Social Collaboration Metrics

Manfred Langen

Siemens AG, Corporate Technology

81730 Munich

Germany

manfred.langen@siemens.com

ABSTRACT
Social Media in the enterprise is widely introduced, and its benefit in general is not in doubt. But the arguments of better communication and improved networking of employees will not be sufficient in the long term. Today's metrics on registered users, number of visits or user generated content have to prove a relation to real business impact. Therefore, we at Siemens Corporate Technology developed the ICUP model (Impact, Connectedness, User engagement, Platform adoption) to close the gap between counting registered users and measuring business value.

Categories and Subject Descriptors
K.4.3 [**Organizational Impacts**]: Computer-supported collaborative work

General Terms
Management, Measurement

Keywords
social networking, social computing, Enterprise 2.0, social media, maturity model, KPI

1. INTRODUCTION
When social software arrived in the enterprise internal use the focus was on experimenting and acquiring experience while using applications like blogs or wikis. Now, the use of social media has been adopted by most enterprises and the primary phase of experimenting is over [5]. Management is seeking for more impactful and tangible results to demonstrate the value of social media. Metrics like number of members, site hits, number of postings are good but not enough. Success stories that made an impact on business performance is one way of showing value but has not the relevance of a KPI. The situation is similar to the one knowledge management (KM) initiatives were in around the year 2000. At that time the discussion on metrics in KM and particular metrics for Communities of Practice came into focus.

As the diversity of use cases was as broad as the gap between qualitative and quantitative measures, no general solution established oneself.

Only some approaches of intellectual capital measurement [1] or maturity models [4] got some resonance.

2. QUALITY VERSUS QUANTITY
Some quantitative measures regarding the usage of a platform are easy to capture. This way you get to know whether there is activity in general but not whether this activity supports your business goals. Therefore, isolated quantitative measures are criticized as vanity metrics [8]:

The only metrics that entrepreneurs should invest energy in collecting are those that help them make decisions. Unfortunately, the majority of data available in off-the-shelf analytics packages are what I call Vanity Metrics. Vanity Metrics are bogus.

Metrics that can help in decision making are particularly useful for decisions regarding the improvement of the platform. In addition, indicators that target the desired goals of the platform are relevant, e.g. cross business unit collaboration.

As content is useful in a specific context for one person it can be useless for another person. There is no general indicator for the quality of information but qualitative evaluation of content can be based on feedback mechanisms, e.g. likes or ratings.

The approach of telling success stories is another qualitative measurement. But as this is done on a by-case basis it does not fulfill the characteristic of a metric.

Finally, there is no clear functional chain from some immaterial information to a number in the company's balance sheet.

3. METRICS IN THE ICUP MODEL
The use of social media in the enterprise has other goals than in the Internet. Therefore, metrics from the Internet cannot easily be transferred. Nevertheless, some indicators as user generated content and user engagement are relevant for both domains.

On the basis of literature research and our experience with several Siemens-internal platforms we developed the ICUP model which is described in the following.

ICUP (Impact, Connectedness, User engagement, Platform adoption, figure 1) integrates aspects of qualitative and quantitative measurements and can be interpreted also as a maturity model.

At the beginning of a social software initiative the focus is on introduction and making people aware of a new platform. Users are motivated to try it out (platform adoption). In the next step the amount and quality of user generated content comes into focus (user engagement).
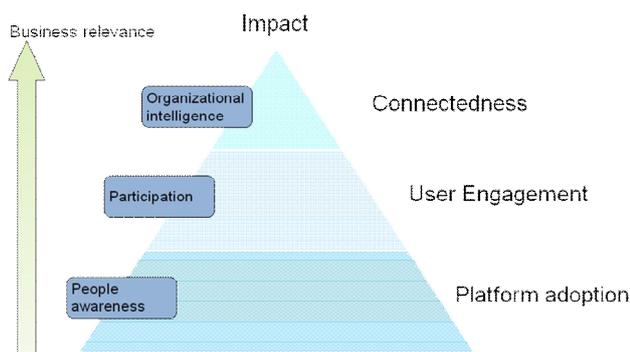
Figure 1. Pyramid of the ICUP model.

Based on the content employee networking has to be enhanced in order to improve problem solving or cross-organizational innovation (connectedness). At the top of our model is the measurement of business impact in tangible monetary value. This way the model reflects the general finding, that the monetary ROI becomes concrete with the deeper understanding of specific use cases [6]:

At start, companies are unsure of what to measure. After a initiative took off appropriate metrics can be developed. This is the best approach to metrics; while it's [...] not always possible to have robust metrics from the start, it's critical to put rigorous ones in place once you find that something clearly adds value.

Compelling use cases have to be identified first and depend from the application environment. Chapter 4 describes an example from Siemens TechnoWeb and elaborates how a business impact for an urgent request functionality can be calculated.

3.1 Platform Adoption

In this layer falls the number of registered user and their variation in time (growth rate). In addition, the number of people who come back in a certain time interval is helpful. Otherwise it can be overseen that while many new users enter the platform the people leave after a short time.

3.2 User Engagement

The core of social media is user interaction around user generated content. Interactions like post and comment, likes or ratings can be captured and processed into some statistics. The interaciton behaviour of users can be analyzed and a profile of interest can be derived.

3.3 Connectedness

The IQ of human beings depends among others on the neuronal networking of brain cells. Employee networking by analogy leads to effective knowledge exchange and can avoid duplication of work or support complex problem solving and innovation. The strength of networking can be derived from the structure of communities or expert networks, follow relationships or the length and structure of discussions.

3.4 Business Impact

Monetary values are estimated for a certain use case. Cost reduction by the reuse of good practices or answering urgent

requests (UR) are examples in this category. Nevertheless, most of these calculations are estimations based on certain assumptions.

Figure 2. ICUP model with possible KPI.

4. TECHNOWEB 2.0

TechnoWeb is a networking and collaboration platform used by around 40.000 technology experts at Siemens [7]. A key element is the so-called Urgent Request – a special type of Q&A system – used within the company to help each other in accomplishing business tasks. The requesters publish questions to a community of potential experts who are not known by name in advance. A broad acceptance rate and a positive ROI of the urgent request functionality cannot be achieved if too many knowledge workers are distracted from their daily work. At the same time it is a crucial requirement that a sufficient number of employees can be addressed in order to solve the problem of the requester.

The distribution of requests follows an intelligent algorithm to address a certain target group dependant on context information. An important strategy to modulate the optimal number of receivers is to categorize the business impact of an Urgent Request. In consequence, we use the weight of this categorization to control the amount of people who will be involved in the answering process. A high business impact justifies a higher number of notifications and larger involvement of employees while a low business impact must not distract the attention of too many knowledge workers.

Before posting an Urgent Request on TechnoWeb, it is required for the sender to select the estimated Business Impact (BI) of the answer to his Urgent Request with a slider (figure 3).
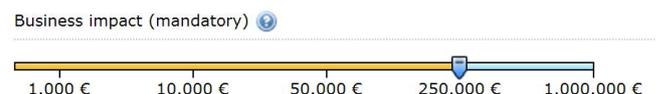

Figure 3. Slider to select the Business Impact of an answer

The Business Impact that has to be set ranges from €1000 to €1 000 000. The higher the Business Impact the less rigorous is the selection of recipients. If the Urgent Request has a Business Impact of just €1 000, it is not appropriate to contact thousands

of experts. In this case the Urgent Request is only sent to those experts which are directly associated to one of the tags of the Urgent Request. Here, we take the risk that we lose some experts in TechnoWeb which might have replied to the Urgent Request. As long as the sender gets support, this is acceptable. If the Urgent Request has a Business Impact of more than €1 000 000, we do not want to take the risk that we lose a potential answer from an expert. In this case the Urgent Request is broadcasted to the whole TechnoWeb community.

Every month an average of 25-40 requests are published. Each request receives an average of 8 replies – the first arriving within half an hour.

The software solution uses Liferay Portal, a Java-based open source software for enterprise portals. The specific enhancements are own developments including innovative, patent-pending software technologies [2].

4.1 TechnoWeb Platform Adoption

According to the ICUP model the importance of adoption metrics has lost significance during the last years. Nevertheless, the number of members and number of new users per month is still tracked. The same is true for the number of TechnoWeb expert networks. Looking back, the number of members raised from 15.000 in July 2011 to 43.000 in June 2015. In total there are around 1500 networks for technology experts.

4.2 User Engagement – Digital Trace

Profile information, or Digital Trace [3], is acquired when a user is active within the platform. The users of TechnoWeb can follow tags, can join a TechnoWeb network in a field of interest (a network also has tags assigned) and can assign tags whenever they post some news. These tags are the basic data of their digital trace. All these tags are managed together with tags from other social media applications in an enterprise wide Tagging Framework.

Tags of a Digital Trace are divided into two types, *Strong Tags* and *Weak Tags*. A Strong Tag is when the user personally assigns a tag to him/her (e.g. following a specific tag that relates to their expertise). A Weak Tag is when the user is indirectly assigned a tag (e.g. joining a network will indirectly assign you to the network's tags).

An improvement in the Digital Trace metric will also improve the Q&A effectiveness. The richer the Digital Trace, the easier it is to identify the experts. These experts are valuable in helping to answer Urgent Requests or commenting related content in TechnoWeb.

The target messaging algorithm is only as perfect as the Digital Trace data. Therefore, an increased activity level of all users will advance the quality of results.

4.3 TechnoWeb Connectedness

One of the goals of TechnoWeb is knowledge exchange across organisational boundaries. In consequence, we can define as a relevant metric, whether this is true for the answers to urgent requests. An urgent request is published when the local competence in a business unit is not sufficient. The metric analyses the origin of the answers compared with the organisation of the asker.
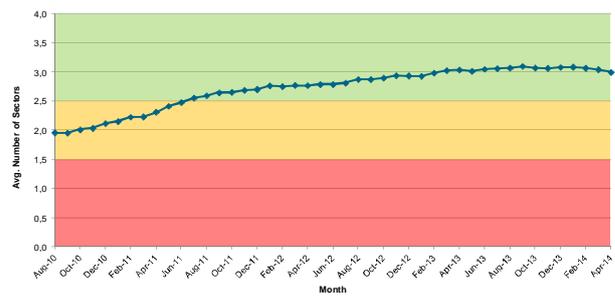

Figure 4. Involved sectors in answering Urgent Requests.

The Siemens organization was structured in 4 sectors until end of September 2014. Corporate units are bundled as a fifth sector. Figure 4 shows the KPI over time. In the beginning, only two sectors were involved in the answers of an urgent request, and this increased to three within two years. With regard to the goal of TechnoWeb, this provides proof for good progress.

Another metric regarding knowledge exchange across organisational boundaries can be applied to TechnoWeb networks. Cross-sector participation in a network can be calculated similar to the preceding example. TechnoWeb has an average of 3.7 sectors per network (figure 5). Around 60% of all networks have members from at least four different sectors. The 5% of all networks that only involve members working in the same sector are mostly sector-specific networks that are created for very specific issues.
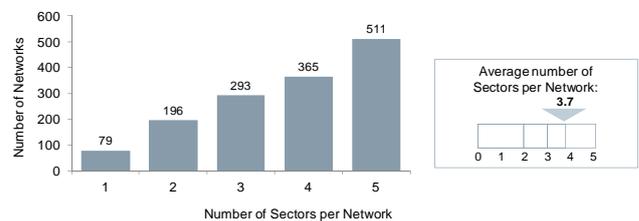

Figure 5. Number of sectors per network.

4.4 TechnoWeb Business Impact

The feature of Urgent Request is available for all Siemens employees since the global roll-out in 2010. Due to a high frequency of usage, a targeting algorithm was implemented in October 2011. Instead of broadcasting the Urgent Request to every member of TechnoWeb, an expert identification algorithm is used to send the Urgent Requests to those experts with a higher probability of responding.

Although the Urgent Requests are sent to a lower number of TechnoWeb users, the message targeting algorithm preserved the Urgent Request high success rate.

One of the metrics used to monitor success in corporate problem solving is the percentage of Urgent Requests that are answered, including monitoring the Business Impact levels of unanswered Urgent Requests on a monthly basis. The success rate was kept above 80% most of the times and has now an average above 90% (figure 6). This indicates the significance of identifying the right experts within a social network.
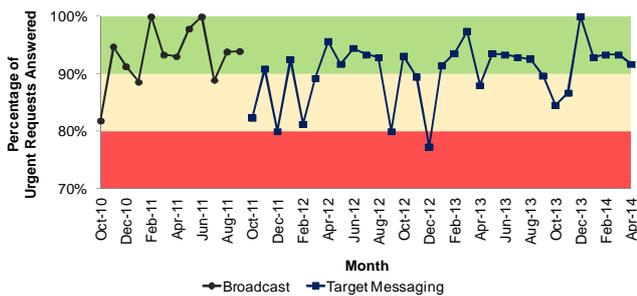
Figure 6. TechnoWeb Urgent Request success rate.

Already within the first three months after the launch of the new algorithm, more than 1 000 000 notification emails were saved, which is more than 80% compared to a broadcast of notifications. A more detailed metric involving the success of Urgent Request is the monitoring of the business impact values of the unanswered Urgent Requests. The not answered requests have mostly a low value. The reason is that the distribution algorithm expands the target group with increasing business values.

Another metric monitors the average answers per Business Impact question. While the category of €1000 questions receives between 3 and 4 answers, questions with the highest Business Impact receive more than 20 answers on average.

Summarizing the business values of answered Urgent Request over a month results in an average value of 3.5 million Euro per month. Since the introduction of the concept of business impact in October 2011 the cumulated business impact in three years exceeds 100 million Euro.

Of course, this is an estimation which is as realistic as the estimation of each author. We do not control the credibility of each impact value. Nevertheless, the feedback of the community is an effective social control if there is a misuse. In order to calculate a realistic ROI the time of all people who thought about an urgent request should be taken into account as costs. This is hard to measure, but compared to the 100 million mark, it seems marginal.
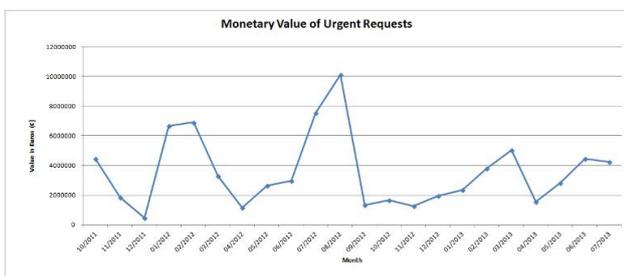

Figure 7. Monthly business impact of Urgent Requests.

5. CONCLUSION

The approach shows how several possible metrics can be structured in a multi layer model. Many examples of metrics applied to TechnoWeb demonstrated that specific metrics make sense in a certain use case.

When we decided, in 2009, to introduce TechnoWeb for Enterprise Social Networking we had no estimation of the ROI. Now we have a measured value that can be used as a reference for other companies that are planning such application.

It has to be considered that measurement itself creates costs. Measuring everything that can be measured does not make sense. Furthermore, metrics that are published can influence the usage of a platform – sometimes in an unexpected way.

Our current research is on the topic of *Digital Influence* [9] which can be seen as another important KPI in the category of connectedness.

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] Edvinsson, L., Malone, M.S. 1997. Intellectual Capital: Realizing your Company's True Value by Finding Its Hidden Roots. New York: Harper Business.

[2] Ehms, K., Heiss, M., Langen, M. 2013. Method and Apparatus for Distribution of a Message. United States Patent Application Publication US 20130060864 A1, filed: 6.11.2011, published: 7.3.2013.

[3] Kannampallil, T. G., Fu, W. 2009. Trail patterns in social tagging systems: Role of tags as digital pheromones. In Foundations of augmented cognition. Neuroergonomics and operational neuroscience: 165–174.

[4] Langen, M. 2000. Knowledge Management Maturity Model – Holistic Development of Knowledge Management with KMMM®. In: "Taking Knowledge and Best Practices to the Bottom Line", APQC's Fifth Knowledge Management Conference, December 2000

[5] McKinsey Global Institute. 2012. The social economy: Unlocking value and productivity through social technologies.

[6] McKinsey Quarterly. November 2013. Building the social enterprise. http://www.mckinsey.com/insights/organization/building_the_social_enterprise

[7] Mörl, S., Heiss, M., Richter, A. 2012. Siemens: Knowledge Networking with TechnoWeb 2.0. http://www.e20cases.org/files/fallstudien/e20cases-09-siemens_english.pdf

[8] Ries, E. 2011. Techcrunch interview 24.9.2011 http://techcrunch.com/2011/09/24/founder-stories-eric-ries-vanity-metrics/

[9] Solis, B. 2012. The Rise of Digital Influence, Altimeter Group. http://www.briansolis.com/2012/03/report-the-rise-of-digital-influence/