. *Project Management in Practice*. Wiley: USA.

Schäuffele J, Zurawka T. 2003. *Automotive Software-Engineering – Grundlagen, Prozesse, Methoden und Werkzeuge*, Vieweg Verlag.

Versteegen G, Hindel B, Meier E, Vlasan A. 2005. *Prozessübergreifendes Projektmanagement – Grundlagen erfolgreicher Projekte*, Springer Verlag.

DOI: 10.1002/spip