ENTERPRISE 2.0
An example of a MACHINERY MANUFACTURER

In this article you will read:

• *How the working world could change using the so-called Web 2.0 technology following a descriptive example*

• *How such a process could – and should – run ideally in a company or in a government agency*

• *Why such a long-ranging development strategy of the information and communication technologies should be a working field with staff council or employee committee.*

Enterprise 2.0: hype or a real option for companies?

You will read a simulated story of a machinery manufacturer called MaNu & Co. The main actors are the member of Employee Committee Steve and Chief Information Officer (CIO) Jennifer. A meeting with both of them takes place on a hot summer afternoon in the year 2012 in the company's video chat room. The object is to find out, how the company has changed from a traditional machinery manufacturer to an Enterprise 2.0…

The example is imaginary, but all technical terms and ICT applications are not. They exist today… And every company could use them in the same way, as illustrated here. In the year 2008 MaNu

& Co. was a typical German machinery manufacturer: with about 500 employees the company developed and produced automation and handling technology for fields of application in high-tech-automated areas, in particular for the chemical industry and the paper manufacture industry. With its tailor made and custom built manufacturing equipment and its patented in-house development. The company was ranked in the globalized market of 2008 in its niche among the world market leaders – or as they were often called "Hidden Champions".

The German machinery manufacturer branch was again an export champion – despite the tight state of economy (as we all remember, in 2008 the so called credit and bank crisis in the U.S. began).

Also MaNu & Co was doing fine with a yearly gain of about 20%.

MaNu & Co. was doing fine on one hand but on the other: the expenses were sky rocketing, especially in energy costs. Despite a good starting point, MaNu & Co. was very conscious about one thing:

In the years to come, the costs will need to be reduced and the overall performance will need to be increased. That means, in the first place, more innovation, more service and more customer relations. In other words: more quality in each and every aspect. Saving only on the costs of labor will not alone help to attain this goal. A new creative solution had to be found.

New Questions for Old ICT-Solutions

"Today looking back at that situation, it was at the point when new questions came into play", says Steve. When it came to savings, the first approach was to always look at the wages from our colleagues in the production floors or equipment assembly and installation departments. As an Employee Committee Representative we raised different questions: What does all this information and communication technology cost? And how much does it really help us?

But no one was able to answer these questions with numbers. But one thing became obvious: the investments in the ERP-System in the beginning of the year 2002 were immense, as well as the long delayed leap in the next generation technologies of networks in the year 2006. "From that moment on we looked more closely at it and it became obvious: We were investing a lot of money and time for ICT, but we didn't even know how much exactly." Says Jennifer, looking back from today's point of view and

as the person in charge of Information and Communication technology (ICT).

- Is the time over for main standard software solutions?
- Are there going to be customized solutions for smaller companies?
- Do we have to think into a new direction for the usage of ICT in companies?

But as soon as the costs for ICT were questioned, it raised many uncertainties about their actual use – it lead to a discussion within the whole company. The ICT department was battered with questions: Did our productivity increase at all? Did our processing time decrease since we're using this system? Have customer loyalty and customer satisfaction really improved, because of purchasing a CRM-Module? Are our innovation cycles faster, has the quality of customer service enhanced, since we were able to calculate the length time for the average customer support call? Everybody got really skeptical, recalls Jennifer.

Jennifer (Chief Information Officer)

Back then she was still a rookie in MaNu & Co.´s ICT department, because of that fact, she could see, all the raised questions were justified and the previous CEO of ICT department had only the same standard answers for them…

"He always said: We're just buying the standard, everyone is using, and we even indulged ourselves in getting the Mercedes among the ERP-Systems. If that's not working out, it sure isn't because of the software." From his point of view it was only logical, that it was everybody else's fault: the operating departments, because they didn't specify in the Customizing-Process enough what they needed or the end-users, because they again didn't want to get involved into something new.

Old insufficiencies become apparent

It was just like in the old fairy tale: As soon as the "Jeanie" was left outside of the bottle, it was impossible to get him back inside. Even the manufacture came out with some problems. The assignment of the production orders never really worked out with the old ERP system. And the whole stock receipt department had stories to tell, what really was loaded or unloaded from the trucks or moved from one part of the storage to the other just to accommodate the posting procedures of the ERP-System. And even People from the Research and Development raised their voices, since the purchase of a PLM-System was close. This System promised consistency of data of all products, in other words, all information and data concerning a product should be accessible at each station along the entire product-life-cycle. This though apparently seemed to only go along with a broad standardization of the innovation processes and with another huge financial investment.

There was a lot of controversy and discussion with many different opinions. The points of views differed between "I always told you, all this new fancy stuff would not work out!" And: "If we buy the highest standards and it still does not work, it has to be due to our people!"…

Bit by bit one thing got clearer: the world changes, especially the ICT world. Maybe so, it was considered, the time was done for big and expensive standard solutions? Maybe it is the time that customized solutions can be within means of smaller companies now? Maybe we have to think into a different direction of how to use ICT in our company?

"Well, and that's exactly what we did!" recalls Steve.

What has changed in the mean time?

An important feature that then came into play was the possibility of using a so called open-source-software – 2008 still a recent new development for an

application in companies. Despite that fact MaNu & Co. decided to switch.

Open Source at the Product development department

After MaNu & Co.´s network and software (such as text processing) switched to Open-Source-products, the confidence in the suspiciously considered new software grew. The programs ran smoothly, almost no one missed any functions and even the support by the users-community in the Web worked better and faster than before, when they used expensive hotlines, which in the end hardly ever helped anyways. It was in a way a natural development that the concept about the companies own products changed.

The big turning point came, when Head of R&D discovered OSADL – "Open Source Automation Development Lab", an Open-Source- Initiative Program that was founded in 2005 by many well known machinery and industrial equipment manufacturers as a cooperative association. Their task was to develop an Open Source Software, serving industrial automation standards.

With this organization the Open Source system software Linux became an application capable of real time use ("power control"), introducing automation certificates and also standards for software interfaces. Steve remembers: "That was incredible! A lot of the things we had to complexly develop ourselves to control our machinery or had to buy expensively from third parties – was already there existing, ready to be used!"

The initial doubts concerning patent and legal issues could be resolved rather quickly. Though it is not possible to patent the software code itself, the automation techniques designed for the system can.

Soon MaNu & Co. joined the cooperative association and by now they put in quite an amount of their own developments. Currently they are leading a project relating to embedded Linux. "Today, the best of all", says Head of ICT

Jennifer, "we were able to reduce 25% of our costs for development regarding the control system and we are also much faster than before. We are more flexible towards customer demands the problem solving is much more direct – because the entire OSADL community is supporting each other. And our clients are happy. Because our innovation cycles of the control technology is much shorter now and we can offer a higher quality service. Our R&D department is backed up with more ICT specialists now.

The Human Resources department and small side effects

From the HR's point of view the kind of information and the communication with the employees changed. In the new MaNu & Co.'s Wiki all the information and news about medical insurances for instance or the company's retirement funds (like the 401k) are being published. Especially that anyone could raise their questions openly. The employees now are much more up to date than before, especially about those things that concern them.

That is one side to it. The other side is that no one in MaNu & Co. needs something like a skill-database anymore. Since almost everybody installed their own in house blog, it is much more visible than before who can do what and who knows what. Where do I find what knowledge? Who has which qualifications? To know this serves everyone, but off course mainly the HR department.

Steve (member of Employee Committee)

And there is another important side effect of "MaNu & Co. 2.0": Back in 2008, when the switch started, the industry talked about the lack of qualified workers. Being a small, fairly unknown firm out in the Boondocks it was not easy to recruit young engineers. On the other hand they belonged to a generation that grew up not only with the internet, but also with YouTube, Flickr and Twitter – in other words with the Web 2.0. "And we were able to show them, that being a traditional machinery manufacturer we are at the same time up to date", says Steve. "And today everyone can select which device they want to work with, i-Phone, Blackberry or whatever else. What everyone might find "cool" or fashionable, it works here. It only has to be a web compatible device; everything else does not matter anymore."

ERP-System: a long way parting

Mainly for the Management Accounting Department the switch was a big step. The ERP System before, with its complex structure and the many modules, was always like a baby of the Management Accounting Department. In the end their work and controlling processes were based on the mass of data and financial ratios that the System spit out consistently. And even though the system always had its deficiencies (a major part of the needed reports was only possible with the detour of many Excel-data files): Continuing without the old ERP-system was unthinkable for the management accounting department for a long time.

And indeed: the switch from the ERP-system to a relational, web-based data base was the biggest project on MaNu & Co.'s way towards being an Enterprise 2.0. But this long and sometimes rocky road was worth it and it paid off. Not only because MaNu & Co. became independent from the ERP-producer and saved immense costs for licenses, customizing and release-changes. But also because the old ERP-System implies a standard that in many cases does not match the actual processes within the company.

The first step was the Web-based tool for employee time card tracking in 2009 – since then the service staff for instance who temporarily deployed to China could promptly put their labor time on the corresponding projects at the end of the month.

The basis was and is a data base solution, realized by Open-Source-tools such as my SQL and PHP. And was bit by bit expanded: the automated invoice issuing of the service operations was the next step, the controlling of major customer projects another… Other than with the centralized, hierarchical ERP-System it could be developed locally, application by application and always very close to the needs of the users.

Starting from the key data collecting system, bit by bit a system emerged that supported the real workflow in each workstation. Although there are less operating figures now, those that do exist help everybody.

Steve is happy, too: "Mainly the production department profited from being able to design locally a control technology for the production processes that earns its name." That everything works much better now with all the workstations connected, has also to do with the team leaders and all the employees of the project planning and logistics department being able to access the system with their mobile WLAN-enabled devices wherever in the production floor they might be at that very moment.

"The production workers are already thinking one step ahead", adds Jennifer head of ICT. "They came to us and now we are having a project of how to use RFID in a sensible way in production. That has also changed a lot: Today everybody is actively participating in designing our ICT. The things are not just put in front of our people anymore.

A new culture of exchange / communication

"Yes, the organizational culture has changed quite a bit – back then in 2008 no one would have imagined this", recalls Steve, who just was voted as a new member of the Employee Committee or Staff council representative, then. "And all this has to do with these new Web 2.0 things."

It all started with the setup of the company's Wiki. Looking back Jennifer

Head of ICT says: "That was comparable to a cultural revolution." Because the intranet, which was used to place information within the company before suddenly became a real communication platform where communication could be joined by everybody. The start-up took a while, but only after a few days the use practically exploded. By now there are Wiki-categories for all sorts of topics. The most effective use the company experienced was probably through the Development and Design department –Wiki.

Everyone could drop direct comments concerning a product in there. If a service technician sees room for improvement while starting up a new machine on site, he can add it in the Wiki with his laptop right then without putting much effort into it – of course well protected from unauthorized admission. He writes for instance: "When the cover for the supply of the MaNu & Co. 18S is open, the warning light of the sensor 237-1 can hardly be seen – yet, especially for the set up of the supply process I have to keep an eye on it." A technician, who then is on duty at the support hotline, adds: "That is very similar to the 16S. But there you can not only open the cover for the supply, but also push it to the side – is that not possible anymore with the M18S?" And a feedback from the responsible design engineer does not take long: "It is no longer possible to push the cover away at the M18S, because of the modified position of the handling robotics. But it should be no problem to move the warning lamp, I'll check it right now…"

This or close to this is how communication works in the MaNu & Co.-Wiki now. It became normal, that everybody is participating – regardless of function or position. Whoever has something to say, says it.

A similar development took by blogs, today – in 2012 – 67% of the employees at MaNu & Co. have their own blogs! And you can find completely different topics: starting with the idea to use the new generation of MaNu & Co. machinery with the Apple-User-Group up to discussing the new product of a competitor. At the same time private interests mix with company specific interests.
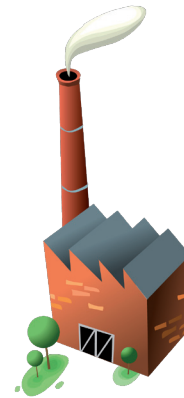
Steve: "Well, the staff council had to rethink – obviously our work could be directly and visibly criticized since then. But we can present ourselves completely different in the Wiki, what we do, discuss, with whom we are negotiating about what currently and so forth." And Jennifer adds: "Technically all this cost us almost nothing! The Wiki- and the blog-platforms are all Open Source and run Web-based. They are easy to install, everyone could participate right away. That is what I call real knowledge management – with no effort and no costs!"

MaNu & Co.'s Wikis and Blogs all have external and internal areas. So that for instance the support-Wiki is as well an accessible platform for MaNu & Co. customers. Service and Marketing are closer to the customers. The customer's feedback gets much faster and more direct into the R&D department - and by now the customers even help each other. With that alone MaNu & Co. realized in a short time with low costs a huge competitive advantage. The customers are being helped much faster; the products are being developed faster and closer to market requirements. Steve is sure: "Also the lead time for new products got shorter because of it. And the added value for the user is immense, because they can communicate directly, when they have similar needs in their industry."

And what happened with the ICT department?

At the end of our video chat I still had one question left: "Wasn't that an enormous effort for the ICT-department – this whole switch of the ICT-strategy?" Jennifer laughs: "Well, we definitely do not have less work, that's true. But we don't have much more. And above all: With fewer costs and with less effort we can do much more. Since everything is put on Web-based technology we can attach different end devices with less effort and at the same time we are able to run different operating systems in-house. "

Also the time and effort for training reduced by a lot, because the users help each other in the Wiki and many applications are very similar in the handling and can be used very intuitively. "Hardly anyone ever needs coaching", says Head of ICT. That also includes the software designers. Because a wide range of applications can be designed and maintained with the same tools.

MaNu & Co.

At the same time the web applications of MaNu & Co. are very well rounded – they are complete interactive applications, which back then in 2008 it could hardly be imagined by anyone. "But to develop them it just became much easier", says head of ICT, "with design frameworks such as 'Ruby on Rails' or Sproutcore' and with PHP and mySQL for our Databases we are able to cover about 98% of our customer requirements concerning our ICT. And since everything is open source it does not only mean fewer costs but also more support from the designing-community in the web. We can find so many already prepared scripts and libraries, that only have to be adapted and it's ready to go!"

That all might sound very complicated and technical, but in the end it only means, that the ICT department can take much better care of the needs in every day's practical work situations and appropriate applications. Thereby the self-concept of the ICT department has changed: Instead of nurturing their knowledge of domination it is now all about the satisfaction of the employees. "It is amazing", says Jennifer, "our users today are much happier and our

ICT people are less stressed – four years ago in 2008 the situation was very different!"

What can be taken from this story?

Well, I hope this fictitious story of MaNu & Co. can inspire new thoughts in regards to the current ICT-strategies in your own company or in your own government agency.

• Most rarely ICT-strategies are scrutinized. And: in fact who in your company is taking decisions on the ICT-strategy? And according to what criteria?
• Most rarely companies know how much their IT environment actually costs – even more rarely do they know if these investments are justified or really increase productivity.
• Most decisions in regards to ICT are made blindly always following the same patterns: expensive systems that everyone uses seem to be a standard one has to follow. Only then you feel as though you have made the right choice. A lot of investments, no experiments – that is the standard procedure.
• Thereby you are getting ICT that makes a lot of noise when a new version is issued, its core though, its basic architecture, often is rigid and hierarchical. It's seldom as newly as it seems – especially it is not as dynamic and flexible as today's software needs to be.
As a consequence companies often burden themselves with far too expensive software that is binding them for years with update obligations and license fees. And far too often the companies in the end, adapts to the software and not the other way around.

WORC – the new ICT strategy

Many people might think now:

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COMPANY + BLOG =
  ENTERPRISE 2.0
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Our story though illustrates much more: Not only how a middle sized company of the industrial goods industry discovers "blogging", but also how it aligns its new ICT strategies into a completely new direction. And in doing so, four elements are essential, which add up to be newer and especially for smaller companies adequate development strategies that are fit for the future. Abbreviated, I would like to call those elements WORC:

• **W**eb 2.0
• **O**pen Source
• **R**ich Internet Applications and
• **C**loud Computing

What usually is meant with "Web 2.0" – are in other terms participation methods like Blogs or Wiki – becomes within the WORC – strategy a base for a new, local and dynamic way of knowledge management and of communication inhouse and to the outside.

In doing so the potentials of "Open Source" software reduce costs for design –especially for the in-house design of control system software and of automation technology – and it improves service quality. Due to the "Rich Internet Applications" the company is no longer dependent on expensive licenses, complex server-hardware and proprietary operating systems. The design of applications oriented towards specific needs becomes affordable – while expensive ready-made ERP standards "off the rack" is out!

And finally "Cloud Computing" makes anything anywhere possible. No matter what end device, what operating system, and no matter where on the planet: all company data are accessible any time anywhere and due to synchronization and push-functions always up to date for everyone.

And the moral of the story is?

Technology changes our world. But it does not involve one-sided changes as for instance forces of nature might. It is the people or different interests within a company that dominate the decisions of purchasing or using technology. And ICT today is a working tool that employees use on a daily basis.

For just that reason alone Staff council or Employee committee should not only be interested when it comes to personal related data. Particularly when it comes to ICT strategies Staff council should actively intervene, because those strategies determine how tomorrows work will be done.

One thing must not be forgotten in the nice new Web 2.0 world: Internet, open-source, web-communities – all this is based on the idea that equal partners can communicate on non-hierarchical platforms and create something new together – and all this in a way that everyone benefits from it.

Our economy however works with different policies. For that very reason open and community oriented approaches are always threatened to be exploited for one-sided interests of individuals. A web blog in the company does not compensate the real conflicts of interest or hierarchies. But it makes visible what could be changed - other than with the current ordinary hierarchical ICT-systems, where in the end company management, ICT-specialists and expensive consultants decide over the employees head about purchase and use.

Dr. Sabine Pfeiffer

Projektinformation

Im Forschungsprojekt „SInn – Smarte Innovation" stellen sich Partner aus Wirtschaft und Wissenschaft gemeinsam die Frage: wie kann zukünftig jede Station im Produktlebenszyklus ihren Beitrag zur Innovation einbringen? Und zwar lebendig, partizipativ und nachhaltig – mit und für die Menschen in der Innovationspraxis: Von der Entwicklungsingenieurin bis zum Servicetechniker. Weitere Infos unter www.smarte-innovation.de

Projektförderung

Das Projekt wird im Rahmen des Forschungs- und Entwicklungsprogramms „Arbeiten – Lernen – Kompetenzen entwickeln. Innovationsfähigkeit in einer modernen Arbeitswelt" aus Mitteln des Bundesministeriums für Bildung und Forschung und aus dem Europäischem Sozialfonds der Europäischen Union gefördert. Betreut wird das Projekt vom Projektträger im DLR Arbeitsgestaltung und Dienstleistungen.

GEFÖRDERT VOM

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