

# Conclusion

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The case of Novell and the openSUSE project has been an interesting study, and has provided a great insight into the relatively new domain of firm-sponsored communities. Approaching the concluding remarks of this thesis, it serves to ask: What have we learned? How can we use this knowledge and take it further?

### **Luhmann, Star and Novell**

My first research question sought to investigate the nature of the firm (i.e. Novell) in relation to the external community. I have found that different understandings of this relationship are expressed by my informants. For example, within Novell's US-based marketing department, there is an assumption that the openSUSE community is an independent network of individuals that control the openSUSE project: "We don't own it. (...) So they [the community] kind of take the project in the direction they want to" (interview #5, 25.5.07). This description is not very accurate. A quick glance at the characteristics of software projects that are entirely community-managed (O'Mahony, 2007b) will reveal that the openSUSE project does not fit the case of an autonomous organization, largely because the external community has had no decision-making rights or way to directly influence the development of the product. A second view I have encountered of Novell's new organizational construction is to see the company and the community as entirely integrated; meaning that the external community is *part of* Novell and that Novell therefore is a "pure" open source company. In my analysis, I find that neither of these understandings above are true. I have found that Niklas Luhmann's theory of autopoietic social systems is precise at capturing the differences between Novell and the external openSUSE community, as it defines these two as different types of social systems; an organizational and an

interactive system. Luhmann's minimalist understanding of social systems as being based on communicative events is also helpful in identifying the boundaries of the active parts of the openSUSE community, which my informants otherwise find quite difficult to frame. To be part of this interactive system, no contracts are needed – only direct participation. This understanding fits the open source methodology well, and I therefore believe autopoietic systems theory is especially useful in this context. I also believe this analytical model can be generalized to the larger population of firm-sponsored communities, as they are likely to share similar characteristics as Novell and the openSUSE community in terms of dilemmas of decision-making and control. In addition, the emphasis on process in Luhmann's theory provides a historical dimension that I believe is important to capture; if a developer contributed a patch to openSUSE once several months ago without having participated since, he would probably not identify himself as part of the active community. However, this action is part of the systems history; it is a communicative event that has had an impact on later communications in the system and is thus part of what explains the current status of the system. To return to the answer of my first research question, I have found that the openSUSE community is distinguished as an interactive system from Novell's decision-network. The openSUSE community is not an organizational system in its own right, but has features that nevertheless make it a fairly stable system that has a boundary towards Novell in the development of the openSUSE distribution.

The second research question addressed the *connectivity* between these two systems: How can they, despite their conflicts and differences, manage to stay united around the development of the openSUSE distribution? I have emphasized the role of boundary objects, shared communications channels and marginal people in my response to this question. The insights from previous research on boundary objects show how such objects can be supportive of multiple, simultaneous translations of interests. This knowledge has been particularly useful for explaining how potential difficulties in the collaboration between the organizational and interactive system are overcome. The solution has not been to battle disagreements on opinions and values, but provide room for all of them to co-exist. If a developer does not "win" in a development-dispute, the openSUSE Build Service will allow him to take things in his own direction, rally support and prove the others wrong.

The objects are also important in explaining how the systems are "glued" together, at the same time as the objects maintain the distinction between the systems. The factory code base is the most prominent example of an object embodying this duality, as it receives focus and attention from all developers. It represents the latest developments and manifestation of decisions, yet at the same time it provides different access-levels to employees and external developers, thereby differentiating them. The strongest attraction exists in the openSUSE object, that unites the interests of all actors. It is a shared, collective object that has meaning for each group and each

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individual. In explaining how the systems are held together, I have also emphasized the importance of marginal people whom actively part-take in both of them and whom are the most vigorous users of the shared communication channels.

### **Exploring theory**

My third research question has directed me towards pushing the limits of the theoretical framework I have applied in this thesis, by trying to investigate what the data from my case may do for these theories. I will start off this theoretical summary by accounting for some of the unintended insights that I have stumbled over along the way of this research project. They have been useful for me and might be helpful for others as well. For one, it has been interesting to experiment with metaphors from the natural sciences, and I have found it useful to develop a terminology for describing the nature of organizational boundaries in terms of their level of *permeability*<sup>31</sup>. As more and more product development is following models of open innovation, such a vocabulary may come in handy in describing similar cases as the one of Novell. Second, I have found that using an iterative and dynamic research design that can be changed along the way, is not restricted only to qualitative methodology. The quantitative measures I initiated for this research project were spurred by the moment, and gave me new answers to further my qualitative research. With more time, I might have initiated other surveys or statistical investigations. I must note, however, that my quantitative escapades were quite small in stature, and may of course not be as easy to initiate in on a larger scale. But, I do believe that the evolution of information technology has made such measures easier to execute. Electronic survey-technology exists at most universities and more and more information is available for easy access to analyze on-line. I therefore think researchers have an opportunity to pursue these advantages further to create more dynamic quantitative research designs.

To address the theories that I have *intended* to explore, I will start by saying that not only has the case of Novell, in my opinion, done justice to Luhmann's and Star's theories by showing the value of their application, but the case has also brought some new and additional insights to these theories. First of all, Novell's case shows how well they (the theories) can work together. I mentioned earlier that I have failed to find elements in Luhmann's theory that adequately describe how social systems may be interrelated. I find that boundary objects are a promising supplement in this respect, and the case shows that these kinds of objects also may be situated between *systems*, as well as individuals and groups.

This thesis has aimed at exploring Star's objects in depth. At an early stage of the analysis I was mildly annoyed by the fact that this theoretical construction – which I found very useful – could

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<sup>31</sup> I extend my thanks to Lars Risan for this idea, and whom deserves credit for several discoveries formulated in this thesis.

not differentiate between the position and role of the objects held in the collaboration, which ultimately led to my distinction of supportive- and target-objects. I have argued that the latter hold a strong motivating power that provides an explanation to why collaborators come together in the first place and how they are held together at a higher level than the social mechanics of translating compatible interests. To illustrate this point, I have drawn upon Emile Durkheim's theory of organic solidarity to explain how social separation – that may seemingly appear as separation of social worlds – in fact is a separation *within* the same world, and that Durkheim's notion of collective symbols is important for explaining how this internally diverse world stays together despite the separation of its consistent parts. I have also appended our knowledge of epistemic objects to argue that these symbolic target-objects also have a functional purpose that provide further motivating qualities.

Although I have a list of theoretical features I have wanted to add to Star's boundary objects, I do not criticize her theory of being inconsistent. The boundary object concept does not aim to explain "why" people want to collaborate or how the collaboration comes into being. It only describes how they actually do it. However, I believe Star's theory should not settle with this lack of ambition, *because I do not find that the motivation for collaboration can be separated from the objects themselves*. Since the construction of target-objects is derived from the case in this thesis, it would be interesting to test its value in future research in other contexts. It would particularly be interesting to use this construction to research cases where multiple target-objects exist. Would they contribute to dividing the collaborators, by attracting followers to each of them, or would they work in unison at uniting them?

In developing the theory of boundary objects, Star pointed to Robert Parker's work on marginal people, which has also been very useful for this case. However, I have used this concept in a different sense than in Parker's original work. Another theoretical contribution from this thesis may therefore be the illustration of how marginal people may represent an abundance of *resources* in collaboration. While earlier research might have put more emphasis on the inherent dilemmas that people with dual identities might have – belonging everywhere yet nowhere – these people may prove to be extremely valuable when the two worlds they inhabit are attempted to be united. My research has shown some strategies they have applied towards the external environment. Further research on this area could focus on the role they play internally, as translators, advocates, mediators, diplomats or maybe as entrepreneurs. While marginal people is a notion attributed to people where rather permanent characteristics such as race create this identity, perhaps the concept of marginality may be used to represent more fleeting characteristics, and determine roles in collaboration that represent a property that may shift when individuals move between different contexts of collaboration. Again, this could be an interesting direction for more studies.

Returning to Luhmann, I believe the discussion in this thesis shows that it is possible to complement this theory successfully with elements drawn from other theorists' work. The theory of autopoietic social systems has several interesting features, yet it is also limited in its explanatory power on several areas. To name a couple, both the absence of people and normative rationality within Luhmann's systems can make the theory fall short on important areas. However, I do not claim that any theory could be combined with Luhmann's without scrutiny. It is certainly possible to criticize the attempt in this thesis to merge two theories, particularly because they come from quite different trains of thought. I nevertheless believe they complement each other successfully and may not even be as different as one might initially think. Star's theory of boundary objects springs from a position closely tied to Latour's actor-network theory, which in itself is a form of systems theory (Bakken & Hernes, 2003). In addition, they both operate at a meso-level of analysis, including both individual actions and events, and more structural macro-phenomena. I believe that further experiments with other constellations with Luhmann's theory by organizational theorists could provide interesting new insights.

### **Managing openness**

In summary, what can the analysis and discussion in this thesis tell us about the problem of managing the tension between openness and control between the sponsor firm and the sponsored community? The discussion shows that it is possible to maintain and develop both control and openness, as these properties are organized through two different kinds of autopoietic systems (the organizational and interactive system). Furthermore, these systems are linked through a boundary, or to be more precise, a set of boundary objects. The objects allow for control to be maintained while they also provide a great deal of freedom and opportunities for external development contributions. The general lesson we may learn from these insights is that the chances for success of the firm-sponsored community model are strengthened when: (1) activity and focus shifts from internal, naturalized object to boundary objects; (2) transparency from the sponsor firm is followed by encouraged participation from the sponsored community on shared channels; (3) the group of marginal people is continuously expanded from both sides – by encouraging employees to communicate externally and by increasingly including external developers in the organizational decision-network; and (4) every possible strategy that may make the common target-object an individual property of everyone is pursued, through mechanisms of contribution that supports shared ownership. The latter may unleash the target-object's power to motivate and draw collaborators tighter together.

Novell's transparent form of development – through using the open communication channels and encouraging input and discussion – has been very important for relieving some of the existing tension in the collaboration surrounding the openSUSE distribution. As I have shown in my discussion of Novell's future perspectives, the pressure may nevertheless build up over time if

the situation does not continue to evolve in a direction *towards more openness*. Novell are aware of this fact and are already taking measures to ensure that the arm (that is holding the community at arms-length) is “shrinking”. *Does this mean, then, that the firm-sponsored open source community-model must evolve towards more openness (and thus abandon control) to survive over time?* My data seem to indicate so, in this particular case. However, Novell’s clever maneuvering and their remarkable technical engineering of the Build Service technology shows that there are ways of devolving control in a “controlled” manner, meaning that the openness can be *managed* and that the risk is therefore minimized. Further research on the topic of firm-sponsored communities could therefore aim at investigating if it is possible to control openness, and whether this is the solution for managing communities such as these over time. If successful, this model may prove that facilitating open innovation – by drawing upon the best of both the commercial and open source software models – is possible.

## References

- Bakken, T., & Hernes, T. (2003). *Autopoietic organization theory: drawing on Niklas Luhmann's social systems perspective*. Oslo: Abstrakt.
- Barth, F. (1969). *Ethnic groups and boundaries: the social organization of culture difference*. Bergen: Universitetsforlaget.
- Bonaccorsi, A., Lorenzi, D., Merito, M., & Rossi, C. (2007). *Firms' Participation in Open Source Projects: Empirical Evidence and Research Agenda*: SSRN.
- Bowker, G. C., & Star, S. L. (1999). *Sorting things out: classification and its consequences*. Cambridge, Mass.: MIT Press.
- Brans, M., & Roszbach, S. (1997). The Autopoiesis of Administrative Systems: Niklas Luhmann on Public Administration and Public Policy. *Public Administration*, 75(3), 417-439.
- Brown, J. S., & Duguid, P. (1991). Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March (1991)*, 2(1), 40-57.
- Bryman, A. (1988). *Quantity and quality in social research*. London: Unwin Hyman.
- Callon, M. (1986). *Some elements of a sociology of translation: domestication of the scallops and fishermen of St. Brieuc Bay*. In Law, John (1986).
- Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization science*, 13(4), 442.
- Carlile, P. R. (2004). Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries. *Organization science*, 15(5), 555.
- Collins, R. (2004). *Interaction ritual chains*. Princeton, N.J.: Princeton University Press.
- Dahlander, L. (2004). *Appropriating the Commons: Firms in Open Source Software*. Gothenburg: Chalmers University of Technology.
- Dahlander, L., & Magnusson, M. G. (2005). Relationships between open source software companies and communities: Observations from Nordic firms. *Research Policy*, 34(4), 481-493.
- Demil, B., & Lecocq, X. (2006). Neither Market nor Hierarchy nor Network: The Emergence of Bazaar Governance. *Organization Studies*, 27(10), 1447-1466.
- Durkheim, É. (1965 [1912]). *The elementary forms of the religious life*. New York: The Free Press.
- Giddens, A. (1984). *The constitution of society: outline of the theory of structuration*. Cambridge: Polity Press.
- Glaser, B. G., & Strauss, A. L. (1968). *The discovery of grounded theory: strategies for qualitative research*. London: Weidenfeld and Nicolson.
- Groth, L. (1997). *Building organizations with information technology: opportunities and constraints in the search for new organizational forms*. Norges handelshøyskole, Bergen.
- Groth, L. (1999). *Future organizational design: the scope for the IT-based enterprise*. Chichester: Wiley.

- Hippel, E. v., & Krogh, G. v. (2003). Open Source Software and the "Private-Collective" Innovation Model: Issues for Organization Science. *Organization science*, 14(2), 209-223.
- Holter, H., & Kalleberg, R. (1996). *Kvalitative metoder i samfunnsforskning*. Oslo: Universitetsforl.
- Hughes, J. A., Martin, P. J., & Sharrock, W. W. (2003). *Understanding classical sociology: Marx, Weber, Durkheim*. London: Sage.
- Jönhill, J. I. (2003). *Communications with decisions as medium and form - some notes on Niklas Luhmann's theory of organization*. In Bakken and Hernes (2003): Chapter 2.
- Kirk, J., & Miller, M. L. (1986). *Reliability and validity in qualitative research*. Beverly Hills, Calif.: Sage Publications.
- Knorr Cetina, K. (1997). Sociality with Objects. Social Relations in Postsocial Knowledge Societies. *Theory, Culture and Society*, 14(4), 1-33.
- Knorr Cetina, K. (2001). *Objectual practice*: In Schatzki T, Knorr Cetina K, Savigny EV (eds) "The Practice Turn in Contemporary Theory". London; Routledge.
- Lamont, M. (2001). Culture and Identity. In Turner, J (2001): Chapter 9.
- Latour, B. (1988). *The pasteurization of France*. Cambridge, Mass.: Harvard University Press.
- Law, J., & Hassard, J. (1999). *Actor network theory and after*. Oxford: Blackwell.
- Lee, A. S., Liebenau, J., & DeGross, J. I. (1997). *Information systems and qualitative resarch: Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, 31st May-3rd June 1997 Philadelphia, Pennsylvania, USA*. London: Chapman & Hall.
- Lerner, J., & Tirole, J. (2002). Some Simple Economics of Open Source. *Journal of Industrial Economics*, 50, 197-234.
- Lin, Y. (2006). Hybrid innovation: The dynamics of collaboration between the FLOSS community and corporations. *Knowledge, Technology, and Policy*, 18(4), 86-100.
- Luhmann, N. (1988). *Organization*. In Bakken and Hernes (2003): Chapter 3.
- Luhmann, N. (2000). *Organisation und Entscheidung*. Wiesbaden: Westdeutscher Verlag.
- Mathur, P. (2005). Neither Cited nor Foundational: Niklas Luhmann's Ecological Communication; A Critical Exegesis and Some Theoretical Suggestions for the Future of a Field. *The Communication Review*, 8, 329-362.
- Mingers, J. (2003). *Observing organizations: An evaluation of Luhmann's organization theory*. In Bakken and Hernes (2003): Chapter 6.
- Mintzberg, H. (1983). *Structure in fives: designing effective organizations*. Englewood Cliffs, N.J.: Prentice-Hall.
- Mintzberg, H. (1989). *Mintzberg on management: inside our strange world of organizations*. New York: Free Press.
- Morner, M. (2003). *The emergence of open-source software projects: How to stabilize self-organizing processes in emergent systems*. In Bakken and Hernes (2003): Chapter 12.
- Nicolini, D., Mengis, J., & Swan, J. (2007). *Organizing scientific work through objects. A case from the field of bioengineering*. Paper presented at the Society for Social Studies of Science Annual Meeting.
- O'Mahony, S. (2003). Guarding the commons: how community managed software projects protect their work. *Research Policy*, 32(7), 1179-1198.
- O'Mahony, S. (2007a). *Sponsored Open Source Communities: a Vehicle for Open Innovation?* Paper presented at the European Academy of Management 2007.



- O'Mahony, S. (2007b). The governance of open source initiatives: what does it mean to be community managed? *Journal of Management and Governance*, 11(2), 139-150.
- Raymond, E. S. (2001). *The cathedral and the bazaar: musings on Linux and open source by an accidental revolutionary*. Beijing: O'Reilly.
- Rheinberger, H. J. (1997). Object Construction and Networks in Research Work: The Case of Research on Cellulose-Degrading Enzymes. *Philosophy of Science*, 64(Supplement. Proceedings of the 1996 Biennial Meetings of the Philosophy of Science Association. Part II: Symposia Papers), 245-S254.
- Ringdal, K. (2001). *Enhet og mangfold: samfunnsvitenskapelig forskning og kvantitativ metode*. Bergen: Fagbokforl.
- Risan, L. (Forthcoming). Selfing Debian and Othering Ubuntu – differences between Whitehead and ANT, and their consequences for how we understand free software. Oslo.
- Seale, C. (1999). *The quality of qualitative research*. London: Sage.
- Seidl, D. (2005a). *Organisational identity and self-transformation: an autopoietic perspective*. Aldershot: Ashgate.
- Seidl, D., & Becker, K. H. (2005b). *Niklas Luhmann and organization studies*. Malmö: Liber.
- Silverman, D. (2005). *Doing qualitative research: a practical handbook*. London: Sage.
- Stallman, R., & Gay, J. (2002). *Free software, free society: selected essays of Richard M. Stallman*. Boston, Mass.: GNU Press.
- Star, S. L., & Griesmer, J. R. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 19(3), 387-420.
- Strauss, A. L. (1978). A Social World Perspective. *Studies in Symbolic Interaction*, 1 119-128.
- Turner, J. H. (2001). *Handbook of sociological theory*. Dordrecht: Kluwer.
- Viskovatoff, A. (1999). Foundations of Niklas Luhmann's Theory of Social Systems. *Philosophy of the Social Sciences*, 29(4), 481-516.
- Weber, S. (2004). *The success of open source*. Cambridge, Mass.: Harvard University Press.
- Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.
- West, J. (2003). How open is open enough?: Melding proprietary and open source platform strategies. *Research Policy*, 32(7), 1259-1285.
- West, J., & Gallagher, S. (2004). *Key Challenges of Open Innovation: Lessons from Open Source Software*. Working paper: May 2004.
- West, J., & O'Mahony, S. (2005). *Contrasting Community Building in Sponsored and Community Founded Open Source Projects*. Paper presented at the System Sciences, 2005. HICSS '05. Proceedings of the 38th Annual Hawaii International Conference on.
- Williamson, O. E. (1987). *The economic institutions of capitalism: firms, markets, relational contracting*. New York: Free Press.
- Woodward, J. (1958). *Management and technology*. London.